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AN EXAMINATION OF EMPLOYMENT OUTCOMES FOR INDIVIDUALS WITH SPINAL CORD INJURY SERVED BY THE STATE VOCATIONAL REHABILITATION SERVICES PROGRAM BETWEEN 2004 AND 2008

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Barbara Schoen

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By

Barbara Schoen

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ABSTRACT

AN EXAMINATION OF EMPLOYMENT OUTCOMES FOR INDIVIDUALS WITH SPINAL CORD INJURY SERVED BY THE STATE VOCATIONAL REHABILITATION SERVICES PROGRAM BETWEEN 2004 AND 2008

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The purpose of this study was to gain an increased understanding of the demographic, service related and outcome variables that reflect characteristics of customers with a SCI who completed a plan and received services through the public rehabilitation system between 2004 and 2008. This study focuses directly on the 23,135 individuals with an SCI who closed in status 26 or 28 between 2004 and 2008. The analysis used RSA911 data and through the use of statistical methodologies including data mining techniques detected and examined variables suggested to be predictors of employment for this population of study.

The majority of study participants were male (65.0%). While on the surface this appears as an over representation of males the opposite is true as males represent over 80.0% of the population of individuals with SCI (NSCISC, 2009) but only 65.0% of study participants. Women had a slightly better employment outcome on average, with 51.8% of women employed at closure as compared to 49.8% of their male counterparts While White or Asian customers make up 71.1% of customers served, 74.5% achieved a positive employment outcome. Hispanic customers achieved a slightly higher than average outcome, representing 8.8% of customers served and 9.0% of customers with a positive employment outcome. The reverse is true for African American or Black and All

Other Race customers. African American or Black customers comprised 17% of customers and only 13.8% of those employed at closure and finally All Other Races represented 3% of customers and 2.7% of those employed.

Chi-square and exhaustive CHAID findings suggest the most significant predictors of employment were level of education attained at closure, cost of purchased services, days from application to closure, the delivery of rehabilitation technology and job placement assistance services and the use of supports at closure. While findings indicate a positive linear relationship between level of education and employment outcome additional study findings suggest that other variables are strong mediators as well. Regardless of education level other factors including cost of purchased services and the number of years from application to closure were found to impact employment outcome as well.

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As Peggy Tabor Millin said, "We never touch people so lightly that we do not leave a trace". There are many people in my life that have left great traces. First of course is my family and circle of friends who encouraged me when my courage waned. Drs. Denise Tate and Claire Kalpakjian who were instrumental in guiding me toward doctoral studies; and Cynthia Banton, Sandy Zawacki, Dawn Ybarra and many others at AllState who kept me in good hands so that I could pursue and achieve my goals. I thank you all.

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CHAPTER 1

Introduction

Background and Descriptive Epidemiology

Traumatic spinal cord injury (SCI) has been considered one of the most severe and devastating physical impairments (Basso, 2000; Inge, Wehman, Kregel, & Sherron-Target, 1996) as it significantly impacts socialization, employment and quality of life (Dijkers, 2005; Krause & Pickelsimer, 2008; North, 1999). There are several factors that may contribute to the severity of this disability such as the direct physiological and psychosocial implications of SCI, secondary conditions, a lack of direct services, and physical and attitudinal barriers (McKinley, Jackson, Cardenas & DeVivo, 1999; Meyers, Mitra, Walker, Wilber & Allen, 2000; Weaver, Guihan, Pape, Legro, LaVela & Collins, 2001; Wehman, Wilson, Parent, Sherron-Targett, & McKinley, 2000).

Approximately 12,000 individuals acquire and survive spinal cord injuries each year. An estimated 259,000 individuals with SCI currently live in the United States (National Spinal Cord Injury Statistical Center [NSCISC], 2009). According to recent statistics, the average age at injury is 40 with the majority being Caucasian (66.1%), male (80.9%), and most frequently injured as a result of a motor vehicle accidents (42.1%) or falls (26.7%) (NSCISC, 2009). While 57.5% are employed at the time of injury, only 11.5% are employed one year post injury with just over 35% employed 20 years later (NCSCISC, 2009). In addition, employment figures for individuals with SCI are consistently below the national employment average for all individuals with any disability (reported at 36.0% for 2007) (Meade, Armstrong, Barrett, Ellenbogen, & Jackson, 2006; U.S. Census Bureau, 2007). Several studies also suggest women and

individuals of color with SCI may face additional barriers to employment based on their minority status (Jackson, et al., 2006; Young, et al., 1994).

Employment for individuals with SCI is important for a number of reasons. First, employment has been reported to provide identity and impact self-esteem (Rice, Near, & Hunt, 1980; Waters & Moore, 2000). Second, employment can help to accommodate costs often associated with SCI including attendant care, medical supplies and assistive technology (Krause & Terza, 2006). Finally, researchers have suggested that individuals like those with SCI who experience a disparity in resources impacted by employment have an increased vulnerability for increased morbidity and premature death (Aday, 1994; Flaskerud & Winslow, 1998; Krause, DeVivo & Jackson, 2004).

Statement and Significance of the Problem

Spinal cord injury is categorized as a severe disability statistically associated with lower rates of employment and income (Basso, 2000; Meade, et al., 2006; Wehman et al., 2000). The culmination of these potential disparities creates an amplified risk that place individuals like those with SCI in a state of vulnerability. The vulnerable population model developed by Aday (1993) and Flaskerud and Winslow (1998) provides a framework to better understand the collective disparities and the detrimental interrelationships affecting at-risk populations including individuals with SCI. As reflected in Figure 1 this model identifies the core categories as resource availability, relative risk and health status. *Resource availability* refers to socioeconomic and environmental resources. *Relative risk* refers to the proportion of individuals with poor health who lack resources and are exposed to risk to those with resources and free from

risk. Finally, *health status* refers to the absence of disease including physical, mental and social well-being (Leight, 2003).

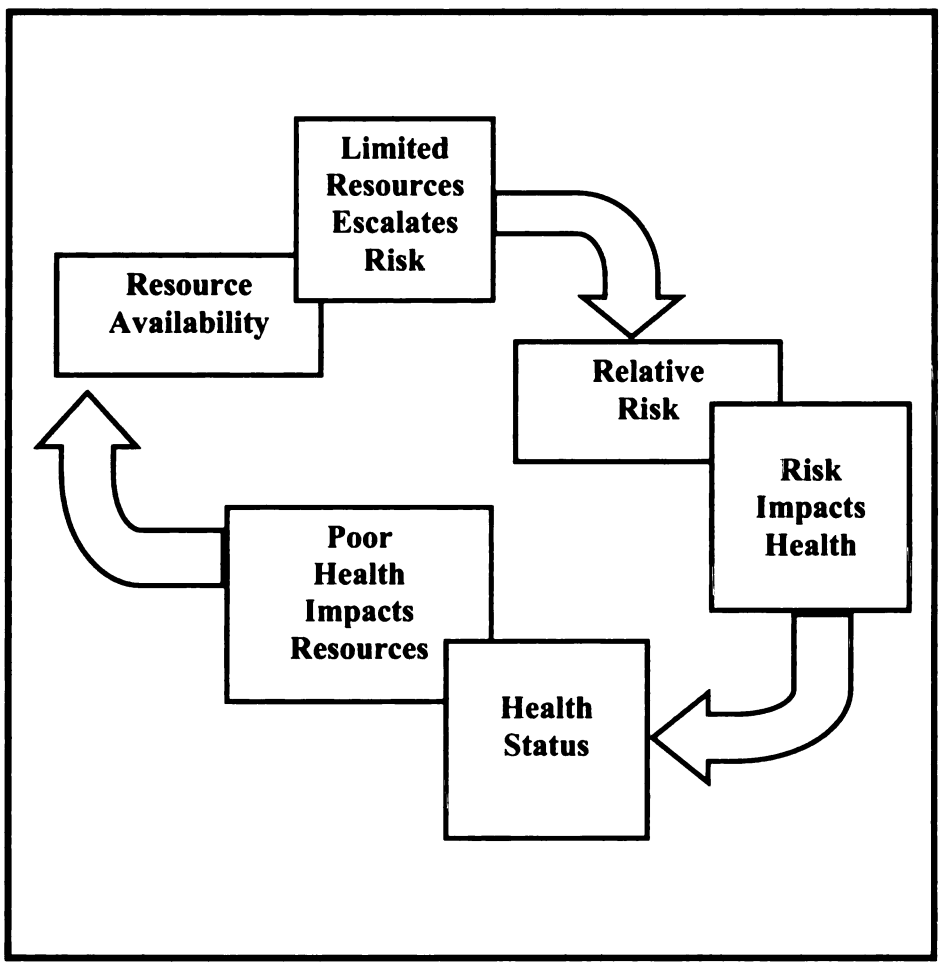

Figure 1. Vulnerable Population Model

This model illustrates a cycle of reciprocity that serves to increase the risk and vulnerability associated with disabilities such as SCI and amplifies the need to understand the relationship between customer demographics and vocational service delivery to determine the effectiveness of and improvement in employment outcomes for customers with SCI. The Rehabilitation Services Administration (RSA) is the federal organization

charged with the duty to serve individuals with disabilities (Leahy & Szymanski, 1995) through the provision of funds to state Vocational Rehabilitation (VR) agencies to afford employment-related services for individuals with disabilities (Rehabilitation Services Administration, n.d.).

Bruyere & Houtenville suggest that data such as the (RSA-911) data collected by state VR services can validate service needs and assess the resultant service impact (2006). In a review of existing research there has been increased attention on the disparities in employment experienced by individuals with SCI; however, there is a lack of research investigating whether improvements in outcomes are being experienced by individuals with SCI served by state VR agencies. A study by Krause & Pickelsimer (2008) examined factors impacting employability for 343 participants with spinal cord injury in 1998 and 2002. However, the population of study was recruited from Midwestern rehabilitation hospitals and a large specialty hospital in the Southeastern United States and did not directly focus on employment services from state VR's (Krause, et al., 2008). Another study examined employment outcomes for 10,901 persons with spinal cord injury who received services from state VR agencies however the study was limited to fiscal year 2001 (Marinia, Lee, Chan, Chapin, & Romero, 2008).

Gilmore, Schuster, Timmons, and Butterworth (2000) used RSA-911 data to perform a longitudinal analysis of trends in VR services from 1985 to 1995 but the population of study was people with mental retardation, cerebral palsy, and epilepsy. One final study used RSA-911 data to examine the effect of vocational rehabilitation services on employment outcomes but their population of study included three different disability groups (Dutta, Gervey, Chan, Chou & Ditchman, 2008). A review of literature to date

suggests that no studies have examined five year service delivery patterns for customers with SCI served by the Rehabilitation Services Administration. Understanding the ongoing effectiveness of supports received by individuals with SCI seeking employment may assist counselors and agencies in providing the most effective resources to maximize outcomes for customers with SCI.

Purpose of the Study

The purpose of this study was to gain an increased understanding of the demographic, services related and outcome variables that reflect characteristics of customers with a SCI who completed a plan (IPE or Individualized Plan for Employment) and received services through the public rehabilitation system between 2004 and 2008. The analysis used RSA911 data for 2004 through 2008 and through the use of statistical methodologies including data mining techniques detected and examined variables suggested to be predictors of employment for this population of study.

The research questions to be addressed in this proposed study are:

1. What are the characteristics of customers with SCI served by the VR system?
    a. Have the characteristics of customers with SCI served by the VR system changed over the five (5) year span?
2. Are there differences in outcomes (type of closure) based on characteristics for this population and have they changed over the five (5) year span?
3. What are the factors (characteristics and/or services?) associated with positive outcomes for customers with SCI?

a. Is there a recognizable pattern displaying an increase in the service provisions most often associated with positive outcomes for customers with SCI?

Definition of Terms

Competitive Employment- As specified by Technical Regulations Circular RSA-TAC-06-01 the definition to be used by State VR's in defining competitive employment is the 34 CFR 361.5(b) (11) description of "competitive employment" which defined work to mean:

"(i) In the competitive labor market that is performed on a full-time or part-time basis in an integrated setting; and (ii) For which an individual is compensated at or above the minimum wage, but not less than the customary wage and level of benefits paid by the employer for the same or similar work performed by individuals who are not disabled" (2005, p. 3).

Rehabilitation Services Administration (RSA): The State-Federal VR agency mandated by the Rehabilitation Act that oversees formula and discretionary grant programs that help individuals with physical, sensory or mental disabilities to obtain employment and live more independently through the provision of such supports as counseling, medical and psychological services, job training and other individualized services. RSA's major Title 1 grant program provides funds to state vocational rehabilitation (VR) agencies to provide employment-related services for individuals with disabilities, giving priority to individuals who are significantly disabled (RSA, n.d.).

Spinal Cord Injury (SCI): A disturbance of the spinal cord that results in loss of sensation and mobility (Palmer, Kriegsman, & Palmer; 2000). SCI is also defined as an

acute traumatic lesion of neural elements in the spinal canal that results in temporary or permanent sensory deficit motor deficit, and/or bladder dysfunction (Hedrick, Pape, Heinemann, Ruddell, & Reis; 2006).

CHAPTER 2

Review of the Literature

A spinal cord injury (SCI) is a multifaceted disability that requires a significant amount of supports and services and affects much more than an individual's mobility. To live well and barrier free often requires home modifications, accessible transportation, assistive technology and support from others. Many of these supports and services are expensive and may become obsolete or degrade over time creating an environment of continued need for financial funding. For almost a century many of those serving individuals with a disability have purported that employment is an effective method to insure an individual's self sufficiency.

This chapter presents a review of the literature on the return to work related needs and experiences of individuals with SCI. To gain a greater understanding of these needs and experiences, this chapter will specifically review literature related to: (a) factors associated with a spinal cord injury including the current demographic profile of individuals with SCI as well as the physiology of SCI and associated health care and accommodations needs (b) agencies charged with the duty to provide services to and/or study the needs of persons with SCI, (c) a comprehensive review of research investigating factors related to the employment of individuals with SCI, and (d) the need for further analysis of factors associated with the employability of individuals with SCI including an analysis of recent trends associated with the service and employment outcomes of those served through the State Vocational Rehabilitation System.

Demographic Profile of Individuals with SCI

The National Spinal Cord Injury Statistical Center (NSCISC) estimates that as of 2008 there are approximately 259,000 individuals with SCI living in the United States and of those, more than 80% are male (2009). The average age at the time of injury has recently shifted from 28 years of age in 1979 to 40 years of age in 2005 which may be attributed to many factors including a general increase in longevity and survival rates of older individuals at the scene of the accident (NSCISC, 2009). Also shifts in prevalence by race have occurred between 1979 and 2005; Caucasians decreased by 10% (66.1%) while African Americans nearly doubled (27.1%) and Hispanics saw an increase of 2% (8.1%) (NSCISC, 2009). These changes can partially be attributed to general shifts in population as census data from 1979 and 2008 indicates that aggregate population of whites decreased by almost 5% and African American or Blacks increased by nearly 2%. Changes in Hispanic and Asian populations cannot be determined because 1979 census data combined all other races (U.S. Census Bureau, 1979; U.S. Census Bureau, 2008).

According to the National Spinal Cord Injury Statistical Center (NSCISC) the occurrence of SCI due to motor vehicle crashes is fairly consistent and accounts for 42.1% of reported SCI cases (2009). The proportion of sports-related injuries has decreased over time while the proportion of injuries due to falls has increased (NSCISC, 2009). In 1980 acts of violence resulted in 13.3% of SCI injuries, a spike between 1990 and 1999 brought the level to 24.8% before declining to it current level (15.1%) since 2005 (NSCISC, 2009). The majority of individuals with SCI (87.1%) return to residential non-institutional homes with just under 6% discharged to nursing homes (NSCISC,

2009). Still shortened hospital stays and scarce resources result in many patients being discharged without adequate self-care training, durable medical equipment, home modifications and community services (Kelly, 2007).

Because a spinal cord injury impacts multiple systems including musculoskeletal, circulatory, respiratory and skin, there are significant health maintenance needs and increased risk for secondary conditions including pneumonia, deep venous thrombosis (DVT), pulmonary embolus, pressure ulcers, urinary tract infections, spasticity, autonomic dysreflexia, renal calculi and fractures (McKinley, et al., 1999; Meyers, et al., 2000). This is an area of particular concern as Flaskerud & Winslow (1998) suggest that morbidity may create an ongoing cycle of reciprocity that depletes the availability of resources and increases the risk of morbidity and mortality. Resources at risk include jobs, income and health insurance (Blane, Davey, Smith, & Bartley, 1993). A 1996-1997 Household Survey reported by Flaskerud and colleagues, (2002) found low-income families were more likely to report worsening access to health care.

Premature mortality is a serious concern for many with SCI. Individuals with tetraplegia or injury to the cervical section of the spine (e.g., neck) acquired at an early age (e.g., 20 years old) may die on average 20 years earlier than those without injury and seven years earlier than those with paraplegia (NSCISC, 2009). A study by Saunders and colleagues (2009) found that certain populations including African American or Blacks, persons younger than 25 or older than 64 years of age, and residents in a rural area were at higher odds for death. Two additional studies suggest a direct correlation between income and mortality. In an evaluation of data from the NSCISC, Krause, Devivo &

Jackson (2004) reported that economic self-sufficiency increased the percentage of normal life expectancy more than 13%. A second study found that participants with an income of at least $75,000, "were 4.5 times more likely to have survived over the 6-year period than participants whose annual income was $25,000 or less" (Krause & Terza, 2006, p. 4). Such findings are especially concerning as accommodations addressing mobility impairments are numerous and costly. Durable medical equipment for activities of daily living (ADL) generally include manual and/or power wheelchairs, shower chairs, bed lifts, home and vehicle modifications (Krause & Terza, 2006).

Berkowitz and colleagues (1998) reported that home modifications for people with SCI averaged $21,000 (in 1996 dollars) in modifications including constructing ramps (83%), widening doors (57%), and remodeling bathrooms (46%) or other rooms in the house (43%). Accessible and reliable transportation is another significant concern for individuals with SCI (Fletcher, Garasky, & Jensen, 2002). Lack of transportation was identified by Whiteneck and colleagues (2004) as a main barrier for individuals with SCI. In fact the employment rate for people who could drive and had a vehicle adapted for independent driving was 40%, compared with 12% for those who did not (Berkowitz, et al., 1998; Jang, Wang, Wang, 2005).

As noted, mobility limitations are significant, but they are only a part of a complex set of needs which signify SCI as a severe disability (Inge, et al., 1996). Injury to the spinal cord at any level most frequently impairs the functioning and emptying of the bladder and bowel; requiring medical and personal assistance for some (Wehman, et al., 2000; Hampton, 2004). Blackwell reported that approximately half of individuals with SCI require some type of personal assistance with daily care (2001). Average estimated

annual costs for attendant care exceeded $21,000 (in 1996 dollars) with over half (61%) being paid assistance and the remainder provided by family members or others without direct payment (Berkowitz, et. al., 1998). For an individual injured early in life (e.g. 25 years old) lifetime costs may exceed three million dollars excluding indirect costs such as losses in wages, associated benefits and productivity averaging $64,443 per year in December 2008 dollars (NSCICS, 2009).

The totality of these factors has a collective effect that serves to limit an individual's ability to obtain adequate resources, maximize health and locate and maintain employment. The vulnerable population model developed by Aday (1993), Flaskerud and Winslow (1998) provides a framework to better understand the collective disparities and the detrimental interrelationships affecting at-risk populations including individuals with SCI. As reflected earlier this model illustrates a cycle of reciprocity that serves to increase the risk and vulnerability associated with disabilities such as SCI (Figure 1). The first association in the model between resource availability and relative risk suggests limits in resources amplify relative risk, (e.g., exposure to risk factors). Socioeconomic and environmental resources significantly impact an individual's capacity to circumvent risks and reduce disease and its effect (Aday, 1993; Flaskerud & Winslow, 1998).

The model's second relationship outlines the impact of relative risk on health status. "Increased exposure to risk factors leads to increased morbidity and mortality in a population group. Morbidity and mortality may also impact exposure to risk factors" (Flaskerud & Winslow, 1998, p. 72). The final relationship in the model is between

health status and resource availability. From a community perspective morbidity and mortality has a collective effect that may feed back into resource availability and further deplete the availability of resources (Flaskerud & Winslow 1998). This explanation postulates that poor health status in turn diminishes socioeconomic and environmental resources social connectedness, employability and associated resources including health insurance (Blane, Davey, Smith, & Bartley, 1993).

This model further demonstrates the importance of a secure funding stream for individuals to live well with SCI. Since the establishment of the Smith Fess Act (P.L. 236, Civilian Vocational Rehabilitation Act) nearly a century ago society, government and business entities have understood the importance of employment for individuals with disability to maintain self sufficiency and an adequate quality of life (Rubin & Roessler, 2001). The rehabilitation philosophy is based on the "dignity and worth of all people" (Maki & Riggar, 1997, p. 5). Within the framework of this philosophy is the commitment to empower individuals with disabilities by providing them with integrated comprehensive services that foster independence, integration, employability and community and societal inclusion (Jenkins, Patterson & Szymanski, 1992). A twenty year longitudinal study by Crewe found that 84% of the study participants received and reported satisfaction with the employment and education support they had received through their state VR agencies (2000).

Addressing factors associated with employment is important for several reasons. In addition to affecting the individuals with disabilities, society at large is affected as well. Unemployment is associated with increased expenditures in unemployment

insurance, Supplemental Security Income (SSI) and Social Security Disability Income (SSDI). In December 2008, over 8.5 million people received Social Security disability benefits as disabled workers, disabled widow(er)s, or disabled adult children (SSA Publication No. 13-11826, 2009). In September 1999, there were nearly 4.9 million workers with disabilities receiving SSDI benefits and an additional 3.6 million working age adults were receiving SSI benefits, a combined total of 8.6 million SSI/SSDI beneficiaries according to Social Security Administration (2000).

Agencies Providing Services to Individuals with SCI

The National Institute of Disability and Rehabilitation and Research (NIDRR) funded through the National Institute of Health is a key organization charged with research and data collection for individuals with disabilities and has a further focus on the SCI population. Since 1985 they have overseen the Model Spinal Cord Injury Care System, currently administering 14 model systems throughout the country that are charged with supporting model projects aimed at establishing innovative projects for the delivery, demonstration and evaluation of comprehensive medical, vocational and other rehabilitation services to meet the wide range of needs of individuals with spinal cord injuries (http://www.naric.com/research/pd/type.cfm).

The Rehabilitation Services Administration (RSA) is the federal organization charged with the duty to serve individuals with disabilities (Leahy & Szymanski, 1995). Funds through the title I formula grant program are made available to state VR agencies to provide employment-related services for individuals with disabilities; priority is given

to individuals with significant disabilities (http://www.ed.gov/print/about/offices/list/osers/rsa/about.html).

The state VR's (as mandated by the Rehabilitation Act) collect customer demographic and service provision information annually. Systematic reporting of VR customers through the utilization of the Case Service Reporting System was put into practice and strengthened in response to Vocational Rehabilitation Act Amendments of 1954 and Regulations issued in 1966 (Walls, Misra & Majumder, 2002). The Rehabilitation Act facilitated the further enhancement of SRS-RSA-300 and required the collection and dissemination of periodic statistical data (Posavec & Carey, 1985) that reported on all phases of the rehabilitation process; "from first referral to final closure" (Walls, et al., 2002, p. 4). A new Case Service Report System (Form RSA-911) which replaced the earlier reporting system was approved in 1986 and has continued to change in response to new data reporting and researcher needs (Walls, et al., 2002). The data is compiled, customer identifiers are removed and a text file is made available for research (Wheaton & Kosciulek, 2004). Marinia and colleagues suggest that RSA-911 dataset available through the Rehabilitation Services Administration is one of a few options that, "afford rehabilitation researchers the opportunity to study a full range of predictors discussed in the SCI literature" (2008, p. 2). The raw data is accessible through RSA in Washington DC and can be converted into an SPSS file for analysis. Wheaton and Kosciulek published a paper with conversion guidelines to increase access to and use of the RSA-911 data (2004).

Research Investigating Factors Related To the Employment of Individuals with SCI

Findings from these national sources as well as more targeted studies have identified a number of factors that appear problematic for customers with SCI. These include physiological factors, psychosocial implications associated with adjustment to SCI, post-injury employment outcomes including factors associated with education, race, gender and disincentives. The need to better understand these components impacting return to work are vital as research indicates that while 57.5% are employed at the time of injury, only 11.5% are employed one year post injury with just over 35% employed 20 years later (NCSCISC, 2009). As suggested by Mariana and colleagues (2008, p.2) these numbers are "alarmingly low" when in 2007 approximately 79% of non-institutionalized, men and women, without a disability, aged 21 to 64 years, all races, regardless of ethnicity, with all education levels in the United States were employed (Bjelland, Erickson, & Lee, 2008).

Physiological Factors

Physiological components of SCI must be considered when examining post-injury employment as Berkowitz and colleagues reported a direct correlation between functional status and employment success for individuals with SCI with the likelihood of employment for those requiring assistance being less than half (18%) of their counterparts that did not require assistance (1998). Jang, et al., (2005) and Krause & Anson, (1996) also reported functional limitations as a major barrier to employment. These findings are further supported by Conroy and McKenna (1999) and Berkowitz, O'Leary & Kruse (1998) who reported that post-injury employment was correlated with injury severity.

Finally, a study by Smith (2007) investigating unemployment across disability type found that needing help with personal care, particularly routine needs, was more predictive of unemployment than any one condition suggesting that loss of function (fundamental in SCI) is a strong barrier to employment. Kelly recently reported that post injury medical and functional outcomes for individuals with a violently acquired SCI were poorer than individuals who injuries were acquired in alternative ways (2007). This has direct implications for minority populations as Burnett and colleagues (2002) reported that violence is the primary cause for SCI in minority patients served by the model system.

Research suggests perceived health limitations may serve as a barrier to employment as well (Krause & Pickelsimer, 2008; Hampton, 2004). Learning about and adjusting to alternative methods of mobility, proper bowel and bladder and skin care and grooming are important factors to be addressed (Kelly, 2007; Krause & Terza, 2006). As a result early perceived and actual health limits should be assessed and addressed before counselors initiate employment related counseling processes (Krause & Pickelsimer, 2008).

Psychosocial Implications

Addressing the aforementioned physiological needs of living well with SCI is important for maintaining health; however there are additional factors that must be addressed as well. Wehman reported that, "One of the major issues facing persons with spinal cord injury (SCI) after rehabilitation is the adjustment to a different quality-of-life" (2000, p. 162). Wehman defined that quality-of-life was associated with "meeting individual needs, controlling one's environment, and having the opportunity to make

choices" (2000, p. 163). While psychosocial adjustment to SCI varies by the individual, research indicates that it a time-intensive process occurring over years rather than days or months (Devivo & Richards; 1992; Wehman, et al., 2000). Because SCI significantly impairs the functionality of major body systems, it has been suggested that an individual may go through a grieving and adjustment process which may include the five stages of grief proposed by Kubler-Ross (1969) which includes denial, anger, bargaining, depression and acceptance.

Though some individuals may pass through all five stages of grief, it should not be considered a mandatory process for adjustment. Early studies by Lawson (1976) and Howell, Fullerton, Harvey, and Klein (1981) failed to demonstrate a direct correlation with depression following SCI. While adjustment to disability eventually occurs for most individuals over time, research has shown that adjustment is a unique process that occurs on an individual continuum (Wehman, et al., 2000; Wortman & Silver, 1989). Several studies suggest that psychological adjustment counseling was found to relate positively to employment outcomes (Marini, et al., 2008; Meade, et. al., 2004).

Hampton (2004) found factors that promote quality of life or a sense of well being included perceived social support and self-efficacy. Hampton's findings for social support were further validated by Krause & Terza (2006) who found that social support or "community inclusion" was positively correlated with post injury quality of life and Kelly (2007) suggested that individuals with SCI particularly those with a violence associated SCI should work to enhance their understanding of community resources. Kelly also reported that an individual's "coping self-efficacy" is an important factor for recovery as well (2007). Finally, a number of studies have found that employment is an

essential component of post injury quality of life (Chapin & Kewman, 2001; Kelly, 2007; Kemp & Vash, 1971; Krause & Anson, 1996).

Factors Impacting Post-Injury Employment Outcomes

As previously evidenced, employment is important for socioeconomic as well as psychosocial reasons yet a significant body of research has consistently reported low employment rates among people with SCI ranging from 13% to 69% (Krause & Pickelsimer, 2008). It has been reported "Society often defines us by our earning power, the type of work that we do, the regularity with which we are employed, the type of environment that we work in, and our long-term work potential; America is a capitalist society, a country that expects people to be productive in work" (Yasuda, Wehman, Target, Cifu. & West, 2002, p. 177).

Still individuals with SCI identified many factors for not working; Targett, Wilson, Wehman, & McKinley (1998) reported these include "a physical inability to perform the same type of work postinjury (60%); poor health, stamina, or endurance (28%); loss of benefits (28%); not feeling physically capable of working (27%); inaccessibility of the workplace (23%); and lack of transportation. Studies indicate those individuals successful in returning to work or finding new employment were most commonly successful in white collar positions as opposed to blue collar jobs or those in the service industry (Berkowitz, et. al, 1998; Meade et al., 2004).

White collar positions are more likely to provide health benefits, flexibility in work schedules, accessible workspace and salaries that can help offset transportation costs (Anderson & Vogel, 2002; Krause, 1992). A substantial body of research suggests that factors that impact post-injury employment are further affected by demographic factors

that include education, race, gender and time since injury as well as disincentives; these factors will be examined next.

Education

Level of education was found to have a significant impact on a number of factors associated with return to work. In a study by Krause (1992) 70% of individuals with SCI with a college education were employed as opposed to only 6% of those with less than a high school education. In 1998, Berkowitz and colleagues reported similar findings; over 75% of those with a master's degree and close to 55% of those with a bachelor's degree were employed after SCI. This same report stated less than 15% of those with high school diplomas were employed (Berkowitz, et. al., 1998). The more education a person with SCI has at the time of injury, the more their employment options generally increase as well (Anderson, et. al., 2002).

Race

Racial inequities in the VR systems have been an ongoing concern. A review by Atkins and Wright in the eighties addressed factors in service disparities from acceptance to closure (1980). Herbert and Martinez (1992) provided similar findings that European Americans had a higher VR acceptance rate and that African Americans and Hispanics were more likely to be found ineligible for VR services than were other minority groups. A significant body of research indicates that race is correlated with employment success (Hess, Ripley, McKinley, & Tewksbury, 2000; DeVivo, & Richards, 1992; Krause, Kewman, DeVivo, et al., 1999; Meade, 2004; Krause, Sternberg, Maides, & Lottes, 1998; Young, et al., 1994) of which many suggest European Americans more likely to become employed than minorities (Yasuda et al., 2002). Still others have found opposite findings

(Bellini, 2003; Giesen, Cavenaugh, & Sansing, 2004; Wilson, Alston, Harley & Mitchell, 2002).

Research supporting service limitations for minorities are examined first. A recent study by Meade and colleagues who directly examined employment and race for persons with SCI by comparing their pre and post injury employment patterns against general population statistics (2004). Racial disparities which mirrored the general population were found at 1, 5, 10, 15, and 20 years after SCI. The type of job held was generally similar as well (Meade, et al, 2004). This study also found that African Americans generally did poorer post injury than their white counterparts with "lower economic self-sufficiency scores, regardless of employment status, and lower social integration scores among those who were not employed" (Meade, et al., 2004, p 1782).

Direct findings from this same study include lower employment rates (50% vs. 73%) and higher rates of unemployment (37% vs. 11%) for African Americans (Meade, et al., 2004). When compared with their white counterparts, four percent fewer African Americans were students (4% vs. 10%) and those employed were more likely to be working in less skilled, lower-paying jobs (Meade, et al., 2004). The study also suggested a decreased potential for future employment for African Americans evidenced by a growing gap in student status between employment and education (Meade, et al., 2004). An earlier study found minority participants were 2.8 times less likely to be gainfully employed than their white counterparts (Krause, Sternberg, Maides, & Lottes, 1998). Minority participants also reported a higher occurrence of inability to return to their previous occupation (Krause & Anson, 1996).

Rubin & Roessler acknowledged that minority populations have been traditionally underserved but suggest attempts for change are being made (2001). Section 107 of the 1992 amendment of the rehabilitation act of 1978 required annual reviews and monitoring of established standards and measures with increased accountability (P.L. 102-569) and included factors associated with minority outreach. In the last decade studies which support equitable and increased services to minorities exist. Wilson and colleagues (2002) used binary logistic regression to examine the relationship between vocational rehabilitation (VR) acceptance and race, gender, education, work status at application, and primary source of support at application. When other variables were controlled in the study African Americans were over two times more likely to be accepted for VR services. A study by Bellini (2003) indicated that some improvements have been made in the vocational training rates that favored people of color as well as costs for service. Finally, a study of access of the state-federal vocational rehabilitation (VR) system, Giesen, Cavenaugh, & Sansing (2004) found that access percentages were higher for African Americans, lower for Whites and about the same for Hispanic Americans. Finally, it is important to recognize that demographic characteristics do not occur in isolation and factors in addition to race (e.g., level of education) may be impacting employability.

Gender

The research on women with SCI reflects mixed findings. A significant body of research suggests that women are less likely to be competitively employed than their male counterparts. Young and colleagues reported that men were 50% more likely to be employed (1994). Another study reported that women who were competitively employed

generally worked fewer hours than their male counterparts (Krause, et al., 1999). A final study by James, Devivo & Richards reported an increased likelihood for Caucasian men to be competitively employed (1993). However, other studies have shown women to achieve better outcomes than their male counterparts (Krause & Anson, 1996). Researchers suggest that there are a number of interacting variables that influence outcome by gender (e.g., education, type of work, age and level of injury) (Anderson, Dumont, Azzariaa, Le Bourdaisc, & Noreau, 2007; Marini, 2008).

Assistive Technology

As suggested by the World Health Organization (2001) disability is the relationship between impairments and the environment. Several studies suggest assistive technology (AT) may be used to improve an individual's functionality by overcoming barriers and improving independence (Dittuno, Stover, Freed & Ahn, 1992; Scherer & Cushman, 2001; Smith, 1996). The improvement in functionality provided by AT has been reported to increase socialization, integration and employment opportunities (Heinemann & Pape, 2002; National Council on Disability, 2005; Pape, Kim, & Weiner, 2002). Looking directly at individuals with SCI, a study by Hedrick and colleagues indicated that assistive technology ownership and use impacted employment success (2006) with a positive correlation between AT use frequency and disability severity potentially suggesting that the use of AT can compensate functional limitations. Those AT instruments of occupational significance were 3.5 times more costly than other devices suggesting the need for cost sponsorship (Hedrick, et al., 2006). Finally, for the analysis of VR customers it is important to recognize that other AT funders and providers

may have independently provided services so the 911 data may not fully reflect a customer's utilization of adaptive devices.

Research Investigating Factors Related To the Employment of Individuals with SCI

While legislative initiatives such as the Americans with Disabilities Act (ADA: PL 101-336) were enacted to assist individuals with disabilities into the workforce, nearly twenty years later substantial work is still left to be done (Yasuda, 2002). Such persistent disparities in employment suggest the potential for modification or reconsideration of traditional interventions to promote effective rehabilitation services and social reintegration (Meade, et. al, 2004).

Recently researchers in the field of rehabilitation studies have begun using data mining technologies including classification trees as a method for investigating the impact of intake, process and outcome variables on the of employability of VR customers (Kosciulek, 2004; Marinia, Lee, Chan, Chapin, & Romero, 2008; Rosenthal, Dalton, & Gervey, 2007). Because classification trees are used to predict the membership of cases into a categorical criterion variable (e.g., employment outcome) from their measurement on a predictor variable (e.g., level of education) as well as segment large groups of people into homogeneous subgroups they are well suited for use with the 911 data (Kosciulek, 2004; Rosenthal. et. al., 2007).

