PREDICTORS OF STARTING WAGE FOR INDIVIDUALS WITH SCHIZOPHRENIA SUCCESSFULLY EMPLOYED AFTER RECEIVING STATE-FEDERAL VOCATIONAL REHABILITATION SERVICES: COMPARING SUPPORTED AND NON-SUPPORTED EMPLOYMENT GROUPS

By

Ashley A. Kaseroff

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The dissertation is approved by the following members of the Final Oral Committee:

Brian Phillips, Professor, Rehabilitation Psychology and Special Education

Fong Chan, Professor, Rehabilitation Psychology and Special Education

Timothy Tansey, Professor, Rehabilitation Psychology and Special Education

Norman Berven, Professor, Rehabilitation Psychology and Special Education

Daniel Bolt, Professor, Educational Psychology

DEDICATION

For my Babunya

Darunya Petrovna Volkoff

Because, “Volkoff’s are smart.”

I love you always Babun.

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ABSTRACT

This study examined demographic, state-federal vocational rehabilitation (VR) service, and supported employment fidelity predictors of starting wages for consumers with schizophrenia in supported employment and not in supported employment. A total of 4,318 state-federal VR consumers with schizophrenia who were closed with a successful employment outcome were selected from the Rehabilitation Service Administration (RSA) 911 database for the year 2014. Cases were divided into two groups: consumers receiving supported employment (n=1,106) and consumers who were not receiving supported employment (n = 3,213). A hierarchical regression analysis (HRA) was conducted on each group to determine which demographic and state-federal VR services predicted starting wage, and to see if receiving services in a state promoting high-fidelity supported employment (i.e. Individual Placement and Support, IPS) predicted higher wages after controlling for demographic and service variables. The final HRA model for the supported employment group showed demographics and state-federal VR services explained 11.9% of the variance in starting wages, while all three factors explained 9.2% of the variance in starting wages for the non-supported employment group. Receiving services in an IPS promoting state was not a significant predictor for consumers with schizophrenia in supported employment. Results indicated that state-federal VR consumers with schizophrenia who were African American/black, younger, not receiving cash benefits from the social security administration (i.e. Supplemental Security Income [SSI] or Social Security Disability Insurance [SSDI]), and participated in post-secondary education or training were predicted to have higher starting wages regardless of participation in supported or non-supported employment. If not receiving supported employment programming, then being Hispanic or Latinx was also associated with higher starting wage. Supported employment seemed to

moderate the negative of effect lower education (i.e. less than a high school diploma) had on starting wage for the non-supported employment group. Significant state-federal VR service variables predicting higher starting wage included transportation for both groups, and maintenance and diagnosis and treatment of impairment for the supported employment group. Some services significantly predicting lower starting wages were most likely a function of symptom severity. The discussion explores these results in context of this study's purpose, which was to assess which state-federal VR services were capable of advancing an already successful employment outcome to a potentially financially meaningful outcome for the consumer. Implications for rehabilitation counselors, and future directions for both researchers and state-federal VR policy-makers are discussed.

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CHAPTER ONE

Statement of Purpose

Leahy and colleagues (2014) conducted an analysis of evidenced based practices in state-federal vocational rehabilitation. Their examination highlighted multiple gaps in the current delivery of best practices for individuals with disabilities accessing the state-federal vocational rehabilitation program. The authors said improving the system required vocational rehabilitation (VR) research to focus on, "a purposeful approach to define what types of interventions or services appear to work best with what specific populations, under what specific conditions" (p. 159). As the field of vocational rehabilitation evolves, an important part of keeping this mandate involves focusing on meaningful outcomes. One way of improving interventions, is exploring how they are affecting the quality of employment a VR consumer achieves. For this reason, the specific population of this study are individuals with schizophrenia who have already achieved an employment outcome through supported and non-supported employment interventions provided by the state-federal VR program. The purpose of this study is to use a hierarchical repression model to explore demographic, service, and fidelity factors that may influence the starting wage for this population; thereby, highlighting which interventions might be contributing not just to job placement, but to quality employment that has the power to affect consumers lives in truly meaningful ways. The following will detail the rationale for focusing on the specific population of individuals with schizophrenia, receiving supported or non-supported employment interventions, within specific condition of the state-federal VR program.

Introduction

Ditchman and colleages (2014) cited the state-federal VR program as, "the oldest and most successful public program supporting the employment and independence of individuals with disabilities" (p. 344). Indeed, 60% of individuals receiving services from state-federal VR are placed in competitive, integrated settings (Dutta, Gervey, Chan, Chou, & Ditchman, 2008). Despite the success with job placement, several studies have emphasized areas still in need of improvement. Leahy and colleagues (2014) highlighted the average hourly earnings of state-federal VR consumers are still 52% of the general population. Other studies have cited the significant variation in employment, earnings, and amount of services received based on disability types and personal factors (U.S. Government Accountability Office [GAO], 2005). For instance, minorities receive roughly 80% of the services European-Americans receive (Leahy et al., 2014), and consumers with least severe psychiatric symptoms tend to receive the most services regardless of race or gender (Hall, 1993). Multiple studies have shown, despite political and social advances, individuals with psychiatric disabilities continue to have more difficulty finding and maintaining employment than any other disability type (Anthony, 1994; Marshak, Bostick, & Turton, 1990; Noble, Honberg, Hall, & Flynn, 1999).

A review of literature found that, while individuals with schizophrenia do benefit from VR services, they often benefit unequally as compared to people with physical, cognitive, or even other psychiatric disabilities (Cook & Razzano, 2000; Lehman, 1995). According to the Substance Abuse and Mental Health Services Administration (SAMHSA; 2014), only 27.1% of U.S. individuals with schizophrenia participating in the workforce and receiving mental health services were employed in 2014. When compared to other severe psychiatric diagnoses, such as Bipolar disorders (47.6% employed) and Depressive disorders (56.3% employed), the

employment rate for individuals with schizophrenia is considerably lower (SAMHSA, 2014). This trend continues even when individuals are receiving supported employment programming. A meta-analysis of four randomized controlled trials (RCTs) examining the impact of the Individual Placement and Support (IPS) model of supported employment found individuals with mood disorders and less severe thought disorders were more likely to obtain employment than individuals with schizophrenia (Campbell, Bond, Drake, McHugo, & Xie, 2010). Furthermore, Individuals with schizophrenia have been found to be the costliest group to serve through state-federal VR services (Cimera, 2009).

Additional to low employment rates, individuals with schizophrenia struggle with underemployment, particularly if they are beneficiaries of Social Security Administration (SSA) Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI; Cook & Razzano, 2000; O'Leary, Livermore, & Stapleton, 2011; Pete, 2013). Salkever and colleges (2007) found the average national wage for individuals with schizophrenia was $7.05, which was considerably lower than substantial gainful activity, meaning an individual was not making enough to work off government financial benefits (i.e. SSI/SSDI). This collective evidence suggests the importance of further examination of factors influencing competitive employment and starting wage, specifically for individuals with schizophrenia within the state-federal VR system.

A great deal of research has focused on addressing the difficulties associated with providing psychiatric VR, culminating in the adaptation of supported employment techniques. Originally developed to serve individuals with developmental and cognitive disabilities (Wheman, 1986), the supported employment model was adapted for individuals with psychiatric disabilities in the early 90's (Becker & Drake, 1993). The adapted model proposed a place-train

method focused on rapid placement and training on-the-job to overcome barriers associated with generalizability found in people with psychiatric disabilities. Other core elements included integrating mental health and vocational services, focusing on competitive and integrated placement goals, and providing unlimited, ongoing support based on consumer need (Luciano et al., 2014). As the success of this supported employment model spread, many programs adopted several of the core elements, but only the IPS model adheres to all core elements; thus, it is often referred to as high-fidelity supported employment (Campbell et al., 2010). IPS has become a staple evidence-based practice in psychiatric vocational rehabilitation, touting effect sizes of .96 for job acquisition, .79 for total weeks worked, and .74 for job tenure (Campbell, Bond, & Drake, 2011). A review of nine U.S. and six international RCT's found competitive employment rates of 65% and 50% respectively (Bond, Drake, & Becker, 2012). There is even reason to suspect the positive influence of IPS fidelity may extend beyond supported employment. Based on the results of a qualitative study in which state-federal VR counselors, IPS specialists, and mental health professionals identified collaborative approaches that could enhance employment outcomes (Oulvey, Carpenter-Song, & Swanson, 2013), The Johnson & Johnson-Dartmouth Community Mental Health Program started using state-based IPS learning collaboratives to disseminate multiple types of trainings, conferences, discussions, and research findings that are available to all vocational rehabilitation professionals within a learning collaborative state or jurisdiction (Becker, Drake, & Bond, 2014). These cross-over trainings and informational opportunities facilitates learning of best practices by state-federal VR counselors and supervisors who may not be connected to an IPS supported employment program in their specific agency, but whose state may be participating in these learning collaboratives. Oulvey and colleague's (2013) participants cited that learning important principles such as forgoing lengthy pre-job

assessments and having access to evaluation tools can assist state-federal VR counselors and supervisors in their commitment to high quality services, regardless of agency access to IPS services.

Despite obvious success with the IPS model of supported employment specifically, an accumulation of research has highlighted some remaining limitations. First, Campbell and colleagues (2010) urged researchers to examine the 50% job placement success in relation to the 50% of IPS consumers who do not obtain a job during any follow-up period. Second, it is well known that despite the high effect size, IPS has demonstrated difficulty in helping participants to achieve long lasting employment. Early studies found half of IPS recipients held a job for six months (Bond et al., 1997; Shafer & Huang, 1995). A more recent study found the monthly employment rate for IPS consumers dropped to 15-20% eight months after the initial success of obtaining employment (Lehman et al., 2002). Cook, Burke-Miller, and Roessel (2016) examined longitudinal effects of supported employment models, including IPS, and found the effects of all types of supported employment rapidly declined and were completely attenuated at the 13-year follow-up. Furthermore, individuals with schizophrenia have been cited to have some of the greatest attenuation rates among those with psychiatric disabilities (Fabian, 1992). Lastly, and perhaps most importantly, are the studies indicating supported employment models, including IPS, have little effect on wages. One study compared IPS to a well-respected psychosocial rehabilitation program and found no differences in job tenure, wages, or hours worked (Lehman et al., 2002). Another found 32.9% of individuals with psychiatric disabilities who were employed using IPS had earnings significantly below the substantial gainful activity threshold (Cook et al., 2016), and Henry, Hashemi, and Zhang (2014) found absolutely no effect on wages in their evaluation of a statewide supported employment program.

Adding to the complexity of utilizing supported employment for individuals with schizophrenia is the interplay between the state-federal VR system and the implementation of supported employment services. Rehabilitation counselors are faced with a choice to either authorize supported employment services or not, and the state-federal VR system offers some additional limitations. First, only those with the "most significant disabilities" are eligible for supported employment services (Department of Workforce Development; DWD, 2014, p. 1). This presents a unique complication for individuals with schizophrenia who present with remitting and relapsing symptoms and are not likely to be organized enough to request state-federal VR services during their most severe symptom presentation. Second, supported employment services can only be authorized for 18 additional months after placement without an appeal of extenuating circumstances, at which point rehabilitation counselors must find county human service agencies to pick up the support, or they are encouraged to re-examine the placement and/or close the case unsuccessfully (DWD, 2014). Third, the IPS model of supported employment is only available in 16 U.S. states and jurisdictions, and only 13 of those were actively participating in fidelity programming in 2012 (Becker et al., 2014). Johnson-Kwochka, Bond, Becker, Drake, and Greene (2017) reported the number of states IPS programs per 1,000,000 people ranged from 0.05 to 16.62, meaning the availability of the most validated model of supported employment is extremely limited. Lastly, funding for supported employment services either comes from private agencies the consumer must secure before applying for state-federal VR services or from Title I funds, which has an extensive waitlist (DWD, 2014). These considerations, coupled with the researched limitations of supported employment, provide reasonable justification as to why rehabilitation counselors may choose not to authorize supported employment services for individuals with schizophrenia.

Statement of the Problem

Rehabilitation counselors are tasked with selecting services that will produce positive, measurable, vocationally related outcomes while using the fewest resources in order to maintain funding from governments and important stakeholders (Ditchman et al., 2014). Their service choices are informed through decades of rehabilitation research that have identified which practices are most likely to yield a successful job placement. For individuals with schizophrenia, the literature has identified IPS supported employment, other models of supported employment, and standard state-federal VR services as the constellation of interventions that will be most effective in acquiring a job. For cases where supported employment is not a viable service choice, rehabilitation researchers have identified specific state-federal VR services that appear most beneficial in producing a successful placement. For individuals with schizophrenia, these services include job placement assistance, on-the-job supports, maintenance services, and counseling and guidance (Dutta et al., 2008; Pete, 2013). The success of the state-federal VR program to produce 60% successful placements is an example of the scientist-practitioner model in action and suggests there is room for continued clinical growth through extension research.

Szymanski, Parker, and Butler (1990) stated that precision research and clinical services require choosing a meaningful, measurable outcome. While job acquisition is obviously the key component of any VR, employment that contributes to community participation and independent living is a critical consideration (Bolton, 2001), one that the state-federal VR system has been increasingly criticized for not prioritizing (Chan et al., 2010; GAO, 2005; Noble et al., 1999). One such outcome that is particularly meaningful for individuals with schizophrenia is starting wage. As stated above, individuals with schizophrenia seem to have particular difficulty in achieving substantial gainful activity (Salkever et al., 2007). Cho (1999) conducted a study

examining the effects of state-federal VR services on starting wages. The sample included 677 individuals with psychiatric disabilities in a midwestern state and focused on services influencing wages by gender. The results revealed that for the entire sample, both males and females, college/university training, business/vocational training, and maintenance services were positively correlated with wages at closure. Conversely, adjustment and miscellaneous training were negatively correlated with wages at closure. When combined with the existing knowledge of services leading to successful placement, this study facilitates the ability of rehabilitation counselors to choose services that not only lead to job placement, but to economically meaningful employment. The current study provides a replication of Cho's research nearly 20 years later, with a nationally representative sample that is specific to the starting wage of people with schizophrenia and is controlling for potential confounds affecting the relationship between state-federal VR services and wages.

Bishop, Miller, and Chapin (2008) highlighted how a narrow focus on a single outcome often masks the benefits of interventions. Supported employment has been deemed the gold standard practice for job acquisition but has been criticized for its effectiveness to produce other vocational outcomes (Cook et al., 2016; Henry et al., 2014). It is possible the focus on job acquisition has masked the benefit state-federal VR services may provide when considering a broader range of outcomes such as starting wages. Furthermore, individuals receiving supported employment through the state-federal VR program are also consumers of standard services. It is possible that VR services provided in conjunction with supported employment may have a positive impact on vocational outcomes such as starting wage.