Rosenthal and colleagues (2007) used a data mining approach to examine the vocational outcomes of individuals with psychiatric disabilities who received state VR services in FY 2001. Their study found that job placement services were the most significant predictor of employment. SSI/SSDI was found to be a disincentive. Race and

transportation services appeared to impact employability as well. While an earlier study (Bolton et. al., 2000) reported that job placement services were a key predictor of employment only 33.3% of customers in Rosenthal's study had received this service (2007).

In a separate study Marini and colleagues (2008) used a data mining approach to examine VR service patterns related to successful competitive employment outcomes of persons with SCI. This study also examined customers served in 2001 and found job placement services and work disincentives were key factors in employability as well. Case expenditures (cost of goods and purchased services) were also noted as important as clients receiving above average expenditures had a higher probability for employment.

The purpose of this study is to expand on the research by Marini & colleagues examining the effect of demographic variables and rehabilitation services on employment outcomes of persons with SCI with cases closed by state vocational rehabilitation agency settings. This study will expand on the earlier study by examining customers served between 2004 and 2008. Aggregate and five year patterns to investigate factors associated with improvements or changes in customer employment outcomes will be examined.

CHAPTER 3

Methodology

This study examined characteristics of customers with SCI with cases closed by state vocational rehabilitations (VR) services administered through the Rehabilitation Service Administration (RSA) from fiscal year (FY) 2004 through (FY) 2008. Most directly this study investigated the relationships among customer characteristics, service delivery patterns and vocational rehabilitation outcomes to explore potential barriers to or predictors of employment success. This section describes a) the data source used in the study, b) study design with associated statistical analyses, c) the characteristics of the participants (customers with SCI who received services), d) research questions and e) the variables associated with the customer, services and outcomes.

Data Source

The Rehabilitation Service Administration (RSA) provides vocational rehabilitation services at a state level to individuals with disability and collects customer data on all VR case closures during a fiscal year (Dutta, et al., 2008). The requirements for reporting were expanded in accordance with Rehabilitation Act of 1973 (Koch & Merz, 1995) and consists of extensive information collected at intake, during services, and at closure and includes demographics, type of public support at intake, types of VR services received, and type of closure. The Case Service Report (RSA-911), which is periodically revised, is the document that specifies the data collection and reporting criterion (Schwanke & Smith 2005) and as such promotes long term program accountability (Walls, et al., 2002). This structure is important as it provides the

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framework for the "assessment of service needs, patterns of use, program outcomes, and efficiency of services offered" (Walls, et al., 2002, p.4).

The RSA-911 reporting process provides a means for understanding customers and factors associated with intake, process and outcome. A consolidation and comparison of several years of data specifically analyzing the dynamics of factors associated with outcomes could provide significant guidance for needs assessment, program planning, program evaluation, and policy development activities. Walls and Tseng (2004) further stressed the need to examine multiple outcome related measures to further illustrate and understand customer achievements. To address this need for the population of individuals with SCI this study examined factors including five year patterns related to customer characteristics, types of services received as well as closure related items. Data used in this study was acquired through the Rehabilitation Services Administration within the United States Department of Education Office of Special Education and Rehabilitative Services.

Study Design

An ex post facto design was used as this type of design is consistently used to perform impact analysis on existing data such as the Rehabilitation Services Administration RSA-911 data and is useful in establishing a relationship between variables. This study's design utilizing RSA 911 data fits Kerlinger's (1986) ex post facto design definition as it employs independent variables that have already occurred and starts with the observation of a dependent variable. In this study all independent variables will not be manipulated (as they have already occurred) and the rehabilitation outcome was not randomly selected. In addition, because ex-post facto design is used to

understand the relationship or effect between variables (e.g., variable A on variable B) this design meets the parameters for this proposed study (Ary, Cheser, Razavieh, & Sorensen, 2009).

Participants

This study focuses directly on individuals with an SCI who achieved an employment outcome (status 26) or had services initiated but were not employed (status 28) between 2004 and 2008. The use of five years of customer records is important for two main reasons. First it provides a data set with a larger sample size to allow for statistically significant analyses of variables not possible with a one year sample. Second it provides for an analysis of patterns or differences including changes in customer, service or outcome related factors.

To understand patterns of differences in the population of customers with SCI an extensive subset of variables used by RSA to collect customer data were included in this analysis. The criterion for the collection and coding of each variable is specified in RSA's Case Service Report (RSA 911). This report is updated periodically to meet RSA's collection and reporting demands. The definitions and specifications for variables used in this analysis is specified Case Service Report (RSA-911) PD-06-01 which was approved for use through 2008. An overview of the variables used in this study are summarized in this chapter. The record layout, a more detailed description of all data elements (variables) collected per customer, with unique identifiers, is provided in Appendix B.

Variables

Variable or data elements in the Case Service Report (RSA 911) are grouped into 43 categories some of which break down into subsets. For example Data Element 32; Type of Public Support at Closure includes Social Security Disability Income, Worker's Compensation and General Assistance. A total of 70 variables were used for this analysis. Data elements were organized into three major categories; customer characteristics at application (intake), services received (process) and closure related (outcome) factors.

Dependent Variables

The dependent variable in this analysis was employment status at closure; only customers who closed with a status 26 or 28 were included in this study. Both status 26 and 28 customers completed a plan and received services. Only status 26 customers closed with an employment outcome.

Independent Variables

The remaining variables were used in cross tabulations and classification tree as predictor variables to better understand the relationship between customer input, service and outcome variables. All variables used in this study are summarized below and described in more detail in Appendix A.

Table 1

Customer Intake, Service and Outcome Variables

Customer Characteristics at Application (Intake) Variables	
Variable Name	Variable Name
Age @ Application Categories	Private Ins Through Other Mans at Application
Categories for number of days from application to eligibility	Private Insurance Through own Employment at Application
Categories for Hours Worked at Application	Public Insurance from Other Sources at Application
Category for Hourly Wage at Application	Race
Employment Status at Application	Races (Collapsed)
Gender	Social Security Disability Insurance (SSDI)
General Assistance (State or local government)	Supplemental Security Income (SSI) for the Aged, Blind or Disabled
Individualized Education Program	Type of Closure (Status 26 or 28)
Level of Education Attained at Application	Temporary Assistance for Needy Families (TANF)
Medicaid Ins Coverage at Application	Veterans' Disability Benefits
Medicare Ins Coverage at Application	Weekly Earnings at Application
Number of service types received?	Workers' Compensation
Number of supports at application	Year of Service

(table continues)

Table 1 (*continued*).

Service/Cost Related (Process) Variables	
Variable Name	Variable Name
Assessment Services Received	Miscellaneous Training Services Received
Augmentative Skills Training Services Received	Occupational/Vocational Training Services Received
Basic Remedial or Literacy Services Received	On-the-job Supports Services Received
Categories for Cost of Goods and Purchased Services	On-the-job Training Received
College or University Training Services Received	Other Services Received
Diagnosis and Treatment Services Received	Personal Attendant Services Received
Information and Referral Services Received	Reader Services Received
Interpreter Services Received	Rehabilitation Technology Services Received
Job Placement Assistance Services Received	Technical Assistance Services Received
Job Readiness Training Services Received	Transportation Services Received
Job Search Assistance Services Received	Voc Rehab Counseling and Guidance Services Received
Maintenance Services Received	

(table continues)

Table 1 (*continued*).

Closure Related (Outcome) Variables	
Variable Name	Variable Name
Categories for # of days from application to closure	Previous Closure
Categories for Hours Worked at Closure	Primary Source of Support at Closure
Categories for Weekly Earnings at Closure	Private Ins Coverage Through Other Means at Closure
Category for Hourly Wage at Closure	Private Ins Coverage Through own Employment at Closure
Employment Status at Closure	Public Insurance from Other Sources at Closure
General Assistance (State or local government)	Social Security Disability Insurance (SSDI)
Medicaid Ins Coverage at Closure	Social Security Insurance (SSI)
Medicare Ins Coverage at Closure	Temporary Assistance for Needy Families (TANF)
Level of Education Attained at Closure	Veterans' Disability Benefits
Number of supports at closure	Workers' Compensation
Other Public Support	Employment Outcome (Status 26 or 28)

Data Analysis

For this study, univariate measures (descriptive statistics) were used to identify frequencies and percentages of the composition of customers with SCI on an aggregate basis and for each fiscal year. Cross tabulations and chi-square analyses were used to assess differences associated with inputs, service and outcome variables in relation to employment outcome and fiscal years of service. Chi-square test for independence was used because of its appropriateness in analyzing the relationship between categorical

variables such as gender and race/ethnicity (Bellini & Rumrill, 1999; Gravetter & Wallnau, 2000; Pallant, 2001). For all statistical tests the alpha level was set at .05; a Bonferroni correction was received to correct for the number of statistical tests within each predictor. PASW Statistics 18 Release 18.0.0 with the PASW Decision Trees add-on was used for this analysis. Any missing data was automatically omitted by the data analysis software. Variables with missing cases affected only a small percentage of responses, so collectively a large portion of the data was retained and should not have reduced statistical power (Saunders et al., 2006). Decision tree analysis was used to further explore the factors (characteristics and/or services) that had a statistically significant association with 26 and 28 status outcomes based on chi-square analyses.

As suggested by Kosciulek, decision tree analysis was used in this study to augment and not replace more traditional methods of analysis (2004). While the variables selected for the decision tree analysis were chosen because of their statistically significant association with 26 and 28 status outcomes several variables were omitted because of their multi-collinearity (e.g., variables indicative of employment). Variables included and excluded from the data mining process are identified in Chapter 4.

CHAPTER FOUR

Results

The purpose of this study was to gain an increased understanding of customers with spinal cord injury served by the Rehabilitation Services Administration between fiscal years (FYs) 2004 and 2008. Research questions that guided the study were:

1. What are the characteristics of customers with SCI served by the VR system?
    a. Have the characteristics of customers with SCI served by the VR system changed over the five (5) year span?
2. Are there differences in outcomes (type of closure) based on characteristics for this population and have they changed over the five (5) year span?
3. What are the factors (characteristics and/or services?) associated with positive outcomes for customers with SCI?
    a. Is there a recognizable pattern displaying an increase in the service provisions most often associated with positive outcomes for customers with SCI?

Population of Study and Summary of Customers Served

The population of interest for this study were individuals with spinal cord injury (SCI) who received services and had cases closed by the state-federal public vocational rehabilitation system. Participants were drawn from the Rehabilitation Services Administration reporting system (RSA-911 database) for FYs 2004 through 2008. This database is annually collected by RSA and is publicly available. The RSA911 data is suitable to examine relationships among input and process variables and outcomes of VR customers. This database provides demographic, service related and outcome variables

that reflect characteristics of consumers and services of the public rehabilitation system. The sample of interest for this study was customers with a SCI who completed a plan (IPE or Individualized Plan for Employment) and received services. The dependent variable for this study was closure status. Status 26 indicates the customer closed with an employment outcome and status 28 indicates that the customer closed without an employment outcome

A total of 3,106,310 individuals had cases closed between 2004 and 2008. Of this population 34,262 (0.011%) reported SCI as their primary or secondary cause of disability. This study focuses directly on the 23,135 individuals with an SCI who closed in status 26 or 28 between 2004 and 2008. This group of 23,135 represents 0.013% of all public VR customers (N=1,768,686) who were closed in status 26 or 28 in this timeframe. As reflected in Table 2, customers with SCI are less likely to achieve an employment outcome than the aggregate group of VR customers (without SCI); 50.4% of those with SCI achieved an employment outcome as opposed to 57.9% of the people with all other disabilities combined exiting with status a 26 or 28.

Table 2

Descriptive Statistics for Type of Closure by Group

	No-SCI		SCI	
Type of Closure	*N*	%	*N*	%
Employed	1,024,726	57.9	11,660	50.4
Services initiated, not employed	743,960	42.1	11,475	49.6
Total	1,768,686	100.0	23,135	100.0

The use of five years of customer records is important for two main reasons. First it provides a data set (N = 23,135) with a larger sample size to provide a more reasonable chance of detecting a significant association between the variables being investigated. Second it provides for an analysis of patterns or differences including changes in customer, service or outcome related factors over time.

Research Question One

This first question examined the characteristics, service and outcome variables of customers with SCI served by the VR system. Findings are illustrated in tables with a narrative summary of distinctive findings

Customer Characteristics at Application

This first analysis of the study examined customer characteristics at application (Table 3). In terms of gender, the majority of customers with SCI or 65% were male. While this expanded database allowed for higher numbers in many categories, many race/ethnicity categories were too small for valid assessment of statistical significance. In order to address this issue, Asian customers were combined with Whites because of similarity in education levels and employment outcomes. African American became the second race/ethnicity category, Hispanic customers became the third category and Native American, Mixed Races and Pacific Islanders were collapsed into an All Other Races category.

The 40 through 49 was the most common age bracket (28.3%) followed by those between 30 through 39 (25.6%) years of age. The next most commonly represented groups were 21 years of age and under which comprised 15.1% of the sample and ages 22-29 which comprised 14.9%. Individuals aged 50-59 represented 13.4% of all

individuals with SCI injury who were served and individuals 60 and over represented only 2.7%. The majority of customers served (81.4 %) had no previous closure in the past 36 months and less than seven percent (6.1%) had an Individualized Education Program (IEP), indicating that they received services in accordance with provisions of the Individuals with Disabilities Education Act (RSA Policy Directive, 2008).

Table 3

Customer Characteristics at Application

	N	%
Gender		
Male	15,032	65.0
Female	8,103	35.0
Race/Ethnicity Collapsed		
White/Asian	16,453	71.1
African American or Black	3,941	17.0
Hispanic	697	8.8
All Other Races	2,035	3.0
Age at Application		
Up to age 21	3,502	15.1
22 to 29	3,446	14.9
30 to 39	5,920	25.6
40 to 49	6,552	28.3
50 to 59	3,092	13.4
60 to 64	407	1.8
Over 64	216	0.9
Previous Closure		
None in past 36 mos.	18,831	81.4
Customer had a previous closure	4,304	18.6
IEP		
Yes	1,412	6.1
No	21,723	93.9

Education and Employment Related Characteristics at Application

Table 4 summarizes customers' education and employment characteristics at application. Slightly less than 20% of customers (N = 4,430; 19.2%) reported having less than a high school degree equivalency, just over 40% reported high school graduate equivalency, and another 40% reported at least some post secondary education at the time of application for VR services. Employment status at application includes customers who are currently employed in a variety of settings as well as students, interns, trainees and customers who are unemployed. For this study customers considered to be employed at application include customers employed with or without supports, homemakers and individuals who are self employed (n= 3986).

Of those customers employed and reporting employment wages (N=3,807) nearly 40% (38.5%) reported hourly earnings of less than $8.50. Another 41.6% of those reporting wages had earnings between $8.50 and $17.49 and the remaining customers (19.9%) earned an hourly wage of $17.50 or above. The largest proportion of the customers who were employed at application reported they worked 36-40 hours per week (44.5% or 1,771). An additional 2.7% reported working 41 or more hours per week. In contrast, 7.7% worked 10 hours or less per week.

Table 4

Education and Employment-Related Characteristics of Customers at Application

	N	%
Level of Education		
No formal schooling	40	0.2
Elementary, grades 1-8	594	2.6
Secondary, no diploma	3,548	15.3
Special education completion	248	1.1
High school graduate equiv	9,444	40.8
Post secondary, no degree	4,214	18.2
Associate deg or voc tech	2,347	10.1
Bachelor	1,950	8.4
Masters degree or higher	750	3.2
Employment Status		
Integrated setting, no supports	3,401	14.7
Extended employment	27	0.1
Self employed	213	0.9
Homemaker	180	0.8
Unpaid Family Worker	35	0.2
Employment w/Supports	192	0.8
Not Employed Secondary Student	944	4.1
Not Employed Other Student	1,020	4.4
Not Employed: Trainee, Intern or Volunteer	72	0.3
Not Employed: Other	17,051	73.7
Hourly Wage (n = 3,807)		
Up to $6.49	739	19.4
$6.50 to $8.49	726	19.1
$8.50 to $11.49	818	21.5
$11.50 to $17.49	765	20.1
Over $17.50	759	19.9
Hours Worked (n=3,983)		
0	179	4.5
1-10	308	7.7
11-20	891	22.4
21-35	725	18.2
36-40	1,771	44.5
41 or more	109	2.7

Supports at Application

The RSA 911 data includes information about customers' self-reported primary source of financial support as well as the public support benefits the customer was receiving at the time they applied for services; these are examined next (Table 5). A total of 23,091 participants identified a primary source of support at the time of application. These included public support (40.7%), followed by family and friends (34.2%) and personal income (15.0%). All other sources represented the remaining 10.2%. For those receiving public support benefits at application, over a quarter received SSDI (27.4%; *N* = 6,326), almost 20% received SSI (19.8%; *N* = 4,574), just under 10% reported receiving Other Public Support at Application (7.9% *N* =1,821). Fewer than 5% received Worker's Compensation (4.5%; *N* = 1,046) and less than 3% received TANF (2.1%; *N* = 490), General Assistance (2.3%; *N* = 538) and Veteran's Disability (0.8%; *N* = 176). A review of the number of supports at application indicated almost 45% of applicants used no supports (44.3%). The majority (47.3%) used one support and fewer than 10% used two or more supports at application (8.3%).

Medical Insurance Coverage at Application

Fewer than 30% of applicants reported having any type of medical insurance coverage at application. Of those with insurance, the majority reported Medicaid benefits (27.2%; *N* = 6,249), followed by another 20% who had Private Insurance Coverage through Other Means (19.5%; *N* = 4,463). Just over 15% of cases received Medicare (16.9%; *N* = 3,882). Approximately 10% reported Private Insurance through Own Employment at Application (8.6%; *N* =1,984) and just under five percent reported having Public Insurance from Other Sources at Application (4.2%; *N* = 961).

Days from Application to Eligibility

An analysis of days from application to eligibility indicated the majority (51.8%; $N = 11{,}993$) were determined eligible within 30 days. An additional 28.8% ($N = 6{,}671$) were determined eligible within 60 days while just under 10% (9.2%; $N = 2{,}128$) became eligible between 61 and 90 days from the time of application. Approximately 10.1% ($N = 2{,}343$) of the participants took longer than 90 days to achieve eligibility.

Table 5

Customers Supports at Application

Customer Characteristics	Total *N*	*n*	%
Primary Support Source at App			
Personal income	23,091	3,456	15.0
Family friends	23,091	7,890	34.2
Public support	23,091	9,389	40.7
Other	23,091	2,356	10.2
Type of Public Support			
Social Security Disability	23,099	6,326	27.4
SSI - Aged, Blind, Disabled	23,094	4,574	19.8
TANF	23,100	490	2.1
Veterans' Disability	23,098	176	0.8
Workers' Compensation	23,100	1,046	4.5
Other Public Support	23,100	1,821	7.9
General Assistance	23,100	538	2.3
Type of Medical Insurance			
Medicaid	22,987	6,249	27.2
Medicare	22,963	3,882	16.9
Other Public Source	22,970	961	4.2
Private via Employment	22,944	1,984	8.6
Private via Other Means	22,941	4,463	19.5

(table continues)

Table 5 (*continued*).

Customer Characteristics	Total *N*	*n*	%
Number of Supports at Application			
0	23,089	10,239	44.3
1	23,089	10,917	47.3
2	23,089	1,766	7.6
3	23,089	161	0.7
4	23,089	5	0.0
5	23,089	1	0.0
Days from Application to Eligibility			
0-30	23,135	11,993	51.8
31-60	23,135	6,671	28.8
61-90	23,135	2,128	9.2
91 or more	23,135	2,343	10.1

Cost of Goods and Purchased Services

An analysis of the cost of purchased goods and services identified that no services were purchased for 7.9% of the customers (Table 6). Approximately twenty percent (19.4%) received goods and services that cost $1,000 or less. For the majority (32.2%) services were purchased for a cost between $1,001 and $5,000. An additional 27.7% received services that were purchased at an expense between $5,001 and $20,000. Fewer than 10% (9.5%) received services the price of which was between $20,001 and $50,000. Finally 3.4% of customers received over $50,000 in services.

Table 6

Cost of goods and purchased services

Cost of Goods and Purchased Services	*N*	%
0 (no money spent on services)	1,821	7.9
$1 to $1,000.00	4,488	19.4
$1,001 - $5,000	7,455	32.2
$5,001 - $10,000	3,624	15.7
$10,001- $20,000	2,770	12.0
$20,001 - $50,000	2,193	9.5
$50,001 or more	784	3.4

Number and Percent of SCI Customers Receiving Services

The RSA data classifies the types of services provided to customers into 22 groups that include various assessment and job related services. The information on services is summarized in Table 7. The two most frequently provided services were Assessments (67.8%; *N* =15,681), and Vocational Rehabilitation Counseling and Guidance, (61%; *N* = 14,112). The remaining eight of the top ten services include Diagnosis and Treatment (40.9%; *N* = 9,462), Transportation (35.7%; *N* = 8,251), Other (31.0%; *N* = 7,171), College or University Training (27.8%; n=6,423), Rehabilitation Technology (24.9%; n= 5,759), Job Placement Assistance (24.8%; 5,742), Job Search Assistance (21.0%; *N* = 4,859) and Maintenance (19.5%; *N* = 4,513) services.

Table 7

Number and Percent of SCI Customers Receiving Services

Service	*n of 23,135* Receiving Services	*% of 23,135* Receiving Services
Assessment	15,681	67.8
Vocational Rehab and Guidance	14,112	61.0
Diagnosis and Treatment	9,462	40.9
Transportation	8,251	35.7
Other Services Received	7,171	31.0
College or University Training	6,423	27.8
Rehabilitation Technology	5,759	24.9
Job Placement Assistance	5,742	24.8
Job Search Assistance	4,859	21.0
Maintenance Services	4,513	19.5
Occupational/Vocational Training	3,797	16.4
Information and Referral Services	3,378	14.6
Miscellaneous Training	3,025	13.1
On-the-job Support	2,110	9.1
Job Readiness Training Services	1,722	7.4
Technical Assistance	1,327	5.7
Augmentative Skills Training	714	3.1
Personal Attendant	594	2.6

(Table continues)

Table 7 (*continued*).

Service	*n of 23,135* Receiving Services	*% of 23,135* Receiving Services
On-the-job Training	493	2.1
Basic Remedial or Literacy	345	1.5
Interpreter Services	110	0.5
Reader Services	46	0.2

Customer Characteristics at Closure

This next part of the analysis examines factors associated with closure variables including education level, employment outcomes, earnings and wages.

Education and Employment-Related Characteristics of Customers at Closure

Education and employment related variables at the time of case closure are examined next. Findings are summarized in Table 8. Analyses of educational level at closure indicate that approximately 17% of individuals with SCI improved their level of education while receiving services (refer to Table 4 for comparison). The population of customers who reported a level of education below a high school graduate equivalency at application declined by 6.6%. There was an additional 10.7% reduction in the number of those who reported a high school graduate equivalency (from 40.8% to 30.1 %). The remaining group reporting some post secondary education grew by over 17%, from 40% to 57.4%. As previously reported just over half of the customers closed with a positive employment outcome (50.4%; N = 11,660).

A total of 11,186 individuals reported wages at closure. Of this group, 20.1% reported hourly earnings of less $8.49, as opposed to 38.5% at application. While 41.6% of those working at application reported hourly earnings between $8.50 and $17.49, 62.4% reported this wage at closure. Almost 20 percent (19.9%) of those working at application reported hourly earnings of $17.50, as opposed to only 17.5% at closure. Of

the 11,160 customers reporting hours worked at closure, 51.0% worked 36-40 hours, 19.1% percent worked 11-20 hours and 20.4 percent worked 21-35 hours. Fewer than 5% (4.7%) worked 10 hours or less and only 2.5 percent reported working 41 or more hours.

Table 8

Education and Employment-Related Characteristics of Customers at Closure

	N	%
Level of Education		
No formal schooling	19	0.1
Elementary, grades 1-8	450	1.9
Secondary, no diploma	2,199	9.5
Special ed completion certificate	237	1.0
High school graduate equivalency	6,957	30.1
Post secondary, no degree	4,958	21.4
Associate deg or voc tech certif	3,868	16.7
Bachelor	3,267	14.1
Masters degree or higher	1,180	5.1
Type of Closure		
Services initiated, not employed	11,475	49.6
Employed	11,660	50.4
Hourly Wage		
Up to $6.49	1,169	10.5
$6.50 to $8.49	1,079	9.6
$8.50 to $11.49	4,323	38.6
$11.50 to $17.49	2,659	23.8
Over $17.50	1,956	17.5
Hours Worked		
0	474	4.1
1-10	531	4.6
11-20	2,135	18.3
21-35	2,286	19.6
36-40	5,949	51.0
41 or more	285	2.4

SCI Customer Supports at Closure

This next section examines the types and number of supports customers received at closure and changes from time at application (Table 9). In evaluating changes in public support from application to closure, the number of individuals with SCI receiving SSDI increased by 4.3%, from 27.3% (N = 6,326) at application to 31.7% (N = 7,237) at closure. The number of SSI recipients remained basically unchanged at closure (20.0%; N = 4,575), compared to 4,574 at application. Customers who reported Other Public Support decreased from 7.9% (N = 1,821) at application to 3.6% (N = 832) at closure. Worker's Compensation also dropped from 4.5% (N = 1,046) at application to 2.3% (N =524) at closure. TANF decreased from 2.1% (N = 490) to 1.2% (N = 274) as well as General Assistance from 2.3% (N = 538) at application to 1.4% (N = 325) by the time these individuals exited public VR. Finally, the number of Veteran's Disability benefits recipients dropped slightly from 176 to 145 at closure.

In reviewing changes in medical insurance coverage from application to closure several distinctions were found. First, Medicaid increased slightly from 27.2%, (N = 6,249) to 28.2% (N = 6,441) and Medicare increased from 16.9% (N = 3,882) to 21.9% (N = 4,982). Private Insurance through Own Employment increased as well from 8.6% (N =1,984) at application to 18.3% (N = 4,167) at closure. Private Insurance Coverage through Other Means dropped from 19.5% (N = 4,463) to 12.5% (N = 2,847) and Public Insurance from Other Sources dropped slightly as well from 4.2% (N = 961) at application to 3.7% (N = 853).

An analysis of days from application to closure indicated that over a third of customers spent four or more years in the VR process (34%; N = 7,869). Just over ten

percent (11.8%; N = 2,741) spent between three to four years. Those that received two to three years of VR services made up 16.0% of customers (N = 3,712). The second largest group (N = 5,123) received one to two years of service. The final 15% of customers (N = 3,690) received less than one year of services.

Table 9

SCI Customer Supports at Closure

Characteristic	Total N	n	%
Primary Source of Support			
Personal income	21,831	9,956	45.6
Family friends	21,831	3,454	15.8
Public support	21,831	7,430	34.0
Other	21,831	991	4.5
Type of Public Support			
Social Security Disability	22,822	7,237	31.7
SSI for Aged, Blind or Disabled	22,825	4,575	20.0
TANF	22,797	274	1.2
Veterans' Disability Benefits	22,802	145	0.6
Workers' Compensation	22,802	524	2.3
Other Public Support	22,808	832	3.6
General Assistance	22,801	325	1.4
Type of Medical Insurance			
Medicaid	22,809	6,441	28.2
Medicare	22,800	4,982	21.9
Public Insurance from other Source	22,835	853	3.7
Private via Employment	22,751	4,167	18.3
Private via Other Means	22,746	2,847	12.5
Number of Supports at Closure			
0	22,773	10,759	47.2
1	22,773	10,304	45.2
2	22,773	1,606	7.1
3	22,773	100	0.4
4	22,773	4	0.0
Days from Application to Closure			
Less than 1 year	23,135	3,690	15.9
1 year to less than 2 years	23,135	5.123	22.1
2 years to less than 3 years	23,135	3,712	16.0
3 years to less than 4 years	23,135	2,741	11.8
Greater than 4 years	23,135	7,869	34.0

Research Question 1 (Part 2): Analysis of Customer Data by Year

In order to address research question one, have the characteristics of customers with SCI served by the VR system changed over the five (5) year span, this section of the study examines the results of comparisons performed across the five years studied on the variables pertaining to customer characteristics, services received and employment outcomes. Chi-square analysis was used to determine whether changes over time were statistically significant.

Customer Characteristics at Application by Year

Table 10 summarizes customer characteristics at application by year. While not statistically significant, there was a 2.2% difference in gender dispersion for FY2008 when 67.2% of the sample was represented by men in comparison to the overall 65% male versus 35% female difference. A chi-square analysis reflected no statistically significant associations between race and fiscal year. Age at application was found to be associated to the year of closure, χ^2 (24, N=23,135) =673.83, $p < 0.0005$. Years 2004 and 2006 experienced the greatest variability on this customer characteristic. While the percentage of customers younger than 21 at application was 15.1% there was a low peak of 10.8% in 2004 and a high peak of 26.4% in 2006. A converse variation in distribution occurred within the 30 to 39 age category with a high peak of 28.8% in 2004 and a low peak of 19.9% in 2006. There was a rise in the percentage of students who had an IEP between 2004 (4.7%) and 2008 (7.4%), χ^2 (4, N= 23,135) = 38.38 $p < .0005$.

Table 10

SCI Customer Characteristics by Year

	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Gender	5,915		4,937		4,427		4,053		3,803	
Male	3,820	64.6	3,173	64.3	2,858	64.6	2,626	64.8	2,555	67.2
Female	2,095	35.4	1,764	35.7	1,569	35.4	1,427	35.2	1,248	32.8
Race	5,906		4,937		4,427		4,053		3,803	
White/Asian	4,169	70.6	3,553	72.0	3,152	71.2	2,885	71.2	2,694	70.8
African American or Black	1,003	17.0	818	16.6	733	16.6	729	18.0	658	17.3
Hispanic	572	9.7	411	8.3	404	9.1	307	7.6	341	9.0
Other	162	2.7	155	3.1	138	3.1	132	3.3	110	2.9
Age at Application *	5,915		4,937		4,427		4,053		3,803	
Up to age 21	641	10.8	613	12.4	1,168	26.4	556	13.7	524	13.8
22 to 29	906	15.3	739	15.0	651	14.7	599	14.8	551	14.5
30 to 39	1,704	28.8	1,360	27.5	880	19.9	1,041	25.7	935	24.6
40 to 49	1,806	30.5	1,497	30.3	1,020	23.0	1,128	27.8	1,101	29.0
50 to 59	725	12.3	599	12.1	579	13.1	602	14.9	587	15.4
60 to 64	89	1.5	88	1.8	73	1.6	89	2.2	68	1.8
Over 64	44	0.7	41	0.8	56	1.3	38	0.9	37	1.0
Previous Closure	5,915		4,937		4,427		4,053		3,803	
None in past 36 months	4,979	84.2	3,947	79.9	3,601	81.3	3,241	80.0	3,063	80.5
Had previous closure	936	15.8	990	20.1	826	19.0	812	20.0	740	20.0
IEP *	5,915		4,937		4,427		4,053		3,803	
Did not have an IEP	5,638	95.3	4,636	93.9	4,160	94.0	3,768	93.0	3,521	92.6
Had an IEP	277	4.7	301	6.1	267	6.0	285	7.0	282	7.4

*Significant difference $p < .0005$

Education and Employment Related Characteristics at Application by Year

This next section examines education and employment-related characteristics of customers at application (Table 11). Level of education of these customers showed a statistically significant difference between 2004 and 2008, χ^2 (32, N= 23,135) = 159.42, p < .0005. There was a 6.5% decline in the percentage of customers with high school graduate equivalency. Conversely there was an approximate 6% increase in the proportion of customers with an associate degree or higher level of academic training. A chi-square analysis indicated statistically significant changes across the years in employment status at application as well, χ^2 (36, N = 23,135) = 89.74, p < .0005. There was a consistent increase in the percentage of customers who reported employment without supports in an integrated setting at application from 13.4% 2004 to 16.5% in 2008. Conversely the proportion of those not employed for other reasons experienced a 3.7% decline during this same time period. Customer's hourly wage at application also experienced statistically significant changes from 2004 to 2008, χ^2 (16, N = 3,987) = 63.61, p < .0005. The percentage of customers earning under $6.49 an hour declined by almost 10.0% while the percentage of customers earning above $17.50 an hour increased by almost 9.0%. The percentage of customers with hourly earnings $6.50 to $8.49 decreased by 2.7% and the percentage of customers earning $11.50 to $17.49 per hour increased by 2.8%. The associations between number of hours worked and years of exit from public VR services were found to be statistically significant χ^2 (20, N = 23,132) = 52.98, p < .0005. Finally there was a 5.8% increase in the number of customers working 36 to 40 hours at application from 2004 to 2008.

Table 11

Level of Education and Employment Characteristics of SCI Customers at Application, by Year

	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Level of Education*	5,915		4,937		4,427		4,053		3,803	
No formal schooling	7	0.1	11	0.2	6	0.1	6	0.1	10	0.3
Elementary, grades 1-8	184	3.1	137	2.8	116	2.6	82	2.0	75	2.0
Secondary, no diploma	894	15.1	744	15.1	697	15.7	639	15.8	574	15.1
Special ed completion	61	1.0	48	1.0	44	1.0	41	1.0	54	1.4
High school grad equiv	2,635	44.5	2,091	42.4	1,730	39.1	1,544	38.1	1,444	38.0
Post secondary, no degree	1,021	17.3	926	18.8	834	18.8	734	18.1	699	18.4
Associate deg or voc tech	534	9.0	478	9.7	467	10.5	436	10.8	432	11.4
Bachelor's degree	442	7.5	364	7.4	389	8.8	401	9.9	354	9.3
Master's degree or higher	137	2.3	138	2.8	144	3.3	170	4.2	161	4.2
Employment Status*	5,915		4,937		4,427		4,053		3,803	
Integrated, no supports	792	13.4	703	14.2	628	14.2	652	16.1	626	16.5
Extended employment	7	0.1	4	0.1	8	0.2	4	0.1	4	0.1
Self employed	46	0.8	44	0.9	47	1.1	37	0.9	39	1.0
Homemaker	66	1.1	39	0.8	29	0.7	25	0.6	21	0.6
Unpaid family worker	10	0.2	4	0.1	8	0.2	8	0.2	5	0.1
Integrated, with supports	29	0.5	34	0.7	35	0.8	49	1.2	45	1.2
Not emp. Student in a secondary setting	202	3.4	216	4.4	186	4.2	181	4.5	159	4.2
Not emp. Other students	274	4.6	215	4.4	198	4.5	181	4.5	152	4.0
Unemployed trainee	11	0.2	14	0.3	19	0.4	13	0.3	15	0.4
Other unemployed	4,478	75.7	3,664	74.2	3,269	73.8	2,903	71.6	2,737	72.0

*Significant difference $p < .0005$

(table continues)

Table 11 (*continued*).

	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Hourly Wage *	867		781		711		738		710	
Up to $6.49	208	24.0	142	18.2	146	20.5	137	18.6	106	14.9
$6.50 to $8.49	182	21.0	151	19.3	144	20.3	119	16.1	130	18.3
$8.50 to $11.49	174	20.1	189	24.2	155	21.8	154	20.9	146	20.6
$11.50 to $17.49	173	20.0	162	20.7	123	17.3	145	19.6	162	22.8
Over $17.50	130	15.0	137	17.5	143	20.1	183	24.8	166	23.4
Hours Worked *	933		819		738		763		730	
0	66	7.1	39	4.8	28	3.8	25	3.3	21	2.9
1-10	72	7.7	66	8.1	65	8.8	50	6.6	55	7.5
11-20	197	21.1	177	21.6	171	23.2	177	23.2	169	23.2
21-35	187	20.0	138	16.8	147	19.9	138	18.1	115	15.8
36-40	388	41.6	383	46.8	310	42.0	344	45.1	346	47.4
41 or more	23	2.5	16	2.0	17	2.3	29	3.8	24	3.3

*Significant difference $p < .0005$

Customers Supports at Application by Year

Table 12 summarizes the analysis of customer supports at application. There were statistically significant changes in customer's primary source of support at application, χ^2 (12, N = 23,091) = 67.65, p < .0005. Family and friends as primary sources of support at application decreased from 35.0% in 2004 to 32.5% in 2008. Conversely, the use of public supports at application increased from 39.8% in 2004 to 42.1% in 2008. When analyzing specific types of public supports, a consistent increase was found in the percentage of customers utilizing Social Security disability insurance at application from 23.7% in 2004 to 30.5% in 2008, χ^2 (4, N = 23,099) = 99.44, p < .0005 and a 1.2% decrease in the use of general assistance at application, χ^2 (4, N = 23,100) = 29.65, p < .0005 during the same years. Other public support had an overall reduction from 8.3% in 2004 to 7.8% in 2008 but had a nonlinear variation greater than 2% through the years, with an 8.9% peak in 2005 to a 6.2% low in 2007, χ^2 (4, N = 23,100) = 23.76, p < .0005.

Medicaid insurance coverage increased from 23.8% in 2004 to 31.7% in 2008, χ^2 (4, N= 22,987) = 89.08, p < .0005. Medicare increased as well from 13.6% in 2004 to 20.3% in 2008 χ^2 (4, N= 22,963) = 114.45, p < .0005. A chi-square analysis indicated statistically significant changes existed in the number of days from application to eligibility from 2004 to 2008, χ^2 (12, N= 23,135) = 71.68, p < .0005. The number of customers determined eligible within 30 days of application increased by 5.3% from 49.6% in 2004 to 54.9% in 2008. Inversely those receiving eligibility after 30 days declined with a 3.0% reduction occurring in the 60-90 days category and a 2.1% reduction occurring in the 91 days or more category.

Table 12

SCI Customer Supports at Application, by Year

	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Primary Source of Support*	5,906		4,920		4,420		4,050		3,795	
Personal income	811	13.7	724	14.7	640	14.5	660	16.3	621	16.4
Family friends	2,068	35.0	1,750	35.6	1,544	34.9	1,295	32.0	1,233	32.5
Public support	2,352	39.8	1,904	38.7	1,798	40.7	1,738	42.9	1,597	42.1
Other	675	11.4	542	11.0	438	9.9	357	8.8	344	9.1
Type of Public Support										
	5,901		4,934		4,422		4,049		3,793	
Social Security Disability*	1,396	23.7	1,251	25.4	1,270	28.7	1,252	30.9	1,157	30.5
	5,898		4,933		4,422		4,048		3,793	
SSI – Aged, Blind, Disabled	1,095	18.6	949	19.2	877	19.8	847	20.9	806	21.2
	5,898		4,934		4,423		4,050		3,795	
TANF	159	2.7	111	2.2	84	1.9	66	1.6	70	1.8
	5,896		4,934		4,423		4,050		3,795	
Veterans' Disability	52	0.9	34	0.7	35	0.8	25	0.6	30	0.8
	5,898		4,934		4,423		4,050		3,795	
Workers' Compensation	315	5.3	211	4.3	184	4.2	176	4.3	160	4.2
	5,898		4,934		4,423		4,050		3,795	
General Assistance*	189	3.2	109	2.2	76	1.7	88	2.2	76	2.0
	5,898		4,934		4,423		4,050		3,795	
Other Public Support*	487	8.3	438	8.9	350	7.9	251	6.2	295	7.8

*Significant difference $p < .0005$

(table continues)

Table 12 (*continued*).

	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Type of Medical Insurance										
	5,844		4,915		4,415		4,029		3,784	
Medicaid*	1,391	23.8	1,262	25.7	1,211	27.4	1,184	29.4	1,201	31.7
	5,842		4,913		4,413		4,011		3,784	
Medicare*	792	13.6	749	15.2	774	17.5	799	19.9	768	20.3
	5,848		4,914		4,416		4,007		3,785	
Other Public Source	231	4.0	216	4.4	171	3.9	181	4.5	162	4.3
	5,838		4,912		4,407		4,006		3,781	
Private via Employment	496	8.5	432	8.8	352	8.0	359	9.0	345	9.1
	5,837		4,911		4,405		4,007		3,781	
Private via Other Means	1,179	20.2	908	18.5	847	19.2	792	19.8	737	19.5
Number of Supports at Application	5,895		4,933		4,421		4,048		3,792	
0	2,694	45.7	2,264	45.9	1,963	44.4	1,720	42.5	1,598	42.1
1	2,760	46.8	2,276	46.1	2,071	46.8	1,975	48.8	1,835	48.4
2	401	6.8	353	7.2	358	8.1	332	8.2	322	8.5
3	39	0.7	40	0.8	28	0.6	19	0.5	35	0.9
4	0	0.0	0	0.0	1	0.0	2	0.0	2	0.1
5	1	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Days from Application to Eligibility*	5,915		4,937		4,427		4,053		3,803	
0 to 30	2,936	49.6	2,480	50.2	2,329	52.6	2,162	53.3	2,086	54.9
31 to 60	1,717	29.0	1,432	29.0	1,224	27.6	1,198	29.6	1,100	28.9
61 to 90	629	10.6	482	9.8	413	9.3	314	7.7	290	7.6
91 or more	633	10.7	543	11.0	461	10.4	379	9.4	327	8.6

*Significant difference $p < .0005$

Cost of Goods and Purchased Services by Year

The cost of goods and purchased services had statistically significant changes between 2004 and 2008, χ^2 (24, N = 23,135) = 171.18, $p < .0005$. As reflected in Table 13 there was an increase in the funding and allocation of services provided to customers during this five year period. There was a consistent decrease in the number of customers receiving funding in all dollar amount categories that were $10,000 or below and an increase in all funding categories above $10,000.

Table 13

Cost of Goods and Purchased Services by Year

	2004 $N = 5{,}915$		2005 $N = 4{,}937$		2006 $N = 4{,}427$		2007 $N = 4{,}053$		2008 $N = 3{,}803$	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
0	482	8.1	398	8.1	343	7.7	301	7.4	297	7.8
$1 to $1,000	1,245	21.0	936	19.0	838	18.9	750	18.5	719	18.9
$1,001 - $5,000	2,032	34.4	1,619	32.8	1,417	32.0	1,229	30.3	1,158	30.4
$5,001 - $10,000	937	15.8	785	15.9	712	16.1	655	16.2	535	14.1
$10,001- $20,000	652	11.0	636	12.9	507	11.5	498	12.3	477	12.5
$20,001 - $50,000	450	7.6	409	8.3	440	9.9	442	10.9	452	11.9
$50,001 or more	117	2.0	154	3.1	170	3.8	178	4.4	165	4.3

*Significant difference $p < .0005$

Number and Percent of SCI Customers Receiving Services by Year

Table 14 highlights the changes in services received between 2004 and 2008. The rate of delivery of basic remedial and literacy services varied between 2004 and 2008, χ^2 (4, N= 23,135) = 20.36, p < .0005; 1.1% of customers received services in 2004, with a peak of 2.0% in 2006 with a decline to 1.2% in 2008. The percentage of people receiving diagnosis and treatment services grew in a linear pattern from 39.1% in 2004 to 43.1% in 2007 but decreased to 41.9% in 2008, χ^2 (4, N= 23,135) = 25.12, p < .0005. The number of recipients of information and referral services increased from 12.8% in 2004 to 19.4% in 2008, χ^2 (4, N= 23,135) = 108.58, p < .0005. The number of job placement assistance recipients grew 3.5% from 22.8% in 2004 to 26.3% in 2008, χ^2 (4, N= 23,135) = 26.71, p < .0005. Occupational/Vocational services declined by 3.5% from 17.9% in 2004 to 14.4% in 2008, χ^2 (4, N= 23,135) = 26.42, p < .0005.

On-the-job Supports increased by 3.4% from 7.5% in 2004 to 10.9% in 2008, χ^2 (4, N= 23,135) = 41.81, p < .0005. On-the-job training declined by just under 1% from 2.8% in 2004 to 1.9% in 2008, χ^2 (4, N= 23,135) = 20.38, p < .0005. Other services received increased by 5.0% from 28.6% in 2004 to 33.6% in 2008, χ^2 (4, N= 23,135) = 31.39, p < .0005. The number of those who received rehabilitation technology services increased by almost 10% from 20.1% in 2004 to 29.8% in 2008, χ^2 (4, N= 23,135) = 151.97, p < .0005. While not significant statistically within the parameters set for this study, the recipients of transportation services increased by 3.7% from 34.1% in 2004 to 37.8% in 2008.

Table 14

Number and Percent of Customers Receiving Services, by Year

	2004 $N = 5,915$		2005 $N = 4,937$		2006 $N = 4,427$		2007 $N = 4,053$		2008 $N = 3,803$	
Services Received	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Assessment	4,088	69.1	3,361	68.1	3,030	68.4	2,688	66.3	2.514	66.1
Augmentative Skills Training	209	3.5	154	3.1	118	2.7	117	2.9	116	3.1
Basic Remedial or Literacy*	64	1.1	92	1.9	87	2.0	55	1.4	47	1.2
College or University Training	1,644	27.8	1,416	28.7	1,239	28.0	1,135	28.0	989	26.0
Diagnosis and Treatment*	2,315	39.1	1,941	39.3	1,868	42.2	1,745	43.1	1,593	41.9
Information and Referral Services*	758	12.8	622	12.6	614	13.9	647	16.0	737	19.4
Interpreter Services	35	0.6	22	0.4	22	0.5	12	0.3	19	0.5
Job Placement Assistance*	1,348	22.8	1,223	24.8	1,083	24.5	1,088	26.8	1,000	26.3
Job Readiness Training Services	399	6.7	364	7.4	334	7.5	319	7.9	306	8.0
Job Search Assistance	1,227	20.7	1,079	21.9	915	20.7	859	21.2	779	20.5
Maintenance Services	1,102	18.6	983	19.9	909	20.5	797	19.7	722	19.0
Miscellaneous Training	754	12.7	644	13.0	628	14.2	541	13.3	458	12.0
Occupational/Vocational Training*	1,061	17.9	836	16.9	735	16.6	617	15.2	548	14.4
On-the-job Support*	446	7.5	434	8.8	393	8.9	421	10.4	416	10.9
On-the-job Training*	168	2.8	97	2.0	88	2.0	68	1.7	72	1.9
Other*	1,691	28.6	1,532	31.0	1,428	32.3	1,243	30.7	1,277	33.6
Personal Attendant	122	2.1	111	2.2	125	2.8	128	3.2	108	2.8

(table continues)

Table 14 (*continued*).

Services Received	2004 *N* = 5,915		2005 *N* = 4,937		2006 *N* = 4,427		2007 *N* = 4,053		2008 *N* = 3,803	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Reader	7	0.1	15	0.3	5	0.1	12	0.3	7	0.2
Rehabilitation Technology *	1,188	20.1	1,176	23.8	1,110	25.1	1,153	28.4	1,132	29.8
Technical Assistance	313	5.3	288	5.8	255	5.8	239	5.9	232	6.1
Transportation	2,017	34.1	1,745	35.3	1,614	36.5	1,438	35.5	1,437	37.8
Vocational Rehab and Guidance	3,539	59.8	3,005	60.9	2,713	61.3	2,531	62.4	2,324	61.1

*Significant difference $p < .0005$

Education and Employment-Related Characteristics of Customers at Closure by Year

This next section examines variables pertinent to education and employment at closure (Table 15). A chi-square analysis of level of education at closure indicated statistically significant differences χ^2 (32, N= 23,135) = 113.04, $p < .0005$ among the five years studied. The percentage of customers with high school graduate equivalency at the time of case closure decreased from 32.9% in 2004 to 29.4% in 2008. However there was a nonlinear variation greater than 2% through the years with a 28.0% low point noted for 2006. The percentage of customers with bachelor's degrees increased from 12.6 % in 2004 to 15.2 % in 2008. The percentage of customers with master's degree or higher increased from 4.0% in 2004 to 6.1% in 2008.

There was an overall increase in employment outcome from 47.8% in 2004 to 50.2% in 2008. However there was a decrease of 1.8% between 2007 and 2008, χ^2 (4, N= 23,135) = 24.13, $p < .0005$. Average hourly wages at closure improved between 2004 and 2008, χ^2 (16, N= 11,186) = 183.97, $p < .0005$. A marked, 9.2% decrease was noted in the percentage of customers earnings $6.49 and less an hour, and a 3.8% increase in the percentage of customers earning between $11.50 and $17.49 an hour. Similarly, a 7.6% increase was found in the percentage of customers earning $17.50 or above an hour. A review of the number of hours worked at closure identified a 2.5% increase in the percentage of customers working between 11 and 20 hours per week, χ^2 (16, N = 11,660) = 94.19, $p < .0005$.

Table 15

Education and Employment-Related Characteristics of SCI Customers at Closure, by Year

	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Level of Education*	5,915		4,937		4,427		4,053		3,803	
No formal schooling	2	0.0	5	0.1	5	0.1	3	0.1	4	0.1
Elementary, grades 1-8	138	2.3	101	2.0	85	1.9	67	1.7	59	1.6
Secondary, no diploma	556	9.4	471	9.5	424	9.6	406	10.0	342	9.0
Special ed completion	45	0.8	59	1.2	44	1.0	39	1.0	50	1.3
High school grad equiv	1,947	32.9	1,499	30.4	1,241	28.0	1,152	28.4	1,118	29.4
Post secondary, no degree	1,262	21.3	1,081	21.9	968	21.9	838	20.7	809	21.3
Associate deg or voc tech	980	16.6	841	17.0	778	17.6	660	16.3	609	16.0
Bachelor's degree	747	12.6	656	13.3	648	14.6	637	15.7	579	15.2
Master's degree or higher	238	4.0	224	4.5	234	5.3	251	6.2	233	6.1
Type of Closure*	5,915		4,937		4,427		4,053		3,803	
Not employed	3,087	52.2	2,397	48.6	2,151	48.6	1,945	48.0	1,895	49.8
Employed	2,828	47.8	2,540	51.4	2,276	51.4	2,108	52.0	1,908	50.2
Hourly Wage*	2,672		2,440		2,193		2,035		1,846	
Up to $6.49	373	14.0	305	12.5	240	10.9	162	8.0	89	4.8
$6.50 to $8.49	279	10.4	230	9.4	198	9.0	212	10.4	160	8.7
$8.50 to $11.49	1,065	39.9	957	39.2	842	38.4	732	36.0	727	39.4
$11.50 to $17.49	589	22.0	562	23.0	528	24.1	503	24.7	477	25.8
Over $17.50	366	13.7	386	15.8	385	17.6	426	20.9	393	21.3

(table continues)

Table 15 (*continued*).

	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Hours Worked*	2,828		2,540		2,276		2,108		1,908	
0	156	5.5	100	3.9	83	3.6	73	3.5	62	3.2
1-10	122	4.3	119	4.7	100	4.4	96	4.6	94	4.9
11-20	476	16.8	449	17.7	418	18.4	424	20.1	368	19.3
21-35	545	19.3	495	19.5	435	19.1	419	19.9	392	20.5
36-40	1,456	51.5	1,321	52.0	1,185	52.1	1,045	49.6	942	49.4
41 or more	73	2.6	56	2.2	55	2.4	51	2.4	50	2.6

*Significant difference $p < .0005$

SCI Customer Supports at Closure by Year

This final section examines the nature and amount of public supports received at closure (Table 16). This first analysis examines the primary source of support at closure. A statistically significant change was noted in the types of supports received between 2004 and 2008, χ^2 (12, N= 21,831) = 61.47, p < .0005. The use of family and friends as support decreased by 3.5% from 17.9% in 2004 to 14.4% in 2008. Conversely the utilization of public supports increased by 3.6% from 32.7% in 2004 to 36.3% in 2008. An examination of distinct types of public supports, it was found that the number of Social Security disability insurance beneficiaries' increased 5.7% from 28.8% in 2004 to 34.5% in 2008 χ^2 (4, N= 22,822) = 61.69, p < .0005. The percentage of customers using TANF support at closure decreased by 0.8% from 1.7% in 2004 to 0.9% in 2008 χ^2 (4, N= 22,797) = 20.97, p < .0005. Similarly, the percentage of customers utilizing general assistance at closure decreased by 1.2% from 2.0% in 2004 to 0.8% in 2008, χ^2 (4, N= 22,801) = 27.25, p < .0005. The number of those benefiting from Medicaid insurance coverage increased by 3.5% from 26.1% in 2004 to 29.6% in 2008 χ^2 (4, N= 22,809) = 20.51, p < .0005. Also, Medicare insurance coverage increased as well from 19.1% in 2004 to 23.6% in 2008 χ^2 (4, N= 22,800) = 59.94, p < .0005.

A chi-square analysis indicated a statistically significant difference in the number of supports used by customers contingent on the year of exit, 2004 through 2008 χ^2 (16, N= 22,773) = 58.86, p. < .0005. The percentage of customers who received zero supports decreased by over 5% from 49.3% in 2004 to 44.2% in 2008. In contrast, the number of customers who received one support increased slightly with under 5% from 43.3% in 2004 to 48.0% in 2008.

This final analysis of this section looks at differences in the amount of time (in years) elapsed between application and closure across these years studied, 2004 through 2008, χ^2 (16, N= 23,135) = 330.71, p < .0005. The percentage of customers closing within one year of application increased by 5.7% from 13.4% in 2004 to 19.1% in 2008. The percentage of customers closing between two to three years from application to closure decreased by 6.6% from 19.7% in 2004 to 13.1% in 2008. The number of customers closing within three to four years from application to closure also decreased by over 6% from 15.4% in 2004 to 9.1% in 2008. Finally the percentage of customers closing four or more years from application to closure increased by 4.2% from 30.8% in 2004 to 35.0% in 2008.

Table 16

SCI Customer Supports at Closure, by Year

SCI Customer Supports	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Primary Source of Support*	5,564		4,664		4,183		3,833		3,587	
Personal income	2,464	44.3	2,207	47.3	1,917	45.8	1,744	45.5	1,624	45.3
Family friends	998	17.9	756	16.2	654	15.6	528	13.8	518	14.4
Public support	1,821	32.7	1,503	32.2	1,414	33.8	1,389	36.2	1,303	36.3
Other	281	5.1	198	4.2	198	4.7	172	4.5	142	4.0
Type of Public Support										
Social Security Disability*	5,732		4,907		4,402		4,009		3,772	
	1,649	28.8	1,467	29.9	1,428	32.4	1,391	34.7	1,302	34.5
SSI – Aged, Blind, Disabled	5,735		4,904		4,403		4,010		3,773	
	1,093	19.1	938	19.1	890	20.2	853	21.3	801	21.2

(table continues)

Table 16 (*continued*)

SCI Customer Supports	2004		2005		2006		2007		2008	
	N		*N*		*N*		*N*		*N*	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
TANF *	5,708		4,905		4,399		4,011		3,774	
	99	1.7	57	1.2	50	1.1	34	0.8	34	0.9
Veterans' Disability	5,711		4,906		4,400		4,011		3,774	
	45	0.8	34	0.7	22	0.5	24	0.6	20	0.5
Workers' Compensation	5,711		4,906		4,400		4,011		3,774	
	158	2.8	90	1.8	101	2.3	92	2.3	83	2.2
General Assistance *	5,710		4,906		4,400		4,011		3,774	
	115	2.0	76	1.5	48	1.1	54	1.3	32	0.8
Other Public Support	5,718		4,906		4,400		4,010		3,774	
	255	4.5	163	3.3	159	3.6	116	2.9	139	3.7
Type of Medical Insurance										
	5,789		4,875		4,409		3,997		3,739	
Medicaid *	1,513	26.1	1,362	27.9	1,291	29.3	1,170	29.3	1,105	29.6
	5,790		4,875		4,409		3,985		3,741	
Medicare *	1,105	19.1	1,009	20.7	990	22.5	994	24.9	884	23.6
	5,790		4,878		4,415		3,993		3,759	
Other Public Source	187	3.2	184	3.8	152	3.4	177	4.4	153	4.1

(table continues)

Table 16 (continued)

SCI Customer Supports	2004 N	2004 %	2005 N	2005 %	2006 N	2006 %	2007 N	2007 %	2008 N	2008 %
	5,773		4,874		4,405		3,978		3,721	
Private via Employment	991	17.2	923	18.9	832	18.9	768	19.3	653	17.5
	5,777		4,866		4,402		3,970		3,731	
Private via Other Means	816	14.1	562	11.5	533	12.1	482	12.1	454	12.2
Number of Supports at Closure *	5,700		4,899		4,398		4,006		3,770	
0	2,808	49.3	2,443	49.9	2,066	47.0	1,775	44.3	1,667	44.2
1	2,468	43.3	2,118	43.2	1,990	45.2	1,919	47.9	1,809	48.0
2	393	6.9	315	6.4	320	7.3	295	7.4	283	7.5
3	29	0.5	22	0.4	22	0.5	16	0.4	11	0.3
4	2	0.0	1	0.0	0	0.0	1	0.0	0	0.0
Days from Application to Closure *	5,915		4,937		4,427		4,053		3,803	
Less than 1 year	790	13.4	730	14.8	744	16.8	699	17.2	727	19.1
1 to 2 years	1,230	20.8	1,064	21.6	964	21.8	967	23.9	898	23.6
2 to 3 years	1,164	19.7	766	15.5	673	15.2	609	15.0	500	13.1
3 to 4 years	912	15.4	691	14.0	418	9.4	374	9.2	346	9.1
4 or more years	1,819	30.8	1,686	34.2	1,628	36.8	1,404	34.6	1,332	35.0

*Significant difference $p < .000$

Research Question Two: An analysis of outcomes (type of closure) based on characteristics for this population

The second part of this analysis examines differences associated with employment outcomes. The first review is of the aggregate population of all customers served from 2004 through 2008, followed by an examination of changes in outcomes between 2004 and 2008. As previously illustrated (Table 2) during the period between 2004 and 2008 on average 50.4% of customers with SCI achieved employment at closure.

Customer Characteristics by Type of Closure

This first part looks directly at customer characteristics at application by closure status (Table 17). A chi-square analysis reflected no statistically significant differences in the distribution of employment outcome by gender. However, women had a slightly better employment outcome than men. The percentage of women achieving employment was 51.8% as opposed to 49.6% of men. This next analysis examines employment outcome by race and their statistically significant differences χ^2 (3, N= 23,126) = 189.79, p. < .0005. White or Asian customers represent 71.1% of customers served yet 74.5% of customers with a positive employment outcome. Hispanics also achieved a higher than average outcome representing 8.8% of customers served yet 9.0% of customers with a positive employment outcome. The reverse is true for African American or Black and All Other Race customers. African American or Black customers comprised 17% of customers and only 13.8% of those employed at closure and finally All Other Races represent 3% of customers and 2.7% of those employed. A chi-square analysis indicated age at application was statistically significant with a higher percentage of older customers achieving positive employment outcomes χ^2 (6, N = 23,135) = 27.92, p < .0005. The

highest percentages of customers achieving a positive employment outcome were those over 64 years old; 63.4% became employed. Over 55% of customers aged 60 to 64% were successful followed by those 50 to 59 (52.0%). Age was not a statistically significant determinant of employment for those 49 and younger; with the percentage of employed varying by less than 2%; from 48.6% to 50.4%. There was no significant difference in the employment outcome of customers without a closure within 36 months or customers who had an IEP.

Table 17

Customer Characteristics by Type of Closure

	Total	Unemployed		Employed	
	N	*n*	%	*n*	%
Gender					
Male	15,032	7,573	50.4	7,459	49.6
Female	8,103	3,902	48.2	4,201	51.8
Race *					
White/Asian	16,453	7,767	47.2	8,686	52.8
African American or Black	3,941	2,229	59.1	1,612	40.9
Hispanic	2,035	986	48.5	1,049	51.5
Other	697	385	55.2	312	44.8
Age at Application *					
Up to age 21	3,502	1,767	50.5	1,735	49.5
22 to 29	3,446	1,772	51.4	1,674	48.6
30 to 39	5,920	2,945	49.7	2,975	50.3
40 to 49	6,552	3,248	49.6	3,304	50.4
50 to 59	3,092	1,483	48.0	1,609	52.0
60 to 64	407	181	44.5	226	55.5
Over 64	216	79	36.6	137	63.4
Previous Closure					
None in past 36 months	18,831	9,555	50.7	9,276	49.3
IEP					
Did not have an IEP	21,723	10,764	49.6	10,959	50.4
Had an IEP	1,412	711	50.4	701	49.6

*Significant difference $p < .0005$

Level of Education and Employment Characteristics of Customers at Application, by Type of Closure

Table 18 summarizes the outcome related differences associated with education and employment factors at application. There were a number of statistically significant differences in employment outcome based on the education level at application. χ^2 (8, N = 23,135) = 725.77, $p < .0005$. The majority of customers with an Associates degree or higher achieved a positive employment outcome. More than three quarters (77.5%) of customers with a master's degrees and two thirds (68.3%) of customers with a bachelor's degree were employed at closure. Employment status at application also impacted employment outcomes at closure χ^2 (9, N = 23,135) = 1,577.55, $p < .0005$. The majority of customers unemployed at application (N = 7,426) were also unemployed at closure; only 43.6% achieved employment. Over half of students in a secondary setting (54.7%), students in other classifications (51.5%) and unemployed trainee's or interns (52.8%) were employed at closure.

The majority of customers employed at application in an integrated setting without supports were still employed at closure (78.3%) as were customers employed in an integrated setting with supports (84.4%) and those who were self-employed (81.7%). These customers were included in this study because they represent almost twenty percent (17.2%) of customers served and researchers, counselors and administrators may benefits from an understanding of the characteristics of this population as well. An examination of demographic factors associated with customers employed at application and closure revealed a number of items for discussion. First race and gender differences were not statistically significant however a higher percentage of Whites and Asians as

well as males exited employed. The majority of customers with fewer than three supports at application were also employed at closure.

An examination of the services received by customers employed at application was also examined. The largest proportion of customers utilized assessment services (n = 2634), diagnostic and treatment services (n = 1,736), rehabilitation technology services (n = 1,504), transportation services (n = 703), vocational rehabilitation counseling and guidance services (n = 2,010). Only 561 customers received college or university training services; 64.2% were employed at closure.

There was a statistically significant and positive linear relationship between hourly wage at application and employment closure χ^2 (6, N = 3,987) = 140.94, p < .0005. Over two thirds of customers employed at application were still employed at closure regardless of their hourly wage however the higher the salary at application the higher percentage of employment at closure. Almost 90% (89.1%) of those employed at application earning over $17.50 an hour were still employed at closure. Similarly approximately 80% of those earning between $11.50 and $17.49 an hour (81.6%) and those earning between $8.50 and $11.49 an hour (79.8%) were still employed at closure. The final review in this section examines the differences associated with hours worked at application and employment outcome χ^2 (5, N = 23,132) = 1,490.44, p < .0005. Consistent with employment status at application, hours worked at application is positively associated with a positive employment outcome at closure. Over 70% of all customers working at least one hour a week were employed at closure. Over 65.0% of those reporting zero hours but working at application (n = 179) were employed at closure.

Table 18

Level of Education and Employment Characteristics of Customers at Application, by Type of Closure

	Total	Unemployed		Employed	
	N	*n*	%	*n*	%
Level of Education *					
No formal schooling	40	23	57.5	17	42.5
Elementary, grades 1-8	594	345	58.1	249	41.9
Secondary, no diploma	3,548	2,125	59.9	1,423	40.1
Special education completion	248	119	48.0	129	52.0
High school graduate equivalency	9,444	4,981	52.7	4,463	47.3
Post secondary, no degree	4,214	2,103	49.9	2,111	50.1
Associate deg or voc tech	2,347	991	42.2	1,356	57.8
Bachelor's degree	1,950	619	31.7	1,331	68.3
Master's degree or higher	750	169	22.5	581	77.5
Employment Status *					
Integrated, no supports	3,401	739	21.7	2,662	78.3
Extended employment	27	9	33.3	18	66.7
Self employed	213	39	18.3	174	81.7
Homemaker	180	61	33.9	119	66.1
Unpaid family worker	35	15	42.9	20	57.1
Integrated, with supports	192	30	15.6	162	84.4
Not emp. student in a Secondary setting	944	428	45.3	516	54.7
Not emp. Student other	1,020	495	48.5	525	51.5
Unemployed trainee	72	34	47.2	38	52.8
Other unemployed	17,051	9,625	56.4	7,426	43.6
Hourly Wage *					
Up to $6.49	789	267	33.8	522	66.2
$6.50 to $8.49	760	207	27.2	553	72.8
$8.50 to $11.49	853	172	20.2	681	79.8
$11.50 to $17.49	790	145	18.4	645	81.6
Over $17.50	795	87	10.9	708	89.1

(table continues)

Table 18 (*continued*).

	Total	Unemployed		Employed	
	N	*n*	%	*n*	%
Hours Worked *					
0	179	61	34.1	118	3.8
1-10	308	85	27.6	223	72.4
11-20	891	229	25.7	662	74.3
21-35	725	166	22.9	559	77.1
36-40	1771	302	17.1	1469	82.9
41 or more	109	25	22.9	84	77.1

*Significant difference $p < .0005$

Customer Supports at Application, by Type of Closure

This next section reviews the difference in closure status in relation to customer supports at application (Table 19). There was a statistically significant difference in employment outcome based on a customer's primary source of support at app< lication χ^2 (3, N = 23,091 = 973.96, $p < .0005$. Almost three quarters (73.3%) of customers with personal income were employed at closure. Only 42.2% of customers who received any type of public support at application were employed at closure. Chi-square analyses indicated a statistically significant difference in the employment outcome for customers utilizing Social Security Disability Insurance χ^2 (1, N = 23,099 = 25.40, $p < .0005$, Social Security Income, Aged, Blind, Disabled χ^2 (1, N = 23,094 = 489.01, $p < .0005$; Temporary Assistance to Needy Families χ^2 (1, N = 23,100 = 22.51, $p < .0005$ and General Assistance χ^2 (1, N = 23,10 = 59.12, p.0005. Only 47.4% of SSDI recipients, 41.0% of TANF users, 35.7% of those on SSI, and 35.3% of those on General Assistance achieved an employment outcome. The majority (58.1%) of customers using Medicaid were unemployed at closure χ^2 (1, N = 22,987 = 256.10, $p < .0005$.

There was no statistically significant difference in those utilizing Medicare and Other Public Source's; just over 52.0% were employed at closure. Chi square analyses

detected statistically significant differences for customers with private insurance via other means (56.4% employed) χ^2 (1, N = 22,941 = 74.94, p < .0005 and customers with private insurance via employment (73.0% employed) χ^2 (1, N = 22,944 = 439.09, p < .0005. An evaluation of the number of supports for categories with 50 or more customers indicated a statistically significant and linear relationship between number of supports and employment outcome χ^2 (5, (N = 23,089) = 395.37, p < .0005.

The majority of customers with no supports were employed whereas as the majority of customers with one or more supports were unemployed at closure. A chi-square analysis of days from application to eligibility and employment reflected a statistically significant difference χ^2 (3, N = 23,135) = 146.24, p < .0005. There was a negative linear relationship as customers with a shorter time between application and eligibility we more likely to achieve employment; 53.9% of customers who achieved eligibility within 30 days or less were employed at closure as opposed to only 42.6% of those who achieved eligibility after 91 or more days.

Table 19

Customer Supports at Application, by Type of Closure

	Total	Unemployed		Employed	
	N	*n*	*%*	*n*	*%*
Primary Source of Support*					
Personal income	3,456	924	26.7	2,532	73.3
Family friends	7,890	3,939	49.9	3,951	50.1
Public support	9,389	5,423	57.8	3,966	42.2
Other	2,356	1,145	48.6	1,211	51.4

(table continues)

Table 19 *(continued)*

	Total	Unemployed		Employed	
	N	*n*	%	*n*	%
Type of Public Support					
Social Security Disability *	6,326	3,309	52.3	3,017	47.4
SSI Aged, Blind, Disabled *	4,574	2,939	64.3	1,635	35.7
TANF *	490	295	60.2	195	41.0
Veterans' Disability	176	95	54.0	81	46.0
Workers' Compensation	1,046	490	46.8	556	53.2
General Assistance *	538	348	64.7	190	35.3
Other Public Support	1,821	917	50.4	904	49.6
Type of Medical Insurance					
Medicaid *	6,249	3,632	58.1	2,617	41.9
Medicare	3,882	1,834	47.2	2,048	52.8
Other Public Source	961	457	47.6	504	52.4
Private via Employment *	1,984	535	27.0	1,449	73.0
Private via Other Means *	4,463	1,947	43.6	2,516	56.4
Number of Supports *					
0	10,239	4,383	42.8	5,856	57.2
1	10,917	5,686	53.8	5,049	46.2
2	1,766	1,095	62.0	671	38.0
3	161	108	67.1	53	32.9
4	5	1	20.0	4	80.0
5	1	0	0.0	1	100.0
Days from Application to Eligibility *					
0 to 30	11,993	5,523	46.1	6,470	53.9
31 to 60	6,671	3,467	52.0	3,204	48.0
61 to 90	2,128	1,139	53.5	989	46.5
91 or more	2,343	1,346	57.4	997	42.6
*Significant difference	$p < .0005$				

Cost of Goods and Purchased Services by Type of Closure

There is a statistically significant difference in the cost of goods and purchased services and employment outcome $\chi 2$ (4, N = 23,135) = 1,297.76, $p < .0005$ (Table 20). Less than 35% of customers who received $1,000.00 or less in goods and purchased services achieved employment at closure as opposed to almost 70% of those receiving over $20,000.00.

Table 20

Cost of Goods and Purchased Services by Type of Closure

Cost of Goods and Purchased Services	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
$0.00	1,821	1,221	67.1	600	32.9
$1.00 to $1,000	4,488	2,942	65.6	1,546	34.4
$1,001 to $5,000	7,455	3,804	51.0	3,651	49.0
$5,001 to $10,000	3,624	1,555	42.9	2,069	57.1
$10,001 to $20,000	2,770	1,005	36.3	1,765	63.7
$20,001 to $50,000	2,193	689	31.4	1,504	68.6
$50,001 or more	784	259	33.0	525	67.0
*Significant difference	$p < .0005$				

Number and Percent of Customers Receiving Services, by Type of Closure

Of the 22 service categories 11 appeared to impact employment outcome (Table 21). Almost 70% of customers who received on-the-job training were employed at closure χ^2 (1, N = 23,135) = 72.53, $p < .0005$. Nearly two-thirds of customers who received rehabilitation technology were successful as well χ^2 (1, N = 23,135) = 639.38, $p < .0005$. Over 60.0% of customers who received job placement assistance χ^2 (1, N = 23,135) = 556.63, $p < .0005$, on-the-job-support χ^2 (1, N = 23,135) = 118.73, $p < .0005$ and technical assistance χ^2 (1, N = 23,135) = 69.29, $p < .0005$ had a successful

employment closure as well. The majority of customers who received job search assistance χ^2 (1, N = 23,135) = 225.41, p < .0005, maintenance χ^2 (1, N = 23,135) = 181.03, p < .0005, other services, χ^2 (1, N = 23,135) = 143.17, p < .0005; information and referral χ^2 (1, N = 23,135) = 14.85, p < .0005, job readiness training χ^2 (1, N = 23,135) = 13.42, p < .0005 and vocational rehabilitation and guidance χ^2 (1, N = 23,135) = 13.96, p < .0005 were employed at closure as well.