While no current study has examined these effects directly, Roberts and Pratt (2007) conducted a meta-analysis indicating that readiness training prior to supported employment

services could greatly improve vocational outcomes. McGurk and Whykes (2008) conducted an analysis of studies combining cognitive remediation with supported employment. Results generally showed the addition of cognitive remediation not only improved job acquisition, but increased hours and starting wages. Furthermore, Gewurtz, Cott, Rush, and Kirsh (2012) found when an Ontario Disability Support Program shifted to rapid job placement, the attention to career development was lost and starting wages significantly decreased. These studies imply the combination of state-federal VR services with supported employment may have a significantly positive effect on starting wages. The current study will address these gaps in knowledge through the comparison of starting wages of individuals with schizophrenia receiving only state-federal VR services and state-federal VR services plus supported employment.

Significance of the Study

Bolton (2001) referenced three duties to consider when choosing outcomes for rehabilitation research: duty to consumers, the VR field, and stakeholders. This study addresses the needs and interests of all three groups. Earnings have been shown to be particularly important to individuals with schizophrenia (Cook & Razzano, 2000), and it is specifically gainful employment that is associated with higher levels of quality of life and well-being (Mueser, Drake, & Bond, 2016). There has also been increasing support for returning to gainful employment as a sign of full recovery due to addressing empirically overlapping recovery themes of quality of life, professional reintegration, length and quality of social relationships, and autonomy or independence in daily life (Pachoud, Plagnol, & Leplegel, 2010).

The results of this study may contribute knowledge about services more likely to produce a meaningful outcome related directly to consumer quality of life and recovery. This knowledge may have direct research to practice implications that will assist state-federal VR counselors in

making service provision decisions. In addition, the focus on wages captures the additional benefits state-federal VR services can have on the economic lives of individuals with schizophrenia; a valuable commodity in a field where every service must be empirically justified (Bishop et al., 2008).

Lastly, this study addresses stakeholders' interest by providing knowledge about rehabilitation practices directly influencing the annual cost associated with schizophrenia. Wu and colleagues (2005) conducted a breakdown of expenses associated with average annual care for individuals with schizophrenia in the U.S. during 2002. Findings revealed, of the 64.4 billion dollars spent, 52% (32.4 billion) was related to indirect costs such as unemployment and reduced workplace productivity, while another 15% (9.3 billion) was related to direct non-health care related costs such as encounters with law enforcement and homeless shelter use. These costly problems are addressed by focusing on gainful employment.

Research Questions

Hierarchical multiple regression will be used to address the following research questions:

1) What are the primary demographic predictors of starting wage for state-federal VR consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?
2) After controlling for demographics, which state-federal VR services predict starting wages for state-federal VR consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?

3) After controlling for demographics and state-federal VR services, does receiving state-federal VR services in an IPS promoting state predict higher starting wages for consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?

CHAPTER TWO

Literature Review

The purpose of this study is to explore factors associated with the starting wage of individuals with schizophrenia who were successfully employed (closed status 26) through receipt of supported and non-supported employment from the state-federal VR program. This chapter reviews the literature pertaining to the variables of interest for the purposes of informing the research design and subsequent discussions of the research findings. This chapter will review the integral nature of employment to the recovery of individuals with schizophrenia, the unique barriers this population faces to employment, the VR models developed to address these barriers, and the current state of psychiatric vocational rehabilitation in the state-federal VR system.

Employment as Recovery

Definitions of recovery from mental illness have always been dependent upon the current understanding of mental illness. The first conceptualizations involved viewing mental illness as a curable disease; therefore, recovery was synonymous with cure. The psychosocial model conceptualized mental illness as an emotional disturbance in which recovery required full social integration (Wyatt & Livson, 1994). Both models negate the complex interaction of biology and psychology that comprises mental illness. It was not until Anthony and Liberman (1986) developed the stress, vulnerability, coping, and competence model that both aspects were incorporated into conceptualization and treatment. This lead to a revolution in psychiatric rehabilitation in which treatment outcomes focused on functional improvement and the concept of recovery began to be about the fate of the person, rather than the disease.

The shift to functional improvement goals put VR in a prime treatment position for two reasons. First, returning to work in a society where the norm is to work is often seen as a sign of

recovery by others. It means the illness is ameliorated enough to allow a person to return to "normal." This perception is supported across decades of literature highlighting the ability of employment to reduce symptoms and inpatient hospitalizations (Bell, Lysaker, & Milstein, 1996; Burns et al., 2008; Drake et al., 1999; Lehman, 1995; Mueser et al., 2004); improve symptom management (Bond et al., 2001; Bond, 2004); and increase self and provider ratings of overall global functioning (Baronet & Gerber, 1998; Bell & Lysaker, 1997; Eklund, Hanson, & Ahlqvist, 2004).

Second, employment as an outcome meets nearly all aspects of recovery as defined by individuals with mental illness. For instance, Smith (2000) conducted a qualitative study that asked 10 individuals with schizophrenia, bipolar disorder, and major depression about recovery. Participants identified critical factors as the right medication, a group of supportive people, meaningful activities, a sense of control and independence, resiliency, and a positive outlook for present and future. Corrigan, Rao, and Lam (2005) found opportunity, inclusion, independence, employment, and quality of life were cited as the most important goals of recovery for individuals with mental illness. Both studies accent areas research shows can be improved by employment. For example, Ruesch, Graf, Meyer, Rossler, and Hell (2004) found employed individuals with schizophrenia and schizoaffective disorder had larger social networks and received more social support than peers engaged in workshops or unpaid activities. They also found employment to be positively related with overall satisfaction with social relationships and environment. Bryson, Lysaker, and Bell (2002) found participation in paid work improved overall quality of life, motivation, sense of purpose, anhedonia, empathy, and interpersonal relatedness for individuals with schizophrenia. A review of psychiatric vocational rehabilitation

literature indicated several studies found a positive impact on family atmosphere as a product of the financial independence gained through employment (Baronet & Gerber, 1998).

The collective body of literature in psychiatric rehabilitation clearly illuminates employment as a vital component of recovery both from a practitioner and consumer point of view. The ultimate evidence for employment as recovery is simply that individuals with mental illness typically want to work (Mueser, Salyers, & Mueser, 2001; Onken, Craig, Ridgeway, Ralph, & Cook, 2007; Rogers, Walsh, Masotta, & Danley, 1991); however, achieving this desire requires overcoming numerous barriers.

Barriers to Employment

Individuals with schizophrenia only comprise 1% (2.4 million) of the U.S. population, but the holistically debilitating severity of the illness has made schizophrenia one of the costliest disorders. As stated in Chapter 1, Wu and colleagues (2005) estimated a total of 64.4 billion dollars as the cost of schizophrenia health care in the year 2002. Unemployment alone was responsible for 21.6 billion dollars of that total. Add in other indirect costs associated with poor employment outcomes such as, family income loss due to caregiving and reduced workplace productivity, and the cost of poor employment in individuals with schizophrenia is 52% (32.4 billion) of the total annual economic impact. The economics alone provide a rationale for focusing on employment interventions for this population; however, there is further evidence to suggest individuals with schizophrenia do not benefit from VR methods as thoroughly as individuals with other psychiatric diagnoses (Cook & Razzano, 2000). For example, Fabian (1992) found participants with schizophrenia had significantly lower employment rates (19%) than participants with major affective disorder at the end of one-year follow-up from a vocational intervention. Jacobs and colleagues (1992) found only 15% of patients with schizophrenia had a

positive outcome after participating in a job finding club. This was significantly poorer than other diagnostic groups. The following sections will review literature exploring barriers contributing to the unique difficulty in benefiting from VR.

Stigma

The U.S. Department of Health and Human Services (1999) cited stigma as, "The most formidable obstacle to future progress in the area of mental illness and health." (p. 29). Schizophrenia is perhaps one of the most stigmatized diagnoses (Pescosolido, Monahan, Link, Stueve, & Kikuzawa, 1999; Torrey, 2006), although the evidence for increased stigma per mental illness diagnosis is mixed (Corrigan, 2004). Regardless, evidence strongly indicates stigma affects employment through two primary avenues: (1) the perception of others and (2) the perception of the self.

Beliefs about individuals with mental illness have been shown to have direct consequences on helping behaviors. Corrigan, Larson, and Kuwabara (2007) conducted a study in which 815 individuals across the U.S. responded to items about the responsibility and dangerousness of "Chris" and whether he should receive two fundamental supported employment services: help finding a job and help keeping a job. There were three conditions in which Chris was identified as having a (1) mental illness, (2) drug addiction, or (3) physical disability (i.e., using a wheelchair). Results showed participants viewed Chris as responsible for his condition only when it was a mental illness. This assessment lead to lessor endorsement of employment assistance. Participants viewed mentally ill Chris as dangerous and wanted to stay away from him even in settings where people with mental illness were likely to work.

These results highlight how stigma can affect helping behavior among the general population; however, several studies have found stigma can influence the provision of vocational

services from professionals as well. Uninformed beliefs and concerns about stress, symptomology, medication compliance, and rehospitalization have resulted in unnecessary delays in service provision, have limited vocational options (Bond, Dietzen, McGrew, & Mill, 1995; Hall, 1993), and have contributed to the withholding of vocational services by providers until the client can prove successful participation in a community setting (Pratt, Gill, Barrett, & Roberts, 2006). This is in stark contrast to evidence indicating direct entry into competitive employment does not result in decompensation, but rather improves functioning, community involvement, general supports, and independence (Bond et al., 2001; McFarlane et al., 2000; Torrey, Becker, & Drake, 1995).

The second, and perhaps more pervasive, avenue with which stigma negatively impacts employment is through self-stigma. Corrigan, Larson, and Rusch (2009) detail a three-step process of self-stigmatization in which a person first becomes aware of the stereotype, then agrees with it, and finally applies it to him or herself. This last part often results in lowered self-esteem and self-efficacy. The authors coined this as the, "why try" syndrome (p. 75), and it has obvious impacts on employment. In a study about adherence to psychosocial treatment in individuals with schizophrenia in Hong Kong, results showed that once participants internalized the stigma, they were less likely to participate in any form of psychosocial treatment, including employment services. Several studies have found this self-devaluation results in consciously electing not to be successful or simply avoiding employment all together due to fear of failure and lack of belief in ability to contribute to society (Corrigan, 2004; Corrigan et al., 2003; Gary, 2005).

Symptomology

Schizophrenia is characterized as, "A chronic and debilitating mental illness in which patients often have diminished capacity for learning, working, self-care, interpersonal relationships, and maintaining general living skills" (Wu et al., 2005, p. 1122). The illness is defined by a combination of positive symptoms (e.g., delusions, hallucinations, disorganized or bizarre speech, and lack of behavioral self-control); negative symptoms (e.g., flat affect, alogia, and avolition); and severe impairments in cognitive social, and occupational functioning (APA, 1994; McGurk & Til, 2008; Pratt, Gill, Barrett, & Roberts, 2014). Symptoms often cycle through levels of severity at unpredictable rates, and the impairments are found to be lifelong in 40-60% of individuals (Crown et al., 2001).

Research regarding the relationship between symptom severity and employment outcomes has been mixed. Early studies found diagnosis of schizophrenia did not relate to obtaining a job (Walker, Winnick, & Frost, 1969; Wolkon, Karmen, & Tanaka, 1971; Bell & Ryan, 1984; Bond & Dincin, 1986). More recent studies have shown specific types of symptoms may have more effect than others. For example, an increase in positive symptoms has been correlated with a greater use of site supports (McGurk, Mueser, Harvey, LaPuglia, & Marder, 2003). Several studies have found negative symptoms and some cognitive impairments are related to job tenure (Christensen, 2007; Green, 1996; McGurk & Meltzer, 2000). The effect of symptom severity on obtaining and maintaining employment is most effectively linked to the cyclical nature of schizophrenia symptoms.

Kupper and Hoffman (2000) used cluster analysis to categorize the symptom path of individuals with schizophrenia. The analysis revealed five levels of functioning: (1) high level, (2) middle level or fluctuating symptoms, (3) middle level with slight descent, (4) steep descent,

and (5) low level. After undergoing a transitional employment rehabilitation program, all but three individuals experiencing high or middle level symptoms achieved a favorable employment outcome (i.e., job placement or job tenure). Of the individuals experiencing a slight descent in functioning, two achieved favorable outcomes, and none of the individuals in a steep descent or low level of functioning had a successful outcome. This study illustrates how the fluctuating nature of symptom severity can influence employment outcomes. During low levels of severity, an individual may easily obtain a job, but struggle to keep it as symptoms increase. Conversely, an individual may apply for vocational services and be deemed unfit for work due to high level of symptom presentation.

Despite the strong evidence and logic of the relationship between symptom severity and employment outcomes, multiple studies have found the effects of a schizophrenia diagnosis (e.g., symptom severity, stigma) disappear when demographic and other factors are considered. For example, Mueser and colleagues (1997) found gender and types of service models used erased the significance of diagnosis from their regression model.

Demographic Factors

Given the difficulty in pinpointing symptom severity as the cause for poor responses to vocational services, researchers have consistently explored the intersectionality of schizophrenia and other typically disenfranchised demographic statuses. The following will summarize the literature regarding the influence of major demographic factors on employment outcomes for individuals with schizophrenia.

Gender. The significance found for gender on employment acquisition has been relatively stable across years of study. Results have consistently indicated male individuals with schizophrenia typically have better employment outcomes (Salkever et al., 2007; Slade &

Salkever, 2001). Some studies have found the type of employment outcome matters. For example, Henry and colleagues (2014) found that being male was associated with job attainment within one year of receiving vocational services and with working 20 hours per week, but not with earning $9.00 per hour or more. Cho (1999) conducted a specific examination of gender in individuals with schizophrenia and found that males consistently earned more money than females. Given the inconsistency of the impact of gender on wages of individuals with schizophrenia, this variable is important to consider for the current study.

Race and ethnicity. The impact of race and ethnicity variables on employment outcomes for individuals with schizophrenia has been mixed in the literature. Some studies have found race to be not significant in predicting employment outcomes such as job acquisition, earnings, hours worked, and achieving non-beneficiary status (Campbell et al., 2010; Cook et al., 2016). Other studies have found race is significant only for certain outcomes. For example, Henry and colleagues (2014) found race was not a significant factor in obtaining a job or working 20 hours per week or more but did significantly impact wages. In this study, non-white individuals were statistically more likely than their white counterparts to make $9.00 or more if they did not have a diagnosis of psychotic disorder. In a dissertation by Hall (1993), African American women with non-severe symptoms had the highest likelihood of being accepted for rehabilitation services but were the lowest performing group when considering job acquisition and wages. These studies reflect the importance of symptom severity as opposed to race. A more recent multi-site study found younger, female, Latina individuals had better employment outcomes when controlling for clinical symptoms (Bond & Drake, 2008). The mixed results regarding the intersectionality of race and schizophrenia, and the unexpected evidence suggesting individuals

of color with schizophrenia may earn better wages, indicate a strong need for continued examination of this variable in this study.

Level of education. Some studies have found education to not be a significant predictor of job acquisition, hours worked, or other employment outcomes (Campbell et al., 2010; Henry et al., 2014). However, these studies are largely overruled by a larger body of empirical evidence indicating higher levels of education strongly correlate with better employment outcomes for individuals with mental illness (Bond & Drake, 2008; Cho, 1999; Pete, 2013; Lorei & Gurel, 1973; Mueser et al., 2001). Salkever and colleagues (2007) conducted a study examining clinical and labor market factors predictive of employment outcomes for individuals with schizophrenia. Greater levels of education were found to specifically improve wages, just as in the general population.