Table 21

Number and Percent of Customers Receiving Services, by Type of Closure

	Total	Unemployed		Employed	
Services Received	*N*	*n*	%	*n*	%
Assessment	15,681	7,898	50.4	7,783	49.6
Augmentative Skills	714	316	44.3	398	55.7
Basic Remedial/Literacy	345	202	58.6	143	41.4
College or University	6,423	3,289	51.2	3,134	48.8
Diagnosis and Treatment	9,462	4,641	49.0	4,821	51.0
Information and Referral *	3,378	1,572	46.5	1,806	53.5
Interpreter	110	52	47.3	58	52.7
Job Placement Assistance *	5,742	2,073	36.1	3,669	63.9
Job Readiness Training *	1,722	781	45.4	941	54.6
Job Search Assistance *	4,859	1,945	40.0	2,914	60.0
Maintenance *	4,513	1,833	40.6	2,680	59.4
Miscellaneous Training	3,025	1,429	47.2	1,596	52.8
Occupational/Vocational	3,797	1,802	47.5	1,995	52.5
On-the-job Support *	2,110	808	38.3	1,302	61.7
On-the-job Training *	493	151	30.6	342	69.4
Other *	7,171	3,136	43.7	4,035	56.3
Personal Attendant	594	282	47.5	312	52.5
Reader	46	26	56.5	20	43.5
Rehab Technology *	5,759	2,025	35.2	3,734	64.8
Technical Assistance *	1,327	511	38.5	816	61.5
Transportation	8,251	3,970	48.1	4,281	51.9
Voc Rehab & Guidance *	14,112	6,861	48.6	7,251	51.4

*Significant difference p < .0005

Level of Education and Employment Characteristics of Customers at Closure, by Type of Closure

Table 22 illustrates the level of education and employment characteristics of customers at closure, by type of closure. Similar to level of education at application a customer's level of education at closure appeared to influence employment outcome χ^2 (8, N = 23,135) = 1,844.62, $p < .0005$. Nearly 80% of customers with a master's degree or higher, 72.7% of customers with a bachelor's degree and 61.7% of those with an Associate degree or vocational technology certification were employed at closure. The majority of customers with a post secondary education with no degree or below were unemployed at closure. Hourly wage and hours worked are specific to customers employed at closure so a comparison by type of closure is not possible.

Table 22

Level of Education and Employment Characteristics of Customers at Closure, by Type of Closure

	Total	Unemployed		Employed	
	N	*n*	%	*n*	%
Level of Education*					
No formal schooling	19	15	78.9	4	21.1
Elementary, grades 1-8	450	261	58.0	189	42.0
Secondary, no diploma	2,199	1,430	65.0	769	35.0
Special ed completion	237	129	54.4	108	45.6
High school grad equiv	6,957	4,033	58.0	2,924	42.0
Post secondary, no degree	4,958	2,971	59.9	1,987	40.1
Associate deg or voc tech	3,868	1,481	38.3	2,387	61.7
Bachelor's degree	3,267	908	27.8	2,359	72.7
Master's degree or higher	1,180	247	20.9	933	79.1
Hourly Wage					
Up to $6.49	1,169	0	0.0	1,169	100.0
$6.50 to $8.49	1,079	0	0.0	1,079	100.0
$8.50 to $11.49	4,323	0	0.0	4,323	100.0
$11.50 to $17.49	2,659	0	0.0	2,659	100.0
Over $17.50	1,956	0	0.0	1,956	100.0
Hours Worked					
0	474	0	0.0	474	100.0
1-10	531	0	0.0	531	100.0
11-20	2,135	0	0.0	2,135	100.0
21-35	2,286	0	0.0	2,286	100.0
36-40	5,949	0	0.0	5,949	100.0
41 or more	285	0	0.0	285	100.0

*Significant difference $p < .0005$

Customer Supports at Closure, by Type of Closure

This next section examines customer supports at closure (Table 23). There was a notable difference in the primary source of support and employment status at closure χ^2 $(3, N = 21,831) = 10,593.04, p < .0005$. Over 90% of customers reporting personal income at closure were employed. Just over a quarter of customers with public support at

closure and just under 20.0% of customers utilizing other support at closure exited with an employment outcome. Finally only 12.0% of customers relying on family and friends at closure were employed. The majority of customer's utilizing any type of public support was unemployed at closure. Statistically significant differences in closure include the 46.8% of customers employed at closure who received social security disability, χ^2 (1, N = 22,822 = 56.06, $p < .0005$ and the 32.7% of social security income recipients also employed, χ^2 (1, N = 22,825 = 722.55, $p < .0005$. Just over a quarter of TANF recipients, χ^2 (1, N = 22,797 = 73.04, $p < .0005$ and slightly over a third of those with worker's compensation, χ^2 (1, N = 22,802 = 45.68, $p < .0005$ and other public support, χ^2 (1, N = 22,808 = 93.63, $p < .0005$ were also employed. Finally only 21.5% of customers who received general assistance at closure were employed, χ^2 (1, N = 22,801 = 110.38, $p <$ .0005. Three of the five types of medical insurance had a statistically significant difference at closure. As one might expect nearly the entire population of customers with private insurance via employment were employed at closure χ^2 (1, N = 22,751 = 3,987.37, $p < .0005$. The majority (57.9%) of customers with private insurance via other means χ^2 (1, N = 22,746 = 62.72, $p < .0005$ were employed at closure as well. Only 39.5% of customers who received Medicaid were employed at closure χ^2 (1, N = 22,809 = 467.45, $p < .0005$. A chi-square analysis of the number of supports at closure indicated a statistically significant difference χ^2 (1, N = 22,773 = 979.16, $p < .0005$ with fewer supports generally associated with improved employment outcome. Years from application to closure also reflected statistically significant difference χ^2 (4, N = 23,135) = 1,042.04, $p < .0005$ with over 70.0% of customers closed within one year were employed. The majority of customers who were active between 1 and 2 years were also

employed at closure. The majority of customers with two or more years from application to closure were less likely to be employed at closure.

Table 23

Customer Supports at Closure, by Type of Closure

	Total	Unemployed		Employed	
	N	*n*	*%*	*n*	*%*
Primary Source of Support *					
Personal income	9,956	898	9.0	9,058	91.0
Family friends	3,454	3,039	88.0	415	12.0
Public support	7,430	5,436	73.2	1,994	26.8
Other	991	798	80.5	193	19.5
Type of Public Support					
Social Security Disability *	7,237	3,849	53.2	3,388	46.8
SSI Aged, Blind, Disabled *	4,575	3,080	67.3	1,495	32.7
TANF *	274	206	75.2	68	25.4
Veterans' Disability	145	83	57.2	62	42.8
Workers' Compensation *	524	336	64.1	188	35.9
General Assistance *	325	255	78.5	70	21.5
Other Public Support *	832	549	66.0	283	34.0
Type of Medical Insurance					
Medicaid *	6,441	3,899	60.5	2,542	39.5
Medicare	4,982	2,397	48.1	2,585	51.9
Other Public Source	853	388	45.5	465	54.5
Private via Employment *	4,167	200	4.8	3,967	95.2
Private via Other Means *	2,847	1,199	42.1	1,648	57.9
Number of Supports *					
0	10,759	4,170	38.8	6,589	61.2
1	10,304	5,982	58.1	4,322	41.9
2	1,606	1,040	64.8	566	35.2
3	100	77	77.0	23	23.0
4	4	3	75.0	1	25.0

(table continues)

Table 23 (*continued).*

	Total	Unemployed		Employed	
	N	*n*	%	*n*	%
Years from Application to Closure *					
Less than 1	3,690	1,068	28.9	2,622	71.1
1 to less than 2	5,123	2,228	43.5	2,895	56.5
2 to less than 3	3,712	2,029	54.7	1,683	45.3
3 to less than 4	2,741	1,608	58.7	1,133	41.3
4 or more	7,869	4,542	57.7	3,327	42.3

*Significant difference $p < .0005$

Research Question Two (Part two): An analysis of outcomes (type of closure) based on characteristics for this population Analysis by Year

This next section examines customer characteristics by year and type of closure. Because this analysis further examines five-year patterns of customer input, process and outcome variables by employment outcomes, many of the proportions are small ($n < 50$) and, as a result, changes in percentages are more sensitive. As a result, this analysis will only report on statistically significant differences and linear patterns of change between 2004 and 2008.

Customer Characteristics by Year and Type of Closure

Table 24 provides a summary of customer characteristics by year and type of closure. A statistically significant difference was found in the distribution of males by year and type of closure χ^2 (4, N = 15,032) = 24.47, $p < .0005$. Changes in outcome greater than 2.0% occurred between 2004 and 2005 (3.4% increase) and 2007 and 2008 (3.7% decrease). There were no five year linear patterns of change observed for males or females between 2004 and 2008. No observable linear patterns of change were found in employment outcomes by race as well. While not perfectly linear, in the age at application category, there was a general increase in the percentage of customers aged 40

to 49 who achieved an employment outcome. A chi-square analysis detected a statistically significant difference in the employment of customers without an IEP χ^2 (4, N = 21,723) = 23.64, $p < .0005$ with a 3.5% increase between 2004 (47.8%) and 2005 (51.3%).

Table 24

Customer Characteristics by Year and Type of Closure

		Total	Unemployed		Employed	
Variable	Year	*N*	*n*	%	*n*	%
Gender						
	2004	3,820	2,035	53.3	1,785	46.7
	2005	3,173	1,584	49.9	1,589	50.1
Male*	2006	2,858	1,403	49.1	1,455	50.9
	2007	2,626	1,246	47.4	1,380	52.6
	2008	2,555	1,305	51.1	1,250	48.9
	2004	2,095	1,052	50.2	1,043	49.8
	2005	1,764	813	46.1	951	53.9
Female	2006	1,569	748	47.7	821	52.3
	2007	1,427	699	49.0	728	51.0
	2008	1,258	590	47.3	658	52.7
Race						
	2004	4,169	2,071	59.7	2,098	50.3
	2005	3,553	1,659	46.7	1,894	53.3
White/Asian	2006	3,152	1,471	46.7	1,681	53.3
	2007	2,885	1,308	45.3	1,577	54.7
	2008	2,694	1,258	46.7	1,436	53.3
	2004	1,003	618	61.6	385	38.4
	2005	818	483	59.0	335	41.0
African American or	2006	733	415	56.6	318	43.4
Black						
	2007	729	419	57.5	310	42.5
	2008	658	394	59.9	264	40.1
	2004	572	291	50.9	281	49.1
	2005	411	166	40.4	245	59.6
Hispanic	2006	404	195	48.3	209	51.7
	2007	307	144	46.9	163	53.1
	2008	341	190	55.7	151	44.3

(table continues)

Table 24 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	162	99	61.1	63	38.9
	2005	156	89	57.4	66	42.6
Other	2006	138	70	50.7	68	49.3
	2007	132	74	56.1	58	43.9
	2008	110	53	48.2	57	51.8
Age at Application						
	2004	641	319	49.8	322	50.2
	2005	613	301	49.1	312	50.9
Up to age 21	2006	1,168	605	51.8	563	48.2
	2007	556	274	49.3	282	50.7
	2008	524	268	51.1	256	48.9
	2004	906	502	55.4	404	44.6
	2005	739	368	49.8	371	50.2
22 to 29	2006	651	298	45.8	353	54.2
	2007	599	305	50.9	294	49.1
	2008	551	299	54.3	252	45.7
	2004	1,704	867	50.9	837	49.1
	2005	1,360	673	49.5	687	50.5
30 to 39	2006	880	433	49.2	447	50.8
	2007	1,041	487	46.8	554	53.2
	2008	935	485	51.9	450	48.1
	2004	1,806	962	53.3	844	46.7
	2005	1,497	720	48.1	777	51.9
40 to 49	2006	1,020	494	48.4	526	51.6
	2007	1,128	546	48.4	582	51.6
	2008	1,101	526	47.8	575	52.2
	2004	725	378	52.1	347	47.9
	2005	599	286	47.7	313	52.3
50 to 59	2006	579	259	44.7	320	55.3
	2007	602	288	47.8	314	52.2
	2008	587	272	46.3	315	53.7
	2004	89	46	51.7	43	48.3
	2005	88	28	43.2	50	56.8
60 to 64	2006	73	26	49.3	37	50.7
	2007	89	33	37.1	56	62.9
	2008	68	28	41.2	40	58.8
	2004	44	13	29.5	31	70.5
	2005	41	11	26.8	30	73.2
Over 64	2006	56	26	46.4	30	53.6
	2007	38	12	31.6	26	68.4
	2008	37	17	45.9	20	54.1

(table continues)

Table 24 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
Previous Closure						
	2004	4,979	2,638	53.0	2,341	47.0
	2005	3,947	1,947	49.3	2,000	50.7
None in past 36 months	2006	3,601	1,809	50.2	1,792	49.8
	2007	3,241	1,588	49.0	1,653	51.0
	2008	3,063	1,573	51.4	1,490	48.6
IEP						
	2004	5,638	2,942	52.2	2,696	47.8
	2005	4,636	2,258	48.7	2,378	51.3
Did not have an IEP *	2006	4,160	2,020	48.6	2,140	51.4
	2007	3,768	1,798	47.7	1,970	52.3
	2008	3,521	1,746	49.6	1,775	50.4
	2004	277	145	52.3	132	47.7
	2005	301	139	46.2	162	53.8
Had an IEP	2006	267	131	49.1	136	50.9
	2007	285	147	51.6	138	48.4
	2008	282	149	52.8	133	47.2

*Significant difference $p < .0005$

Level of Education and Employment Characteristics of Customers at Application, by Year and Type of Closure

This next section presents results on education and employment related characteristics of customers at application, by year and type of closure (Table 25). As noted in the previous section, the consecutive breakdown by category and year has resulted in smaller proportions for some groups so only statistically significant and linear patterns of change over the five years of study will be reported. There were no linear patterns of change associated with level of education at application. In the employment status at application category there was a positive linear relationship in the percentage of Other Unemployed customers employed at closure, with a progressive increase between

2004 (41.3%) and 2008 (57.4%). An examination of the hourly wage and hours worked at application by year and type of employment closure revealed no linear patterns between 2004 and 2008.

Table 25

Level of Education and Employment Characteristics of Customers at Application, by Year and Type of Closure

		Total	Unemployed		Employed	
Variable	Year	*N*	*n*	%	*n*	%
Level of Education						
	2004	7	3	42.9	4	57.1
	2005	11	4	36.4	7	63.6
No formal schooling	2006	6	3	50.0	3	50.0
	2007	6	5	83.3	1	16.7
	2008	10	8	80.0	2	20.0
	2004	184	105	57.1	79	42.9
	2005	137	74	54.0	63	46.0
Elementary, grades 1-8	2006	117	65	56.0	51	44.0
	2007	82	50	61.0	32	39.0
	2008	75	51	68.0	24	32.0
	2004	894	566	63.3	328	36.7
	2005	744	419	56.3	325	43.7
Secondary, no diploma	2006	697	416	59.7	281	40.3
	2007	639	374	58.5	265	41.5
	2008	574	360	61.0	224	39.0
	2004	61	25	41.0	36	59.0
	2005	48	22	45.8	26	54.2
Special ed completion	2006	44	24	54.5	20	45.5
	2007	41	21	51.2	20	48.8
	2008	54	27	50.0	27	50.0
	2004	2,635	1,419	53.9	1,216	46.1
	2005	2,091	1,095	52.4	996	47.6
High school grad equiv	2006	1,730	903	52.2	827	47.8
	2007	1,544	788	51.0	756	49.0
	2008	1,444	776	53.7	668	46.3
	2004	1,021	548	53.7	473	46.3
	2005	926	450	48.6	476	51.4
Post secondary, no degree	2006	834	389	46.6	445	53.4
	2007	734	368	50.0	366	49.9
	2008	699	348	49.8	351	50.2

(table continues)

Table 25 *(continued)*

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	534	224	41.9	310	58.1
	2005	478	197	41.2	281	58.8
Associate deg or voc tech	2006	467	204	43.7	263	56.3
	2007	436	182	41.7	254	58.3
	2008	432	184	42.6	248	57.4
	2004	442	159	36.0	283	64.0
	2005	364	102	28.0	262	72.0
Bachelor's degree	2006	389	121	31.1	268	68.9
	2007	401	115	28.7	286	71.3
	2008	354	122	34.5	232	65.5
	2004	137	38	27.7	99	72.3
	2005	138	34	24.6	1.4	75.4
Master's degree or higher	2006	144	26	18.1	118	81.9
	2007	170	42	24.7	128	75.3
	2008	161	29	18.0	132	82.0
Employment Status						
	2004	792	204	25.8	588	74.2
	2005	703	146	20.8	557	79.2
Integrated, no supports	2006	628	142	22.6	486	77.4
	2007	652	117	17.9	535	82.1
	2008	626	130	20.8	496	79.2
	2004	7	3	42.9	4	57.1
	2005	4	1	25.0	3	75.0
Extended employment	2006	8	3	37.5	5	62.5
	2007	4	1	25.0	3	75.0
	2008	4	1	25.0	3	75.0
	2004	46	7	15.2	39	84.8
	2005	44	5	11.4	39	88.6
Self employed	2006	47	11	23.4	36	76.6
	2007	37	10	27.0	27	73.0
	2008	37	6	15.4	33	84.6
	2004	66	22	33.3	44	66.7
	2005	39	12	30.8	27	69.2
Homemaker	2006	29	11	37.9	18	62.1
	2007	25	8	32.0	17	68.0
	2008	21	8	38.1	13	61.9
	2004	10	4	40.0	6	60.0
	2005	4	0	0.0	4	100.0
Unpaid family worker	2006	8	6	75.0	2	25.0
	2007	8	2	25.0	6	75.0
	2008	5	3	60.0	2	40.0

(table continues)

Table 25 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	29	2	6.9	27	93.1
	2005	34	5	14.7	29	85.3
Integrated, with supports	2006	35	6	17.1	28	82.9
	2007	49	11	22.4	38	77.6
	2008	45	6	13.3	39	86.7
	2004	202	82	40.6	120	59.4
	2005	216	103	47.7	113	52.3
Unemployed h.s. student	2006	186	69	37.1	117	62.9
	2007	181	90	49.7	91	50.3
	2008	159	84	52.8	75	47.2
	2004	274	130	47.4	144	52.6
	2005	215	115	53.5	100	46.5
Other unemployed student	2006	198	91	46.0	107	54.0
	2007	181	84	46.4	97	53.6
	2008	152	75	49.3	77	50.7
	2004	11	5	45.5	6	54,5
	2005	14	5	35.7	9	64.3
Unemployed trainee	2006	19	8	42.1	11	57.9
	2007	13	6	46.2	7	53.8
	2008	15	10	66.7	5	33.3
	2004	4,478	2,628	58.7	1,850	41.3
	2005	3,664	2,005	54.7	1,659	45.3
Other unemployed	2006	3,269	1,465	44.8	1,804	55.2
	2007	2,903	1,287	44.3	1,616	55.7
	2008	2,737	1,165	42.6	1,572	57.4
Hourly Wage						
	2004	208	78	37.5	130	62.5
	2005	142	40	28.2	102	71.8
Up to $6.49	2006	146	46	31.5	100	68.5
	2007	137	48	35.0	89	65.0
	2008	106	34	32.1	72	67.9
	2004	182	39	21.4	143	78.6
	2005	151	42	27.8	109	72.2
$6.50 to $8.49	2006	144	48	33.3	96	66.7
	2007	119	29	24.4	90	75.6
	2008	130	33	25.4	97	74.6
	2004	174	41	23.6	133	76.4
	2005	189	30	15.9	159	84.1
$8.50 to $11.49	2006	155	31	20.0	124	80.0
	2007	154	25	16.2	129	83.8
	2008	146	31	21.2	115	78.8

(table continues)

Table 25 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	173	37	21.4	136	78.6
	2005	162	33	20.4	129	79.6
$11.50 to $17.49	2006	123	21	17.1	102	82.9
	2007	145	17	11.7	128	88.3
	2008	162	28	17.3	134	82.7
	2004	130	18	13.8	112	86.2
	2005	137	11	8.0	126	92.0
Over $17.50	2006	143	13	9.1	130	90.9
	2007	183	19	10.4	164	89.6
	2008	166	16	9.6	150	90.4
Hours Worked						
	2004	66	22	33.3	44	66.7
	2005	39	12	30.8	27	69.2
0	2006	28	11	39.3	17	60.7
	2007	25	8	32.0	17	68.0
	2008	21	8	38.1	13	61.9
	2004	72	17	23.6	55	76.4
	2005	66	19	28.8	47	71.2
1-10	2006	65	21	32.3	44	67.7
	2007	50	13	26.0	37	74.0
	2008	55	15	27.3	40	72.7
	2004	197	58	29.4	139	70.6
	2005	177	38	21.5	139	78.5
11-20	2006	171	45	26.3	126	73.7
	2007	177	41	23.2	136	76.8
	2008	169	47	27.8	122	72.2
	2004	187	56	29.9	131	70.1
	2005	138	29	21.0	109	79.0
21-35	2006	147	36	24.5	111	75.5
	2007	138	30	21.7	108	78.3
	2008	115	15	13.0	100	87.0
	2004	388	76	19.6	312	80.4
	2005	383	65	17.0	318	83.0
36-40	2006	310	53	17.1	257	82.9
	2007	344	50	14.5	294	85.5
	2008	346	58	16.8	288	83.2
	2004	23	6	26.1	17	73.9
	2005	16	5	31.3	11	68.8
41 or more	2006	17	4	23.5	13	76.5
	2007	29	4	13.8	25	86.2
	2008	24	6	25.0	18	75.0

Customer Supports at Application, by Year and Type of Closure

This next section examines five year patterns associated with customer supports at application by year and type of closure (Table 26). There were no linear patterns of change for the employment outcome of customer's who identified a primary source of support at application. In addition, there were no linear patterns in the percent of usage of the types of public support used at application. However, there was a statistically significant difference in the employment outcome of customers receiving Social Security insurance χ^2 (4, N = 6,326) = 18.31, $p < .0005$; most directly a 5.0% increase in customer utilization of Social Security insurance occurred between 2005 and 2006. There were no five-year patterns of change in the either the type of medical insurance or the number of supports used at application. Finally while there were no five-year linear patterns of change associated with days from application to eligibility. However there was a statistically significant change within the five years; most directly there was over a 5% increase in the number of customers achieving eligibility within 30 days between 2004 and 2005 χ^2 (4, N = 11,993) = 23.82, $p < .0005$. There was less than a 2% change between the remaining years (2005 through 2008).

Table 26

Customer Supports at Application, by Year and Type of Closure

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
Primary Source of Support						
	2004	811	240	29.6	571	70.4
	2005	724	191	26.4	533	73.6
Personal income	2006	640	180	28.1	460	71.9
	2007	660	154	23.3	506	76.7
	2008	621	159	25.6	462	74.4
	2004	2,068	1,067	51.6	1,001	48.4
	2005	1,750	823	47.0	927	53.0
Other	2006	1,544	775	50.2	769	49.8
	2007	1,295	657	50.7	638	49.3
	2008	1,233	617	50.0	616	50.0
	2004	2,352	1,425	60.6	927	39.4
	2005	1,904	1,109	58.2	795	41.8
Public support	2006	1,798	982	54.6	816	45.4
	2007	1,738	970	55.8	768	44.2
	2008	1,597	937	58.7	660	41.3
	2004	675	346	51.3	329	48.7
	2005	542	257	47.4	285	52.6
Family friends	2006	438	207	47.3	231	52.7
	2007	357	161	45.1	196	54.9
	2008	344	174	50.6	170	49.4
Type of Public Support						
	2004	1,396	783	56.1	613	43.9
	2005	1,251	685	54.8	566	45.2
Social Security Disability*	2006	1,270	629	49.5	641	50.5
	2007	1,252	611	48.8	641	51.2
	2008	1,157	601	51.9	556	48.1
	2004	1,095	726	66.3	369	33.7
	2005	949	604	63.6	345	36.4
SSI Aged Blind Disabled	2006	877	533	60.8	344	39.2
	2007	847	547	64.6	300	35.4
	2008	806	529	65.6	277	34.4
	2004	159	104	65.4	55	34.6
	2005	111	61	55.0	50	45.0
TANF	2006	84	49	58.3	35	41.7
	2007	66	39	59.1	27	40.9
	2008	70	42	60.0	28	40.0

(table continues)

Table 26 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	52	27	51.9	25	48.1
	2005	34	17	50.0	17	50.0
Veterans' Disability	2006	35	18	51.4	17	48.6
	2007	24	15	60.0	10	40.0
	2008	30	18	60.0	12	40.0
	2004	315	164	52.1	151	47.9
	2005	211	92	43.6	119	56.4
Workers' Compensation	2006	184	73	39.7	111	60.3
	2007	176	80	45.5	96	54.5
	2008	160	81	50.6	79	49.4
	2004	189	130	68.8	59	31.2
	2005	109	70	64.2	39	35.8
General Assistance	2006	76	49	64.5	27	35.5
	2007	88	57	64.8	31	35.2
	2008	76	42	55.3	34	44.7
	2004	487	242	49.7	245	50.3
	2005	438	201	25.9	237	54.1
Other Public Support	2006	350	183	52.3	167	47.7
	2007	251	131	52.2	120	47.8
	2008	295	160	54.2	135	45.8
Type of Medical Insurance						
	2004	1,391	859	61.8	532	38.2
	2005	1,262	716	56.7	546	43.3
Medicaid	2006	1,211	674	55.7	537	44.3
	2007	1,184	681	57.5	503	42.5
	2008	1,201	702	58.5	499	41.5
	2004	792	398	50.3	394	49.7
	2005	749	342	45.7	407	54.3
Medicare	2006	774	343	44.3	431	55.7
	2007	799	373	46.7	426	53.3
	2008	768	378	49.2	390	50.8
	2004	231	127	55.0	104	45.0
	2005	216	95	44.0	121	56.0
Other Public Source	2006	171	73	42.7	98	57.3
	2007	181	90	49.7	91	50.3
	2008	162	72	44.4	90	55.6

(table continues)

Table 26 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	496	166	33.5	330	66.5
	2005	432	114	26.4	318	73.6
Private via Employment	2006	352	85	24.1	267	75.9
	2007	359	82	22.8	277	77.2
	2008	345	88	25.5	257	74.5
	2004	1,179	548	46.5	631	53.5
	2005	908	377	41.5	531	58.5
Private via Other Means	2006	857	352	41.6	495	58.4
	2007	792	321	40.5	471	59.5
	2008	737	349	47.4	388	52.6
Number of Supports						
	2004	2,694	1,229	45.6	1,465	54.4
	2005	2,264	924	40.8	1,340	59.2
0	2006	1,963	871	44.4	1,092	55.6
	2007	1,720	704	40.9	1,016	59.1
	2008	1,528	655	41.0	943	59.0
	2004	2,760	1,555	56.3	1,205	43.7
	2005	2,276	1,237	54.3	1,039	45.7
1	2006	2,071	1,045	50.5	1,026	49.5
	2007	1,975	1,013	51.3	962	48.7
	2008	1,835	1,018	55.5	817	44.5
	2004	401	260	64.8	141	35.2
	2005	353	212	60.1	141	39.9
2	2006	358	213	59.5	145	40.5
	2007	332	209	63.0	123	37.0
	2008	322	201	62.4	671	38.0
	2004	39	32	82.1	7	17.9
	2005	40	23	57.5	17	42.5
3	2006	28	21	75.0	7	25.0
	2007	19	15	78.9	4	21.1
	2008	35	17	48.5	18	51.4
	2004	0	0	0.0	0	0.0
	2005	0	0	0.0	0	0.0
4	2006	1	0	0.0	1	100.0
	2007	2	1	50.0	1	50.0
	2008	2	0	0.0	2	100.0

(table continues)

Table 26 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	1	0	0.0	1	100.0
	2005	0	0	0.0	0	0.0
5	2006	0	0	0.0	0	0.0
	2007	0	0	0.0	0	0.0
	2008	0	0	0.0	0	0.0
Days from Application to Eligibility						
	2004	2,936	1,464	49.9	1,472	50.1
	2005	2,480	1,103	44.5	1,377	55.5
0 to 30*	2006	2,329	1,060	45.5	1,269	54.5
	2007	2,162	954	44.1	1,208	55.9
	2008	2,086	942	45.2	1,144	54.8
	2004	1,717	913	53.2	804	46.8
	2005	1,432	731	51.0	701	49.0
31 to 60	2006	1,224	608	49.7	616	50.3
	2007	1,198	619	51.7	579	48.3
	2008	1,100	596	54.2	504	45.8
	2004	629	332	52.8	297	47.2
	2005	482	263	54.6	219	45.4
61 to 90	2006	413	220	53.3	193	46.7
	2007	314	163	51.9	151	48.1
	2008	290	161	55.5	129	44.5
	2004	633	378	59.7	255	40.3
	2005	543	300	55.2	243	44.8
91 or more	2006	461	263	57.0	198	43.0
	2007	379	209	55.1	170	44.9
	2008	327	196	59.9	131	40.1

*Significant difference $p < .0005$

Cost of Goods and Purchased Services by Year and Type of Closure

Table 27 provides a summary of the cost of goods and purchased services by year and type of closure. While there were no statistically significant changes, there was a funding category that revealed close to a negative linear pattern. There was a 3.7% decrease in the percentage of funding between $10,001 and $20,000.

Table 27

Cost of Goods and Purchased Services by Year and Type of Closure

Cost of Goods and Purchased Services	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	482	331	68.7	151	31.3
	2005	398	257	64.6	141	35.4
0	2006	343	234	68.2	109	31.8
	2007	301	194	64.5	107	35.5
	2008	297	205	69.0	92	31.0
	2004	1,245	859	69.0	386	31.0
	2005	936	576	61.5	360	38.5
$1 to $1,000	2006	838	555	66.2	283	33.8
	2007	750	481	64.1	269	35.9
	2008	719	471	65.5	248	34.5
	2004	2,032	1,072	52.8	960	47.2
	2005	1,619	810	50.0	809	50.0
$1,001 - $5,000	2006	1,417	694	49.0	723	51.0
	2007	1,229	623	50.7	606	49.3
	2008	1.158	605	52.2	553	47.8
	2004	837	402	42.9	535	57.1
	2005	785	343	43.7	442	56.3
$5,001 - $10,000	2006	712	315	44.2	397	55.8
	2007	655	268	40.9	387	59.1
	2008	535	227	42.4	308	57.6
	2004	652	226	34.7	426	65.3
	2005	636	227	35.7	409	64.3
$10,001- $20,000	2006	507	178	35.1	329	64.5
	2007	498	191	38.4	307	61.6
	2008	477	183	38.4	294	61.6
	2004	450	157	34.9	293	65.1
	2005	409	134	32.8	275	67.2
$20,001 - $50,000	2006	440	124	28.2	316	71.8
	2007	442	131	29.6	311	70.4
	2008	452	143	31.6	309	68.4
	2004	117	40	34.2	77	65.8
	2005	154	50	32.5	104	67.5
$50,001or more	2006	170	51	30.0	119	70.0
	2007	178	57	32.0	121	68.0
	2008	165	61	37.0	104	63.0

Number and Percent of Customers Receiving Services, by Year and Type of Closure

This next section provides an overview of the number and percent of customers receiving services, by year and type of closure, and highlights any statistically significant changes and linear patterns of change (Table 28). While there were no observable linear patterns demonstrating a decrease or increase in services from 2004 through 2008 there were statistically significant changes within two of the 22 service types. There were changes in the percentage of customers who received occupational and vocational services and achieved an employment outcome χ^2 (4, N = 3,797) = 24.97, p < .0005. Specifically, there was a 3.4% increase between 2004 and 2005 and a 7.1% decrease between 2006 and 2007 followed by an additional 4.7% decrease between 2007 and 2008. A chi-square analysis also detected a statistically significant change in vocational rehabilitation counseling and guidance services χ^2 (4, N = 14,112) = 21.16, p < .0005. A 4.3% increase between 2004 and 2005 was the only change greater than 1% that occurred in the provision of vocational rehabilitation counseling and guidance services between 2004 and 2008.

Table 28

Number and Percent of Customers Receiving Services, by Year and Type of Closure

Services Received	Year	Total	Unemployed		Employed	
		N	*n*	%	*n*	%
Assessment	2004	4,088	2,156	52.7	1,932	47.3
	2005	3,361	1,654	49.2	1,707	50.8
	2006	3,030	1,532	50.6	1,498	49.4
	2007	2,688	1,313	48.8	1,375	51.2
	2008	2,514	1,243	49.4	1,271	50.6
Augmentative Skills	2004	209	106	50.7	103	49.3
	2005	154	52	33.8	102	66.2
	2006	118	49	41.5	69	58.5
	2007	117	57	48.7	60	51.3
	2008	116	52	44.8	64	55.2
Basic Remedial/Literacy	2004	64	44	68.8	20	31.3
	2005	92	54	58.7	38	41.3
	2006	87	49	56.3	38	43.7
	2007	55	26	47.3	29	52.7
	2008	47	29	61.7	18	38.3
College or University	2004	1,644	831	50.5	813	49.5
	2005	1,416	724	51.1	692	48.9
	2006	1,239	617	49.8	622	50.2
	2007	1,135	583	51.4	552	48.6
	2008	989	534	54.0	455	46.0
Diagnosis and Treatment	2004	2,315	1,205	52.1	1,110	47.9
	2005	1,941	924	47.6	1,017	52.4
	2006	1,868	908	48.6	960	51.4
	2007	1,745	834	47.8	911	52.2
	2008	1,593	770	48.3	823	51.7
Information and Referral	2004	758	387	51.1	371	48.9
	2005	622	283	45.5	339	54.5
	2006	614	268	43.6	346	56.4
	2007	647	293	45.3	354	54.7
	2008	737	341	46.3	396	53.7
Interpreter	2004	35	13	37.1	22	62.9
	2005	22	13	59.1	9	40.9
	2006	22	10	45.5	12	54.5
	2007	12	6	50.0	6	50.0
	2008	19	10	52.6	9	47.4
Job Placement Assistance	2004	1,348	485	36.0	863	64.0
	2005	1,223	426	34.8	797	65.2
	2006	1,083	375	34.6	708	65.4
	2007	1,088	395	36.3	693	63.7
	2008	1,000	392	39.2	608	60.8

(table continues)

Table 28 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	399	190	47.6	209	52.4
	2005	364	158	43.4	206	56.6
Job Readiness Training	2006	334	138	41.3	196	58.7
	2007	319	141	44.2	178	55.8
	2008	306	154	50.3	152	49.7
	2004	1,227	504	41.1	723	58.9
	2005	1,079	401	37.2	678	62.8
Job Search Assistance	2006	915	364	39.8	551	60.2
	2007	859	338	39.3	521	60.7
	2008	779	338	43.4	441	56.6
	2004	1,102	473	42.9	629	57.1
	2005	983	400	40.7	583	59.3
Maintenance	2006	909	364	40.0	545	60.0
	2007	797	311	39.0	486	61.0
	2008	722	285	39.5	437	60.5
	2004	754	372	49.3	382	50.7
	2005	644	299	46.4	345	53.6
Miscellaneous Training	2006	628	288	45.9	340	54.1
	2007	541	251	46.4	290	53.6
	2008	458	219	47.8	239	52.2
	2004	1,061	501	47.2	560	52.8
	2005	836	366	43.8	470	56.2
Occupational/Vocational	2006	735	320	43.5	415	56.5
	2007	617	312	50.6	305	49.4
	2008	548	303	55.3	245	44.7
	2004	446	181	40.6	265	59.4
	2005	434	164	37.8	270	62.2
On-the-job Support	2006	393	131	33.3	262	66.7
	2007	421	170	40.4	251	59.6
	2008	416	162	38.9	254	61.1
	2004	168	67	39.9	101	60.1
	2005	97	23	23.7	74	76.3
On-the-job Training	2006	88	18	20.5	70	79.5
	2007	68	19	27.9	49	72.1
	2008	72	24	33.3	48	66.7
	2004	1,691	711	42.0	980	58.0
	2005	1,532	650	42.4	882	57.6
Other	2006	1,428	613	42.9	815	57.1
	2007	1,243	569	45.8	674	54.2
	2008	1,277	593	46.4	864	53.6

(table continues)

Table 28 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	122	54	44.3	68	55.7
	2005	111	55	49.5	56	50.5
Personal Attendant	2006	125	57	45.6	68	54.4
	2007	128	60	46.9	68	53.1
	2008	108	56	51.9	52	48.1
	2004	7	6	85.7	1	14.3
	2005	15	10	66.7	5	33.3
Reader	2006	5	2	40.0	3	60.0
	2007	12	5	41.7	7	58.3
	2008	7	3	42.7	4	57.1
	2004	1,188	445	37.5	743	62.5
	2005	1,176	401	34.1	775	65.9
Rehab Technology	2006	1,110	375	33.8	735	66.2
	2007	1,153	409	35.5	744	64.5
	2008	1,132	395	34.9	737	65.1
	2004	313	131	41.9	182	58.1
	2005	288	107	37.2	181	62.8
Technical Assistance	2006	255	84	32.9	171	67.1
	2007	239	98	41.0	141	59.0
	2008	232	91	39.2	141	60.8
	2004	2,017	980	48.6	1,037	51.4
	2005	1,745	822	47.1	923	52.9
Transportation	2006	1,614	755	46.8	859	53.2
	2007	1,438	693	48.2	745	51.8
	2008	1,437	720	50.1	717	49.9
	2004	3,539	1,837	51.9	1,702	48.1
	2005	3,005	1,430	47.6	1,575	52.4
Voc Rehab Counseling/ Guidance *	2006	2,713	1,283	47.3	1,430	52.7
	2007	2,531	1,191	47.1	1,340	52.9
	2008	2,324	1,120	48.2	1,204	51.8

*Significant difference $p < .0005$

Level of Education and Employment Characteristics of Customers at Closure, by Year and Type of Closure

This next section provides an overview of the level of education and employment characteristics of customers at closure, by year and type of closure (Table 29). There were no statistically significant or linear patterns of change associated with level of education by year by type of closure. No statistics were computed for hours worked and hourly wage because employment status is a constant.