Age. In the general population, age has a curvilinear relationship to employment, indicating an ideal middle age range where individuals are more likely to obtain a successful placement. For individuals with schizophrenia, age has shown to be a complex variable. Bond and Drake (2008) conducted a review of literature to explore predictors of competitive employment among individuals with schizophrenia. Some of the studies they reviewed found age to not be predictive of competitive employment outcomes, while other studies found younger participants had overall better outcomes. Henry and colleagues (2014) found younger individuals had better employment outcomes than older individuals. Salkever and colleagues (2007) found the baseline age of their participants with schizophrenia *(M* = 41.9) was negatively related to wages, indicating the younger an individual was, the better their pay was likely to be. While no ideal age has been pinpointed, it appears as if younger individuals with schizophrenia are more likely to have better employment outcomes, including wages. Given the complex nature of the

effect age may have on employment outcomes, this is an important variable to consider in VR research.

Benefit System

The receipt of cash and insurance benefits provided by the Social Security Administration (SSA) is a particularly profound variable for individuals with schizophrenia. Individuals with mental illness who are SSA beneficiaries are reported to have the worst state-federal VR outcomes and highest unemployment rates (Drake, Skinner, Bond, & Goldman, 2009; MacDonald-Wilson, Rogers, Ellison, & Lyass, 2003). Some studies have shown a greater reluctance to work out of the benefit systems from individuals with schizophrenia than individuals with other diagnoses (Cook & Razzano, 2000; Pete, 2013). It has been theorized individuals fear losing their medical benefits due to the high cost of medications, hospitalizations, and psychotherapy treatment (MacDonald-Wilson et al., 2003; New Freedom Commission on Mental Health, 2003; Wahl, 1997). Campbell and colleagues (2010) examined client predictors of multiple vocational outcomes in four randomized control trials of IPS supported employment. Results revealed receiving disability benefits (i.e., SSI and SSDI) was a reliable predictor of fewer total weeks worked after controlling for the effects of work history.

The barriers associated with employment for individuals with schizophrenia can often seem insurmountable. Understanding these barrier variables and how they influence tangible, real-world outcomes, such as wages, can lead to better overall service provision and consumer involvement. Additionally, there is a body of evidence indicating characteristics of VR programs may be a more important contributor to outcomes than personal factors (Blankertz & Robinson, 1996; Campbell et al., 2010; Lehman et al., 2002; Mueser et al., 1997).

Psychiatric Vocational Rehabilitation

Towards the end of the 20th century, psychiatric vocational rehabilitation had become a primary focus in the VR literature (Cook & Pickett, 1995). Researchers and practitioners were beginning to fully understand the unique needs of people with psychiatric disabilities, and more specifically, the needs of individuals with schizophrenia. Through decades of studying a multitude of VR interventions (e.g., hospital-based programs, sheltered workshops, transitional employment, and supported employment), common characteristics that contributed to the efficacy of each model began to emerge. These included concepts of situational assessment, integration of mental health and vocational services, rapid job placement, provision of on-going support, and focus on a competitive employment outcome (Cook & Razzano, 2000; Lehman, 1995). Each of the psychiatric vocational rehabilitation models developed during this time implemented the core characteristics in different ways, with the greatest distinguishing feature becoming the point at which competitive employment would be achieved. Two overarching genres were developed: programs known as "train-place" models that believed skills should be developed before competitive placement and "place-train" models that believed skills could be learned while competitively employed.

Train-Place Models

Many of the models developed for psychiatric vocational rehabilitation use a "train-place" methodology of applying the characteristics of successful psychiatric rehabilitation. Hospitals were among the first to recognize the treatment power of work and thus developed their own VR model in which patients would perform tasks for either minimal or no wage at all. The goal was for patients to build skills and establish a work history that may assist them upon release (McGurrin, 1994). These programs were generally found to be ineffective (Becker, 1967;

Walker et al., 1969) and primarily fostered dependency more than independence and desire to discharge from the hospital (Bond & Boyer, 1988).

Sheltered workshops and job clubs are designed to have an individual train for a specific type of work or job with the goal of obtaining community-based employment after the appropriate skills and experience have been garnered (Pratt et al., 2006). These programs typically own, manage, and operate agencies that specialize in a type of employment, such as manufacturing, commercial cleaning, or landscaping. Consumers are then hired for a minimal wage while they learn the desired work skills. While the goal is for consumers to eventually obtain competitive employment, accumulated evidence shows most sheltered workshop participants never advanced to the fully integrated employment goal (Bond & Boyer, 1988; Bond & Dincin, 1986; Twamley et al., 2003).

Transitional employment (TE), a more commonly used psychiatric VR model, improves upon the sheltered workshop model by addressing the "rapid placement" characteristic more thoroughly. Originally pioneered by Fountain House, TE works with mental health practitioners to rapidly place an individual into an entry-level position where, with job coaching, an individual may gradually increase the number of hours worked and responsibilities (McGurrin, 1994). Individuals are not expected to advance to competitive employment until they have demonstrated the ability to handle more complex demands (Yankowitz, 1990). This results in consumers holding several part-time, minimal skill jobs while they accumulate a wide range of skills and earn a small wage (Pratt et al., 2006). According to Mueser and colleagues (2004), transitional employment, "has been widely adopted and adapted among [Psychosocial Rehabilitation] centers throughout the united states" (p. 480).

Place-Train Models

General supported employment model. Amidst the boom of psychiatric vocational rehabilitation programs, the supported employment (SE) model deviated from the rest by placing individuals immediately into competitive employment jobs and providing training along the way. Supported employment has been described as, "…A social movement. It represents inclusion [of people with disabilities] into the fabric of community settings." (DiLeo in Roberts, 1996, p. 12). Supported employment was born from a convergence of several lines of empirical research occurring in the 1980s. Behavioral analytic approaches were demonstrating that even individuals with the most severe disabilities could be trained to do complex tasks (Gold, 1980). Other university-based projects were demonstrating that people with the most severe disabilities could work successfully in community settings with the proper placement, training, and support (Roberts, 1996). Using the evidence of the times, Wehman (1981) outlined an approach using experienced job coaches to systematically train individuals with severe disabilities while on the job and slowly removing instructional support as an individual grew in efficacy. The approach was called, "place, then train," a direct reversal of the "train, then place" genre of VR models described above. Although originally developed to serve individuals with the most severe intellectual and developmental disabilities, supported employment has become a staple service in psychiatric VR as well (Wehman, Targett, & West, 2014).

The development of the supported employment model lead to a host of psychiatric VR programs implementing supported employment principles in various ways. The Schapiro Training and Employment Program (S.T.E.P.) focused on obtaining a job with a minimum of 20 hours per week and included a 7-week intake group to prepare individuals for SE services (McGurrin, 1994). The Choose-Get-Keep approach (Danley & Anthony, 1987) honed in on

matching consumer preferences to job placement research, and effectively added a new self-determination principle to the supported employment genre of psychiatric VR models (Pratt et al., 2006; Rogers, Anthony, & Farkas, 2006). The Program of Assertive Community Treatment (PACT) integrated time unlimited psychiatric case management with vocational services (Russert & Frey, 1991; Test, 1992). However, none of the supported employment approaches have gained as much empirical and clinical evidence to support successful employment outcomes as the Individual Placement and Support model.

Individual Placement and Support (IPS) model. The IPS model of supported employment was not conceptualized as an original psychiatric vocational rehabilitation service, but rather a way to standardize the implementation of key characteristics the literature had identified as important and effective in successful psychiatric VR (Drake & Becker, 1996). Drawing from the Wehman model, the PACT model, and the Choose-Get-Keep Model, Drake and Becker outlined six core principles of IPS supported employment: (1) competitive employment is the only goal, (2) consumers are entitled to a rapid job search without lengthy pre-employment training or orientation, (3) mental health services and VR must be integrated and cannot be provided as separate services, (4) consumer preferences and choices must always be respected and accounted for in the job search process, (5) assessment of an individual's progress must be continuous and based in real work experiences, and (6) individuals have access to unlimited support in order to assist in long term employment maintenance. The implementation of these core principles is guided by a fidelity measure to ensure standardization across programs, and research has shown higher fidelity scores positively correlate with better competitive employment outcomes (Henry et al., 2014; Kim, Bond, Becker, Swanson, & Langfitt-Reese, 2015).

This standardization process allowed for stronger experimental research methods (i.e., randomized controlled trials) to be used to assess the efficacy of IPS supported employment in psychiatric vocational rehabilitation. Over the years data have been collected regarding several employment outcomes, including job acquisition, average hours worked, time till first job, job tenure, and wages.

Job acquisition. The IPS model is unchallenged in superior competitive job acquisition. An early review of 11 randomized controlled trials (RCTs) found the average competitive placement rate was 61% as compared to 23% for control groups (Bond, Drake, & Becker, 2008). A more recent review cited 50% of IPS participants achieve competitive employment as compared to 20% of clients in control conditions (Bond et al., 2012). These results also do not seem to be inflated due to "no treatment" control groups. For example, Lehman and colleagues (2002) found out of 219 outpatients, 75% of whom had chronic psychoses, the IPS participants were more likely to be competitively employed (27%) than those in a transitional employment condition (7%). Bond and colleagues (2007) compared the IPS model to a well-regarded psychiatric rehabilitation model and still found greater competitive employment rates for the IPS condition. Even participants who are receiving SSDI appear to benefit from IPS. Drake and colleagues (2013) examined 2000 SSDI beneficiaries and found rates of paid employment doubled after receipt of IPS services.

Average hours. The IPS model also tends to show superior results in terms of greater numbers of hours worked, both in comparison to standard control conditions (Bond et al., 2012; Bond et al., 2008), and when compared to other VR models (Campbell et al., 2011; Mueser et al., 2004). Henry and colleagues (2014) even found IPS to be superior in participants working 20 hours a week or more when compared with similar, but unstandardized, supported employment

programming. When compared against a transitional employment model, however, no differences in hours worked were found (Lehman et al., 2002). While a rarer result, it is worth noting that in some circumstances, IPS and other VR models may perform at similar levels in assisting participants in working more hours.

Time till first job. While unparalleled in achieving competitive employment placement, and generally achieving better working hours outcomes, results regarding the amount of time it takes to achieve a competitive placement have been mixed. Most studies have found IPS contributes to faster placement as compared to control conditions (Bond et al., 2012; Bond et al., 2008); however, when compared to other VR models, such as transitional employment, the differences in speed of placement tend to disappear (Lehman et al., 2002). Mueser and colleagues (2004) conducted a study where they compared standard services, a psycho-social vocational rehabilitation model, and IPS. The authors found no significant differences between any of the three conditions with regards to the number of days till acquiring the first job.

Job tenure. Job tenure has historically been IPS's Achilles heel. Early studies simply did not follow participants long enough to assess whether IPS could contribute to a significantly long job tenure. In a review of 11 published IPS studies, only four incorporated a 24-month follow-up, and the remaining seven had follow-ups ranging from 6 to 18 months (Bond et al., 2008). Studies that have included follow-up found only half of the IPS participants maintained their employment (Bond et al., 1997; Shafer & Huang, 1995) for six months or more.

One study examined the effects of IPS ten years after receiving the intervention. Results revealed 75% worked beyond the initial study period, 33% worked for at least five years, but the average job tenure was 32 months. These authors also reported few clients made the transition to full time employment with health benefits (Salyers, Becker, Drake, & Torrey, & Wyzik, 2004).

A more recent study in Switzerland followed 100 individuals with mental illness who were randomly assigned to IPS or traditional VR for five years. At the end of the study, 28% were in competitive work without active support and 15% were competitively employed with vocational specialist support (Hoffman, Jackel, Glauser, Mueser, & Kupper, 2014). While both of these studies are still considered to have strong results, it also means 57% - 67% of the participants were unable to maintain employment for five years.

The longest job tenure study comes from Cook and colleagues (2016) who examined data over a 13-year period comparing participants in IPS and control conditions. The results revealed that, while IPS participants were three times more likely than the control group to be employed, this effect was completely attenuated over time. Unfortunately, individuals with schizophrenia appear to be highly susceptible to attenuation effects (Fabian, 1992).

Wages. The literature regarding the relationship between IPS and wages of individuals with mental illness has been mixed. In their review of 11 randomized controlled trials, Bond and colleagues (2008) found IPS produced greater earnings than control groups. Mueser and colleagues (2004) found IPS to produce higher wages than both a psychosocial vocational rehabilitation program and standard vocational services. However, when compared to a transitional employment program, no differences in wages were found (Lehman et al., 2002). Henry and colleagues (2014) also found no differences in wages when comparing a converted IPS program to a similar, unstandardized supported employment program offered in the same state. Another study reported that even IPS participants were earning significantly lower than the substantial gainful activity threshold (Cook et al., 2016). While IPS clearly helps individuals with schizophrenia achieve paid employment, it is uncertain if IPS contributes to higher earnings to a greater extent than other services.

For individuals with schizophrenia, competitive wage has shown to be of particular importance in achieving both positive long-term vocational outcomes and greater quality of life outcomes that influence job tenure. Bell and colleagues (1996) had 150 individuals with schizophrenia randomized into a pay and no-pay condition. After six months of supported work at a Department of Veterans Affairs medical center, participants in the pay condition worked more hours and showed more total symptom improvement at follow-up than those in the non-pay condition. They also had significantly lower rates of rehospitalization than the no-pay participants, which could directly influence extended job tenure. Bond and colleagues (2001) conducted an 18-month study in which participants were classified into four groups: competitive work, sheltered work, minimal work, and no work. Results showed the competitive group experienced higher rates of symptom improvement, satisfaction with vocational services, leisure, finances, and self-esteem than did participants in all other work groups. Bryson and colleagues (2002) found participants randomized into a pay condition showed significant improvements in overall quality of life, including higher levels of motivation, sense of purpose and empathy and lower levels of anhedonia, which are all important factors for maintaining employment. The potential influence of wages on the job tenure, and the quality of life, for individuals with schizophrenia makes earnings a vital outcome to explore in psychiatric vocational rehabilitation research.

The culmination of psychiatric VR literature strongly indicates IPS supported employment is the superior intervention for assisting individuals with schizophrenia in obtaining a competitive position; however, the results regarding additional employment outcomes indicates the need for further comparison of the IPS supported employment model to other vocational models and rehabilitation services. Throughout the United States, the largest purveyor of

psychiatric vocational rehabilitation services, including supported employment, is the state-federal VR program.