Table 29

Level of Education and Employment Characteristics of SCI Customers at Closure, by Year and Type of Closure

		Total	Unemployed		Employed	
Variable	Year	*N*	*N*	%	*n*	%
Level of Education						
	2004	2	2	100.0	0	0.0
	2005	5	3	60.0	2	40.0
No formal schooling	2006	5	3	60.0	2	40.0
	2007	3	3	100.0	0	0.0
	2008	4	4	100.0	0	0.0
	2004	138	82	59.4	56	40.6
	2005	121	50	49.5	51	50.5
Elementary, grades 1-8	2006	85	50	58.8	35	41.2
	2007	67	41	61.2	26	38.8
	2008	59	38	64.4	21	35.6
	2004	556	376	67.6	180	32.4
	2005	471	278	59.0	193	41.0
Secondary, no diploma	2006	424	296	69.8	128	30.2
	2007	406	253	52.3	153	37.7
	2008	342	227	66.4	115	33.6
	2004	45	24	53.3	21	46.6
	2005	59	33	55.9	26	44.1
Special education completion	2006	44	25	56.8	19	43.2
	2007	39	21	53.8	18	46.2
	2008	50	26	52.0	24	48.0

(table continues)

Table 29 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	1,947	1,160	59.6	787	40.4
	2005	1,499	869	58.0	630	42.0
High school graduate equiv.	2006	1,241	717	57.8	524	42.2
	2007	1,152	646	56.1	506	43.9
	2008	1,118	641	57.3	477	42.7
	2004	1,262	778	61.6	484	38.4
	2005	1,081	648	59.9	433	40.1
Post secondary, no degree	2006	968	556	57.4	512	42.6
	2007	838	496	59.2	342	40.8
	2008	809	493	60.9	316	39.1
	2004	980	380	38.8	600	61.2
	2005	841	305	36.3	536	63.7
Associate deg or voc tech	2006	778	297	38.2	481	61.8
	2007	660	261	39.5	399	60.5
	2008	609	238	39.1	371	60.9
	2004	747	226	30.3	521	69.7
	2005	656	163	24.8	493	75.2
Bachelor's degree	2006	648	169	26.1	479	73.9
	2007	637	164	25.7	473	74.3
	2008	579	186	32.1	393	67.9
	2004	238	59	24.8	179	75.2
	2005	224	48	21.4	176	78.6
Master's degree or higher	2006	234	38	16.2	196	83.8
	2007	251	60	23.9	191	76.1
	2008	233	42	18.0	191	82.0
Hourly Wage *						
	2004	373	0	0.0	373	100.0
	2005	305	0	0.0	305	100.0
Up to $6.49	2006	240	0	0.0	240	100.0
	2007	162	0	0.0	162	100.0
	2008	89	0	0.0	89	100.0
	2004	279	0	0.0	279	100.0
	2005	230	0	0.0	230	100.0
$6.50 to $8.49	2006	198	0	0.0	198	100.0
	2007	212	0	0.0	212	100.0
	2008	160	0	0.0	160	100.0

(table continues)

Table 29 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	1,065	0	0.0	1,065	100.0
	2005	957	0	0.0	957	100.0
$8.50 to $11.49	2006	842	0	0.0	842	100.0
	2007	732	0	0.0	732	100.0
	2008	727	0	0.0	727	100.0
	2004	589	0	0.0	589	100.0
	2005	562	0	0.0	562	100.0
$11.50 to $17.49	2006	528	0	0.0	528	100.0
	2007	503	0	0.0	503	100.0
	2008	477	0	0.0	477	100.0
	2004	366	0	0.0	366	100.0
	2005	386	0	0.0	386	100.0
Over $17.50	2006	385	0	0.0	385	100.0
	2007	426	0	0.0	426	100.0
	2008	393	0	0.0	393	100.0
Hours Worked *						
	2004	156	0	0.0	156	100.0
	2005	100	0	0.0	100	100.0
0	2006	83	0	0.0	83	100.0
	2007	73	0	0.0	73	100.0
	2008	62	0	0.0	62	100.0
	2004	122	0	0.0	122	100.0
	2005	119	0	0.0	119	100.0
1-10	2006	100	0	0.0	100	100.0
	2007	96	0	0.0	96	100.0
	2008	94	0	0.0	94	100.0
	2004	476	0	0.0	476	100.0
	2005	449	0	0.0	449	100.0
11-20	2006	418	0	0.0	418	100.0
	2007	424	0	0.0	424	100.0
	2008	368	0	0.0	368	100.0
	2004	545	0	0.0	545	100.0
	2005	495	0	0.0	495	100.0
21-35	2006	435	0	0.0	435	100.0
	2007	419	0	0.0	419	100.0
	2008	392	0	0.0	392	100.0
	2004	1,456	0	0.0	1,456	100.0
	2005	1,321	0	0.0	1,321	100.0
36-40	2006	1,185	0	0.0	1,185	100.0
	2007	1,045	0	0.0	1,045	100.0
	2008	942	0	0.0	942	100.0

(table continues)

Table 29 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	73	0	0.0	73	100.0
	2005	56	0	0.0	56	100.0
41 or more	2006	55	0	0.0	55	100.0
	2007	51	0	0.0	51	100.0
	2008	50	0	0.0	50	100.0

* No statistics were computed because Type of Closure was a constant.

Customer Supports at Closure, by Year and Type of Closure

This final section examines customer supports at closure, by year and type of closure (Table 30). There was a statistically significant difference between social security disability income by year χ^2 (4, N = 7,237) = 29.59, $p < .0005$. There was a 7.8% increase in the number of customers utilizing social security disability income between 2005 and 2006 and a 3.0% decrease between 2007 and 2008. While not statistically significant, there was a positive linear pattern in the number of customers receiving workers compensation from 27.8% in 2004 to 44.6% in 2008. In an evaluation of the number of supports by year by type of closure there was a statistically significant change in the use of one support χ^2 (4, N = 10,304) = 34.33, $p < .0005$. There was a 12.0% increase in the percentage of customers using one support between 2004 and 2005, a 5.1% increase between 2005 and 2006 and a 4.1% decrease between 2007 and 2008. There was a positive linear pattern in the percentage of customers with two to less than three years from application to closure by year, from 43.6% in 2004 to 47.6% in 2008. Finally there was a statistically significant change in the percentage of customers with three to less than four years from application to closure χ^2 (4, N = 7,869) = 22.48, $p < .0005$. There was a 2.2% decrease in percentage of customers between 2006 and 2007.

Table 30

Customer Supports at Closure, by Year and Type of Closure

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
Primary Source of Support						
	2004	2,464	244	9.9	2,220	90.1
	2005	2,207	177	8.0	2,030	92.0
Personal income	2006	1,917	177	9.2	1,740	90.8
	2007	1,744	154	8.8	1,590	91.2
	2008	1,624	146	9.0	1,478	91.0
	2004	998	877	87.9	121	12.1
	2005	756	661	87.4	95	12.6
Other	2006	654	580	88.7	74	11.3
	2007	528	460	87.1	68	12.9
	2008	518	461	89.0	57	11.0
	2004	1,821	1,379	75.7	442	24.3
	2005	1,503	1,122	74.7	381	25.3
Public support	2006	1,414	988	69.9	426	30.1
	2007	1,389	986	71.0	403	29.0
	2008	1,303	961	73.8	342	26.2
	2004	281	236	84.0	45	16.0
	2005	198	164	82.8	34	17.2
Family friends	2006	198	162	81.8	36	18.2
	2007	172	125	72.7	47	27.3
	2008	142	111	78.2	31	21.8
Type of Public Support						
	2004	1,649	932	56.6	717	43.5
	2005	1,467	824	56.2	643	43.8
Social Security Disability	2006	1,428	691	48.4	737	51.6
	2007	1,391	704	50.6	687	49.4
	2008	1,302	698	53.6	604	46.4
	2004	1,093	763	69.8	330	30.2
	2005	938	625	66.6	313	33.4
SSI Aged Blind Disabled	2006	890	577	64.8	313	35.2
	2007	853	573	67.2	280	32.8
	2008	801	542	67.7	259	32.3
	2004	99	73	73.7	26	26.3
	2005	57	46	80.7	11	19.3
TANF	2006	50	36	72.0	14	28.0
	2007	34	23	67.6	11	32.4
	2008	34	28	82.4	6	17.6

(table continues)

Table 30 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	45	25	55.6	20	44.4
	2005	34	17	50.0	17	50.0
Veterans' Disability	2006	22	14	63.6	8	36.4
	2007	24	14	58.3	10	41.7
	2008	20	13	65.0	7	35.0
	2004	158	114	72.2	44	27.8
	2005	90	58	64.4	32	35.6
Workers' Compensation	2006	101	62	61.4	39	38.6
	2007	92	56	60.9	36	39.1
	2008	83	46	55.4	37	44.6
	2004	115	98	85.2	17	14.8
	2005	76	55	72.4	21	27.6
General Assistance	2006	48	33	68.8	15	31.3
	2007	54	43	79.6	11	20.4
	2008	32	26	81.3	6	18.8
	2004	255	168	65.9	87	34.1
	2005	163	97	59.5	66	40.5
Other Public Support	2006	159	112	70.4	47	29.6
	2007	116	69	59.5	47	40.5
	2008	139	103	74.1	36	25.9
Type of Medical Insurance						
	2004	1,513	953	63.0	560	37.0
	2005	1,362	827	60.7	535	39.3
Medicaid	2006	1,291	771	59.7	520	40.3
	2007	1,170	686	58.6	484	41.4
	2008	1,105	662	59.9	443	40.1
	2004	1,105	560	50.7	545	49.3
	2005	1,009	471	46.7	538	53.3
Medicare	2006	990	450	45.5	540	54.5
	2007	994	474	47.7	520	52.3
	2008	884	442	50.0	442	50.0
	2004	187	91	48.7	96	51.3
	2005	184	91	49.5	93	50.5
Other Public Source	2006	152	65	42.8	87	57.2
	2007	177	75	42.4	102	57.6
	2008	153	66	43.1	87	56.9

(table continues)

Table 30 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
	2004	991	63	6.4	928	93.6
	2005	923	42	4.6	881	95.4
Private via Employment	2006	832	37	4.4	795	95.6
	2007	768	29	3.8	739	96.2
	2008	653	29	4.4	624	95.6
	2004	816	387	47.4	429	52.6
	2005	562	213	37.9	349	62.1
Private via Other Means	2006	533	207	38.8	326	61.2
	2007	482	189	39.2	293	60.8
	2008	454	203	44.7	251	55.3
Number of Supports						
	2004	2,803	1,151	41.0	1,657	59.0
	2005	2,443	893	36.6	1,550	63.4
0	2006	2,066	837	40.5	1,229	59.5
	2007	1,775	668	37.6	1,107	62.4
	2008	1,667	621	37.3	1,046	62.7
	2004	2,468	1,521	61.6	947	28.4
	2005	2,118	1,260	59.5	858	40.5
1*	2006	1,990	1,083	54.4	907	45.6
	2007	1,919	1,052	54.8	867	45.2
	2008	1,809	1,066	58.9	743	41.1
	2004	393	264	67.2	129	32.8
	2005	315	205	65.1	110	34.9
2	2006	320	193	60.3	127	39.7
	2007	295	195	66.1	100	33.9
	2008	283	183	64.7	100	35.3
	2004	29	26	89.7	3	10.3
	2005	22	15	68.2	7	31.8
3	2006	22	18	81.8	4	8.2
	2007	16	11	68.8	5	31.3
	2008	11	7	63.6	4	36.4
	2004	2	2	100.0	0	0.0
	2005	1	0	0.0	1	100.0
4	2006	0	0	0.0	0	0.0
	2007	1	1	100.0	0	0.0
	2008	0	0	0.0	0	0.0

(table continues)

Table 30 (*continued*).

Variable	Year	Total *N*	Unemployed *n*	Unemployed %	Employed *n*	Employed %
Years from Application to Closure						
	2004	790	253	32.0	537	68.0
	2005	730	204	17.9	526	72.1
Less than 1	2006	744	229	30.8	515	69.2
	2007	699	187	26.8	512	73.2
	2008	727	195	26.8	532	73.2
	2004	1,230	584	47.5	646	52.5
	2005	1,064	434	40.8	630	59.2
1 to less than 2	2006	964	419	43.5	545	56.5
	2007	967	403	41.7	564	58.3
	2008	898	388	43.2	510	56.8
	2004	1,164	656	56.4	508	43.6
	2005	766	424	55.4	342	44.6
2 to less than 3	2006	673	361	53.6	312	46.4
	2007	609	326	53.5	283	46.5
	2008	500	262	52.4	238	47.6
	2004	912	535	58.7	377	41.3
	2005	691	401	58.0	290	42.0
3 to less than 4 *	2006	418	239	57.2	179	42.8
	2007	374	222	59.4	152	40.6
	2008	346	211	61.0	135	39.0
	2004	1,819	1,059	58.2	760	41.8
	2005	1,686	934	55.4	752	44.6
4 or more	2006	1,628	903	55.5	725	44.5
	2007	1,404	807	57.5	597	42.5
	2008	1,332	839	63.0	493	37.0

*Significant difference $p < .0005$

Research Question Three (Part One): Predictor Variables Associated with Status 26 or 28 Outcomes for Customers with SCI

This next section addresses research question 3. To determine the input, service and output factors associated with positive outcomes for customers with SCI exhaustive CHAID was used to build a classification tree. Through the use of a systematic algorithm the strongest relationships between predictors and the outcome variable (status 26 or 28 employment outcome) were identified and organized into a hierarchical framework

similar to a tree with branches. A top-down, step-wise approach was utilized; as the predictor variable with the strongest relationship to the outcome variable was presented first, followed by splits or branches that identify the next set of variables with the strongest relation to the outcome variable (nodes). The analysis resulted in a total of three branches with 97 nodes (65 end nodes). PASW Statistics Release 18.0.0 with the PASW Decision Trees add-on was used for this analysis. For all statistical tests the alpha level was 0.05; a Bonferroni correction was utilized to correct for the number of statistical tests within each predictor. The estimated risk is 0.304 with a standard error of 0.003. The correct classification of 65% is a significant improvement over the base rate of 46.1%. The variables considered for inclusion were variables from question two that reflected a statistically significant difference in outcome (Table 31).

Table 31

Variables with a Statically Significant Outcome Variance

Variables	
Age at application categories	On-the-job supports services received
Assessment services received	On-the-job training received
Categories for number of days from application to closure	Other services received
Categories for number of days from application to eligibility	Private insurance through other means at application
Cost of services categories	Private insurance through other means at closure
Information and referral services received	Rehabilitation technology services received

(table continues)

Table 31 *(continued)*.

Variables	
Job placement assistance services received	Social security disability insurance at application
Job readiness training services received	Social security disability insurance at closure
Job search assistance services received	Social security insurance (SSI)-aged, blind, disabled at application
Level of education attained at application	SSI-aged, blind, disabled at closure
Level of education attained at closure	Technical assistance services received
Maintenance services received	Temporary assistance for needy families at application
Medicaid insurance coverage at application	Temporary assistance for needy families at closure
Number of supports at application	Voc rehab counseling and guidance services received
Number of supports at closure	Workers compensation at closure

Several variables were excluded due to their multi-collinearity with the outcome variables. These variables include Private (medical insurance) via Employment at application and closure, number and percent of SCI customers by type of closure and employment status at application, number and percent of SCI customers by type of closure and hours worked at application, number and percent of SCI customers by type of closure and hourly wage at application, number and percent of SCI customers by type of closure and primary support at closure.

Of the 30 predictor variables included in the analysis the six variables selected as the most significant predictors of employment outcome include level of education attained at closure, cost of services categories, categories for # of days from application to closure, rehabilitation technology services received, job placement assistance services received and number of supports at closure. The most significant predictor of employment outcomes was level of education attained at closure. Several sets of figures follow to describe the significant predictors of employment outcome by level of education.

Predictor Variables for Customers with an Education Level of Elementary Education grades 1 thru 8

As reflected in Figure 2 of the 469 customers with no formal schooling or an education level of elementary education grades one through eight only 41.2% achieved employment outcome at closure. For this group cost of goods and purchased services was the most important predictor variable. Customers receiving less than $1000 in goods and purchased services were too small in population to allow for further breakdown (n=164). Number of days from application to closure was the next most important predictor for customers who received more than $1000 in goods and purchased services. Spending more in services appeared to increase employment outcomes. The number of days from application to closure also appeared highly impactful for this group. Findings suggest that closing within one year of application increased almost 50.0%.

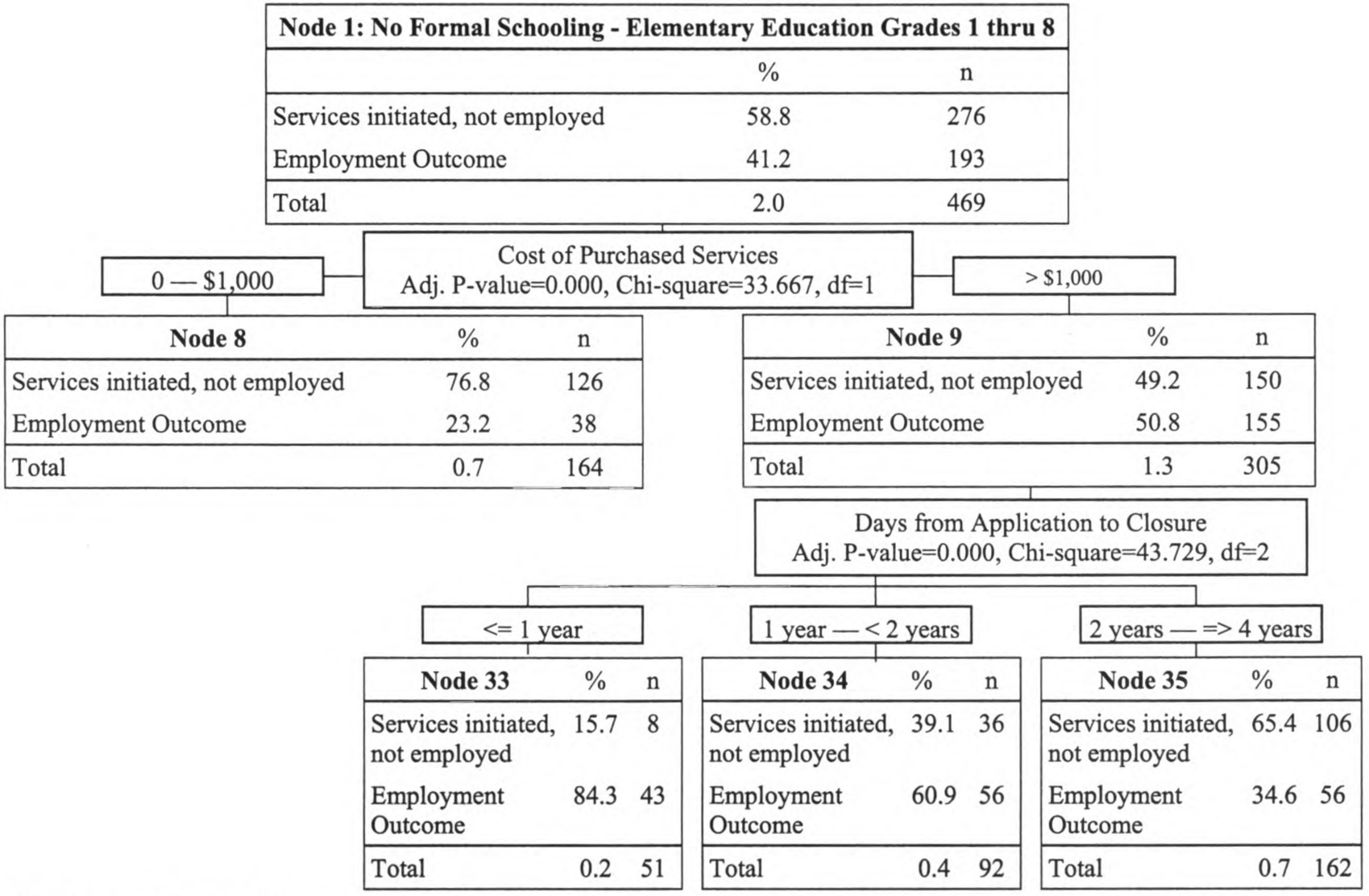

Figure 2. Partial Tree of Outcome Predictor for Customers with No Formal Schooling - Elementary Education Grades 1 thru 8

Predictor Variables for Customers with an Education Level of Secondary Education no high school diploma grades 9 thru 12

Of the 2,199 customers who closed with an education level of secondary education no high school diploma grades nine through 12 only 35.0% were employed (Figure 3.1). For this group the number of days from application to closure was the most important predictor variable associated with employment outcome. For those who closed within a year of application; rehabilitation technology services variable appears key; 89.2% of this group were employed at closure. The next group represents customers who closed in one but less than two years of application; over two-thirds (66.7%) of those who received job placement services were employed at closure.

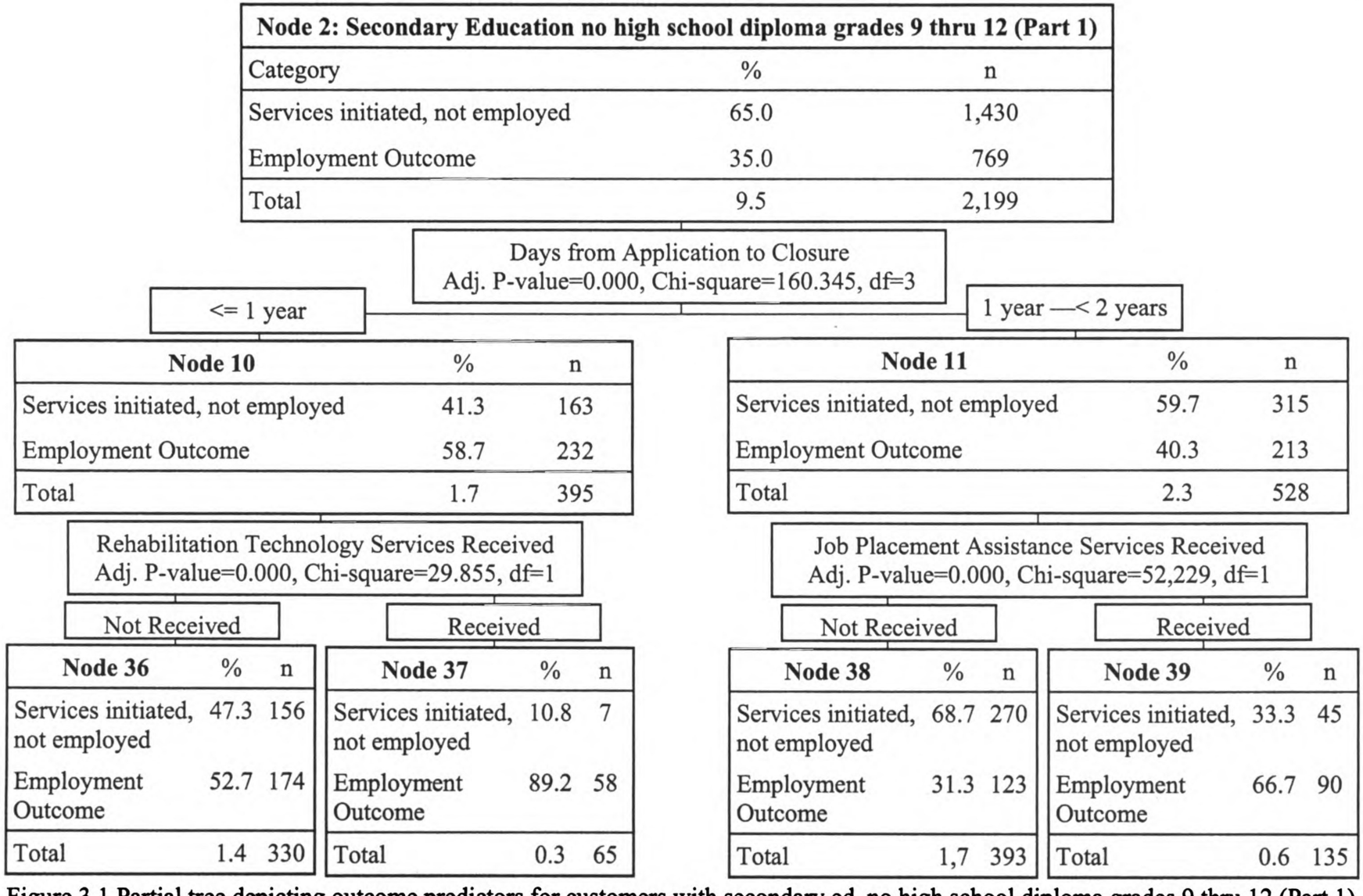

Figure 3.1 Partial tree depicting outcome predictors for customers with secondary ed. no high school diploma grades 9 thru 12 (Part 1).

The next group within this education level is represented in Figure 3.2 and examines customers with more than two years from application to closure. While only 29.4% of those receiving two but less than three years of service were employed at closure 47.4% of those who received $5,000 or more in goods and purchased services were employed at closure. The final group at this level of education had three or more years from application to closure and only 23.6% were employed at closure. Of the subgroup that received job placement services 35.7% were employed.

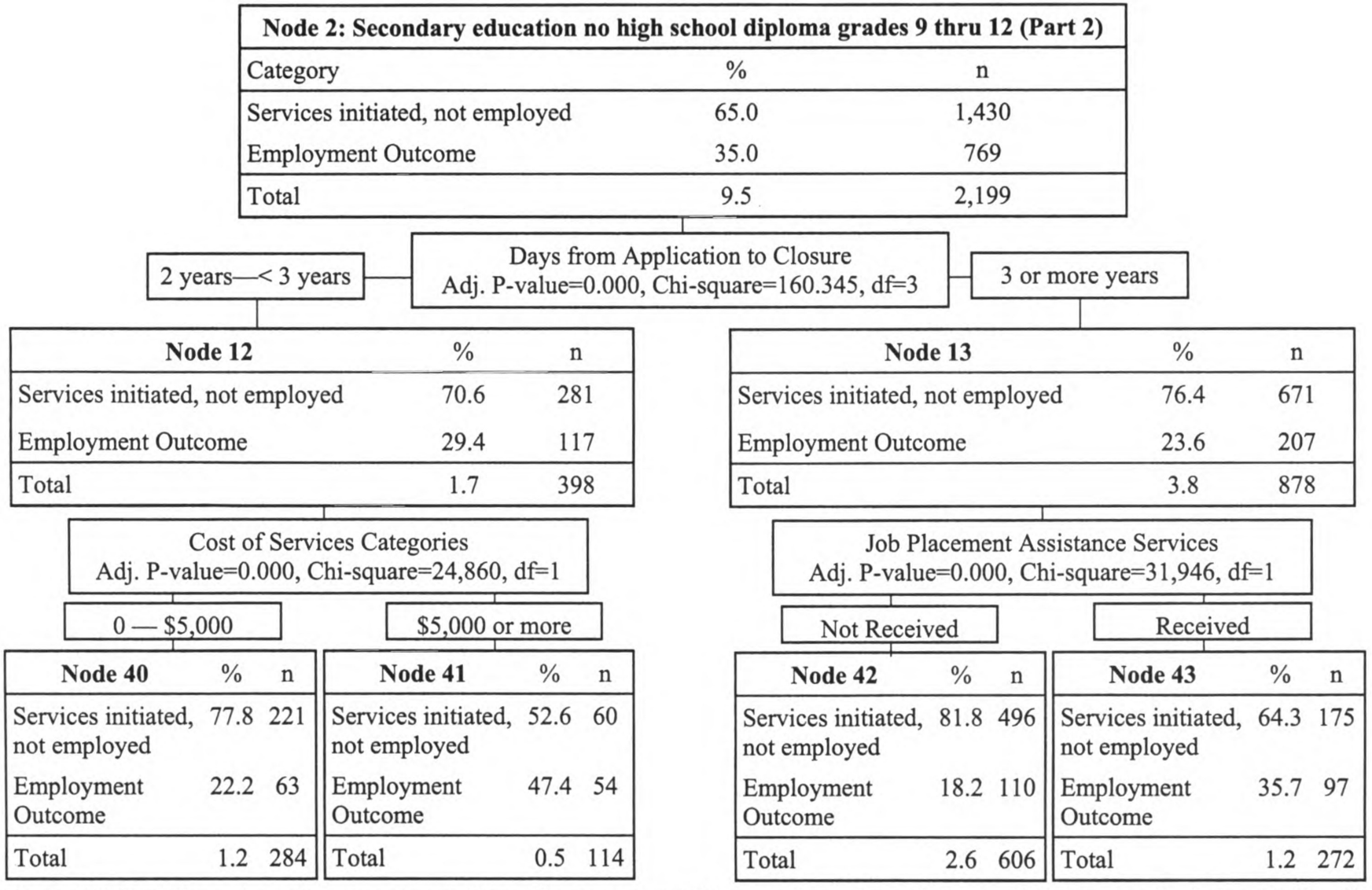

Figure 3.2. Partial tree depicting outcome predictors for customers with secondary ed. no high school diploma grades 9 thru 12 (Part 2).

Predictor Variables for Customers with an Education Level including Special Education Certificate of Completion or High School Graduate Equivalency

Of the 7,194 customers with an education level including special education certificate of completion (N = 237) or high school graduate equivalency (N = 6,957) only 42.1% achieved an unemployment outcome. These next set of figures will examine what factors and or services impact employment outcomes. As was previously reported for other groups fewer days from application to closure appear to improve outcomes; 66.3% of this group (with less than one year from application to closure) achieved employment. For customers in this group that received over $5,000 in goods and purchased services 92.3% were employed at closure (Figure 4.1).

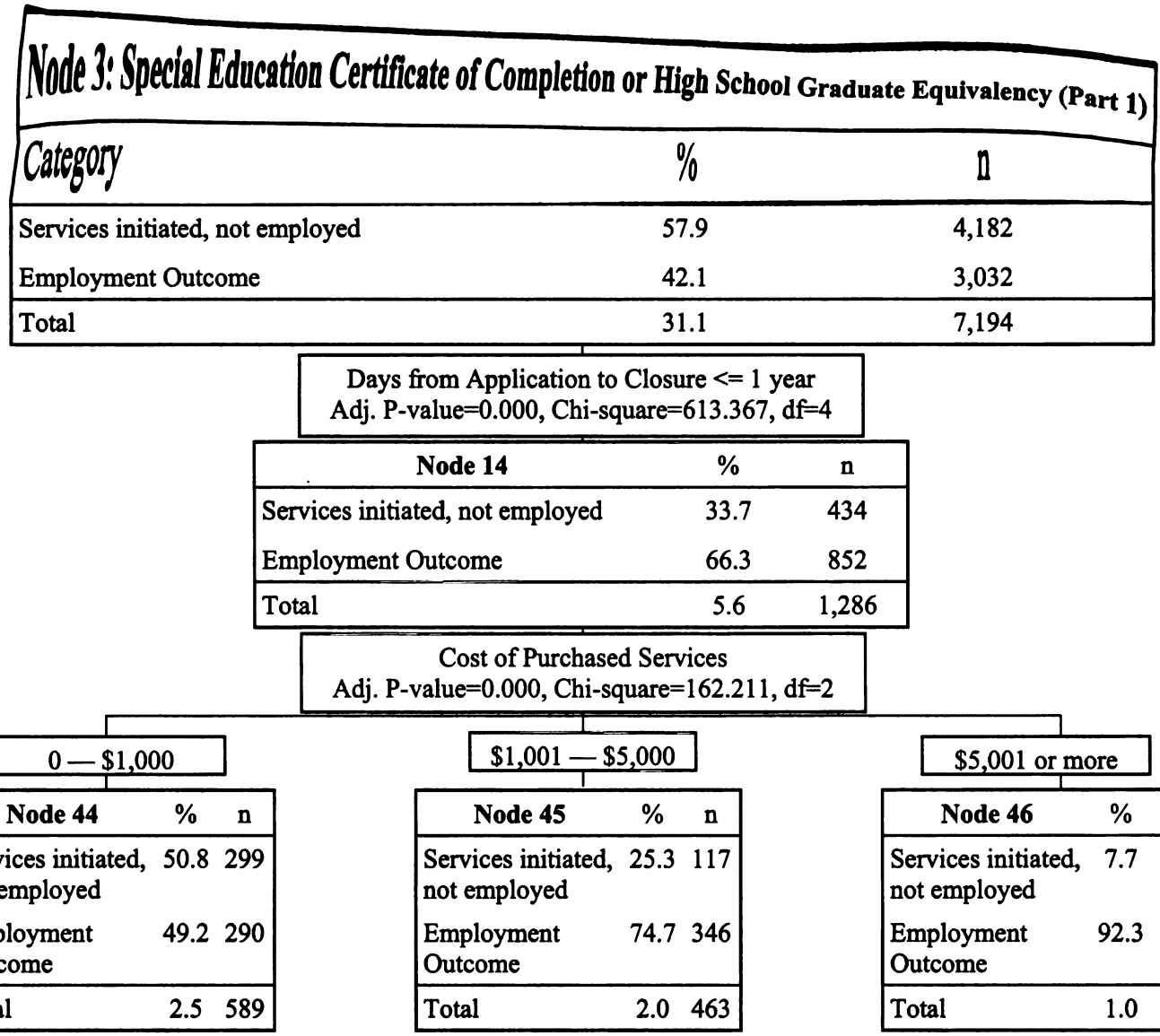

Figure 4.1. Partial tree depicting outcome predictors for customers with Special Ed Cert of Comp or High School Grad Equiv (Part 1).

The next group of 1,865 customers is comprised of those with at least one year but not more than two years from application to closure; 49.9% of this aggregate group was employed at closure (Figure 4.2). Funding was important for this group as well. Over two-thirds of customers who received $1,000 or less in funding were unemployed at closure. In contrast 87.2 of customers who received more than $20,000 were employed at closure.