Psychiatric Vocational Rehabilitation in the State-Federal VR Program

The state-federal VR program is the largest supplier of VR services to individuals with disabilities in the U.S. The program accepts almost 500,000 people annually, 300,000 of whom have been diagnosed with significant disabilities (U.S. Department of Education, 2013). The Rehabilitation Services Administration (RSA) within the U.S. Department of Education was founded largely through federal legislation with the mandate of improving employment rates and decreasing economic burden of individuals with disabilities. The state-federal VR program runs on federal grants (about two billion dollars) and state and local funds (about $645 million dollars; Ditchman et al., 2014). Individuals with psychiatric disabilities were not approved to access these funded services until the 1943 Barden-Lafollette amendments (Tashijan, Hayward, Stoddard, & Kraus, 1989). The state-federal VR program did not make psychiatric rehabilitation a priority until 11 years later when public law 83-565 authorized additional financial incentives for programs specifically targeting the improved functioning of people with psychiatric disabilities. Despite the increased funding, it still took two more pieces of legislation, The Employment Opportunities for Disabled Americans Act and the Amendments to the 1973 Rehabilitation Act, passed in 1986, to truly cement the relationship between state-federal VR and people with psychiatric disabilities (McGurrin, 1994). In this way, state-federal psychiatric vocational rehabilitation can still be considered relatively new (i.e., only active for about three decades) and thus has struggled to solidify truly effective services.

Noble and colleagues (1999) wrote an executive summary for the National Alliance on Mental Illness (NAMI) that criticized psychiatric VR in the state-federal program. They cited the

ineffectiveness of the time-limited services provided, the turning away of individuals with the most severe psychiatric disabilities (e.g., schizophrenia), and the lack of competitive employment outcomes as some of the major issues. Their case was based on the simple statistics that individuals with psychiatric disabilities had the lowest placement rates of any other disability group served by the state-federal VR program. Over the last decade, many of these criticisms have been addressed. In 2001 the U.S. Department of Education changed the employment outcome definition to exclude segregated settings, such as sheltered workshops, as "successful" placements (Kregel & Dean, 2002). The primary objective of the state-federal VR program is now competitive employment only, and this can be achieved either though standard VR services or supported employment services. Eligibility determinations have also evolved to prioritize individuals with, "the most significant disabilities" (Ditchman et al., 2014, p. 345). Despite the sincere attempts to improve outcomes for individuals with psychiatric disabilities, this subgroup of state-federal VR consumers continues to have the poorest outcomes (Rosenthal, Chan, Wong, Kundu, & Dutta, 2006). Additionally, outside of job placement, the state-federal VR program is struggling to produce other meaningful outcomes such as longer-term employment and economically significant hourly wages (Leahy et al., 2014). These facts warrant the further study of state-federal VR services that could positively impact the placement and wages of individuals with mental schizophrenia.

The Process of Service Provision

Services provided by the state-federal VR system are not an entitlement. Individuals who apply for services must undergo an eligibility determination. Ditchman and colleagues (2014) summarized the eligibility criteria determined by the Rehabilitation Act of 1973 as follows:

1. The first criterion of eligibility is that a person be an "individual with a disability" as defined in §7(20) (A) of the Rehabilitation Act of 1972; meaning a person who both:
    a. Has a physical or mental impairment which for such individual constitutes or results in a substantial impediment to employment; and
    b. Can benefit in terms of an employment outcome from VR services.
2. The second criterion is that the person requires VR services to prepare for, secure, retain, or regain employment. (p. 345).

If an individual is receiving Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI) benefits, they are automatically deemed eligible and receive immediate services.

After eligibility is determined, an individual will meet with a rehabilitation counselor to collaborate and create an Individual Plan for Employment (IPE). This plan is based on a consumer's skills, abilities, and job preferences and establishes both short-term and long-term, measurable goals that once met will signal the successful completion of services. Based on these goals, a rehabilitation counselor will order the necessary services. Thus, consumers now move into the service provision phase. From there, they will receive services that are intended to lead to job placement and any post-employment services, such as extended job coaching, will be ordered before the case is closed.

There are two genres of services a consumer can be selected for based upon their IPE: standard state-federal VR services and supported employment services.

Standard services. The state-federal VR program has a set of standard services rehabilitation counselors can choose to provide to their consumers. These services range from basic career assessment and counseling services to job search assistance, on-the-job training, job

readiness training, and work place accommodations such as interpreter services or personal attendant services. Table 2.1 shows a comprehensive list of all available services rehabilitation counselors can order for their consumers (U.S. Department of Education, 2013). As can be seen in the table, some of these services will more frequently be ordered for consumers with psychiatric disability than others (e.g., assessment, counseling and guidance), and one consumer is not likely to receive the entire comprehensive list of services. Services used will be based on need and IPE goals. If a consumer has a supported employment goal, it is possible he or she will receive some of these standard services followed by additional supported employment services.

Table 2.1

Comprehensive List of Available State-Federal Vocational Rehabilitation Program Services

Services	Synopsis
Assessment	Services provided to determine an individual's eligibility for VR services, to assign a priority category, and to determine the nature and scope of VR services to be enacted in the IPE.
Diagnosis & Treatment of Impairments	Can include corrective surgery or therapeutic treatment, diagnosis and treatment for mental and emotional disorders, dentistry, nursing services, necessary hospitalization, drugs and supplies, mental health services, etc.
VR Counseling & Guidance	Information and support services to assist an individual in exercising informed choice and is distinct from the case management relationship.
Graduate College or University Training	Academic training leading to a degree recognized as being beyond a baccalaureate degree or other recognized education credential.
Four-Year College or University Training	Academic training leading to a baccalaureate degree or other recognized education credential.
Junior or Community College Training	Academic training above the high school level leading to an associate degree or other recognized educational credential.
Occupational or Vocational Training	Occupational, vocational, or job skill training provided by a community college and/or business, vocational/trade or technical school to prepare students for gainful employment in a recognized occupation.
On-the-job Training	Training in specific job skills by a prospective employer.
Apprenticeship Training	Program that is work-based employment and training program that combines hands-on, on-the-job work experience in a skilled occupation with related classroom instruction.
Basic Academic Remedial or Literacy Training	Literacy training or training provided to remediate basic academic skills that are needed to function o the job in the competitive labor market.
Job Readiness Training	Training provided to prepare an individual for the world of work (e.g. appropriate work behaviors, getting to work on time, appropriate dress and groom, increasing productivity).
Disability-Related Skills Training	Disability-related augmentative skills training includes: 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.
Job Search Assistance	Activities that support and assist an individual in searching for an appropriate job.
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-Short term	Services provided to an individual who has been placed in employment in order to stabilize the placement and enhance job retention.

On-the-job Supports - Supported Employment	On-going support services and other appropriate services needed to support and maintain an individual with a most significant disability in supported employment for a period of time generally not to exceed 18 months.
Transportation	Includes adequate training in the use of public transportation vehicles and systems and travel and related expenses that are necessary to enable an applicant or eligible individual to participate in a VR service.
Maintenance	Monetary support provided for those expenses such as food, shelter, and clothing that are in excess of the normal expenses of the individual.
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.
Reader Services	For an individual who cannot read print because of blindness or other disability.
Interpreter Services	Sign language or oral interpretation services for individuals who are deaf or hard of hearing.
Personal Attendant Services	Personal services that an attendant performs for an individual with a disability including, but not limited to bathing, feeding, dressing, providing mobility and transportation, etc in multiple settings.
Technical Assistance Service	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.
Information and Referral Services	Provided to individuals who need services from other agencies not available through the VR program.
Benefits Counseling	Typically involves an analysis of an individual's current benefits, such as SSDI and SSI, and the effect different income levels from work will have on the individual's future financial situation.
Customized Employment Services	Services that involve a blend of flexible strategies that result in the provision of individually negotiated and designed services, supports, and job opportunities for an individual.
Other Services	This category is for all other VR services that cannot be recorded elsewhere.

Supported employment services. Unlike the standard services, the type of supported employment programming a consumer receives is often based on the state, local agency, and the available resources. For example, in the state of Wisconsin, models of supported employment include, the "individual competitive placement," "enclave," "mobile crew," and "affirmative business" models. The type of model used with a consumer will be based on assessed needs and goals established. For instance, the individual competitive placement model is used to help consumers with, "the most significant disability" to achieve a competitive employment outcome, while the enclave model integrates an entire work group into a single industrial business (DWD, 2014, p. 2-3). There are currently 14 states and two U.S. jurisdictions (collectively referred to as "learning collaboratives") that provide access to IPS supported employment models (Becker et al, 2014, p. 49); however, not all state-federal VR agencies within those learning collaboratives have access to IPS programs. All agencies within a learning collaborative do, however, have access to complementary educational materials, teleconferences, peer groups, annual and bi-annual conferences, and any research produced by learning collaboratives and partners (Becker et al., 2014). Thus, it is reasonable to assume state-federal VR counselors providing services within an IPS learning collaborative state may have different information and training than counselors not within an IPS learning collaborative state.

Supported Employment: Making the Choice

Based on the information presented above, it would appear as if the offering of IPS supported employment to every individual with schizophrenia would be the logical way to improve employment outcomes, but this presumption fails to consider several limitations. First, as stated above, IPS is still limited in terms of the types of outcomes it consistently produces (e.g., limitations in job tenure and wages produced). Second, the availability of IPS supported

employment specifically is extremely limited. Bond and Drake (2008) concluded that within the U.S., fewer than 5% of individuals with schizophrenia who could benefit some supported employment have access to the programming. Johnson-Kwochka and colleagues (2017) reported a total of 523 quality approved IPS programs nationwide, resulting in the number of IPS programs per one million people ranging from 0.05 to 16.62. Thus, it is simply not possible for all state-federal VR agencies to offer IPS consistently to consumers for whom it might be indicated. Rehabilitation counselors who do not have access to IPS supported employment still need to know which of the services that are available will be most effective for consumers with schizophrenia.

Lastly, assuming IPS supported employment is the only service that should be used with individuals with schizophrenia, negates some of the other services state-federal VR provides that have empirical support for their importance and effectiveness. For example, counseling and guidance is one of the most frequently provided services (Ditchman et al., 2014). According to Horvath, Del Re, Flückiger, and Symonds (2011), the working alliance that rehabilitation counselors build with their consumers has a moderate effect (d = .57) on VR outcomes. This has long been supported in the counseling psychology literature that the working alliance is the most important factor in treatment efficacy (Wampold, 2001).

In addition to counseling and guidance, many state-federal VR services commonly provided for individuals with mental illness revolve around “labor market training” (Leahy et al., 2014, p. 149). These include such services as vocational training, on-the-job training, and job readiness training. Gewurtz and colleagues (2012) examined the consequences of sacrificing job readiness training for the supported employment method of rapid job placement for individuals with mental illness. Twenty-five people involved in implementing the policy shift and delivering

employment services were interviewed. Results revealed the increased focus on rapid placement had decreased attention on career development, client preferences, and forced more entry level positions with low pay and few health benefits. When considering wages as an outcome of success, the matching of client preference to job placement becomes even more important. Beveridge and Fabian (2007) examined the relationship between the state-federal VR IPEs and employment outcomes in 171 consumers and found the match had a positive impact on consumer's wages. Roberts and Pratt (2007) highlighted how, even in IPS supported employment studies, screening criteria to assess for job readiness factors, such as need for change and commitment, are still conducted. This suggests that some state-federal VR services outside of, and in addition to, supported employment are important to examine when considering employment outcomes.

The culmination of empirical literature has suggested the need for research to focus on which services within the state-federal VR system are most likely to improve competitive vocational outcomes for individuals with schizophrenia. Average earnings, or wages, has shown to be a particularly important employment outcome for this population as it directly impacts long-term vocational goals and quality of life variables. While supported employment, and particularly the IPS model, have shown superior results, rehabilitation counselors are limited in their access to IPS and still have a wealth of empirically supported services to choose from. This study hopes to provide information that will aid rehabilitation counselors in making the best service provision choices for their consumers with schizophrenia.

CHAPTER THREE

Methodology

This study utilized hierarchical multiple regression to predict the starting wage of state-federal VR consumers with schizophrenia after receiving VR services. The predictive power of consumer demographic characteristics and service delivery variables were examined within two groups: participants in supported employment programming and participants not in supported employment programming who were successfully employed and closed (status 26). The sample of participants with schizophrenia were extracted from the Rehabilitation Services Administration National Case Service Report Dataset (RSA-911), fiscal year (FY) 2014.

Sources of Data and Data Collection Procedures

The Rehabilitation Services Administration (RSA) offers a single catalog of records related to VR and disability known as the RSA-911 database. Rehabilitation professionals providing vocational disability services across the United States input information using a standardized reporting system. Variables tracked include demographics factors (e.g. gender, race, ethnicity, age), services provided, and closure information (e.g. weekly hours worked, weekly earnings, type of employment). The dataset can be accessed online and downloaded with permission and a signed agreement to not use the information in unauthorized ways. The data are then used to help professionals evaluate all aspects of state-federal VR programs, including identifying the types of people applying for services, evaluating the effectiveness of services, and exploring a vast array of vocational outcomes. These characteristics make the RSA-911 database convenient and cost effective to use by rehabilitation researchers.

Convenience in research often corresponds with a high probability of error and bias. Since individuals who participate in state-federal VR are self-selected, the sample may not

reflect the entire population of individuals with disabilities who choose not to participate in state-federal VR. This bias is best mitigated by ensuring the sample be representative of the population in other areas, such as location, age, gender, race, and other demographic factors relevant to the study questions (Gravetter & Forzano, 2012). Additionally, the RSA-911 dataset consists of information that is coded and entered manually throughout the case delivery process, leaving substantial room for human error in all cases. While it is impossible to know how many errors may exist in the data, The U.S. Department of Education (2004) developed a system of 18 crosschecks to help address these concerns. While errors may still exist despite the crosschecks, these are assumed to be random and should not result in systematic variation in the data (Wilson, 2000).

Sample

The U.S. Department of Education (2013) defines disability type using two categorical codes. The first category denotes the type of functioning deficit an individual is experiencing (e.g., sensory/communicative, physical, or mental). The second category indicates the source, or cause, of the deficit. Only individuals coded as having a deficit caused by schizophrenia or other psychotic disorders were selected. According to a personal communication with a Wisconsin state-federal VR counselor, the vast majority of individuals coded in this category will have a diagnosis of schizophrenia. Although schizoaffective disorder could potentially be coded into this category, the rehabilitation counselor believed the mood symptoms related to schizoaffective disorder were often coded as a secondary disability (J.A. Kruk, personal communication, April 23, 2018), suggesting rehabilitation counselors using the schizophrenia and other psychotic disorders code primarily mean schizophrenia. Since schizoaffective disorder is characterized by

the same core symptoms as schizophrenia (American Psychiatric Association, 2013), the study sample will be referred to as consumers with schizophrenia for the duration of the manuscript.

Only cases coded as having a successful employment outcome (i.e., status 26) were included in this study. This resulted in a sample size of 4,318 cases with the primary impairment caused by schizophrenia and closed with a successful employment outcome. The sample was then divided into two groups: consumers who received supported employment services and consumers who did not receive supported employment services.

According to the U.S. Department of Education (2013), an individual can start receiving supported employment services (either contracted or provided in-house) after the initial Individual Plan for Employment (IPE) is established or during regular service delivery when an IPE is amended to a supported employment goal. IPE's can also be amended to a goal other than supported employment. This movement of IPE goals is recorded in the RSA-911 database under the supported employment category. According to this category, 1,143 participants had an initial IPE supported employment goal; however, 37 of those participants switched to another employment goal. The final sample for the supported employment group included only consumers who actually received supported employment services (n = 1,106) while the final non-supported employment sample included consumers who had other employment goals and did not receive supported employment services (n = 3,212). Table 3.1 shows additional demographic characteristics of each group.

Supported Employment Sample Demographics

The supported employment group consisted of 1,106 state-federal VR consumers with schizophrenia. Over half the sample (57.4%) reported a secondary disability. The most prevalent

were psychosocial impairments caused by depressive mood disorders (6.9%) and anxiety disorders (5.0%), and cognitive impairments caused by mental retardation (5.2%).

The supported employment sample consisted of 31.4% female consumers with an average age of 38.7 (*SD* = 11.8). The youngest participant was 16 and the oldest was 70. Consumers identifying as white consisted of 52.5% of the sample, while consumers identifying as African American/Black made up 38.3%. Eighteen individuals (1.6%) identified as American Indian or Alaska Native, and 27 (2.5%) identified as Asian or Other Native Pacific Islander. In terms of ethnicity, 5.1% of the sample identified as Hispanic or Latinx. Education was combined into three categories revealing 19.9% of the sample had less than a high school education, 49.3% had a high school diploma or equivalent, and 32.8% had some level of post-secondary education or training. A little less than half of the supported employment sample (49.3%) were receiving SSDI while, 35.3% were receiving SSI at the time of application. The average starting wage for state-federal VR consumers with schizophrenia in supported employment was $188.33 (*SD* = 115.93) per week.

Non-Supported Employment Sample Demographics

The non-supported employment group consisted of 3,212 state-federal VR consumers with schizophrenia. Over half the sample (51.7%) reported a secondary disability. The most prevalent were psychosocial impairments caused by depressive mood disorders (7.4%), anxiety disorders (4.8%), and drug abuse or dependence (3.3%).

The non-supported employment sample consisted of 33.5% female consumers with an average age of 38.0 (*SD* = 11.7). The youngest participant was 16 and the oldest was 76. Consumers identifying as white consisted of 50.0% of the sample, while consumers identifying as African American/Black made up 34.3%. Fifty-two individuals (1.6%) identified as American

Indian or Alaska Native, and 4.7% identified as Asian or Other Native Pacific Islander. In terms of ethnicity, 9.4% of the sample identified as Hispanic or Latinx. Education was combined into three categories revealing 15.8% of the sample had less than a high school education, 39.9% had a high school diploma or equivalent, and 44.2% had some level of post-secondary education or training. Less than half of the non-supported employment sample (41.5%) was receiving SSDI, while 30.0% was receiving SSI at the time of application. The average starting wage for state-federal VR consumers with schizophrenia not in supported employment was $247.10 (*SD* = 165.61) per week.

Table 3.1

Demographic Information for Supported and Non-Supported Employment Samples

Variable	Supported Employment. (N = 1,106)		Non-Supported Employment (N = 3,212)	
	Mean (*SD*)	n (*%*)	Mean (SD)	*n* (%)
Starting Wage	188.33 (*115.93*)		247.10 (*165.61*)	
Age	38.71 (*11.78*)		38.02 (*11.73*)	
Gender				
Male		759 (*68.6%*)		2,137 (*66.5%*)
Female		347 (*31.4%*)		1,075 (*33.5%*)
Education				
< High School Education		198 (*19.9%*)		509 (*15.8%*)
High School Diploma or Equivalent		545 (*49.3%*)		1,283 (39.*9%*)
Post-Secondary Education or Training		363 (*32.8%*)		1,420 (44.*2%*)
Race/Ethnicty				
White		581 (*52.5%*)		1,605 (*50.0%*)
African American/Black		424 (*38.3%*)		1,102 (*34.3%*)
American Indian or Alaska Native		18 (*1.6%*)		52 (*1.6%*)
Asian or Native Pacific Islander		27 (*2.5%*)		151 (4.*7%*)
Hispanic or Latinx		56 (*5.1%*)		302 (9.*4%*)
Cash Benefits				
SSI		390 (*35.3%*)		963 (*30.0%*)
SSDI		545 (*49.3%*)		1,334 (41.*5%*)

Dependent Variable

This study focused on the starting wage of a state-federal VR participant at closure. Specific data are collected on individuals achieving an employment outcome at the time of closure. For example, rehabilitation counselors are instructed to code the type of employment an individual attained (e.g., competitive integrated employment; self-employment, supported employment in competitive integrated employment), start date of employment, weekly hours worked, and weekly earnings. The weekly earnings at closure is a continuous variable entered by rehabilitation counselors and represents the starting wage of individuals employed at closure. As explained in Chapter 2, starting wage represents an outcome with meaningful, real-world consequences for consumers, VR counselors, and stakeholders in the public state-federal VR program. The aim of this study is to shed light on what factors predict the starting wage of state-federal VR consumers with schizophrenia in supported and non-supported employment. Unfortunately, due to the wide variation in types of employment that state-federal VR consumers achieve, the variance in weekly earnings from one case to the next can be quite large and impedes analysis. For instance, the variance statistic for consumers receiving supported employment was 13,440.53 while the variance statistic for consumers receiving non-supported employment services was 27,425.01. In order to combat this effect, the natural log of weekly earnings was used to standardize the variable and allow for more accurate prediction. After this transformation, the variance for the supported employment group was .505 and .522 for the non-supported employment group. These smaller, more equal variances allow for comparison between the supported and non-supported employment group during data analysis and interpretation.

Independent Variables

Independent variables included three categories: demographic characteristics, VR services provided, and whether the consumer received services in an IPS promoting state. Demographic characteristics were selected based on prior evidence of their influence on work-related outcomes as reviewed in Chapter 2. Ten VR service variables were selected based on rate of use with state-federal VR consumers with schizophrenia and empirical support in the literature. Lastly, based on the success of IPS supported employment in the literature, a measure of the influence of fidelity was created.

Demographic Variables

Demographic variables consisted of primarily categorical variables; gender, race, ethnicity, education attained at application, and public financial support (i.e. cash benefits). Age at application was the only continuous variable used.

Age at application. Age is a continuous variable calculated by subtracting an individual's date of birth from their date of application. This allows for the age at application to be determined and applied as a predictor variable of participant starting wage.

Gender. Per the U.S. Department of Education (2013) reporting manual, gender is a dichotomous, categorical variable focusing on the self-identification of oneself as either male or female. The manual instructs rehabilitation counselors to code two levels: (1) consumer identifies as male or (2) consumer identifies as female.

Race and ethnicity. U.S. Department of Education (2013) indicates that race and ethnicity information should be self-identified. If an individual fails to self-identify, then observer-identification methods are used to provide the best assessment of an individual's race

and ethnicity. The manual instructs observers to follow the Office of Management and Budget (OMB) standards of collecting race data should an individual choose not to self-identify.

In the RSA-911 CY 2014 data, race is divided into five, nominal, dichotomous variables. A person can either identify as belonging to the specified racial group (coded as "1") or not belonging to the specified racial group (coded as "0"). The specified racial groups and their definitions are found in the U.S. Department of Education (2013) RSA reporting manual on pages 5-6 and are as follows:

1) White – An individual having origins in any of the original peoples of Europe, the Middle East, or North Africa.
2) Black or African American – An individual having origins in any of the black racial groups of Africa.
3) American Indian or Alaska Native – An individual having origins in any of the original peoples of North and South America (including Central America), and who maintains a tribal affiliation or community attachment.
4) Asian – An individual having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
5) Native Hawaiian or Other Pacific Islander – An individual having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Individuals who self-identify as multi-racial may have more than one race variable coded as 1. Due to low representation of Native Hawaiian or Other Pacific Islander (*n=23*) in the entire sample, these cases were combined with the Asian group to create the racial category of "Asian or Native Pacific Islander" used in this study and depicted in Table 3.1.

Ethnicity is defined by the U.S. Department of Education (2013) as the self-identification of individuals as Hispanic or Latinx (i.e., "having Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin," p. 6) regardless of self-identified race. This categorical variable is dichotomously coded with 1 meaning an individual self-identifies as Hispanic or Latinx and 0 meaning an individual does not self-identify as Hispanic or Latinx. If an individual chooses not to self-identify, then the same observer method described above is used.

During data analysis, these categories were dummy coded with white as the reference variable. This means predictive results for each racial or ethnic category will be compared individually to white consumers.

Education attained at application. Education is represented as a single, categorical variable with 13 levels (U.S. Department of Education, 2013). Levels range from 0 (no formal schooling); 1 (elementary education grades one through eight); 2 (secondary education with high school no diploma); 3 (special education diploma); 4 (high school graduate or equivalency certificate such as GED); 5 (post-secondary education, no degree or certificate); 6 (post-secondary academic degree, an associate degree); 7 (bachelor's degree); 8 (master's degree); and 9 (any degree above a master's such as Ph.D, Ed.d, or J.D). Vocational/technical certificates are also coded 10, occupational credentials beyond undergraduate degree work are coded 11, and occupational credential beyond graduate degree work are coded as 12.

For the purposes of this study, education was reduced to three categorical, dichotomous variables. The first category included individuals who received, less than a high school education codes 0-2. The second category included individuals who had completed special education or high school (codes 3-4). The third category encompassed all post-secondary engagement (codes

5 - 9) and all post-secondary training (codes 10-12). This method allowed for multiple levels to be compressed into more clinically meaningful categories and maintain format consistency of predictor variables. For purposes of data analysis, two variables were defined. One indicated whether or not the consumer had a high school diploma or equivalent, with a code of 0 indicating less than a high school diploma, and 1 indicating a high school diploma or equivalent. A second indicated whether or not the consumer had completed postsecondary education or training, with a code of 0 indicating no postsecondary engagement and 1 indicating that the consumer had had some postsecondary engagement.

Cash benefits. Individuals with disabilities are often eligible for a variety of monthly cash payments from Federal, State, and local governments. RSA-911 CY 2014 data tracks seven different types of public support individuals with disabilities may receive including: Social Security Disability Insurance (SSDI), Supplemental Security Income (SSI), Temporary Assistance for Needy Families (TANF), General Assistance from State or local government, Veterans' Disability Benefits, Workers' Compensation, and Unemployment Insurance. Each of these sources of support are dichotomously coded (i.e., 0 = not receiving, 1 = receiving). This sample included individuals receiving all seven types of financial support, but specifically examined the predictive value for those receiving SSDI and SSI on starting wages.

The receipt of SSI and SSDI has shown particular influence over employment decisions of individuals with schizophrenia (Cook et al., 2016; Cook & Razzano, 2000; Pete, 2013). SSDI and SSI are often used as a measure of severity of disability, as those who receive these financial supports have specifically been deemed unable to work at a substantial gainful level. Individuals receiving SSI are often assumed to have more severe symptoms than those on SSDI because SSI is given to individuals who were deemed too disabled to work consistently, while SSDI is

usually for individuals who became disabled later in life and had to stop working. Each type of cash benefit comes with unique work disincentives. For example, SSI takes back half of any monthly income earned over $65.00, and medical benefits are only allowed to continue if an individual keeps their assets below $2,000 and never makes more than what is federally considered substantial gainful activity (e.g. for 2018 this limit is about $33,000 per year). SSDI allows a trial work period in which an individual can collect their entire cash benefit while working, there is no asset limit, they can apply for additional work programs such as PASS which allows even greater income to meet work goals, but medical benefits are subjected to the same substantial gainful activity limit as SSI. Due to these differences, SSI and SSDI were kept as separate, dichotomous, categorical variables where 1 indicated an individual was receiving the benefit, and 0 was indicative of not receiving the benefit. The purpose behind keeping these variables separate is to allow for assessments of severity and the impact of different work disincentives.

Vocational Rehabilitation Service Variables

The state-federal VR program offers a total of 28 possible services, including supported employment, that can be provided either by rehabilitation counselors or contracted providers. (See Table 2.1 for a list and brief description of these services). Some of these services have been empirically studied and found to be effective in achieving different employment outcomes. Some studies are so commonly used with consumers with schizophrenia they have become clinically based best practices. Using a combination of empirical and clinical evidence the following 10 service variables were selected for inclusion in this study: Diagnosis and treatment of impairment, counseling and guidance, job readiness training, job search assistance, job placement assistance, transportation, maintenance, information and referral, benefits counseling,

and customized employment. Only those services that were received by at least 25% of the sample were used as predictors, although there were a few exceptions with lower percentages for reasons discussed in following paragraphs. Table 3.2 shows the percentage of participants in this sample receiving each service in both the supported and non-supported employment groups. All VR service variables are characterized as dichotomous, categorical variables coded as either 1 (received) or 0 (not received).

Diagnosis and treatment. Per the U.S. Department of Education (2013) RSA reporting manual (p. 25-26) diagnosis and treatment of impairments means:

a) Corrective surgery or therapeutic treatment that is likely, within a reasonable period, to correct or modify substantially a physical or mental impairment that constitutes a substantial impediment to employment;
b) Diagnosis and treatment for mental and emotional disorders by qualified personnel who meet State licensure laws;
c) Dentistry;
d) Nursing services;
e) Necessary hospitalization (either inpatient or outpatient care) in connection with surgery or treatment;
f) Drugs and supplies;
g) Prescription of prosthetics and/or orthotics related to the individual's diagnosed disability and is necessary for the achievement of the employment outcome;
h) Prescription of eyeglasses and visual services, including visual training, related to the individual's diagnosed disability and necessary for the achievement of the employment outcome;

i) Podiatry;

j) Physical therapy;

k) Occupational therapy;

l) Speech or hearing therapy;

m) Mental health services;

n) Treatment of either acute or chronic medical complications and emergencies that are associated with or arise out of the provision of physical and mental restoration services or that are inherent in the condition under treatment;

o) Special services for the treatment of individuals with end-stage renal disease, including transplantation, dialysis, artificial kidneys, and supplies;

p) Other medical or medically related rehabilitation services; and

q) Medical care for acute conditions arising during rehabilitation and constituting a barrier to the achievement of an employment outcome is also included in this category.

These services are typically purchased by state-federal VR when they are unable to be covered by other sources such as Medicare, Medicaid, or other consumer health insurance.

Services for diagnosis and treatment of impairment appear in the literature in multiple forms and have been identified as an important aspect of psychiatric VR. Early research described the need for "emotional assistance" as a key element to job retention (Carling & Besio, 1992). The call to integrate VR with mental health treatment speaks volumes to the need of diagnosis and treatment services (McGurrin, 1994). Additionally, 20% of consumers in the supported employment group and 28.3% of consumers in the non-supported employment group received this service; thus, it was included as a service predictor variable.

VR counseling and guidance. VR counseling and guidance includes information and support services to assist an individual in exercising informed choice and is distinct from the case management relationship that exists between the counselor and the individual during the VR process. In addition to the 55.8% of non-supported employment and 53.9% of supported employment consumers receiving this service, VR counseling and guidance was found to have a significant relationship with a successful placement for state-federal VR consumers with schizophrenia receiving SSI/SSDI (Pete, 2013).