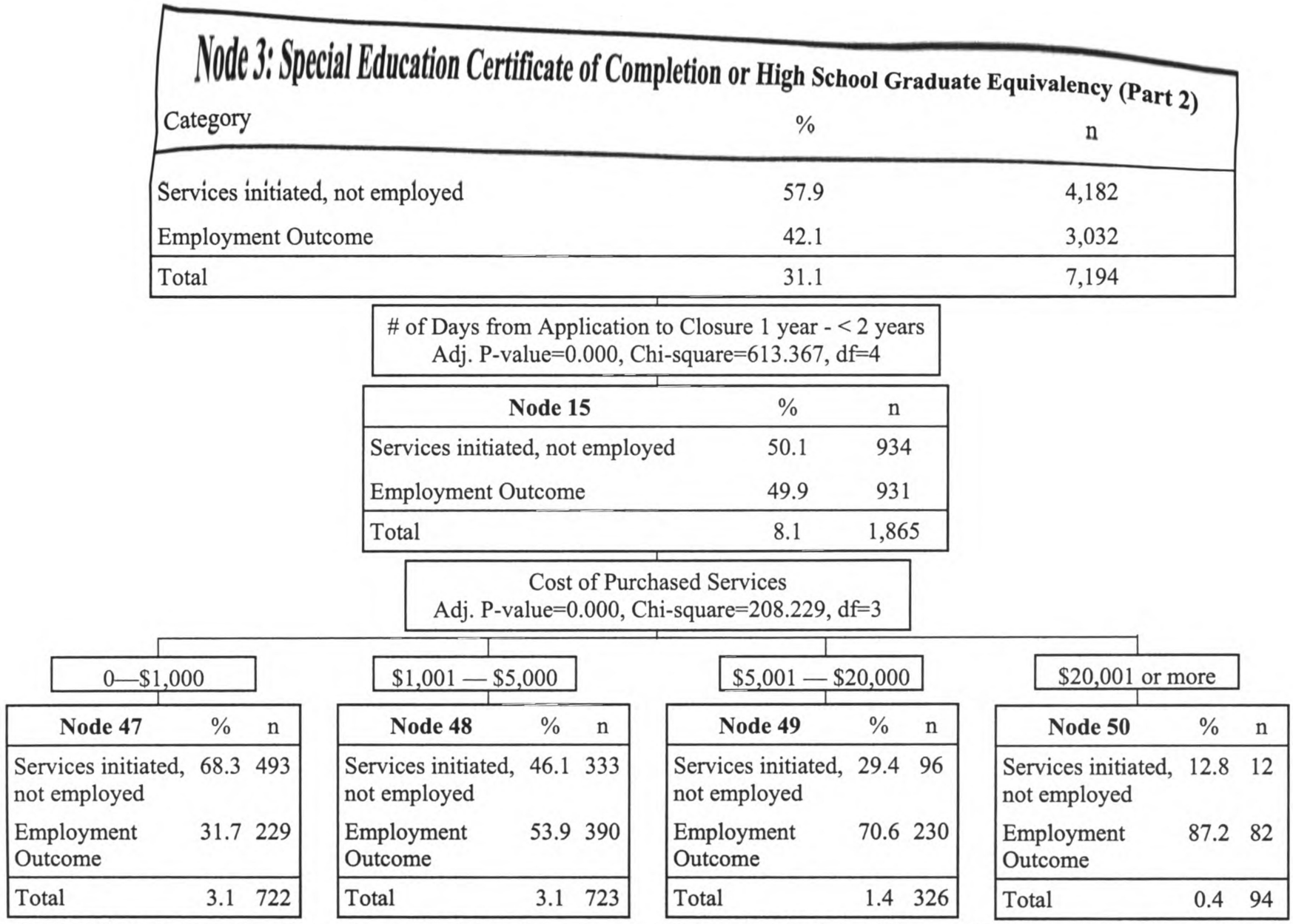

Figure 4.2. Partial tree depicting outcome predictors for customers with Special Ed Cert of Comp or High School Grad Equiv (Part 2).

The third group within this level of education had at least two years but less than three years from application to closure and only 37.8% of this core group achieved employment (Figure 4.3). As with prior groups at this level of education the cost of goods and purchased services was found to be a predictor of employment. Only 25.6% of customers who received $1,000 or less in funding were unemployed at closure as opposed to customers who received more than $5,000; 61.4% achieved employment.

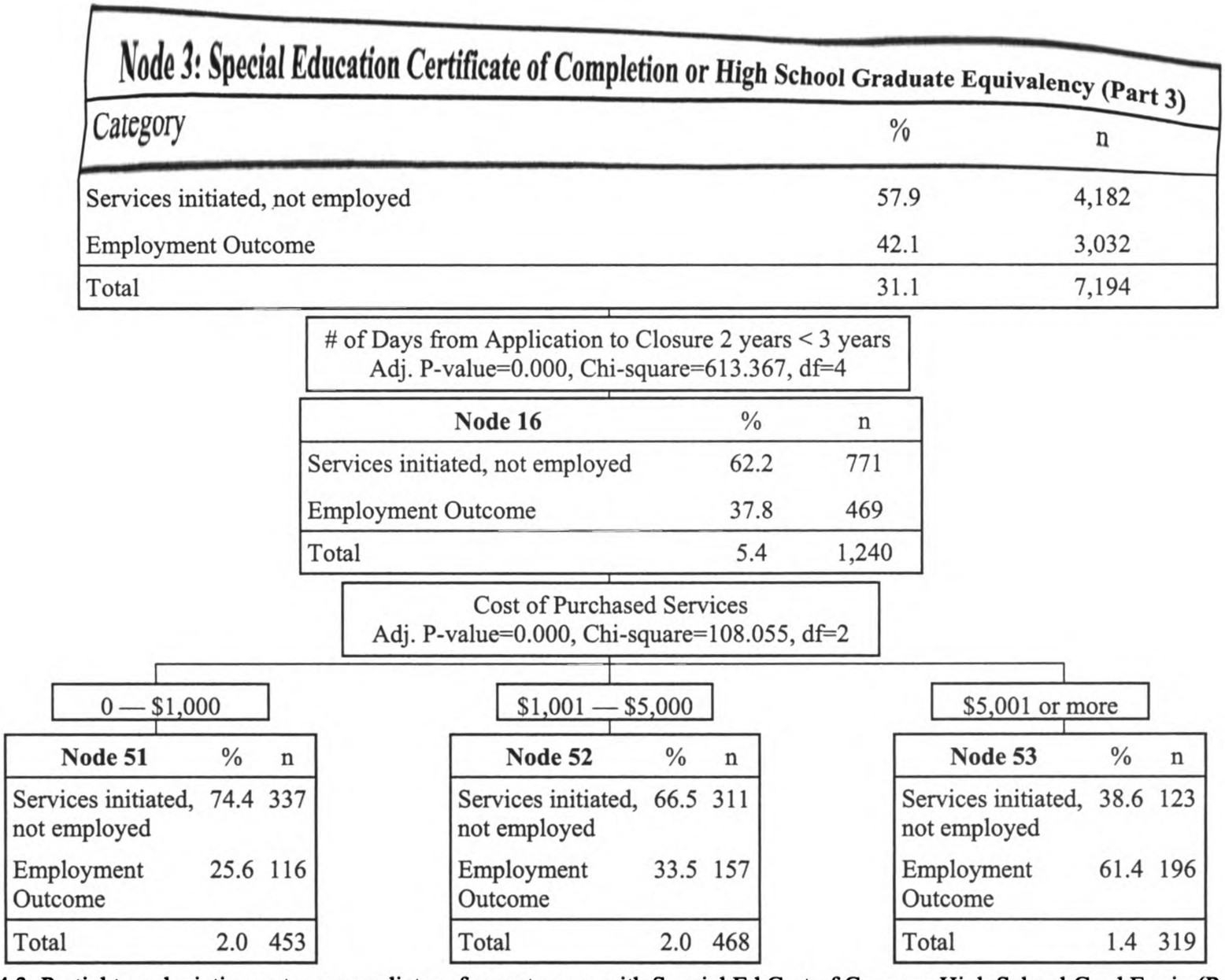

Figure 4.3. Partial tree depicting outcome predictors for customers with Special Ed Cert of Comp or High School Grad Equiv (Part 3).

This fourth group for analysis is of customers who had a least three but less than four years of time from application to closure (Figure 4.4). For this group only 33.3% achieved employment. Only 25.0% of these customers received job placement assistance services with 51.4% employed. Only 27.4% of the group who did not receive services achieved employment.

Node 3: Special Education Certificate of Completion or High School Graduate Equivalency (Part 4)		
Category	%	n
Services initiated, not employed	57.9	4,182
Employment Outcome	42.1	3,032
Total	31.1	7,194

# of Days from Application to Closure 3 years < 4 years
Adj. P-value=0.000, Chi-square=613.367, df=4

Node 17	%	n
Services initiated, not employed	66.9	598
Employment Outcome	33.2	297
Total	3.9	895

Job Placement Assistance Services
Adj. P-value=0.000, Chi-square=42.5555, df=1

Not Received

Node 54	%	n
Services initiated, not employed	72.6	493
Employment Outcome	27.4	186
Total	2.9	679

Received

Node 55	%	n
Services initiated, not employed	48.6	105
Employment Outcome	51.4	111
Total	0.9	216

Figure 4.4. Partial tree depicting outcome predictors for customers with Special Ed Cert of Comp or High School Grad Equiv (Part 4).

The final group of customers who closed with special education certificate of completion or high school graduate equivalency was customers who closed after four or more years from application (Figure 4.5). This group reported the lowest overall employment outcome (25.3%). Funding for these customers appeared impactful as well. With 37.6% of customers who received over $10,000 in funding employed and only 14.2% who received $1,000 or less.

Node 3: Special Education Certificate of Completion or High School Graduate Equivalency (Part 5)		
Category	%	n
Services initiated, not employed	57.9	4,182
Employment Outcome	42.1	3,032
Total	31.1	7,194

# of Days from Application to Closure => 4 years
Adj. P-value=0.000, Chi-square=613.367, df=4

Node 18	%	n
Services initiated, not employed	74.7	1,425
Employment Outcome	25.3	483
Total	8.2	1,908

Cost of Purchased Services
Adj. P-value=0.000, Chi-square=84.423, df=3

0—$1,000

Node 56	%	n
Services initiated, not employed	85.8	393
Employment Outcome	14.2	65
Total	2.0	458

$1,001 — $5,000

Node 57	%	n
Services initiated, not employed	80.0	431
Employment Outcome	20.0	108
Total	2.3	539

$5,001 — $10,000

Node 58	%	n
Services initiated, not employed	71.8	249
Employment Outcome	28.2	98
Total	1.5	347

$10,001 or more

Node 59	%	n
Services initiated, not employed	62.4	352
Employment Outcome	37.6	212
Total	2.4	564

Figure 4.5. Partial tree depicting outcome predictors for customers with Special Ed Cert of Comp or High School Grad Equiv (Part 5).

Predictor Variables for Customers with an Education Level of Post-Secondary Education, no degree

For the 4,958 customers with an education level of post-secondary education, no degree only 40.1% achieved employment at closure. Of this group 67.3% of those who closed in less than one year achieved employment. For the subgroup of customers that received more than $10,000 in funding 96.4% were employed at closure (Figure 5.1).

Node 4: Post-Secondary Education, no degree (Part 1)

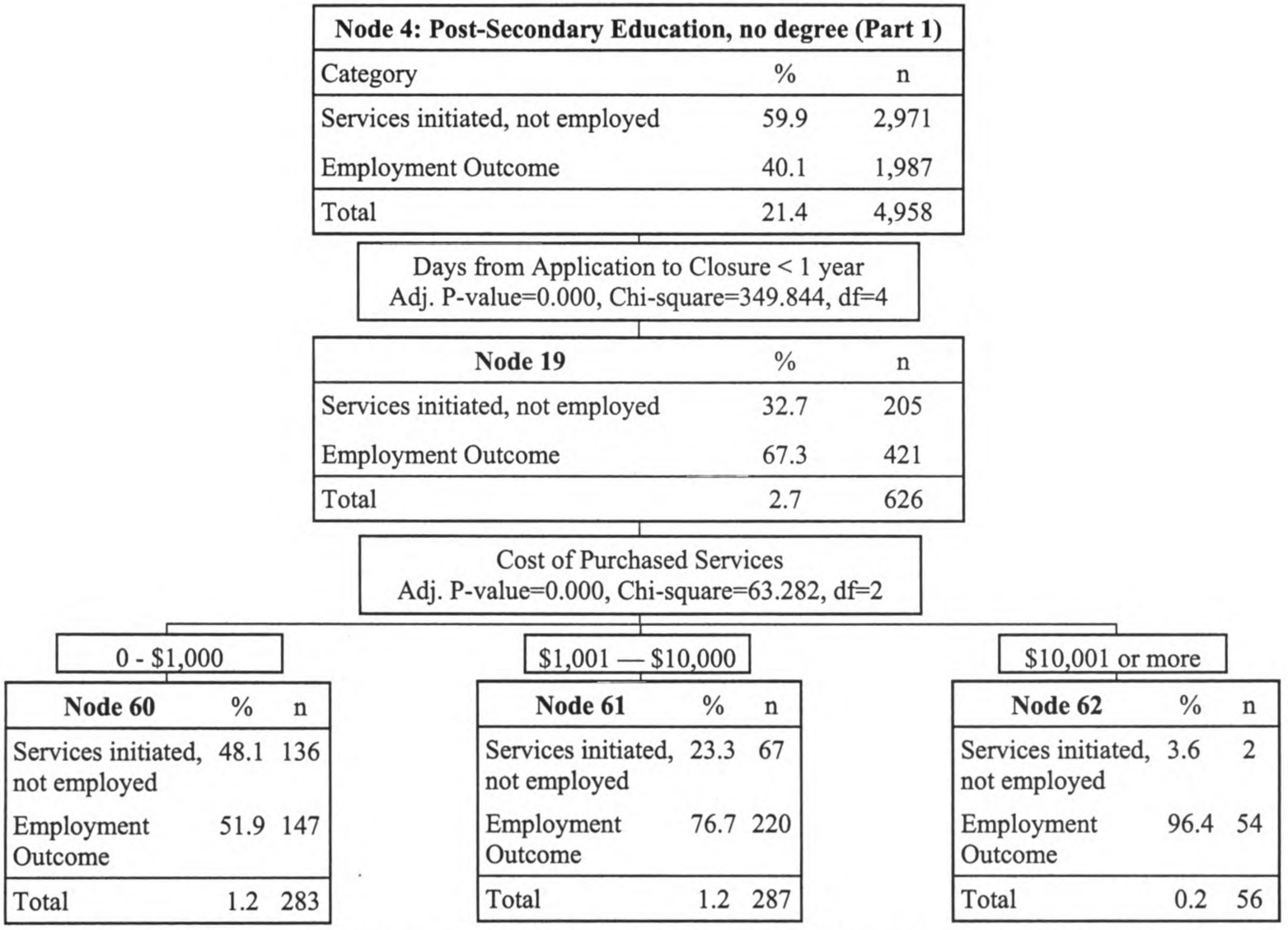

Figure 5.1. Partial tree depicting outcome predictors for customers with a Post-Secondary Education, no degree (Part 1).

This next subgroup of customers had more than one year but less than two years of service (Figure 5.2). While the majority of customers were unemployed by a slight margin (49.8%) those who received above $5000 in funding had a notable increase in their likelihood of employment (73.0%).

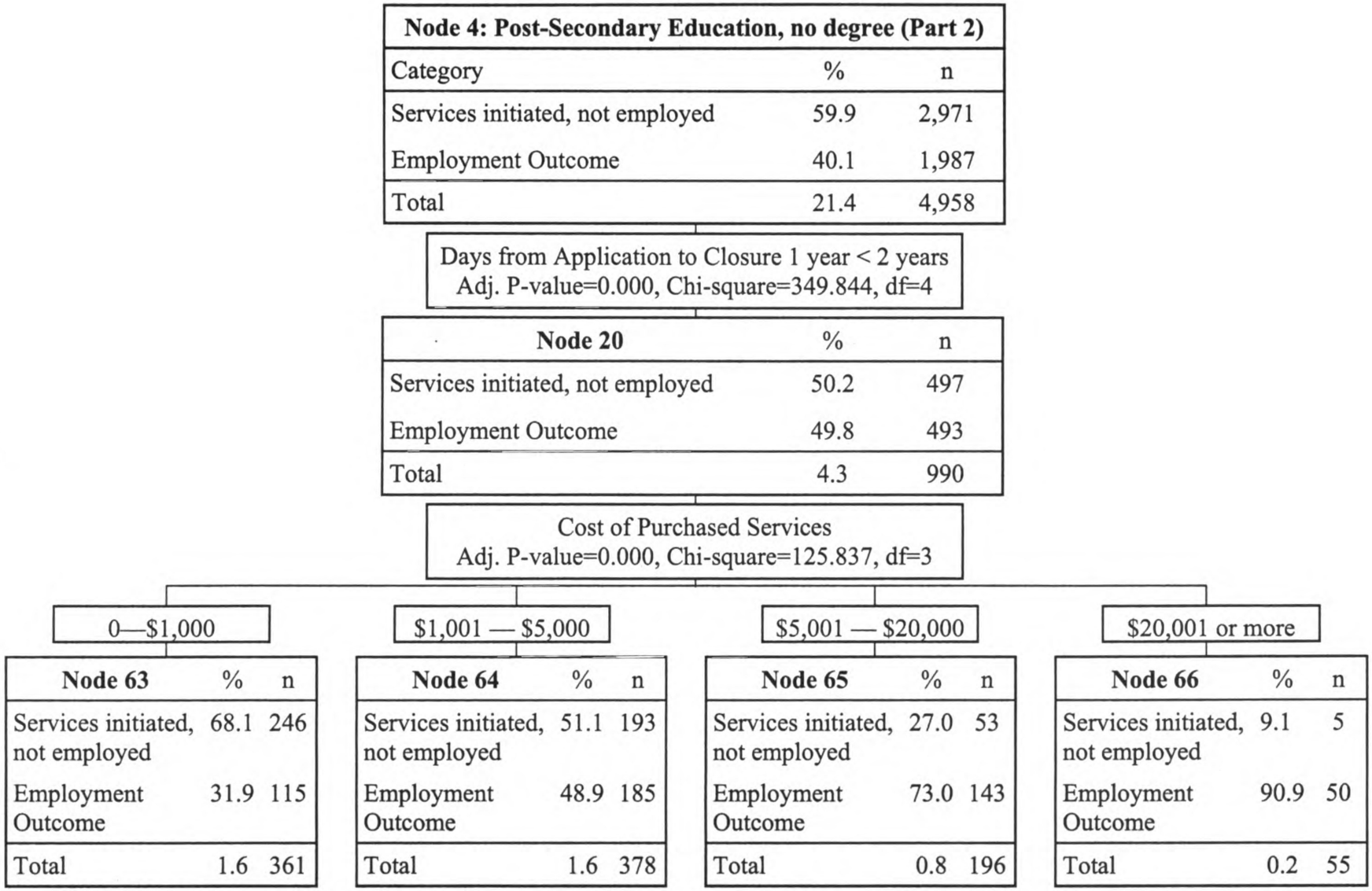

Figure 5.2. Partial tree depicting outcome predictors for customers with a Post-Secondary Education, no degree (Part 2).

For this next group of customers with a post-secondary education, no degree that had more than two years but less than four years of VR service from application to closure, factors other than goods and purchased services were impactful (Figure 5.3). For this first group, customers with more than two years but less than three years, job placement assistance services were found to be important with almost two-thirds of customers who received services achieved employment at closure. Only 34.3% of customers of those that did not receive services achieved employment. For customers with 3 but less than 4 years of time from application to closure number of supports at closure was reported as impactful. Of the customers with one or more support 75.8% were unemployed at closure.

Node 4:Post-Secondary Education, no degree (Part 3)

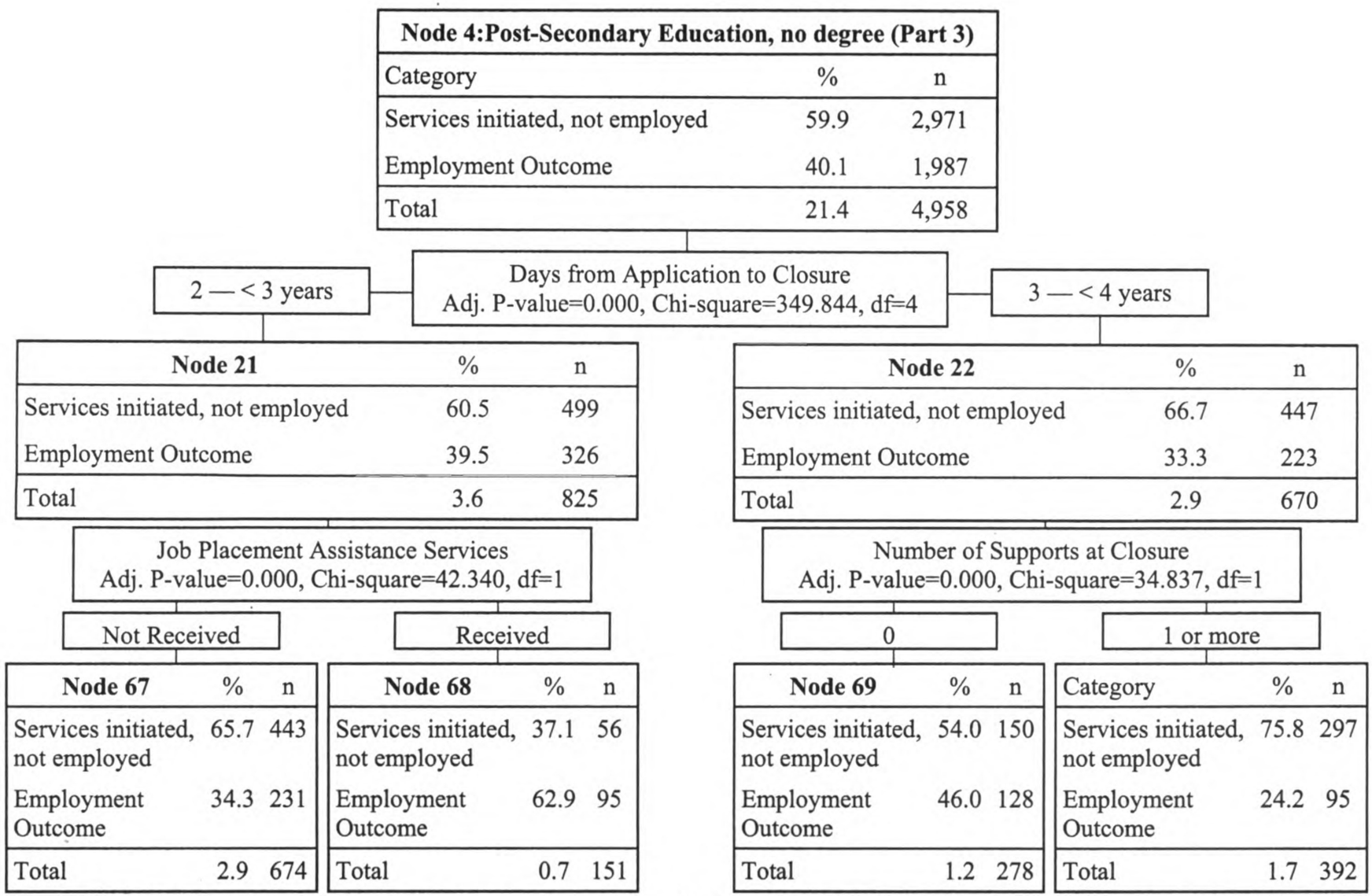

Figure 5.3. Partial tree depicting outcome predictors for customers with a Post-Secondary Education, no degree (Part 3).

Job placement assistance services were also found to be an employment predictor for customers with more than four years of time from application to closure (Figure 5.4). While only 28.4% of this subgroup was employed at closure those receiving job placement services had an improved outcome; 46.0% achieved employment.

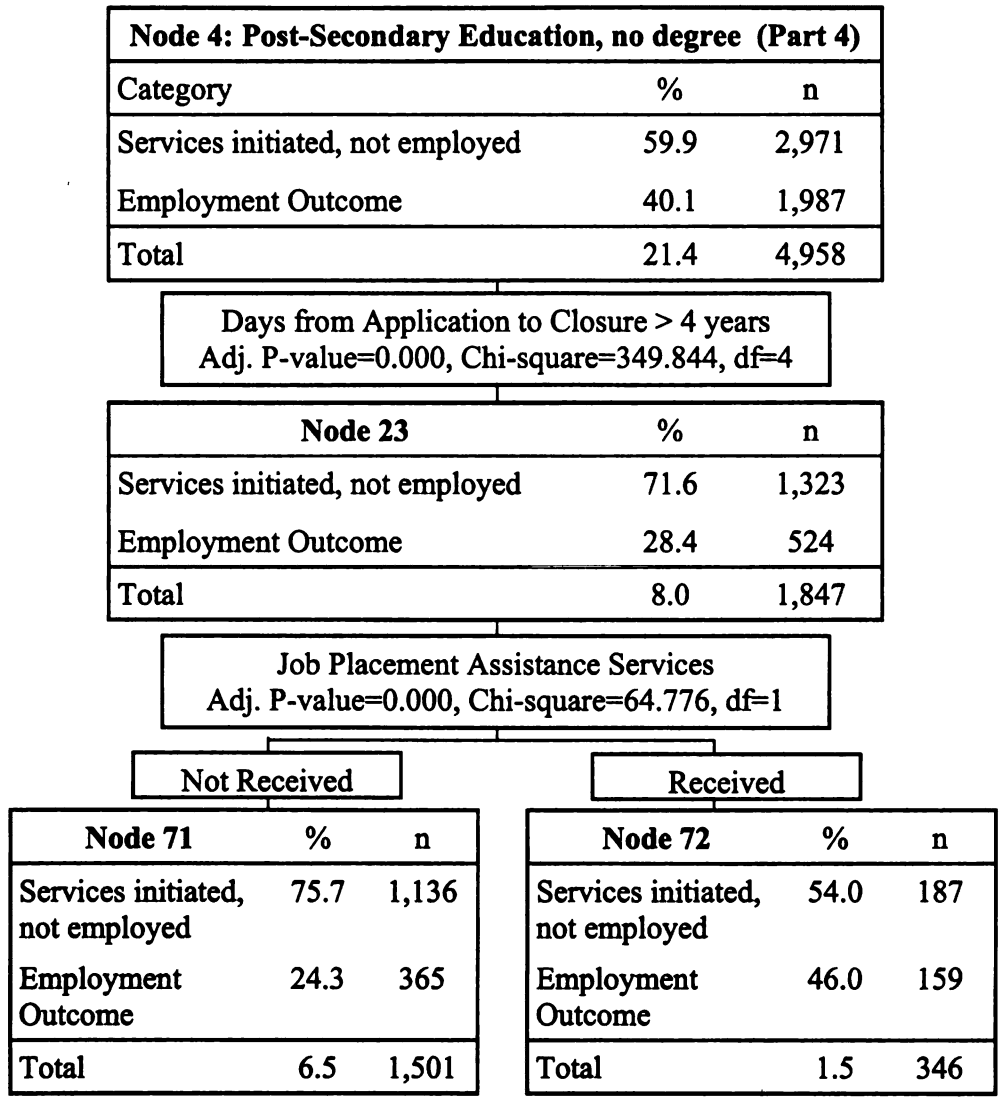

Figure 5.4. Partial tree depicting outcome predictors for customers with a Post-Secondary Education, no degree (Part 4).

Predictor Variables for Customers with an Education Level of Associates Degree or Vocational Technician Certificate

Of the 3,868 customers who closed with an associates degree or vocational technician certificate 61.7% were employed. For this group the number of supports at closure was the next most important predicator. Of the customers who closed without any supports 72.4% were employed (Figure 6.1). Cost of goods and purchased services appeared impactful for this group as well. The customers in this group who received one thousand or less in goods and purchased services were less successful; only 53.7% were employed. In contrast 81.0% of customers who received more than $5,000 in goods and purchased services were employed at closure.

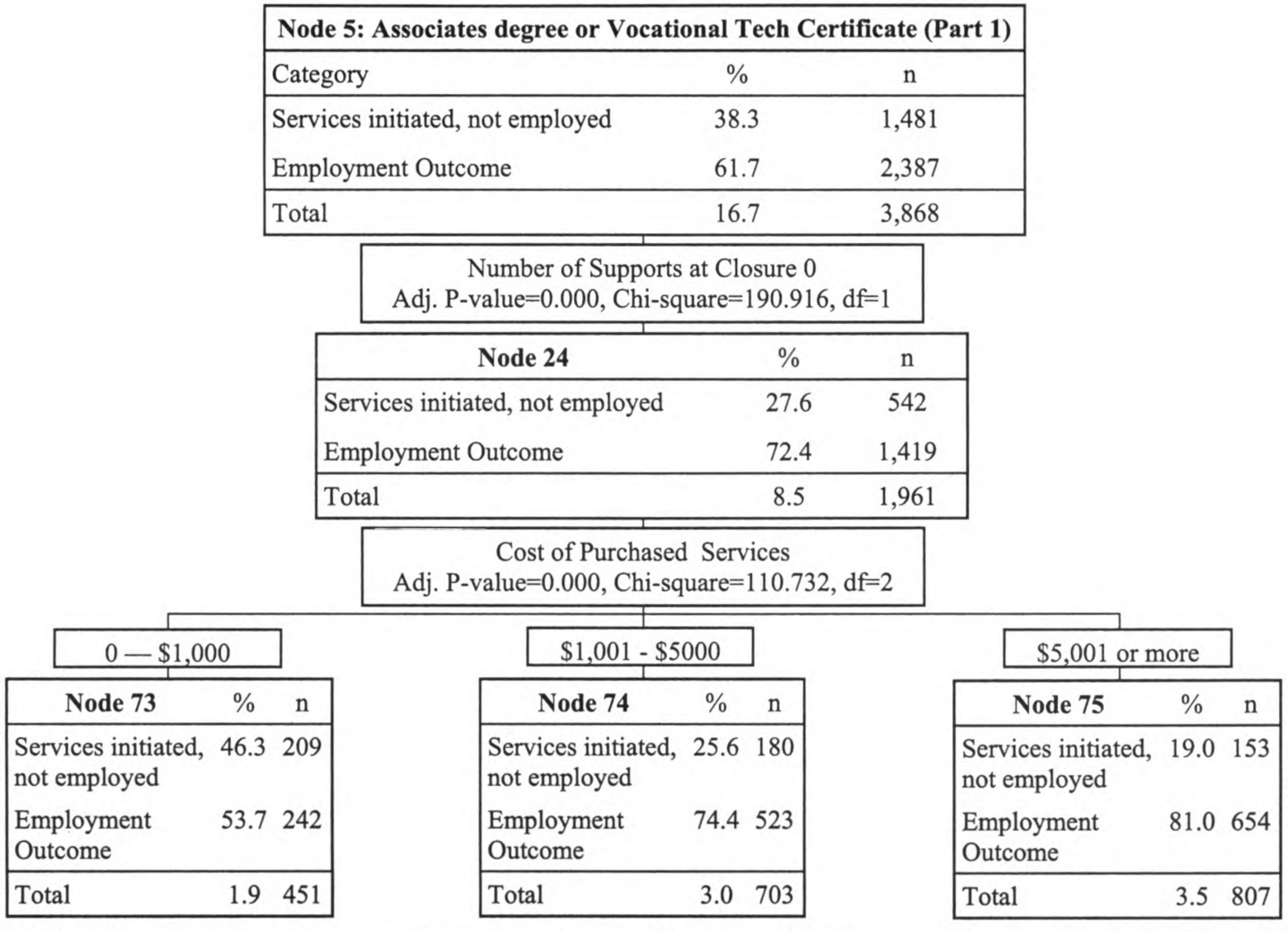

Figure 6.1. Partial tree depicting outcome predictors for customers with an Associates Degree or Vocational Tech. Certificate (Part 1).

For customers who closed using one or more supports only 50.8% were employed at closure (Figure 6.2). The next most important predictor for this group was days from application to closure. Consistent with previous findings customers who closed with a shorter time from application to closure appear more likely to be employed at closure. Of those customers closing within a year of application 74.4% were employed at closure. Only 41.9% of those with more than three but less than four years as VR customers achieved employment.

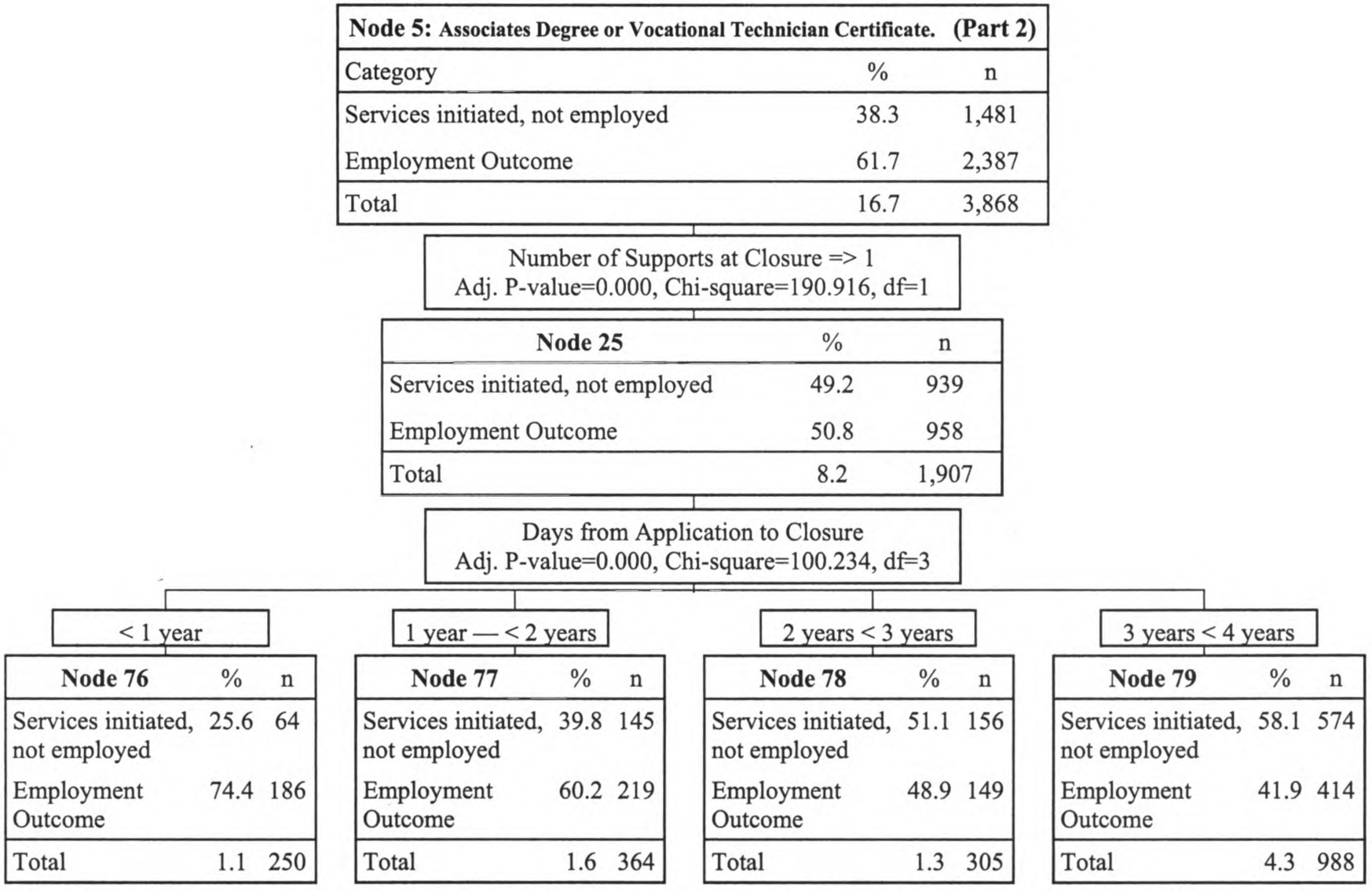

Figure 6.2. Partial tree depicting outcome predictors for customers with an Associates Degree or Vocational Tech. Certificate (Part 2).