Job readiness training. Job readiness training is designed to prepare the individual for the world of work (e.g., appropriate work behaviors, getting to work on time, appropriate dress, and grooming, increased productivity). In this sample, job readiness was used for 14.9% of consumers in supported employment and 16.4% of consumers not in supported employment. While these percentages are low, several studies highlighted the possible importance of job readiness training. Fraser and colleagues (2008) found a VR model emphasizing work readiness produced slightly higher successful state-federal VR closure rates than the IPS model and took 51 days less to successfully close a participant than IPS. Roberts and Pratt (2007) found the screening criteria for supported employment studies was often related to job readiness and conducted a review of literature suggesting job readiness is predictive of improved vocational outcomes. Due to this research evidence, job readiness training was included as a predictor of starting wage.

Job search assistance. Job search assistance includes any activities supporting and assisting an individual in searching for an appropriate job. For example, resume preparation, identifying appropriate job opportunities, developing interview skills, and making contacts with companies on behalf of the consumer. In addition to being a staple service for VR, 44% of

consumers in the supported employment group and 37.2% of consumers in the non-supported employment group received this service.

Job placement assistance. Job placement assistance is a referral to a specific job resulting in an interview, whether or not the individual obtained the job. Another core service in VR with 41.0% of the supported employment group and 46.4% of the non-supported employment group receiving this service.

Transportation services. Transportation, including training in the use of public transportation vehicles and systems, means travel and related expenses that are necessary to enable an applicant or eligible individual to participate in a VR service. Examples of transportation services or expenses include, but are not limited to:

a) Travel and related expenses for a personal care attendant or aide if the services of that person are necessary to enable the individual to travel to participate in any VR service;
b) Relocation expenses incurred by the individual in connection with a job placement that is a significant distance from the individual's current residence;
c) The purchase and repair of vehicles, including vans. This specifically excludes the modification of vehicles, which is to be reported in rehabilitation technology;
d) Training in the use of public transportation vehicles and systems.

Transportation has been recognized as improving job access for people with psychiatric disabilities (Carling, 1993) and wages of state-federal VR consumers at closure with dual-diagnosis (Paugh, 2003). Additionally, 30.3% of the supported employment group and 38.9% of the non-supported employment group received this service. Thus, transportation was included as a predictor in this study.

Maintenance services. Maintenance means monetary support provided for those 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 VR needs or while receiving services under an IPE. Examples of maintenance expenses include, but are not limited to:

a) Cost of uniforms or other suitable clothing required for an individual's job placement or job seeking activities;
b) Cost of short-term expenses, such as food and shelter, that is required in order for an individual to participate in assessment or vocational training at a site that is not within commuting distance of an individual's home;
c) Initial one-time costs, such as security deposits or charges for the initiation of utilities, that are required in order for an individual to relocate for a job placement; and
d) Cost of an individual's participation in enrichment activities related to that individual's training program.

The percentage of consumers receiving this service is slightly lower than the 25% threshold for the supported employment group (22.1%), but not for the non-supported employment group (32.5%). Despite the mixed results, some additional research validated the inclusion of this service variable. For example, Carling, (1993) cited that financial assistance with clothing could improve job access for individuals with psychiatric disabilities. Cho (1999) found maintenance services had a significant positive relationship with starting wages for male state-federal VR consumers with schizophrenia. Due to the empirical backing and frequency of use in the non-supported employment group, maintenance services were included as a service variable in this study.

Information and referral services. Information and referral services are provided to individuals who need services from other agencies (e.g., cooperative agreements) not available through the VR program. The percentage of consumers receiving information and referral services is slightly lower than the 25% threshold for the supported employment group (17.5%), but not for the non-supported employment group (28.9%). Although there is a paucity of research exploring information and referral services directly, supported employment studies have experimented with the use of external services to enhance the supported employment programming, much in the way information and referral services are designed to do. For example, Becker and colleagues (2014) found using a computer to provide information about IPS yielded significantly more participants making at least one contact with an employment specialist within a month of receiving the information.

Benefits counseling. Benefits counseling is a service provided to an individual interested in work, but unsure of the impact work income will have on disability medical and cash benefits. Benefits counseling typically involves an analysis of a consumer's current benefits, financial situation, and the effect different income levels from work will have on the consumer's future financial situation. This VR service represents a response to the culmination of literature suggesting individuals with disabilities, especially schizophrenia, have poorer vocational outcomes when receiving benefits such as SSI and SSDI (Cook & Razzano, 2000; Pete, 2013). The 2014 FY is the first-year benefits counseling was added to the RSA-911 database; thus, the frequency of use by the supported (11.8%) and non-supported (7.5%) employment groups is relatively low. However, the empirical importance of this variable provided adequate validation for inclusion in this study.

Customized employment. The U.S. Department of Education (2013) defines customized employment as, "services that involve a blend of flexible strategies that result in the provision of individually negotiated and designed services, supports, and job opportunities for an individual that lead to an employment outcome of customized employment, including self-employment" (p. 33).

Customized employment represents a unique alternative or addition to supported employment that has slowly been empirically investigated and implemented in state-federal VR. Wehman and colleagues (2014) cited a few studies in which the sample included individuals with psychiatric disabilities. In these studies, not only were rates of employment high (45-89% of the samples) after using a customized employment approach, but rate of pay ranged from $5.15 an hour to $40.00 an hour, with most participants averaging over 20 hours a week. Due to the potential level of impact, customized employment was included in this study despite lower frequencies in the supported (1.0%) and non-supported (1.1%) employment groups.

High-Fidelity Supported Employment

The Johnson & Johnson (J&J) – Dartmouth Community Mental Health Program started implementing an evidenced-based, IPS supported employment service through state VR in 2001. Becker and colleagues (2014) reported 14 states (Colorado, Connecticut, Illinois, Kentucky, Kansas, Maryland, Minnesota, Missouri, North Carolina, Ohio, Oregon, South Carolina, Vermont, Wisconsin) and two U.S jurisdictions (Alameda County California and the District of Columbia) had established at least three IPS supported employment sites. However, Bond, Drake, Becker, and Noel (2016) cited only 13 of these learning communities were actually active in the J&J program in 2012 (i.e. Colorado, North Carolina, and Alameda County in California were no longer active). Since it would take active participation to become contracted venders of

supported employment for the state-federal VR program, only the 13 active learning communities were used in this study.

IPS supported employment is typically implemented within a mental health agency; however, as stated in Chapters 1 & 2, collaboration with state-federal VR counselors is a goal of the J&J initiative. Counselors in participating states may have been exposed to IPS guidelines, participated in trainings, or attended IPS staff team meetings, even if their specific agency did not have access to an IPS supported employment program (Becker et al., 2014). For this reason, high fidelity supported employment was calculated using state agency codes delineated in the U.S. Department of Education (2013) RSA reporting manual and the variable was labeled, "IPS promoting state." All cases were coded as either receiving services in an IPS promoting state (1) or not receiving services in an IPS promoting state (0). Cases originating in these IPS promoting states are assumed to have greater fidelity to IPS services than alternative states.

Table 3.2

Frequency of Participants Receiving State-Federal VR Service Predictors

	Supported Employment (N = 1,106)	Non-Supported Employment (N = 3,212)
Service Predictor	*n* (*%*)	*n* (*%*)
Diagnosis & Treatment of Impairment	221 (*20.0%*)	910 (*28.3%*)
Counseling & Guidance	596 (*53.9%*)	1,793 (*55.8%*)
Job Readiness Training	165 (*14.9%*)	528 (*16.4%*)
Job Search Assistance	487 (*44.0%*)	1,195 (*37.2%*)
Job Placement Assistance	454 (*41.0%)*	1,489 (*46.4%)*
Transportation Services	335 (*30.5%*)	1,250 (*38.9%*)
Maintenance Services	244 (*22.1%*)	1,043 (*32.5%*)
Information & Referral Services	193 (*17.5%*)	927 (*28.9%*)
Benefits Counseling	131 (*11.8%*)	242 (*7.5%*)
Customized Employment	11 (*1.0%*)	34 (*1.1%*)

CHAPTER FOUR

Results

The purpose of the current study was to examine factors influencing the starting wage for individuals with schizophrenia successfully employed (closed status 26) through the receipt of supported and non-supported employment services from the state-federal vocational rehabilitation (VR) system. Hierarchical multiple regression analysis (HRA) was used to determine the amount of variance that could be accounted for by three sets of predictor variables: consumer demographics, state-federal VR services provided, and whether or not services were received in an IPS promoting state. The specific research questions were as follows:

1) What are the primary demographic predictors of starting wage for state-federal VR consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?
2) After controlling for demographics, which state-federal VR services predict starting wages for state-federal VR consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?
3) After controlling for demographics and state-federal VR services, does receiving state-federal VR services in an IPS promoting state predict higher starting wages for consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?

Preliminary Data Screening and Analysis

The RSA-911 database was pre-screened using the U.S. Department of Education (2004) 18-point crosscheck system to address data entry and accuracy concerns. Once the target group of individuals with schizophrenia obtaining employment had been selected, all predictor and outcome variables were screened using SPSS 25.0 for the presence of linearity, homoscedasticity, normality, multicollinearity, and unusual data points. These core assumptions of hierarchical multiple regression were examined separately for the supported and non-supported employment groups.

The presence of linearity was established in two ways. First, partial regression plots for age, the only continuous variable, were examined for both groups. The plots showed a linear relationship between starting wage and age for both supported and non-supported employment groups. Second, the relationship between starting wage and all predictor variables collectively was examined through a scatterplot of studentized residuals plotted against the unstandardized predicted values. A visual inspection of this plot showed, not only a linear relationship between predictor and outcome variables, but also the presence of homoscedasticity for both supported and non-supported employment groups. Furthermore, visual inspection of histograms and P-Plots revealed a normal distribution of errors for both groups as well.

Multicollinearity was assessed by examining the correlation matrix for Pearson product-moment correlation coefficient (r) for values larger than +/- 0.7, as well as through an examination of VIF and tolerance values. Post-secondary education or training and completion of high school diploma or equivalent were strongly correlated in both supported employment (r = -.689) and non-supported employment (r = -.726) groups. The tolerance value of high school diploma or equivalent was .000 in both groups, indicating a correlation too strong to keep both

variables in the model. In order to maintain an accurate representation of all education levels, the education variable was dummy coded with high school diploma or equivalent as the reference variable. After this modification, correlations for both groups were below +/- 0.7, VIF values were under 10, and tolerance values were over 0.1 in both supported (VIF range 1.020 - 1.485; tolerance range .674 - .981) and non-supported (VIF range 1.020 - 1.502; tolerance range .666 - .981) employment groups.

Lastly, an examination of unusual points for both groups was conducted using casewise diagnostics, leverage, and influential points analysis. The casewise diagnostics table highlighted any cases where the standardized residual was greater than +/- 3.0, a common criterion used to identify possible outliers. The table revealed 32 potential outliers (range -7.851 to 3.031) for the non-supported employment group and 11 potential outliers (range -7.597 to -3.044) for the supported employment group. An examination of leverage values revealed all cases for both groups fell within the safe range (< 0.2). Cook's Distance values were examined in order to identify influential points. All values in both groups were below 1.0, indicating no case was particularly influencing the data.

Correlational Analyses

Intercorrelations among the dependent variable and predictor variables were assessed using the Pearson product-moment correlation coefficient (*r*). According to Gravetter and Forzano (2012), if the absolute value is $.10 \leq r \leq .30$, the association is weak. If the absolute value is $.30 \leq r \leq .50$, the association is moderate. Finally, if the absolute value is $.50 \leq r \leq 1.0$, the association is considered strong. Correlations and descriptive statistics for the supported employment group are provided in Table 4.1 and in Table 4.2 for the non-supported employment

group. Below is a summary of the most relevant statistically significant correlations for both groups.

Supported Employment Group

Starting wage was inversely correlated with age at application (r = -.10, p < .01), receiving SSDI (r = -.12, p < .01), and receiving SSI (r = -.15, p < .01). Starting wage was positively correlated with post-secondary education or training (r = .07, p < .05), being African American/Black (r = .10, p < .01), receiving diagnosis and treatment services (r = .07, p < .01), receiving job placement services (r = .06, p < .05), receiving transportation services (r = .15, p < .01), and receiving maintenance services (r = .10, p < .01). While statistically significant, according to the Gravetter and Forzano (2012) criteria, these predictor variables are considered to be weakly associated with starting wage; therefore, a hierarchical regression analysis is an acceptable statistic and these minor relationships should not confound the results. Table 4.1 shows a full report of all significant correlations.

The presence of numerous, statistically significant weak relationships between predictor variables is likely indicative of the characteristics of the represented population. This study has captured the small percentage of consumers with schizophrenia who actually achieve employment; thus, any significant relationship between predictors offers potential insight. For instance, African American/black consumers in supported employment were less likely than their White counterparts to collect SSDI (r = -.18, p < .01) but more likely to collect SSI (r = .15, p < .01). They were more likely than White consumers in supported employment to have less than a high school education (r = .17, p < .01) and less likely to have post-secondary education or training (r = -.12, p < .01). Similarly, Hispanic or Latinx consumers with schizophrenia in supported employment were less likely to collect SSDI than White counterparts (r = -.07, p <

.05), and more likely to have less than a high school education (r = .05, p < .05). These relationships suggest a picture of possible greater levels of symptom severity, lower socioeconomic status, and/or lower levels of education for consumers of color than White consumers with schizophrenia in supported employment.

In terms of state-federal VR services, African American/black consumers in supported employment were less likely than White counterparts to have information and referral services (r = -.16, p < .01), but were more likely to have transportation (r = .12, p < .01) and receive services in an IPS promoting state (r = .06, p < .05). Hispanic or Latinx consumers in supported employment were less likely than White counterparts to have job placement services (r = -.09, p < .01) and receive services in an IPS promoting state (r =- .07, p < .05).

Additional interesting significant relationships highlight which services are more or less likely to be used in an IPS promoting state than in a non-IPS promoting state. For instance, job readiness training (r = -.10, p < .01) and transportation services (r = -.08, p < .01) were less likely to be used in an IPS promoting state for consumers with schizophrenia in supported employment. Conversely, counseling and guidance (r = .32, p < .01), job search (r = .33, p < .01), job placement (r = .06, p < .05), information and referral (r = .08, p < .01), and benefits counseling (r = .09, p < .01) were more likely to be used in an IPS promoting state for consumers with schizophrenia in supported employment.