Predictor Variables for Customers with an Education Level of Bachelors Degree

Of the 3,267 customers who closed with a Bachelors Degree 72.2% were employed at closure. For this group cost of goods and purchased services was the next most important predicator. Figure 7.1 examines the 500 customers who received up to $1000 in goods and purchased services; 49.0% were employed at closure. For these customers the number of supports at closure was the next most important predicator with 63.6% of those customers without supports at closure employed. Only 36.0% of those with one or more supports were employed at closure.

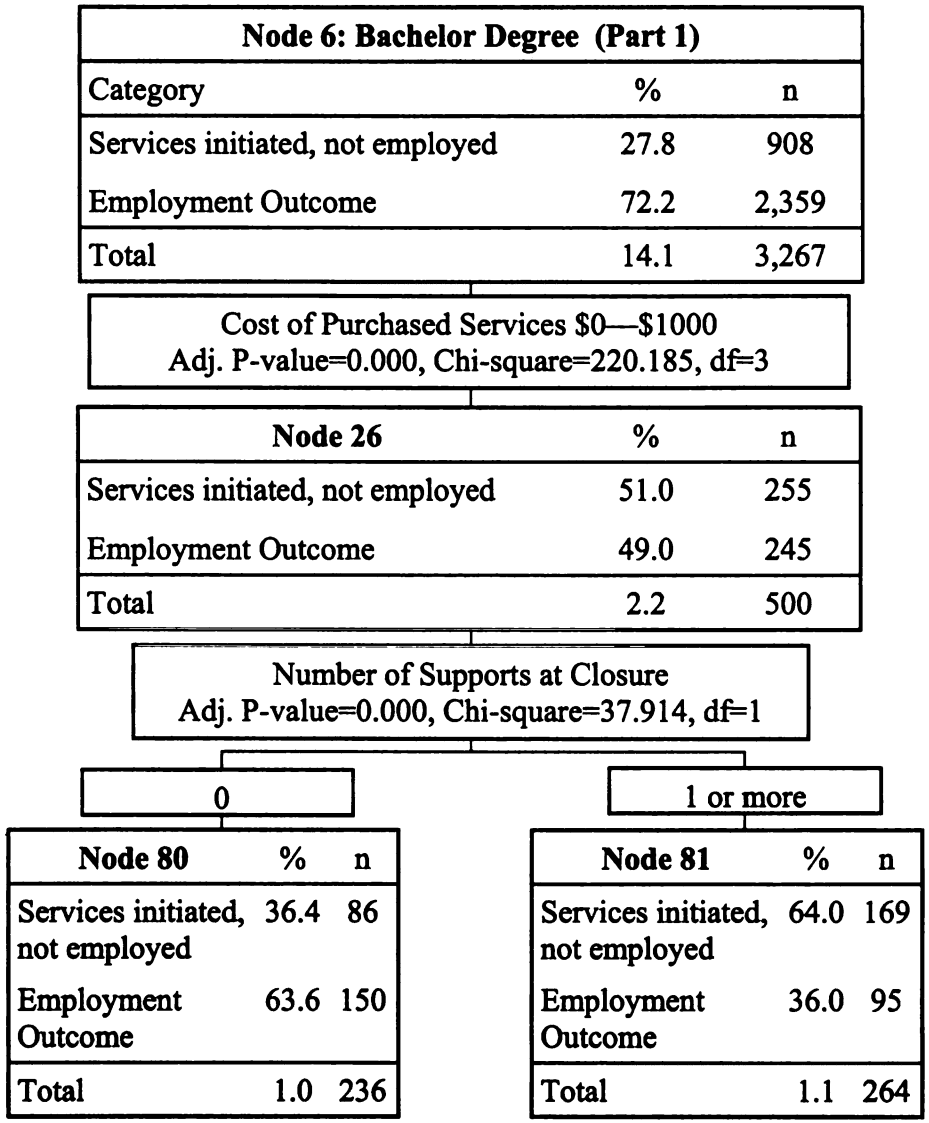

Figure 7.1. Partial tree depicting outcome predictors for customers with a Bachelors Degree (Part 1).

The next group to be examined is customers with a Bachelor's degree who received more than a $1,000 but not more than $5,000 in goods and purchased services (Figure 7.2). Over 65.4% of these customers were employed. Days from application to closure was the next more important predictor with shorter service times equating to better outcomes (e.g. 88.8% of those closing within one year).

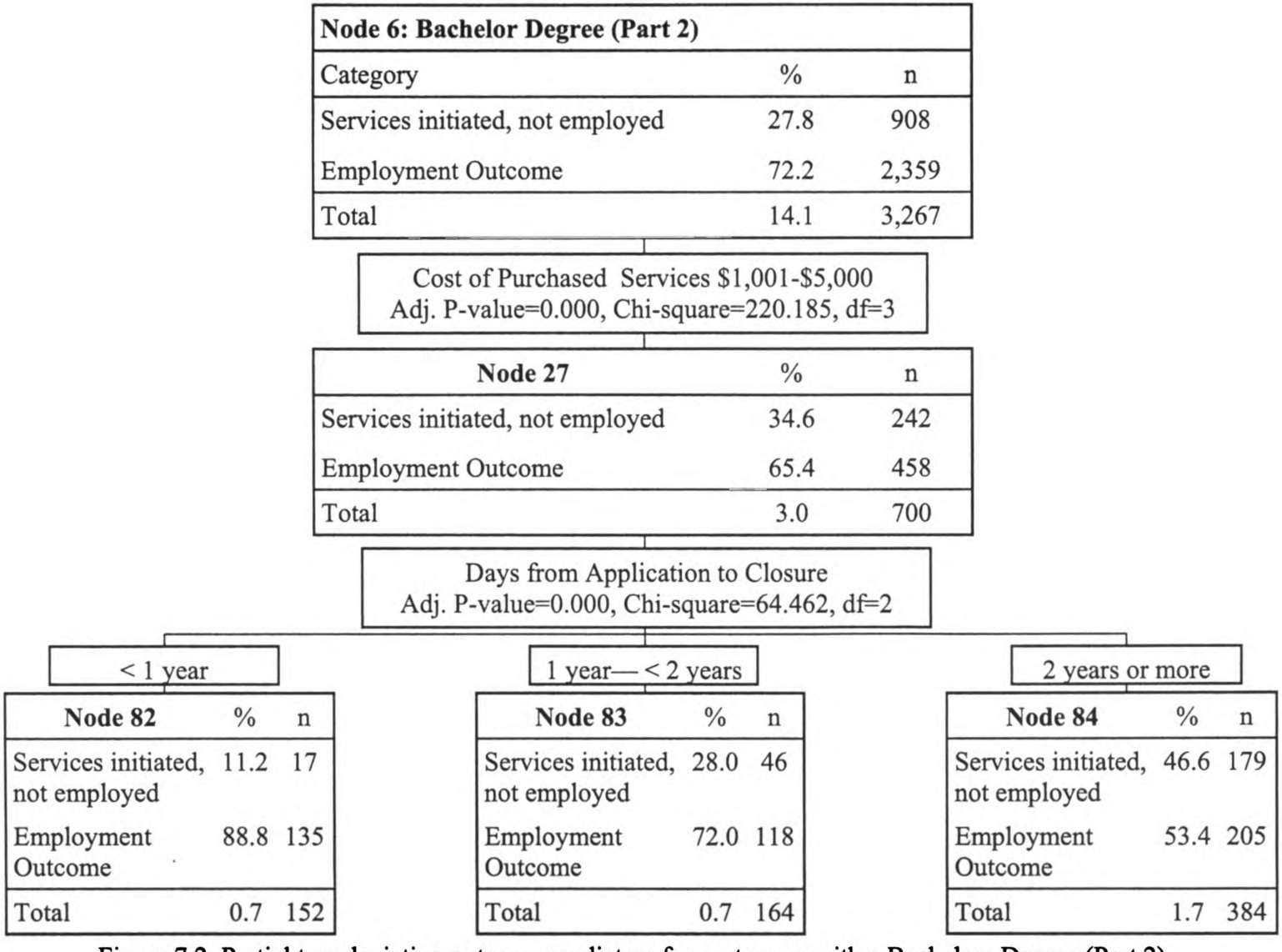

Figure 7.2. Partial tree depicting outcome predictors for customers with a Bachelors Degree (Part 2).

The next group received over $5,001 and up to $10,000 in services with 76.1% achieving employment at closure. For this group the next most important predictor variable was the number of supports at closure. There was a 20.0% difference in employment outcomes between those with and without supports at closure. This final group of customers who closed with a bachelor's degree received more than $10,000 in funding and had the highest likelihood of employment at closure (81.5%) within this group. Support at closure was found to be an important predictor; almost 20% more customers without support at closure closed employed (Figure 7.3).

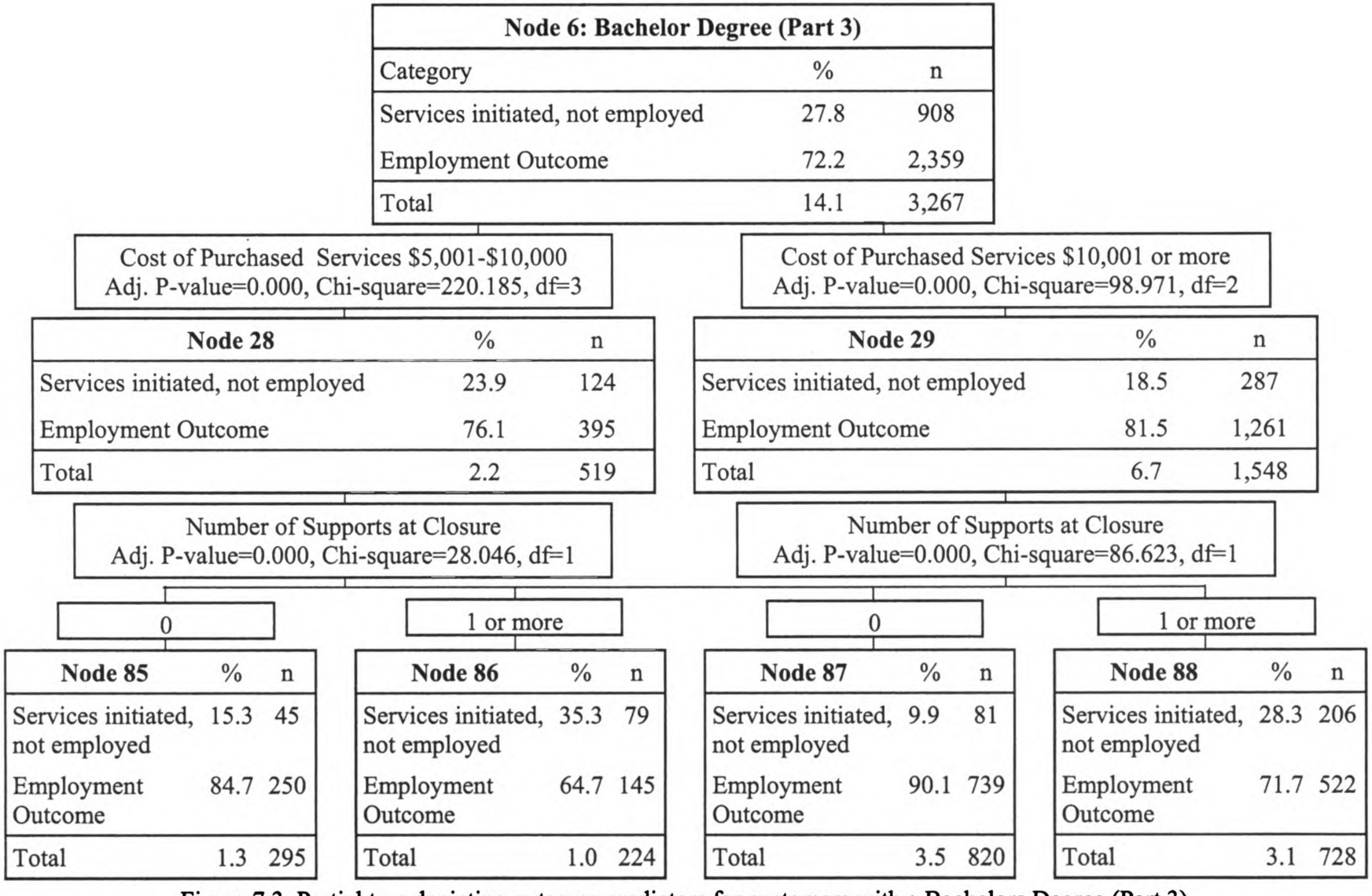

Figure 7.3. Partial tree depicting outcome predictors for customers with a Bachelors Degree (Part 3).

Predictor Variables for Customers with an Education Level of Masters

Almost 80% of 1,180 customers with an education level of Masters Degree were employed at closure (Figure 8.1). As with many other groups including customers with a bachelor's degrees cost of goods and purchased services was an important employment predictor. Even at this higher level of education, limits in funding and supports at closure impact the employability of this group. Less than 40.0% of customers with $1,000 or less in funding and one or more supports at closure were employed at closure. Customers with the similar funding constraints but no supports at closure appear to fare better with 68.6% closing employed.

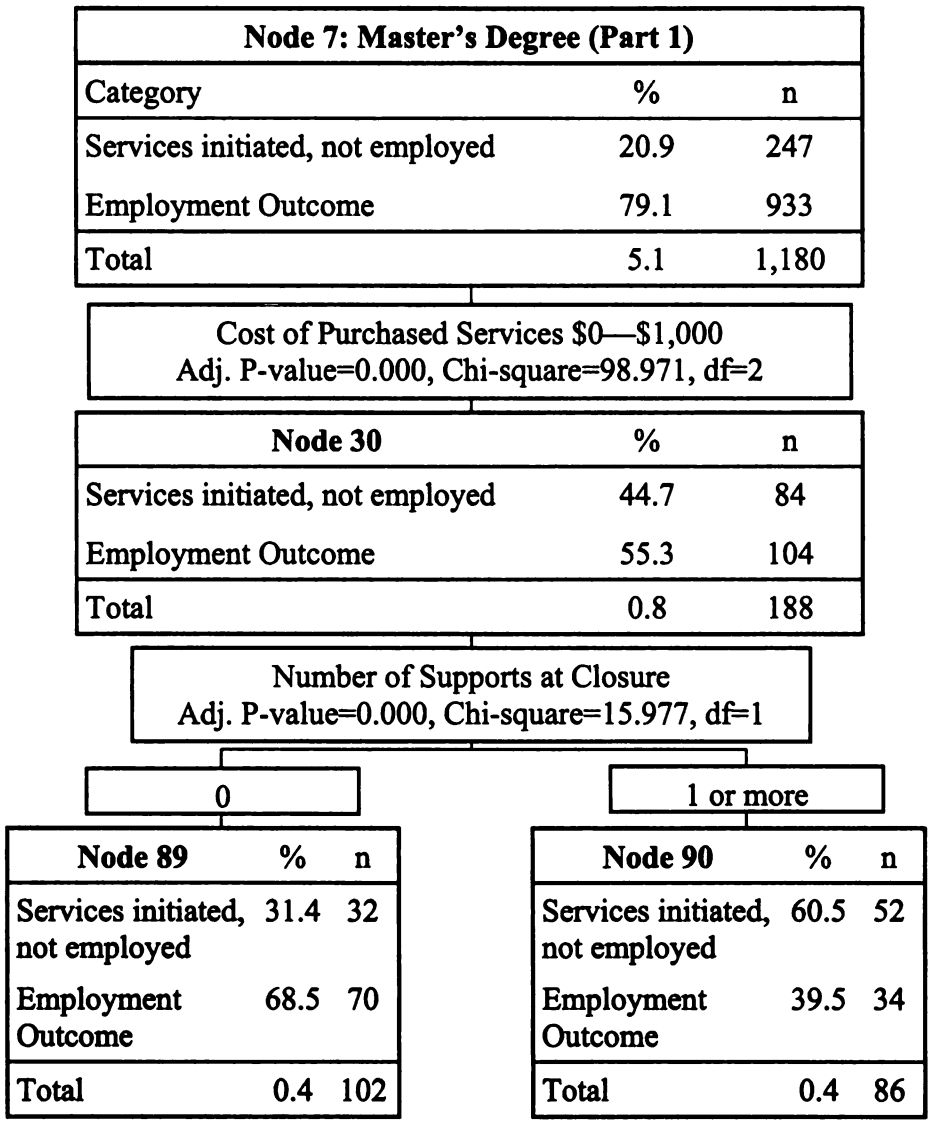

Figure 8.1. Partial tree depicting outcome predictors for customers with a Masters Degree (Part 1).

This second partial tree represents those customers who received over $1,000 but less than $10,000 in goods and purchased services (Figure 8.2). Over 75.0% of this group was employed at closure. Even at this level of education and cost of goods and purchased services, days from application to closure appears to impact employability. The majority of those with four of more years from application to closure exit unemployed, while 89.4% of those who exit within two years are employed at closure.

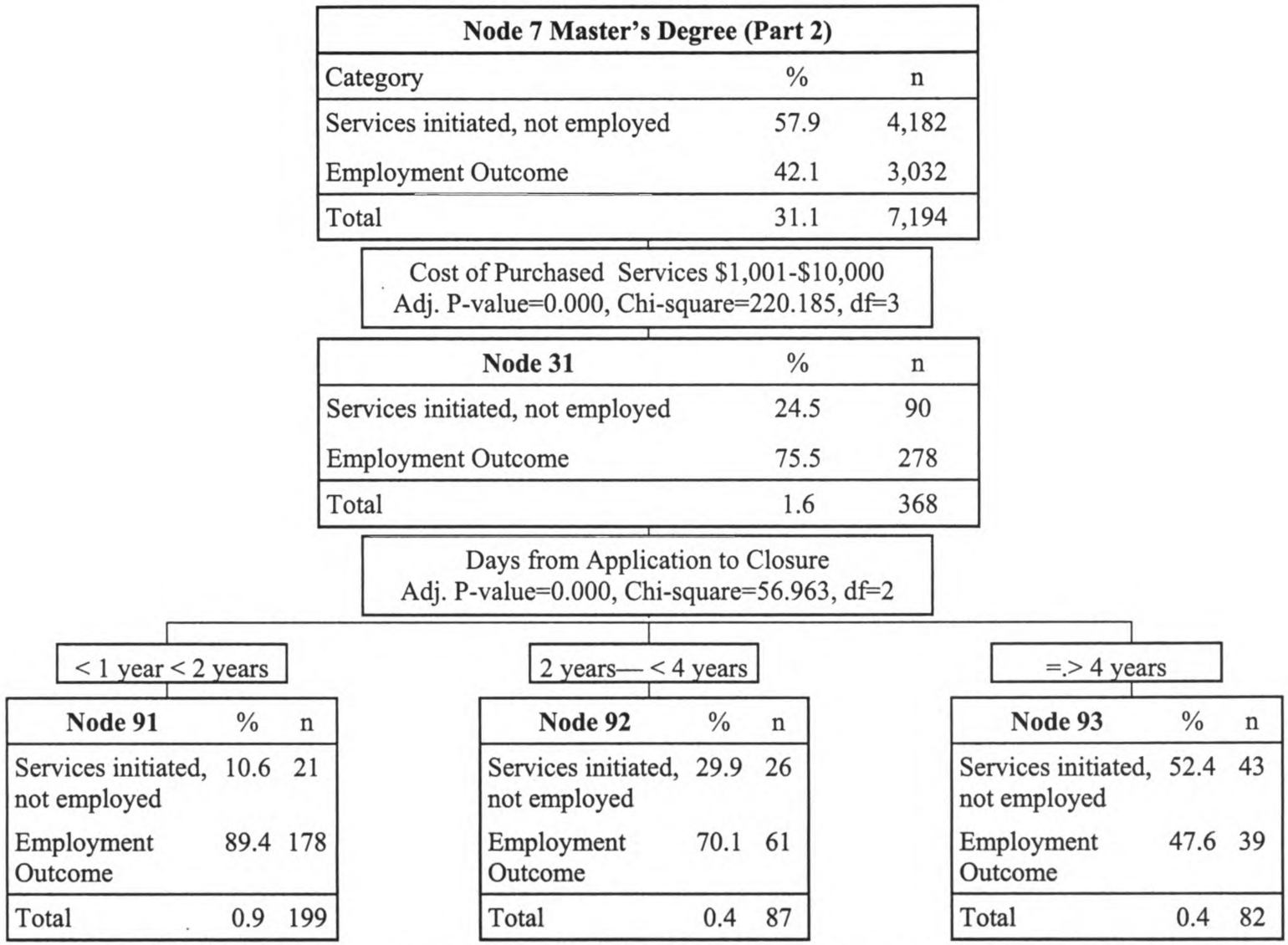

Figure 8.2. Partial tree depicting outcome predictors for customers with an Education Level of Masters Degree (Part 2).

This last figure (8.3) reflects the outcome of the 1,180 customers with master's degrees; the majority (79.1%) of which were employed at closure. As previously seen cost of goods and purchased services and days from application to closure appear impactful. Of customers with more than $10,000 in goods and purchased services and closed within 2 years 99.0% were employed. That number dropped to 80.7% for those with more than four years from application to closure.

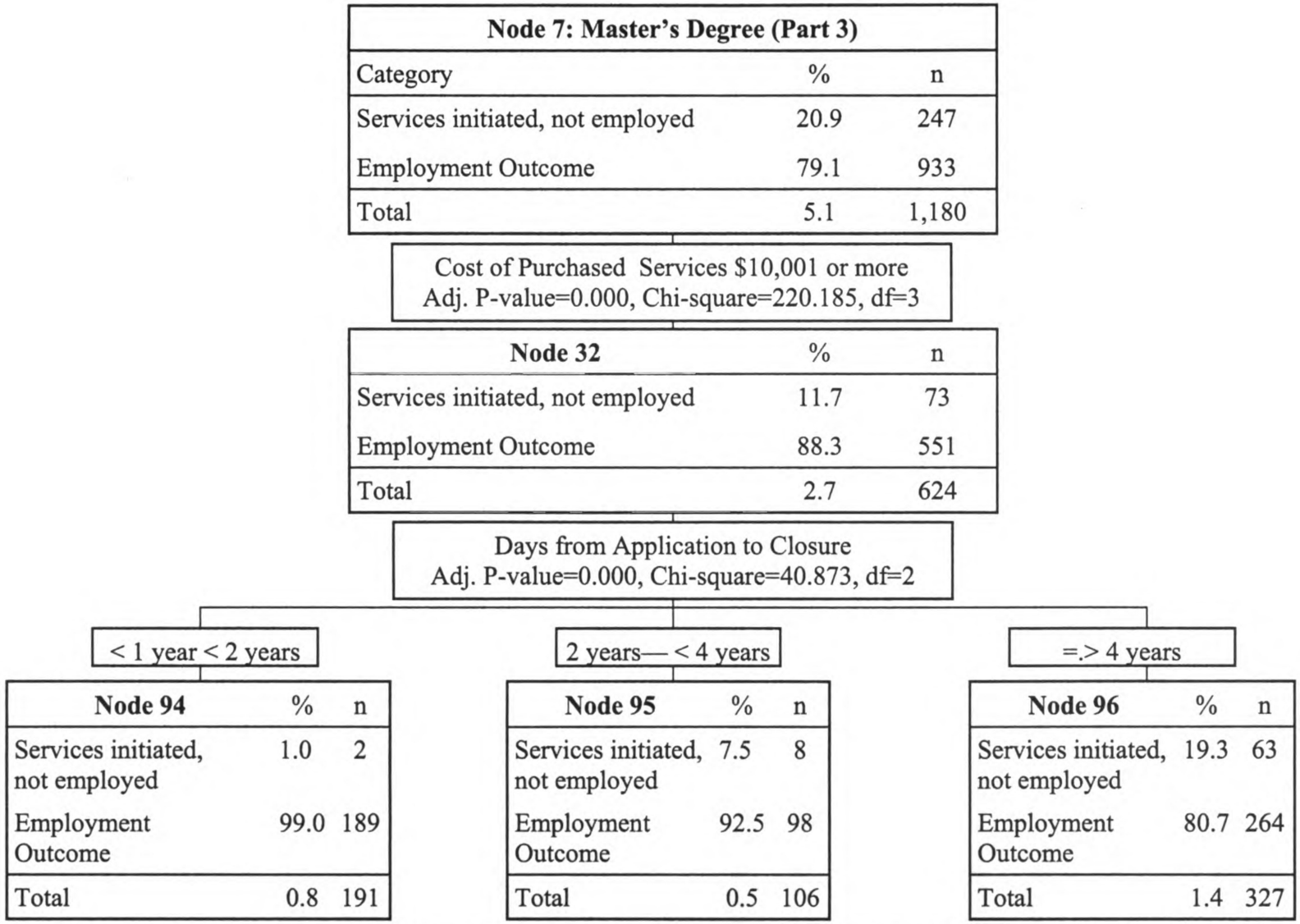

Figure 8.3. Partial tree depicting outcome predictors for customers with an Education Level of Masters Degree (Part 3).

As reflected in previous findings and viewed in these partial decision trees, factors can be supportive or obstructive in customer employment outcomes. While some factors seem to be more or less beneficial Marini and colleagues used a gain chart to better understand the "homogeneous 'end groups' in the decision tree." (2008, p. 11). Table 32 provides gain scores (employment rates) and index scores of the 65 homogeneous end groups relative to the employment rate of the overall sample. Groups with a higher index were more successful and alternatively groups with a lower index were less successful. To better understand factors associated with both employment and non-employment outcomes (status 26 or 28) five nodes were more extensively investigated. First three groups that had a higher employment outcome are examined followed by two nodes with a higher population of customers who closed not employed.

Table 32

Gains chart (node-by-node) statistics for the 60 end groups

Node	No. of Subjects	% of Total Sample	No. of Success	% of Success Sample	Gain (%)	Index (%)
94	191	0.83%	189	1.62%	98.95%	196.34%
62	56	0.24%	54	0.46%	96.43%	191.33%
95	106	0.46%	98	0.84%	92.45%	183.44%
46	234	1.01%	216	1.85%	92.31%	183.15%
66	55	0.24%	50	0.43%	90.91%	180.38%
87	820	3.54%	739	6.34%	90.12%	178.81%
91	199	0.86%	178	1.53%	89.45%	177.48%
37	65	0.28%	58	0.50%	89.23%	177.05%
82	152	0.66%	135	1.16%	88.82%	176.22%
50	94	0.41%	82	0.70%	87.23%	173.08%
85	295	1.28%	250	2.14%	84.75%	168.15%
33	51	0.22%	43	0.37%	84.31%	167.29%
75	807	3.49%	654	5.61%	81.04%	160.80%
96	327	1.41%	264	2.26%	80.73%	160.19%
61	287	1.24%	220	1.89%	76.66%	152.09%
45	463	2.00%	346	2.97%	74.73%	148.27%

(table continues)

Table 32 (*continued*).

Node	No. of Subjects	% of Total Sample	No. of Success	% of Success Sample	Gain (%)	Index (%)
76	250	1.08%	186	1.60%	74.40%	147.62%
74	703	3.04%	523	4.49%	74.40%	147.61%
65	196	0.85%	143	1.23%	72.96%	144.76%
83	164	0.71%	118	1.01%	71.95%	142.76%
88	728	3.15%	522	4.48%	71.70%	142.27%
49	326	1.41%	230	1.97%	70.55%	139.98%
92	87	0.38%	61	0.52%	70.11%	139.12%
89	102	0.44%	70	0.60%	68.63%	136.17%
39	135	0.58%	90	0.77%	66.67%	132.28%
86	224	0.97%	145	1.24%	64.73%	128.44%
80	236	1.02%	150	1.29%	63.56%	126.11%
68	151	0.65%	95	0.81%	62.91%	124.83%
53	319	1.38%	196	1.68%	61.44%	121.91%
34	92	0.40%	56	0.48%	60.87%	120.77%
77	364	1.57%	219	1.88%	60.16%	119.38%
48	723	3.13%	390	3.34%	53.94%	107.03%
73	451	1.95%	242	2.08%	53.66%	106.47%
84	384	1.66%	205	1.76%	53.39%	105.92%
36	330	1.43%	174	1.49%	52.73%	104.62%
60	283	1.22%	147	1.26%	51.94%	103.06%
55	216	0.93%	111	0.95%	51.39%	101.96%
44	589	2.55%	290	2.49%	49.24%	97.69%
64	378	1.63%	185	1.59%	48.94%	97.11%
78	305	1.32%	149	1.28%	48.85%	96.93%
93	82	0.35%	39	0.33%	47.56%	94.37%
41	114	0.49%	54	0.46%	47.37%	93.99%
69	278	1.20%	128	1.10%	46.04%	91.36%
72	346	1.50%	159	1.36%	45.95%	91.18%
79	988	4.27%	414	3.55%	41.90%	83.14%
90	86	0.37%	34	0.29%	39.53%	78.44%
59	564	2.44%	212	1.82%	37.59%	74.58%
81	264	1.14%	95	0.81%	35.98%	71.40%
43	272	1.18%	97	0.83%	35.66%	70.76%
35	162	0.70%	56	0.48%	34.57%	68.59%
67	674	2.91%	231	1.98%	34.27%	68.00%
52	468	2.02%	157	1.35%	33.55%	66.56%
63	361	1.56%	115	0.99%	31.86%	63.21%
47	722	3.12%	229	1.96%	31.72%	62.93%

(table continues)

Table 32 (*continued*).

Node	No. of Subjects	% of Total Sample	No. of Success	% of Success Sample	Gain (%)	Index (%)
38	393	1.70%	123	1.05%	31.30%	62.10%
58	347	1.50%	98	0.84%	28.24%	56.04%
54	679	2.93%	186	1.60%	27.39%	54.35%
51	453	1.96%	116	0.99%	25.61%	50.81%
71	1501	6.49%	365	3.13%	24.32%	48.25%
70	392	1.69%	95	0.81%	24.23%	48.08%
40	284	1.23%	63	0.54%	22.18%	44.01%
57	539	2.33%	108	0.93%	20.04%	39.76%
42	606	2.62%	110	0.94%	18.15%	36.02%
8	164	0.71%	28	0.24%	17.07%	33.88%
56	458	1.98%	65	0.56%	14.19%	28.16%

Group 94: This group represents 191 customers with a Masters degree at closure (Figure 8.3). Nearly everyone in this group achieved employment (n=189). Approximately a third (33.5%) received more than $10,000 up to $20,000 in goods and purchased services, more than half (52.9%) received more than $20,000 up to $50,000 in goods and purchased services and the final 13.6% received $50,000 or more in goods and purchased services. Over 60% achieved closure within two years of application and almost 40% achieved closure in less than one year after application. The group was predominately male (73.8%), White or Asian (91.1%) and earned over $17.50 an hour (71.2%). An analysis of age at application revealed that just over 25.0% of this group was between 30 and 39 years old, almost 30% were between 40 and 49 years of age and just over 30.0% were between 50 and 59 years of age.

For this group, the index score was 196.34% (1.62/0.83).This index score indicates that the proportion of customers who achieved employment at closure did 96.3% better than the employment rate for the sample. While these 191 customers represent less than 1% of the study population; 99.0% of this group achieved employment

at closure. This group's counterparts (groups/nodes 95 & 96; illustrated in Figure 8.3) who had a longer service period were less successful at outcome. For those receiving services for more than two but less than four years slightly less (92.5%) were employed at closure, and for those with over four years of services only 80.7% were employed at closure (compared to 99.0% for study group/node 94).

Group 62: This group represents 56 customers who closed with an education level of post-secondary education, no degree (Figure 5.1). While only 40.1% of customers at this level of education were employed at closure nearly everyone this subgroup closed employed (n=54). The entire group achieved closure within one years of application. Just over half (51.8%) received more than $10,000 up to $20,000 in goods and purchased services, with an additional 46.4% receiving more than $20,000 up to $50,000 in goods and purchased services and just 1.8% received $50,000 or more in goods and purchased services. The group was predominately male (71.4%). White or Asian customers represented (75.0%) of the group followed by African American or Blacks (19.6%), All Other Races (3.6%) and Hispanics (1.8%).The majority of customers (37.5%) earned between $8.50 and $11.49 an hour, an additional 25.0% earned between $11.50 and $17.49 an hour and 17.9% earned over $17.50 an hour.

For this group, the index score was 191.33% (0.46/0.24). This index score indicates that the proportion of customers who achieved employment at closure 91.3% better than the employment rate for the overall sample. While these 56 customers represent less than 1% of the study population; 96.4% of this group achieved employment at closure. This group's counterparts (groups/nodes 61 & 62; illustrated in Figure 5.1) who received lower levels of funding had a lower percentage of customers employed at

closure; for those receiving over $1,000 and up to $10,000, 76.7% were employed at closure and 51.9% of customers receiving more than $10,000 in goods and services were employed at closure as well (compared to 96.4% for study group/node 60).

Group 46: This group represents 234 customers who closed with an education level of special education certificate of completion (n=3) or high school graduate equivalency (n=231) (Figure 4.1). While only 42.1% of customers at this level of education were employed at closure 92.3% of this subgroup closed employed (n=216). The entire group achieved closure within one year of application. Over half (54.7%) received more than $5,000 and up to $10,000 in goods and purchased services, an additional 29.5% received more than $10,000 and up to $20,000 in goods and purchased services with an additional 15.0% receiving more than $20,000 up to $50,000 in goods and purchased services and less than 1.0% received $50,000 or more in goods and purchased services. The group was predominately male (80.8%). White and Asian customers represented (77.4%) of the group followed by African American or Blacks (15.4%), All Other Races (2.1%) and Hispanics (5.1%).The majority of customers (34.6%) earned between $8.50 and $11.49 an hour. An additional 17.9% earned between $6.50 and $8.49 an hour followed by 15.8% who earned between $11.50 and $17.49 an hour and 12.0% earned over $17.50 an hour.

For this group, the index score was 183.15% (1.85/1.01). This index score indicates that the proportion of customers who achieved employment at closure was 83.2% better than the employment rate for the overall sample. While these 234 customers represent approximately 1% of the study population; 92.3% of this group achieved

employment at closure. This group's counterparts (groups/nodes 44 & 45; illustrated in Figure 4.1) who received lower levels of funding had a lower percentage of customers employed at closure; 49.2% of those who received no funding up to $1,000 were employed at closure and 74.7% of those who received over $1,000 and up to $5,000 were employed at closure as well (compared to 92.3% for study group/node 46).

Group 47: This group represents 722 customers who closed with a Special Education Certificate of Completion or High School Graduate Equivalency (Figure 4.2). After level of education the next most important predictor for this group was the number of days from application to closure with this group achieving closure after one year but less than two years of services. The cost of purchased services for this group was the next important predictor. This group received less than $1000.00 in goods and service and only 31.7% were employed at closure (n=229).

Of this group 64.7% were male. White and Asian customers represented (69.4%) of the group followed by African American or Blacks (21.5%), All Other Races (2.4%) and Hispanics (6.5%). Of those employed (n =229) the majority of customers (55.0%) earned less than $8.50 an hour. An additional 25.0% earned between $8.50 and $11.49 an hour followed by 12.5% who earned between $11.50 and $17.49 an hour. A final 7.5% earned over $17.50 an hour. An analysis of age at application revealed that just over 15.4% of this group were 21 years of age or younger, 13.7% were between 22 and 29 years old, 23.7% were between 30 and 39 years old, an additional 31.2% were between 40 and 49 years of age and just over 16.1% over 50 years of age.