Table 4.1

Correlations, Means, and Standard Deviations for Variables Used in Supported Employment Hierarchical Regression Analyses

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Starting Wage	1.00																					
2. Gender	-.01	1.00																				
3. Age	-.10**	.07*	1.00																			
4. SSDI	-.12**	-.02	.26**	1.00																		
5. SSI	-.15**	-.01	-.11**	-.30**	1.00																	
6. <High School Ed.	.02	-.01	-.05*	-.16**	.16**	1.00																
7. Post-Secondary Ed. or Training	.07*	.10**	.15**	.12**	-.11**	-.33**	1.00															
8. African American/Black	.10**	.06*	-.04	-.18**	.15**	.17**	-.12**	1.00														
9. American Indian or Alaska Native	-.05	.01	.01	.05*	.06*	-.02	-.01	-.10**	1.00													
10. Asian or Native Pacific Islander	.04	.01	-.02	-.02	.01	-.06*	.09**	-.13**	-.02	1.00												
11. Hispanic or Latinx	-.01	-.07*	-.05	-.07*	.03	.05*	-.02	-.18**	-.03	-.04	1.00											
12. Diagnosis & Tx	.07**	-.03	-.04	.03	-.04	.03	-.01	-.04	-.01	-.02	.00	1.00										
13. Counseling & Guidance	.05	.02	-.03	-.02	-.09**	-.03	.02	.02	-.03	.01	-.04	.12**	1.00									
14. Job Readiness Training	.01	.00	-.03	-.04	-.04	.02	.01	.03	-.01	.00	.04	.01	.23**	1.00								
15. Job Search Assistance	-.02	.00	-.04	.01	.01	.02	-.03	-.01	.03	.03	-.02	.15**	.31**	-.08**	1.00							
16. Job Placement Assistance	.06*	.03	.02	.04	-.03	.00	.03	.03	.02	-.05	-.09**	.06*	.25**	.10**	.14**	1.00						
17. Transportation	.15**	.00	-.02	-.02	.01	.08**	-.03	.12**	-.02	-.04	.01	.12*	.03	.07*	.09**	.12**	1.00					
18. Maintenance	.10**	.06*	-.01	.01	.00	.07*	-.05	.03	-.02	.03	.03	.12**	.02	.04	-.04	.05*	.19**	1.00				
19. Information Referral	-.03	-.02	.06*	.08**	-.07*	-.08**	.03	-.16**	-.04	-.03	-.03	.26**	.31**	.13**	.06*	.16**	.06*	.14**	1.00			
20. Benefits Counseling	.03	-.01	-.08**	.01**	.09**	.01	-.01	-.01	.02	-.04	-.05	.05*	.21**	.00	.21	.15**	.13**	.03	.14**	1.00		
21. Customized Employment	.04	-.03	.01	.02	.00	.00	-.03	-.04	-.01	-.17	.02	.04	-.05*	-.02	-.03	-.07*	-.01	.01	.07**	-.01	1.00	
22. IPS Promoting State	-.03	.02	.05*	.00	-.06*	.01	.01	.06*	-.02	.03	-.07*	.05	.32**	-.10**	.33**	.06*	-.08**	.00	.08**	.09**	-.05	1.00
Mean	*5.09*	*1.31*	*38.64*	*.47*	*.37*	*.18*	*.33*	*.39*	*.02*	*.03*	*.05*	*.20*	*.54*	*.15*	*.44*	*.41*	*.30*	*.22*	*.18*	*.12*	*.01*	*.18*
SD	*.59*	*.46*	*11.75*	*.50*	*.48*	*.38*	*.47*	*.49*	*.13*	*.16*	*.22*	*.40*	*.50*	*.36*	*.50*	*.49*	*.46*	*.42*	*.38*	*.32*	*.10*	*.39*

Note: High school diploma or equivalent is the reference education variable; White is the reference race and ethnicity variable.
*P < .05; **P < .01

Non-Supported Employment Group

Starting wage was inversely associated with age at application (r = -.08, p < .01), receiving SSDI (r = -.15, p < .01), receiving SSI (r = -.14, p < .01), having less than a high school education (r = -.10, p < .01), job readiness (r = -.06, p < .01), job search assistance (r = -.03, p < .05), and job placement assistance (r = -.06, p < .01). Starting wage was positively correlated with post-secondary education or training (r = .09, p < .01), being Hispanic or Latinx (r = .06, p < .01), transportation services (r = .10, p < .01), and maintenance services (r = .06, p < .01). While statistically significant, these predictor variables are considered to be weakly associated with starting wage; therefore, a hierarchical regression analysis is an acceptable statistic and these minor relationships should not confound the results.

Although there were many significant correlations between predictor variables in the non-supported employment group, only one crossed the threshold into a strong association. The largest correlation in this group consisted of the strong positive relationship between receiving counseling and guidance services and information referral services (r = .51, p < .01). Although this is a strong correlation, multicollinearity only becomes a problem for HRA when the relationship is greater than or equal to +/- .70; thus, this relationship should not confound the HRA results. See Table 4.2 for a full report of significant correlations.

As stated in the previous section, statistically significant weak relationships between predictor variables may still provide valuable information due to this study's focus on consumers with schizophrenia who achieved a successful employment outcome. For instance, African American/black consumers in non-supported employment were less likely than White counter parts to collect SSDI (r = -.08, p < .01) and have post-secondary education or training (r = -.12, p < .01). They were more likely to collect SSI (r = .11, p < .01) and have less than a high school

education (r = .17, p < .01). Hispanic or Latinx consumers with schizophrenia in non-supported employment were also less likely than white counterparts to collect SSDI (r = -.08, p < .01) and have post-secondary education or training (r = -.05, p < .05). Similar to consumers in supported employment, these relationships suggest consumers with schizophrenia in non-supported employment may have greater levels of symptom severity, lower socioeconomic status, and/or lower levels of education than White consumers.

In terms of state-federal VR services, African American/black consumers in non-supported employment were less likely than White counterparts to have job search assistance (r = -.11, p < .01), information and referral services (r = -.11, p < .01), and benefits counseling (r = -.07, p < .01). They were more likely than White counterparts to have job readiness training (r = .07, p < .01), transportation (r = .05, p < .01), and maintenance services (r = .06, p < .01), as well as, receive services in an IPS promoting state (r = .06, p < .05). Hispanic or Latinx consumers in the non-supported employment were less likely than White counterparts to have customized employment services (r = -.03, p < .05) and receive services in an IPS promoting state (r =- .07, p < .05). They were more likely to have diagnosis and treatment of impairment (r = .03, p < .05), counseling and guidance (r = .05, p < .05), transportation (r = .08, p < .01), maintenance (r = .06, p < .01), and information and referral services (r = .09, p < .01).

Some state-federal VR services were more or less likely to be used in an IPS promoting state than in a non-IPS promoting state for consumers with schizophrenia in non-supported employment. Diagnosis and treatment (r = -.14, p < .01), job readiness training (r = -.04, p < .01), transportation (r = -.12, p < .01), and maintenance (r = -.13, p < .01) were less likely to be used in an IPS promoting state. Counseling and guidance (r = .09, p < .01), job search (r = .08, p

< .01), and information and referral services (r = .11, p < .01) were more likely to be used in an IPS promoting state for consumers with schizophrenia in non-supported employment.

Table 4.2

Correlations, Means, and Standard Deviations for Variables Used in Non-Supported Employment Hierarchical Regression Analyses

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Starting Wage	1.00																					
2. Gender	.01	1.00																				
3. Age	-.08**	.09**	1.00																			
4. SSDI	-.15**	.02	.27**	1.00																		
5. SSI	-.14**	-.06**	-.06**	-.15**	1.00																	
6. <High School Ed.	-.10**	-.01	-.03*	-.12**	.13**	1.00																
7. Post-Secondary Ed. or Training	.09**	.14**	.12**	.14**	-.11**	-.39**	1.00															
8. African American/Black	.01	.07**	.03*	-.08**	.11**	.17**	-.12**	1.00														
9. American Indian or Alaska Native	.02	.02	-.01	.00	.02	.01	.02	-.09**	1.00													
10. Asian or Native Pacific Islander	.00	.01	-.04**	-.05**	.02	-.05**	.09**	-.16**	-.03	1.00												
11. Hispanic or Latinx	.06**	-.02	-.10**	-.08**	.02	.02	-.05**	-.23**	-.04*	-.07**	1.00											
12. Diagnosis & Treatment	.02	.00	-.04*	-.04**	-.01	.04*	-.02	.03	.01	.01	.03*	1.00										
13. Counseling & Guidance	.02	-.01	-.02	-.01	.01	-.06**	.07**	-.12**	.02	.06**	.05**	.07**	1.00									
14. Job Readiness Training	-.06**	-.02	-.05**	-.04*	.04**	.08**	-.06**	.07**	-.01	-.03	-.01	.03*	.03*	1.00								
15. Job Search Assistance	-.03*	.01	.01	-.03	.02	-.03*	.06**	-.11**	.01	.09**	.03	-.03*	.38**	.10**	1.00							
16. Job Placement Assistance	-.06**	.01	.04**	.02	.01	.01	.02	-.01	.01	-.03*	-.01	-.01	.19**	.06**	.19**	1.00						
17. Transportation	.10**	.04*	.01	-.10**	.08**	.02	-.01	.05**	.03*	.05**	.08**	.07**	.15**	.12**	.21**	.05**	1.00					
18. Maintenance	.06**	.03*	.01	-.07**	.05**	.01	-.02	.06**	.04*	.01	.06**	.09**	.12**	.06**	.09**	.03	.36**	1.00				
19. Information & Referral	.01	-.01	.03	-.03	.07**	-.02	.07**	-.11**	-.03	.11**	.09**	.04*	.51**	.02	.34**	.11**	.17**	.12**	1.00			
20. Benefits Counseling	-.02	-.04*	.02	.13**	.06**	-.04*	.07**	-.07**	.01	-.01	-.02	.02	.13**	.03	.12**	.11**	.03*	.02	.08**	1.00		
21. Customized Employment	.01	.02	-.01	-.02	.01	.06**	-.02	.02	-.01	.05**	-.03*	.04**	-.04*	.03	.03	.05**	.01	-.01	.00	.05**	1.00	
22. IPS Promoting State	.01	.01	.05**	.03*	.00	-.01	-.02	.05**	-.02	-.02	-.06**	-.14**	.09**	-.04**	.08**	.20**	-.12**	-.13**	.11**	.00	-.02	1.00
Mean	*5.35*	*1.33*	*38.02*	*.42*	*.31*	*.16*	*.44*	*.34*	*.02*	*.05*	*.09*	*.28*	*.56*	*.16*	*.37*	*.46*	*.39*	*.33*	*.29*	*.08*	*.01*	*.13*
SD	*.58*	*.47*	*11.74*	*.50*	*.46*	*.37*	*.50*	*.47*	*.13*	*.21*	*.30*	*.45*	*.50*	*.37*	*.48*	*.50*	*.49*	*.47*	*.45*	*.26*	*.10*	*.34*

Note: High school diploma or equivalent is the reference education variable; White is the reference race and ethnicity variable.
*P < .05; **P < .01

Hierarchical Regression Analysis

Hierarchical regression analysis was used to examine the relative contributions of three sets of predictors to starting wages for state-federal VR consumers with schizophrenia receiving supported employment and those who did not receive supported employment services. The results of the analysis, including values of change in R^2 (ΔR^2), unstandardized regression coefficients (B), standard errors ($SE\ B$), and standardized coefficients (β) for the predictor variables are presented in Table 4.3 for the supported employment group and Table 4.4 for the non-supported employment group. These values are given for each variable at their entry into the model and in the final model in order to assess any notable changes. For both groups, the first step in the regression analysis entered demographic predictors (i.e. gender, age at application, SSDI at application, SSI at application, possession of a high school diploma or equivalent, completion of some post-secondary education or training, African American/black, American Indian or Alaska Native, Asian or Native Pacific Islander, and Hispanic or Latinx), the second step entered service predictors (i.e. diagnosis and treatment of impairment, counseling and guidance, job readiness training, job search assistance, job placement assistance, transportation, maintenance, information and referral, benefits counseling, and customized employment), and the third step entered was whether or not the consumer received services in an IPS promoting state. The results for each group are reported separately.

Consumers Receiving Supported Employment Services

In the first step of the regression analysis, demographic factors were entered as predictors and accounted for a significant amount of variance in weekly earnings, $R^2 = .080$, $F\ (10, 1088) = 9.50$, $p < .001$. The standardized partial regression coefficients revealed age, receiving SSDI or SSI cash benefits, post-secondary education or training, and being African American/black to

significantly contribute to the variance in starting wage for state-federal VR consumers with schizophrenia in supported employment.

Age was inversely associated with starting wage, β = -.090, t (1088) = -2.97, p < .01, meaning that with each standard deviation unit increase in age, starting wage was predicted to decrease by .09 standard deviation units. Receiving SSDI cash benefits was also inversely associated with starting wage, β = -.151, t (1088) = -4.72, p < .001, as was receiving SSI cash benefits, β = -.218, t (1088) = -7.03, p < .001. These results mean that receiving SSDI or SSI cash benefits predicted lower starting wages with state-federal VR consumers with schizophrenia who received supported employment services.

Completion of some post-secondary education or training was positively associated with starting wages, β = .096, t (1088) = 3.063, p < .01. This means that, as education increased, starting wages increased. Being African American/black was positively associated with starting wage, β = .107, t (1088) = 3.41, p = .001. This result means that African American/black state-federal VR consumers with schizophrenia who received supported employment services had higher starting wages.

Service variables were entered into the second step of the regression analysis. This set of variables accounted for a significant amount of additional variance in starting wages beyond that explained by demographic covariates, R^2 = .119, ΔR^2 = .039, F (10, 1078) = 4.77, p < .001. In this step, the same demographic variables remained significant with similar magnitudes and directional relationships with starting wage. See Table 4.3 for details regarding how standardized beta values for demographic predictors changed between the first and final models.

Services accounting for a significant amount of variance in starting wage for state-federal VR consumers with schizophrenia in supported employment included diagnosis and treatment,

transportation, maintenance, and information and referral services. Diagnosis and treatment (β = .063, t (1078) = 2.09, $p < .05$), transportation (β = .116, t (1078) = 3.87, $p < .001$), and maintenance services (β = .073, t (1078) = 2.44, $p < .05$) were all positively associated with starting wages. This means that consumers with schizophrenia who received these services in addition to supported employment had higher starting wages. Conversely, receipt of information and referral services (β = -.068, t (1078) = -2.095, $p < .05$) was inversely associated with starting wage, meaning that consumers with schizophrenia who received information and referral services in addition to supported employment had lower starting wages.

Receiving services in an IPS promoting state was entered in the third, and final, step of the regression analysis. This predictor did not account for a significant amount of additional variance in starting wage beyond what was explained by demographic and service variables, R^2 = .121, ΔR^2 = .001, F (10, 1077) = 1.53, p = .22, *n.s.* An examination of standardized beta values revealed all previously significant demographic and service variables continued to account for a significant amount of variance in starting wage.

Due to the lack of significance in the third step, the final regression model for the supported employment group consisted of demographic and service predictors only. These variables accounted for 11.9% of the variance in starting wages of state-federal VR consumers with schizophrenia in supported employment. According to Cohen's standards for behavioral sciences, the regression coefficient, r = .345 (SE = .556), is considered a medium effect size (Cohen, 1988; 1992). This means the prediction model shows moderate strength in the ability to predict starting wages for state-federal VR consumers with schizophrenia who received supported employment services.