For this group, the index score was 62.93% (1.96/3.12). This index score indicates that the proportion of customers who achieved employment in this group is 6.3% of the

competitive employment rate. While these 722 customers represent 3.1% of the study population; only 31.7% of this group achieved employment at closure. This group's counterparts (groups/nodes 48, 49 & 50; illustrated in Figure 4.2) who received higher levels of funding had a higher percentage of customers employed at closure; for those receiving over $1,000 and up to $5,000 53.9% were employed at closure, 70.6 percent of customers receiving over $5,000 but less than $20,000 were employed at closure and 87.2% of customers receiving more than $20,000 in goods and services were employed at closure as well (compared to 31.7% for study group/node 47).

Group 71: This group represents 1,501 customers who closed with a Post-Secondary Education, no degree (Figure 5.4). After level of education the next most important predictor for this subset was years of service with this group achieving closure after four or more years of services; only 28.4% achieved employment at closure. The receipt of job placement services was the next important predictor. Of this subgroup (group 71) no customers received job placement services and only 24.3% of this subgroup closed employed (n=365). Of this group 65.8% were male. White and Asian customers represented (73.5%) of the group followed by African American or Blacks (15.3%), All Other Races (3.1%) and Hispanics (8.2%). Of those employed (n =107) the majority of customers (58.8%) earned less than $8.50 an hour. An additional 22.4% earned between $8.50 and $11.49 an hour followed by 15.0% who earned between $11.50 and $17.49 an hour. Fewer than four percent (3.7%) earned over $17.50 an hour. An analysis of age at application revealed that just over 21.5% of this group were 21 years of age or younger, 19.0% were between 22 and 29 years old, 27.1% were between

30 and 39 years old, an additional 24.7% were between 40 and 49 years of age and just over 7.0% over 50 years of age.

For this group, the index score was 48.25% (3.13/6.49). This index score indicates that the proportion of customers who achieved employment in this group is 4.8% of the competitive employment rate. While these 1501 customers represent 6.5% of the study population; only 24.3% of this group achieved employment at closure. This group's counterpart (group/node 71) who did receive job placement services (illustrated in Figure 5.4) had a higher percentage of customers employed at closure (46.0% compared to 24.3%).

Research Question Three (Part Two) Analysis of Five Year Patterns of Change in Significant Predictor Variables

This final section examines any recognizable patterns in the service provisions most often associated with positive or negative employment outcomes for customers with SCI. The exhaustive CHAID analysis, of the 30 predictor variables, selected six variables as the most significant predictors of employment outcome. These include level of education attained at closure, cost of services categories, categories for number of days from application to closure, rehabilitation technology services received, job placement assistance services received and number of supports at closure. This section will examine the five year patterns associated with these variables. These factors were fully explored as a part of research question and are summarized for convenience.

Level of Education at Closure

Table 14 illuminated five years patterns in education. The percentage of customers with high school graduate equivalency at the time of case closure decreased from 32.9% in 2004 to 29.4% in 2008. The percentage of customers with bachelor's degrees increased from 12.6 % in 2004 to 15.2 % in 2008 and the percentage of customers with master's degree or higher increased from 4.0% in 2004 to 6.1% in 2008.

Cost of Goods and Purchased Services by Year

As reflected in Table 13 there was an increase in the funding and allocation of services provided to customers during this five year period. There was a consistent decrease in the number of customers receiving funding in all dollar amount categories that were $10,000 or below and an increase in all funding categories above $10,000.

Days from Application to Closure

As illustrated in Table 16 several changes occurred. The percentage of customers closing within one year of application increased by 5.7% from 13.4% in 2004 to 19.1% in 2008. The percentage of customers closing between two to three years from application to closure decreased by 6.6% from 19.7% in 2004 to 13.1% in 2008. The number of customers closing within three to four years from application to closure also decreased by over 6% from 15.4% in 2004 to 9.1% in 2008. Finally the percentage of customers closing four or more years from application to closure increased by 4.2% from 30.8% in 2004 to 35.0% in 2008.

Number and Percent of Customers Receiving Services, by Year

The number of those who received rehabilitation technology services increased by almost 10% from 20.1% in 2004 to 29.8% in 2008 and the number of job placement

assistance recipients grew with 3.5% from 22.8% in 2004 to 26.3% in 2008. Refer to Table 14 for more details.

Number of Supports at Closure

Table 16 further illustrates changes in the Number of Supports at Closure. The percentage of customers who received zero supports decreased by over 5% from 49.3% in 2004 to 44.2% in 2008. In contrast, the number of customers who received one support increased slightly from 43.3% in 2004 to 48.0% in 2008.

CHAPTER 5

Discussion

The purpose of this study was to examine employment outcomes for individuals with spinal cord injury served by the state vocational rehabilitation services program between 2004 and 2008.

Research questions that guided the study were:

1. What are the characteristics of customers with SCI served by the VR system?
    a. Have the characteristics of customers with SCI served by the VR system changed over the five (5) year span?
2. Are there differences in outcomes (type of closure) based on characteristics for this population and have they changed over the five (5) year span?
3. What are the factors (characteristics and/or services?) associated with positive outcomes for customers with SCI?
    a. Is there a recognizable pattern displaying an increase in the service provisions most often associated with positive outcomes for customers with SCI?

Characteristics of customers with SCI served by the VR system and the significant changes in customer profiles between 2004 and 2008

This first section provides an overview of the aggregate population of customers with a status 26 or 28 closure served between 2004 and 2008 and statistically significant changes that occurred during this time. The first observation for discussion is the drop in participation of customers with SCI. There was a consistent decline each year for

customers served with SCI totaling over 33.0% for the five years studied; participation numbers dropped from 5,916 in 2004 to 3,803 in 2008 in contrast to an 8.3% reduction for the aggregate group; from 379,158 in 2004 to 350,071 in 2008. A comparison of the percentage of SCI customers in comparison with the aggregate population reflects a consistent decrease from 0.016% to 0.011% (Table 33). Because spinal cord injury is a severe disability, order of selection should not have limited the acceptance rate of this group. While estimates suggest that each year 12,000 individuals sustain an SCI, no overall incidence studies have been recently conducted to determine annual injury rates (NSCISC, 2009). Such a significant drop should be addressed nationally and through VR.

Table 33

SCI Customer Characteristics by Year

	2004	2005	2006	2007	2008
	n %	*n* %	*n* %	*n* %	*n* %
VR Customers (No SCI)	379,158	351,292	347,711	340,454	350,071
VR Customers (SCI Only)	5,915	4,937	4,427	4,053	3,803
% of VR Customers	0.016	0.014	0.013	0.012	0.011

The majority of customers served were male (65.0%). While on the surface this appears as an over representation of males the opposite is true as males represent over 80.0% of the population of individuals with SCI (NSCISC, 2009) but only 65.0% of those who achieved a status 26 or 28 employment outcome. This distribution was consistent between years 2004 through 2007, with a spike of just over 2.0% in males in year 2008. While the majority of customers were White or Asian (70.6%) these numbers are within one percentage point of the aggregate population estimates for 2008 (U.S. Census Bureau, 2010). As illustrated in Table 34, African American or Black customers

are overrepresented by 4.2% and Hispanic customers are underrepresented by 6.6%. There was only a 0.1% difference between the U.S. census estimates and study participants for All Other Races. Examining outcomes by race the majority of White and Asian (52.8%) and Hispanic (51.5) customers were employed at closure. Fewer than 50.0% of All Other Races (44.8%) and African American or Black (40.9%) customers were employed at closure.

Table 34

SCI Customer Population compared to National Averages

	White or Asian	African American or Black	Hispanic	All Other Races
	%	%	%	%
Percentage of U.S. Population by Race*	70.1	12.8	15.4	2.9
Percentage of VR Customers with SCI by Race	71.1	17.0	8.8	3.0

**2008 Population Estimates total 101.2% due to customers reporting more than one race*

A majority of customers (53.9%) were between 30 and 49 years of age at application (Table 2). The majority of the study population reported at least a high school graduate equivalency (40.0%), with an additional 40% reporting at least a post secondary education at the time of application for VR services. During the five years of study there was an approximate 6.0% improvement in customers with an associate degree or higher level. At time of application about 8.5 % were students and 17.5% were working. Wages for those working improved over the study period (customer's earning above $17.50 an hour increased by almost 10%).

Of the 23,091 customers who received support, over 40.0% used public assistance with an additional 34.2% reporting assistance from family and friends; there was close to

a 3.0% decrease in those seeking support from family and friends and just over a 2.0% increase in the use of public support between 2004 and 2008. A further analysis indicated an increase in the use of SSDI and SSI and a decrease in the use of other public supports. Medicaid, Medicare and other public sources of medical insurance increased during the study period as well. Fewer than 10% of customers with SCI received two or more supports at application. On average over 50.0% of customers received eligibility within 30 days; a slight improvement was observed over time.

There was an increase in the amount of funding for goods and purchased services between 2004 and 2008. An analysis of the aggregate group of customers with SCI revealed 32.2% received between $1,001 and $5,000 in funding while slightly less than 30.0% received less than $1,000 in funding. However, during the study period, funding in these categories decreased with an increase in all funding categories above $10,000. The services most frequently provided included assessment and vocational rehabilitation and guidance. Just over 35.0% received transportation services and just under a quarter received services associated with rehabilitation technology. Services that increased during the study period include information and referral, job placement assistance and rehabilitation technology, transportation and other (non-specified) services.

There were several improvements noted for customers with SCI at closure. The aggregate of customers reporting a post secondary education and above grew by over 17%, from 40% to 57.4%; with an overall pattern of growth evidenced by year as well. Midrange earnings (between $8.50 and $17.49) improved on average by over 20.0% from application to closure. An improvement in proportion of customers earning wages above $11.50 an hour was reported between 2004 and 2008. A review of employment outcomes

over the study's five year period revealed a non-linear progression. The number of customers employed at closure grew from 47.8% in 2004 to 52.0% in 2007 but settled at 50.2% in 2008.

A review of the overall use of customer supports at closure was mixed. A review of customer supports at closure on average reflected a 4.3% increase in SSDI recipients. A 5.0% increase in Medicare was revealed as well. A review of years 2004 through 2008 reflected linear growth of SSDI, suggesting a pattern of increasing utilization of this support; there was a less linear pattern but overall growth in the utilization of Medicare. A 2.1% increase in SSI and a 3.5% increase in Medicaid was detected during this five year period as well. In line with previous findings, a review of five year patterns revealed a linear increase in the number of supports used by customers at closure (5.0% over five years). While these increases were reported, customers' use of other types of support including Worker's compensation, TANF and general assistance decreased. The time from application to closure had mixed findings as well. There was linear improvement of 6.0% for customers closing in less than one year and a 4.2% increase in customers closing within four or more years. There was a reciprocal decline in customers closing in more than one but less than three years.

Differences in Outcomes (Type of Closure) Based On Characteristics for This Population Including Changes in Customer Employment Outcomes over a Five Year Span

This next section reports on factors associated with research question two of which examined differences in outcomes (type of closure) based on characteristics for this population, including changes in customer employment outcomes over a five year span. Women had a slightly better employment outcome on average, with 51.8% of

women employed at closure as compared to 49.8% of their male counterparts. There were no five year patterns observed for either group. The majority of White, Asian and Hispanics were employed at closure. While White or Asian customers make up 71.1% of customers served, 74.5% achieved a positive employment outcome. Hispanics achieved a slightly higher than average outcome, representing 8.8% of customers served and 9.0% of customers with a positive employment outcome. The reverse is true for African American or Black and All Other Race customers. African American or Black customers comprised 17% of customers and only 13.8% of those employed at closure and finally All Other Races represented 3% of customers and 2.7% of those employed. There were no observable linear patterns of change in employment outcomes by race during the five years of study.

A review of customer's age at application revealed a linear relationship between age and employment with older customers achieving better outcomes. Over 60.0% of those over 64 years of age and 55.5% of those 60 to 64 were employed at closure. The majority of customers aged 30 to 59 years of age were employed at closure as well. Conversely approximately 49.0% of those 29 years of age and younger were employed at closure. The only five year pattern observed for age at application was a steady increase in the number of customers aged 40-49 employed at closure; from 46.7% in 2004 to 52.2% in 2008. There was a positive linear relationship between level of education at application and employment outcome as well. The majority of customers with an associate's degree or higher achieved a positive employment outcome. More than three quarters (77.5%) of customers with a master's degree and two thirds (68.3%) of customers with a bachelor's degree were employed at closure. As reported in Chapter

Four the further analysis by employment outcome and year resulted in small populations within each category so no further analysis was completed.

Employment status at application impacted employment outcomes at closure. The majority of customers unemployed at application (N = 7,426) were also unemployed at closure; only 43.6% achieved employment. The majority of customers employed at application in an integrated setting without supports were still employed at closure (78.3%) as were customers employed in an integrated setting with supports (84.4%) and those who were self-employed (81.7%). An examination of demographic factors associated with customers employed at application and closure revealed a number of items for discussion. First race and gender differences were not statistically significant however a higher percentage of Whites and Asians as well as males exited employed. The majority of customers with fewer than three supports at application were also employed at closure.

The types of services received by customers employed at application were also examined. The largest proportion of customers utilized assessment services (n = 2634), diagnostic and treatment services (n = 1,736), rehabilitation technology services (n = 1,504), transportation services (n = 703), vocational rehabilitation counseling and guidance services (n = 2,010). Only 561 customers received college or university training services; 64.2% were employed at closure.

In a review of five year patterns, a positive linear relationship was found in the percentage of Other Unemployed customers employed at closure, with a progressive increase between 2004 (41.3%) and 2008 (57.4%). As with prior findings, there was a statistically significant and positive linear relationship between hourly wage at

application and employment closure with higher salary ranges at application correlating with a higher percentage of employment at closure: Close to 90.0% of those earning over $17.50 an hour were employed. Customers reporting hours worked at application were more likely to be employed at closure as well. There were no observable five year patterns for either of these employment related variables.

As was reported in previous research (Marini, 2007; Rosenthal, 2008) public support can be a disincentive and result in decreased employment. Similar findings were found in this present study: Only 42.2% of customers who received any type of public support at application were employed at closure. Customers utilizing SSI, TANF and general assistance had particularly low rates of employment, as did customers utilizing Medicaid. In addition to the type of supports, the number of supports also impacted employment outcome: The majority of customers with one or more supports at application were unemployed at closure. Finally the majority of customers who achieved eligibility within thirty days were employed at closure.

Cost of goods and purchased services appears to be highly correlated with employment status at closure. Less than 35% of customers who received $1,000.00 or less in goods and purchased services achieved employment at closure as opposed to almost 70% of those receiving over $20,000.00. Services that appear most linked to employment at closure include on-the-job training, rehabilitation technology, job placement assistance, on-the-job-support and technical assistance. Job search assistance, maintenance, other services, information and referral, job readiness training and vocational rehabilitation and guidance appeared impactful as well. No patterns of change

were observed in either the cost of goods and purchased services or the distribution of services.

This next section examines factors associated variables associated with closure. As earlier indicated, there appears to be a correlation between level of education and employment outcome. Nearly 80% of customers with a master's degree or higher, 72.7% of customers with a bachelor's degree and 61.7% of those with an Associate degree or vocational technology certification were employed at closure. The majority of customers with a post secondary education with no degree or below were unemployed at closure. Similar to reports for customers at application, the majority of customers utilizing public support at closure were unemployed. Approximately two thirds of customers utilizing SSI, TANF, worker's compensation and other public support were unemployed at closure as were 39.5% of customers utilizing Medicaid. In line with these findings the majority of customers who reported using even one type of support at closure were unemployed. Findings related to length of service supports earlier research (Marini, 2008). Over 70.0% of customers who closed within one year of application were employed at closure. The majority of customers receiving services from the VR for more than two years were more likely to close without employment. There were no patterns observed that would indicate an increase in earlier closures.

An Analysis of the Allocation and Patterns of Change of Predictor Variables

This next section examines the final analysis of the study. Variables found to be statistically significant and as such impactful on customers employment outcomes were selected as predictor variables for further analysis using data mining techniques. Through the use of a systematic algorithm the strongest relationships between predictors and the

outcome variable (status 26 or 28 employment outcome) were identified and organized into a hierarchical framework similar to a tree with branches. A top-down, step-wise approach was utilized; as the predictor variable with the strongest relationship to the outcome variable was presented first, followed by splits or branches that identify the next set of variables with the strongest relation to the outcome variable (nodes). The analysis resulted in a total of three branches with 97 nodes (65 end nodes).

Of the 30 predictor variables included in the analysis the six variables selected as the most significant predictors of employment outcome include level of education attained at closure, cost of services categories, categories for number of days from application to closure, rehabilitation technology services received, job placement assistance services received and number of supports at closure. The most significant predictor of employment outcomes was level of education attained at closure. While level of education attained at closure was the most significant predictor of employment, interactions with other service factors must be considered. Of the 191 customers with a master's degree who received over $10,000 in goods and purchased services and closed within a year of application, 99.0% achieved employment. For similar customers with a master's degree who received over $10,000 in goods and purchased services who closed after four years, the success rates drops to 80.7%. Decreases in the cost of goods and purchased services and increases in the time from application to closure and number of supports dropped customer success rate to as low as 34.0%.

To better understand the predictor variables and their influence, a gains chart was developed to examine the "homogeneous end groups" (Marini et. al., 2008, p.11). Factors found to influence success for customers varied and were dependent on the interacting

variables. These findings suggest that customers needs vary and a successful outcome cannot be hierarchically prescribed. While level of education is clearly an important predictor of success it is not the only factor. Findings illustrate that customers with a lower level of education can be successful with the right combination of factors. This is an important for consideration as not all customers will chose to or be provided further levels of education. For these clients job placement assistance and rehabilitation technology may be of greater service.

One final analysis looked at the pattern in allocation of the services associated with a positive employment. Most directly was there a pattern of change in services or customer variables associated with success at closure from 2004 and 2008? Findings from the analysis are encouraging. There was an increase in the number of customers who closed with a bachelor or master's degree. The amount of goods and purchased services customers received improved as well. The number of customers who closed within a year of application increased. Those closing within four or more years also increased but this may be attributed to an increase in education levels. Rehabilitation technology services and job placement assistance increased as well. One final factor for review is the customer supports at closure. There was an increase in the number of customers using supports at closure.

Comparison of Study Findings with Previous Research

As addressed earlier, this study is an extension of a prior study by Irmo Marini, Gloria K. Lee, Fong Chan, Martha H. Chapin and Maria G. Romero who examined employment outcomes for individuals with spinal cord injury served by the state vocational rehabilitation services program between 2001. Similar to this current study,

Marini and colleagues examined the effect of demographic characteristics, disincentives and service variables on the employment outcomes of customers with SCI served by the state VR. Table 34 provides a comparison of customer characteristics between the current study and 2008 study by Marini and colleagues. There were demographic differences noted between the two studies however, comparisons on one year of data may not be indicative of patterns or trends. In addition, employment outcomes for the 2001 customer population were higher; 54.0% in 2001 compared to an average of 50.4% between years 2004 and 2008. The first difference of note is a 2.0% variation in the employment outcome of males from the 2001 to the current study however similar variances also occurred between years 2006, 2007 and 2008 in the current study. The employment outcomes for all races appear to decrease between study periods; most notably for African American or Blacks and Hispanic or Latino customers as did the outcome for all levels of education. As reported in 2001 findings work disincentives still appear to impact the employment outcome of customers and have increased by an average of 3.0% during 2004 and 2008.

Table 34

Comparison of Employment Rates of VR Clients in 2001 and 2004 through 2008

Study (Author, Year)	Marini, et al. 2008	Current Study	Marini, et al. 2008	Current Study
Variable	Employed 2001	Employed 2004-2008	Not Employed 2001	Not Employed 2004-2008
Gender				
Male	52.6%	49.6%	47.4%	50.4%
Female	55.2%	51.8%	44.8%	48.2%
Race				
White	54.7%	52.8%	45.3%	47.2%
and Asian[1]	55.9%		44.1%	
African American or Black	48.8%	40.9%	51.2%	59.1%
Hispanic or Latino	53.3%	51.5%	46.7%	48.5%
Education				
Less than High School	45.6%	41.0%	54.4%	59.0%
High School Graduate	53.0%	47.3%	47.0%	52.7%
As least some college	60.1%	58.0%	39.9%	42.0%
Work Disincentive[2]				
Yes	43.1%	40.9%	56.9%	59.1%
No	56.6%	61.2%	43.4%	38.8%

1. White and Asian customers combined in current study
2. Work disincentives in Marini, et al. (2008) study used SSI, SSDI numbers; current study used number of supports at closure

This next comparison examines the findings of the CHAID analysis conducted on data from Marini et al.'s (2008) study of VR customers with SCI served in 2001and the current study's analysis of VR customers with SCI served between 2004 and 2008. Findings from the Marini et al. (2008) study suggest job placement services to be the most important predictor of employment, followed by case expenditures (cost of goods and purchased services) and work disincentives. In addition, physical and/or mental restoration, substantial counseling, and assistive technology were found to be important predictors of employment for the Marini study (2008). A primary difference between the

studies is the importance of level of education as the most significant predictor of employment in the current study with customers served between 2004 and 2008. The next most significant predictor for this group was dependent on level of education and included an additional variable not included in the 2001 study, the number of days from application to closure, along with cost of goods and purchased services, number of supports at closure variables. The final predictor variables for the 2004 through 2008 customers were job placement assistance and rehabilitation technology services. Cost of purchased services, work disincentives (e.g., number of supports at closure), job placement assistance service and rehabilitation technology were found to be strong predictors of employment outcomes in both studies.

Assumptions and Limitations of the Study

Several limitations in this study should be addressed. First, this study used Rehabilitation Services Administration RSA 911 data and as result there are several limitations that are resultant of using an archival dataset. First there are limitations in the characteristics of the customers, their geographic location and resulting socioeconomic conditions as well as the perceived or actual quality of any received services. In addition, the use of archival data restricts the ability of the researcher to control for human error that may have occurred during the coding of customer records. Also because this study's timeframe is limited to a five year period there aren't enough cycles (n <10) for an actual trend analysis. Finally, because this study population was composed of VR customers findings may be less applicable to populations being served by other employer networks; especially those incurred as a result of an accident who receive services, including VR, from a private vendor such as workers compensation or other insurers including auto.

Limitations more directly related to this study include the multi-collinarity of predictor variables with the dependent variable. Several variables included in the initial chi-square analysis were removed from the decision tree analysis as they were closely related to employment outcome (e.g., hourly wages at closure). A future study could include these variables to better understand their relationship with input, service and outcome variables. While level of education has a less direct relationship to employment there is a positive linear relation with employment outcome. This variable was not excluded as it allowed for a more in-depth exploration of employment success at different levels of education and provided further insight of the interrelation with other variables included in this study.

Conclusions

Findings from this study indicate that the factors associated with employment outcomes for consumers with SCI is complex. Through the use of chi-square and decision tree analysis several factors surfaced as key indicators of employment but findings from the analysis suggest that these factors do not operate in isolation and as a result aren't the sole driving forces associated with outcome success. This is important for several reasons; first it provides a hierarchical representation of variables based on their relationship with the dependent variable, and other predictor variables, second it suggests that employment is possible even for particularly challenging customers (e.g., customers with lower levels of education), third it suggests that even with the prescribed supports and services other factors may impact customer success (funding for goods and services) and fourth it suggests that customers needs are varied and a single solution or set of solutions may not work for customers seeking services.

While several analytic methods are available to examine predictors of employment outcomes, classification methods such as decision tree analysis offered several benefits to this study. First it allowed for a graphical display of findings which allowed for easier interpretation and dissemination of information, second it provided a method for "detecting, explicating and interpreting interactions in categorical data" and third the hierarchical nature of the tree provided a schema of the interaction and interrelationship of variables and their impact on the dependent variable (Kosciulek, 2004, p. 142).

Implications for future research

This study while extensive only scratched the surface of the inter-relation of customer characteristics, service provisions and outcome factors. A more thorough examination of the population of customers within each end-node from the CHAID analysis is needed to further identify factors that are particularly important for sub groups of customers.

The exhaustive CHAID analysis also determined that a combination of factors may be supportive or prohibitive of employment at closure. As suggested and illustrated in Figure 5.3 the percentage of those at closure fluctuated from 51.9% to 96.4% depending on the number of year from application to closure and the cost of goods and purchased services in addition to other factors. As provided for the five end nodes examined further exploration of the other factors associated with these groups or clusters of customers needs to be explored.

Pattern or trend analysis may be an important tool for further studies of VR customers. This five year analysis provided insight into the changes occurring within the

population which may warrant further investigation. These include a statistically significant reduction of customers with SCI in comparison with the aggregate group of customers, a reduction of younger customers which may be an indication of changes within the SCI population or a result of a shift in VR recruiting methods, and evidence that services suggested as effective in improving employment outcomes show a pattern of increased allocation.

An important finding for customers employed at application should also be noted for further examination. Study findings suggest that the proportion of customers employed at application may be accessing VR for specific services including assessment services, diagnostic and treatment services, rehabilitation technology services, transportation services and vocational rehabilitation counseling and guidance services.

Implication for Rehabilitation Counselors and Policy Directors

Findings suggest that level of education at closure; funding and services allocation, days from application to closure and the use of public supports at closure are important predictors of employment outcome. However careful analysis of these findings are recommended as there may be a number of critical factors or unknown variables coming into play during the time a customers is receiving services. For example the number of days from application to closure may be more indicative of a customer's health as opposed to the diligence of either the customer or the counselor. Because the time spent from application to closure appeared to be highly impactful on outcomes counselors may benefit from understanding customers delays and methods for mitigating roadblocks as well as facilitating service provision when applicable to allow for earlier closures. While a higher level of education is associated with higher levels of income,

cost of goods and purchased services was impactful as well. Customers who received over $5,000 in services did markedly better than customers with less funding. While these findings suggest providing funding to clients appears impactful an understanding of the actual services provided to customer may help illuminate service benefits. Finally because findings suggest the number of public supports at closure impact employability counselors may want to better understand these customers and how they may be best transition from public support to employment. Again, caution is stressed in that customer's needs are unique and using research findings without the consideration of the human element could result in boilerplate service provisions that inadequately serve all customers equally.

APPENDICES

The Reporting Manual for the Case Service Report [PD-06-01] provides detailed edit and relational edit specifications for reporting RSA-911 data. Specific categories of variables include demographic, public support and VR services. While the majority of variables were in a format that allowed for a comparative analysis (e.g. nominal or ordinal) some variables were continuous and were recoded into categories. The following provides a definition of all variables included in this study including any recoding.

Demographic Variables

Demographic variables included in this study include gender (male or female), race/ethnicity categories used in the rehabilitation literature (African American, Native American, Asian American, European American, Hispanic American), age at application (16-24, 25-34, 35-54, and 55-64), level of education at intake and closure (no formal schooling; elementary education grades 1-8; secondary education; no high school diploma grades 9-12; special education certificate of completion/diploma or in attendance; high school graduate or equivalency certificate; post-secondary education, no degree; associate degree or vocational/technical certificate; Bachelor's degree; Master's degree or higher), IEP (had an IEP or did not have an IEP), and previous closure (previous closure within past 36 months or no previous closure within past 36 months). Employment status at intake included seven categories: employment without supports in an integrated setting, extended employment, self-employment, state agency-managed Business Enterprise Program (BEP), homemaker, unpaid family worker, and employment with supports in an integrated setting. These categories are described below:

- Employment without supports in an integrated setting covered individuals who worked for wages, salary, commissions, tips, or piece-rates, below, at, or above the minimum wage. This category did not include self-employed individuals.
- Extended employment covered those who worked for wages or salary in a non-integrated setting for a public or nonprofit organization. The organization provided any needed support services that enabled the individual to train or prepare for competitive employment. This category applied only to individuals who received services and were placed in extended employment. This category was not considered an employment outcome.
- Self-employment (except BEP) applied to those who worked for profit or fees including those operating their own business, farm, shop or office. Sharecroppers were included in this category, but wage earners on farms were not.
- State Agency-managed Business Enterprise Program (BEP) referred to Randolph-Sheppard vending facilities and other small businesses operated by individuals with significant disabilities under the management and supervision of a State VR agency. This category included home industry where the work was done under the management and supervision of a State VR agency in the individual's own home or residence for wages, salary, or a piece-rate. Individuals capable of activity outside the home, as well as homebound individuals, engaged in this type of employment.
- Homemaker referred to men and women whose activity was keeping house for persons in their households, or for themselves if they lived alone.

- Unpaid family worker referred to persons who worked without pay on a family farm or in a family business.
- Employment with supports in integrated setting covered full-time or part-time employment in an integrated setting with ongoing support services for individuals with significant disabilities.

Additional demographic variables included type of closure (employed or not); hourly wage at intake and hourly wage at closure (recoded from a continuous variable into five categories: less than or equal to $6.49, $6.40 to $8.49, $8.50 to $11.49, $11.50 to $17.49, and $17.50 or more); and hours worked per week at intake and hours worked per week at closure (recoded from a continuous variable into six categories: 0 hours, 1 to 10 hours, 11 to 20 hours, 21 to 30 hours, 31 to 35 hours, 36 to 40 hours, and 41 hours or more).

Public Support Variables

Seven variables addressed the type of public support received at intake and seven variables addressed the type of public support at closure. Types of public support included Supplemental Security Income (SSI), Social Security Disability Insurance (SSDI), Temporary Assistance for Needy Families (TANF), general assistance, veterans' disability benefits, workers' compensation, and other. Each of these variables had two possible values: yes (service received) or no (service not received).

Five variables represented the type of medical insurance coverage at intake and five variables represented the type of medical insurance coverage at closure. Types of medical insurance coverage included Medicaid, Medicare, public insurance from other source, private insurance through own employment, and private insurance through other

means. Each of these variables had two possible values: yes (service received) or no (service not received).

In addition to the 24 support variables discussed above, eight additional support-related variables were considered. Two variables, primary source of support at intake and primary source of support at closure, had four response options: personal income (earnings, interest, dividends, rent); family and friends; public support (for example, SSI, SSDI, TANF); and all other sources (for example, private disability insurance and private charities). Two variables, number of supports at application and number of supports at closure, had values ranging from 0 to 5, representing up to five sources of support. Number of days from application to eligibility for services was recoded from a continuous variable into five categories (0 to 30 days, 31 to 60 days, 61 to 90 days, 91 or more days, and not eligible for services). Number of years from application to closure was recoded from a continuous variable into five categories (less than one year, one to less than two years, two to less than three years, three to less than four years, and four or more years). Cost of goods and purchased services was recoded from a continuous variable into five categories (up to $539; $540 to $2,131; $2,132 to $5,109; $5,110 to $12,841; and $12,842 or more).

VR Service Variables

VR services variables included Assessment, Diagnosis and Treatment of Impairments, Vocational Rehabilitation Counseling and Guidance, College or University Training, Occupational/Vocational Training, On-the-Job Training, Basic Academic Remedial or Literacy Training, Job-Readiness Training, Disability-Related Augmentative Skills Training, Miscellaneous Training, Job Search Assistance, Job Placement

Assistance, On-the-Job Supports, Transportation Services, Maintenance Services, Rehabilitation Technology, Reader Services, Interpreter Services, Personal Attendant Services, Technical Assistance Services, Information and Referral Services, Other Services.

A description of these services follows:

- Assessment: Services provided and activities performed to determine an individual's eligibility for VR services, to assign an individual to a priority category of a state VR agency that operates under an order of selection, and/or to determine the nature and scope of VR services to be included in the Individual Plan for Employment (IPE); included in this category are trial work experiences and extended evaluation.
- Diagnosis and Treatment of Impairments: Surgery, prosthetics and orthotics, nursing services, dentistry, podiatry, occupational therapy, physical therapy, speech or hearing therapy, and drugs and supplies; this category includes diagnosis and treatment of mental and emotional disorders as well treatment of special medical services.
- Vocational Rehabilitation Counseling and Guidance: Discrete therapeutic counseling and guidance services necessary for an individual to achieve an employment outcome, including personal adjustment counseling; counseling that addresses medical, family, or social issues; vocational counseling; and any other form of counseling and guidance necessary for an individual with a disability to achieve an employment outcome; this service is distinct from the general

counseling and guidance relationship that exists between the counselor and the individual during the entire rehabilitation process.

Training

- College or University Training. Full-time or part-time academic training above the high school level that leads to a degree (associate, baccalaureate, graduate, or professional), a certificate, or other recognized educational credential; such training may be provided by a four-year college or university, community college, junior college, or technical college.
- Occupational/Vocational Training: Occupational, vocational, or job skill training provided by a community college and/or a business, vocational/trade, or technical school to prepare students for gainful employment in a recognized occupation not leading to an academic degree or certification.
- On-the-Job Training: Training in specific job skills by a prospective employer; generally the individual is paid during this training and will remain in the same or a similar job upon successful completion; this category also includes apprenticeship training programs conducted or sponsored by an employer, a group of employers, or a joint apprenticeship committee representing both employers and a union.
- Basic Academic Remedial or Literacy Training: Literacy training or training provided to remediate basic academic skills needed to function on the job in the competitive labor market.

- Job Readiness Training: Training to prepare an individual for the world of work (e.g., appropriate work behaviors, methods for getting to work on time, appropriate dress and grooming, methods for increasing productivity).
- Disability-Related, Augmentative Skills Training: Service includes, but is not limited to, orientation and mobility, rehabilitation teaching, training in the use of low vision aids, Braille, speech reading, sign language, and cognitive training/retraining.
- Miscellaneous Training: Any training not recorded in one of the other categories listed, including GED or high school training leading to a diploma.

Job-Related Services

- Job Search Assistance: Assistance includes activities that support and assist a consumer in searching for an appropriate job. These may include help in preparing resumes, identifying appropriate job opportunities, and developing interview skills, and may include making contacts with companies on behalf of the consumer.
- Job Placement Assistance: A referral to a specific job resulting in an interview, whether or not the individual obtained the job.
- On-the-Job Supports: Support services provided to an individual who has been placed in employment in order to stabilize the placement and enhance job retention; such services include job coaching, follow-up and follow-along, and job retention services.

- Transportation Services: Travel and related expenses necessary to enable an applicant or eligible individual to participate in a VR service; includes adequate training in the use of public transportation vehicles and systems.
- Maintenance Services: Monetary support provided for expenses such as food, shelter, and clothing that are in excess of the normal expenses of the individual and that are necessitated by the individual's participation in an assessment for determining eligibility and vocational rehabilitation needs or that are incurred while an individual receives services under an Individualized Plan for Employment (IPE).
- Rehabilitation Technology: The systematic application of technologies, engineering methodologies, or scientific principles to meet the needs of, and address the barriers confronted by, individuals with disabilities in areas that include education, rehabilitation, employment, transportation, independent living, and recreation; includes rehabilitation engineering services, assistive technology devices, and assistive technology services.

Personal Assistance Services

- Reader Services: Services for individuals who cannot read print because of blindness or other disability. Reader services include, in addition to reading aloud, transcription of printed information into Braille or sound recordings if the individual requests such transcription. Reader services are generally for individuals who are blind or deaf-blind, but may also include individuals unable to read because of serious neurological disorders, specific learning disabilities, or other physical or mental impairments.

- Interpreter Services: Sign language or oral interpretation services for individuals who are deaf or hard of hearing and tactile interpretation services for individuals who are deaf-blind. Specially trained individuals perform sign language or oral interpretation. Also include here real-time captioning services for persons who are deaf or hard of hearing. Do not include language interpretation in this category, but in "other services".
- Personal Attendant Services: Includes services that an attendant performs for an individual with a disability such as bathing, feeding, dressing, providing mobility and transportation, etc.
- Technical Assistance Services: Includes technical assistance and other consultation services provided to conduct market analyses, to develop business plans, and to provide resources to individuals in the pursuit of self-employment, telecommuting and small business operation outcomes.
- Information and Referral Services: Services provided to individuals who need assistance from other agencies (through cooperative agreements) not available through the VR program.
- Other Services: All other VR services that cannot be recorded elsewhere; included here are occupational licenses, tools and equipment, initial stocks and supplies, and medical care for acute conditions arising during rehabilitation and constituting a barrier to the achievement of an employment outcome.

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