Once all other factors were controlled, predictors of higher starting wages for state-federal VR consumers with schizophrenia who received supported employment services included: engaging in post-secondary education or training (β = .096), being African American/black (β = .085), receiving diagnosis and treatment for impairments (β = .063), transportation (β = .116), and maintenance (β = .073) services. Predictors of lower starting wages for state-federal VR consumers with schizophrenia in supported employment included: age at application (β = -.077), receipt of SSDI (β = -.166) and SSI (β = -.220) cash benefits and receiving information and referral services (β = -.068). There was no significant unique variance explained by receiving services in an IPS promoting state after controlling for demographic and service variables. Overall, receiving transportation services was the strongest predictor of higher wages while receiving SSI cash benefit was the strongest predictor of lower wages in the final model.

Table 4.3

Hierarchical Regression Analysis for Prediction of Starting Wages in Supported Employment Group (N=1,106)

Variable	R^2	ΔR^2	At Entry Into Model B	At Entry Into Model SE B	At Entry Into Model β	Final Model B	Final Model SE B	Final Model β
Step 1	.080	.080**						
Gender			-.031	.037	-.024	-.035	.037	-.028
Age			-.005	.002	-.090**	-.004	.002	-.077*
SSDI			-.178	.038	-.151**	-.196	.038	-.166**
SSI			-.265	.038	-.218**	-.267	.038	-.220**
<High School Education			.062	.048	.040	.037	.048	.024
Post-Secondary Education or Training			.120	.039	.096**	.120	.039	.096**
African American/Black			.128	.038	.107**	.102	.038	.085**
American Indian or Alaska Native			-.054	.136	-.012	-.051	.134	-.011
Asian or Native Pacific Islander			.171	.112	.045	.191	.111	.050
Hispanic or Latinx			.006	.080	.002	.003	.079	.001
Step 2	.119	.039**						
Diagnosis & Tx			.093	.044	.063*	.093	.044	.063*
Counseling & Guidance			.036	.040	.031	.036	.040	.031
Job Readiness			-.038	.050	-.023	-.038	.050	-.023
Job Search Assistance			-.067	.037	-.057	-.067	.037	-.057
Job Placement Assistance			.056	.036	.047	.056	.036	.047
Transportation			.148	.038	.116**	.148	.038	.116**
Maintenance			.103	.042	.073*	.103	.042	.073*
Information & Referral			-.105	.050	-.068*	-.105	.050	-.068*
Benefits Counseling			.105	.056	.058	.105	.056	.058
Customized Employment			.322	.170	.055	.322	.170	.055
Step 3	.121	.001						
IPS Promoting State			-.061	.049	-.040	—	—	—

Note. F (20, 1078) = 7.299, p < .001 for full model; F (10, 1088) = 9.502, p < .001, for Step 1; ΔF (10, 1078) = 4.768, p <.001 for Step 2; ΔF (1, 1077) = 1.534, p = .216 for Step 3.
*p < .05, ** p < .01

Consumers Receiving Non-Supported Employment Services

In the first step of the regression analysis, demographic factors were entered as predictors and accounted for a significant amount of variance in starting wage $R^2 = .069$, $F\ (10, 3180) = 23.67$, $p < .001$. The standardized partial regression coefficients revealed age, receiving SSDI or SSI cash benefits, having less than a high school education, having post-secondary education or training, being African American/black, and being Hispanic or Latinx significantly contributed to explaining the variance in starting wages for state-federal VR consumers with schizophrenia not receiving supported employment.

Age was inversely associated with starting wage, $\beta = -.050$, $t\ (3180) = -2.77$, $p < .01$, meaning with each standard deviation unit increase in age, starting wage is predicted to decrease by .05 standard deviation unit. Receiving SSDI cash benefits was also inversely associated with starting wage, $\beta = -.168$, $t\ (3180) = -9.26$, $p < .001$, as was receiving SSI cash benefits, $\beta = -.153$, $t\ (3180) = -8.71$, $p < .001$. These results mean that receiving SSDI or SSI cash benefits predicted lower starting wages for state-federal VR consumers with schizophrenia not receiving supported employment.

Having less than a high school education was inversely associated with starting wages, $\beta = -.078$, $t\ (3180) = -4.15$, $p < .001$, while completing some post-secondary education or training was positively associated with starting wages, $\beta = .083$, $t\ (3180) = 4.35$, $p < .001$. Taken together, these results suggested that, as education increases, starting wages are predicted to increase. Specifically, having obtained some sort of post-secondary education or training predicted greater earnings for state-federal VR consumers with schizophrenia who had not received supported employment services.

Being African American/black, (β = .053, t (3180) = 2.85, p = .01) and being Hispanic or Latinx, (β = .068, t (3180) = 3.77, p = .001) were both positively associated with starting wage. These results mean that African American/black and Hispanic or Latinx state-federal VR consumers with schizophrenia not receiving supported employment had higher starting wages.

Service variables were entered into the second step of the regression analysis. This set of variables accounted for a significant amount of additional variance in starting wage beyond what was explained by demographic covariates, R^2 = .089, ΔR^2 = .020, F (10, 3170) = 6.90, p < .001. In this step, the same demographic variables remained significant with similar magnitudes and directional relationships with starting wage. See Table 4.4 for details regarding how standardized beta values for demographic predictors changed between the first and final models.

Services accounting for a significant amount of variance in starting wage for state-federal VR consumers with schizophrenia not receiving supported employment included job readiness training, job search assistance, job placement assistance, and transportation services. Transportation services (β = .106, t (3180) = 5.66, p < .001) were positively associated with starting wage, meaning that non-supported employment state-federal VR consumers with schizophrenia receiving transportation services had higher starting wages. Conversely, job readiness training (β = -.059, t (3180) = -3.41, p = .001), job search assistance (β = -.057, t (3180) = -2.96, p = .01), and job placement assistance (β = -.051, t (3180) = -2.92, p < .01) were all inversely associated with starting wage. This means that non-supported employment state-federal VR consumers with schizophrenia receiving these services had lower starting wages.

Receiving services in an IPS promoting state was entered in the third, and final step, of the regression analysis. This predictor accounted for a significant amount of additional variance

in starting wage beyond what was explained by demographic and service covariates, $R^2 = .092$, $\Delta R^2 = .002$, $F\ (10, 3169) = 8.49$, $p < .01$.

In this step, the same demographic and service variables remained significant with similar magnitudes and directional relationships with starting wage. See Table 4.3 for details regarding how standardized beta values for demographic and service predictors changed between the first and final models.

The standardized beta for receiving services in an IPS promoting state was positively associated with higher starting wage, $\beta = .052$, $t\ (3180) = 2.91$, $p = .01$. This means state-federal VR consumers with schizophrenia not in supported employment had higher starting wages when receiving services in a state supporting high-fidelity supported employment.

The final regression model included all three steps in the analysis and accounted for 9.2% of the variance in starting wages for state-federal VR consumers with schizophrenia not in supported employment. According to Cohen's standards for behavioral sciences, the regression coefficient, $r = .303$ (SE=.556), is considered a medium effect size (Cohen, 1988; 1992). This means the prediction model shows moderate strength in the ability to predict starting wages for state-federal VR consumers with schizophrenia not receiving supported employment.

Once all other covariates were controlled, factors significantly contributing to higher starting wages for state-federal VR consumers with schizophrenia not in supported employment included: engaging in post-secondary education or training ($\beta = .085$); being African American/black ($\beta = .041$); being Hispanic or Latinx ($\beta = .057$); receiving transportation services ($\beta = .112$); and receiving state-federal VR services in an IPS promoting state ($\beta = .052$). Factors significantly contributing to lower starting wages of state-federal VR consumers with schizophrenia not in supported employment included: age at application ($\beta = -.056$); receipt of

SSDI (β = -.162) or SSI (β = -.159) cash benefits; having less than a high school education (β = -.073); receiving job readiness training (β = -.057); job search assistance (β = -.059); and job placement assistance (β = -.061) services. Overall, receiving transportation services was the strongest predictor of higher starting wages while receiving SSDI and SSI cash benefits were the strongest predictors of lower starting wages in the final model.

Table 4.4

Hierarchical Regression Analysis for Prediction of Starting Wages in Non-Supported Employment Group (N=3,212)

Variable	R^2	ΔR^2	At Entry Into Model B	At Entry Into Model SE B	At Entry Into Model β	Final Model B	Final Model SE B	Final Model β
Step 1	.069	.069**						
Gender			-.008	.022	-.006	-.013	.021	-.010
Age			-.002	.001	-.050**	-.003	.001	-.056**
SSDI			-.198	.021	-.168**	-.191	.022	-.162**
SSI			-.194	.022	-.153**	-.202	.022	-.159**
<High School Education			-.125	.030	-.078**	-.115	.030	-.073**
Post-Secondary Education or Training			.097	.022	.083**	.100	.022	.085**
African American/Black			.065	.023	.053**	.050	.023	.041*
American Indian or Alaska Native			.136	.080	.029	.111	.079	.024
Asian or Native Pacific Islander			-.014	.048	-.005	-.036	.048	-.013
Hispanic or Latinx			.135	.036	.068**	.113	.036	.057**
Step 2	.089	.020**						
Diagnosis & Tx			.001	.022	.001	.009	.022	.007
Counseling & Guidance			.027	.024	.023	.025	.024	.022
Job Readiness			-.093	.027	-.059**	-.089	.027	-.057**
Job Search Assistance			-.068	.023	-.057**	-.071	.023	-.059**
Job Placement Assistance			-.060	.021	-.051**	-.071	.021	-.061**
Transportation			.127	.022	.106**	.134	.023	.112**
Maintenance			.027	.023	.022	.033	.023	.027
Information & Referral			.010	.026	.008	.002	.026	.002
Benefits Counseling			.036	.039	.016	.039	.039	.018
Customized Employment			.089	.097	.016	.096	.097	.017
Step 3	.092	.002**						
IPS Promoting State			.089	.031	.052**	.089	.031	.052**

Note. F (21, 3169) = 4.706, p < .001 for full model; F (10, 3180) = 23.669, p < .001, for Step 1; ΔF (10, 3170) = 6.900, p <.001 for Step 2; ΔF (1, 3169) = 8.487, p < .005 for Step 3.
*p < .05, ** p < .01

CHAPTER 5

Discussion of Findings

In 2014, Leahy and Colleagues issued a mandate to those conducting VR research: improve state-federal vocation rehabilitation by using, "a purposeful approach to define what types of interventions or services appear to work best with what specific populations, under what specific conditions" (p.159). A review of literature supported the need to examine individuals with schizophrenia, both those receiving and not receiving supported employment, who were successful employed through the state-federal VR system. Starting wage was revealed to be a particularly meaningful outcome for this population; thus, this study examined how demographic factors, services provided, and receiving services in an IPS promoting state predicted starting wages. A linear hierarchical regression methodology was used to extract significant predictors of starting wages and reveal the amount of variance in starting wages each set of predictors could explain. The ultimate purpose of this study was to provide empirical knowledge to state-federal vocational rehabilitation counselors, administrators, and policymakers to help guide service decisions under varying supported employment conditions through empirically based information. The following discussion will address answers to research questions, highlight limitations within the research, and explore implications for future practice and research.

Using data from the 2014 RSA-911 database, this study attempted to answer the following questions:

1) What are the primary demographic predictors of starting wage for state-federal VR consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?

2) After controlling for demographics, which state-federal VR services predict starting wages for state-federal VR consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?
3) After controlling for demographics and state-federal VR services, does receiving state-federal VR services in an IPS promoting state predict higher wages for consumers with schizophrenia in supported employment and for consumers with schizophrenia not in supported employment who were successful employed and closed (status 26)?

Separate hierarchical regression analyses were conducted for the supported and non-supported employment groups; however, the subsequent sections will explore the results of the supported employment and non-supported employment groups simultaneously to enable both a within and between groups analysis.

Factors Contributing to Starting Wage Prediction

Each of the primary questions represents a step entered into the hierarchical regression analysis (HRA). It was hypothesized each set of variables (demographics, services, and receiving services in IPS promoting states) would contribute significantly to the prediction of starting wages for both supported and non-supported employment groups. Overall, this hypothesis was supported for the non-supported employment group, but not for the supported employment group. All three factors were significant in the final regression model for the non-supported employment group, while the first two factors were significant in the final model for the supported employment group. Thus, demographics, services, and receiving services in an IPS promoting state accounted for 9.2% of the variance in starting wages for state-federal VR

consumers with schizophrenia not in supported employment, while demographics and services accounted for 11.9% of the variance in starting wages of state-federal VR consumers with schizophrenia in supported employment.

Standardized coefficients for each of the final regression models were used to identify individual predictors of starting wage and assess the direction and magnitude of their relationships to starting wages. The following is a tandem discussion of these predictive relationships within the supported and non-supported employment groups with the goal of providing a more thorough exploration of the implications for vocational rehabilitation practice and future research.

Demographic Predictors of Starting Wages

Demographic variables were entered first for both of the regression models. In the final models, these variables alone explained 6.9% of the variance in starting wages for the non-supported employment group and 8.0% for the supported employment group. Demographic predictors contributing significantly to the explained variance for both groups were age, receipt of SSDI and SSI cash benefits, post-secondary education or training, and being African American/black. Having less than a high-school education and being Hispanic or Latinx were significant predictors of starting wages for the non-supported employment group only. The directionality and magnitude of these predictors provides an interesting look into how demographic predictors correlate with starting wages with implications for vocational rehabilitation services.

Age. For both the supported and non-supported employment groups, a consumer's age negatively correlated with starting wages, meaning, as age increases, starting wages are likely to decrease. This result is similar to previous studies of individuals with schizophrenia, which

found older age to be associated with poorer vocational outcomes (Bond & Drake, 2008; Burke-Miller et al., 2006; Cook et al., 2008; Henry et al., 2014) and lower wages (Salkever et al., 2007). Based on this study and previous literature, it seems the younger an individual with schizophrenia begins state-federal VR, the better their vocational outcomes and starting wage.

Cash benefits. Receiving SSDI and/or SSI cash benefits negatively correlated with starting wages for both supported and non-supported employment groups; suggesting a state-federal VR consumer with schizophrenia receiving one, or both, of these cash benefits is predicted to have lower starting wages. Furthermore, receiving SSI, specifically, was the strongest predictor of starting wages in the final regression model for the supported employment group, while SSDI was the strongest predictor for the non-supported employment group. Overall, while a powerful result, it is not a surprising one. Receiving cash benefits has an established empirical history of impacting work outcomes for individuals with schizophrenia (Cook & Razzano, 2000; Drake et al., 2009; MacDonald et al., 2003; Pete, 2013). Even IPS supported employment has historically not mitigated the impact of SSDI and SSI on work outcomes (Campbell et al., 2010; Cook et al., 2008). In concordance with previous literature, the results of this study indicate receiving SSI and SSDI will likely predict lower starting wages for state-federal VR consumers with schizophrenia who achieve a successful employment outcome (closed status 26).

Education. The cumulative results for both supported and non-supported employment regression models suggest supported employment may moderate the relationship between education and starting wages. At least until a state-federal VR consumer with schizophrenia reaches post-secondary education or training. First, lower education (i.e. less than high school education) is only predictive of lower wages in the non-supported employment group. This

suggests supported employment may somehow be compensating for the effects that lower education has on starting wages. Second, post-secondary education and training predicted higher starting wages for both supported and non-supported employment groups. This suggests that the ability of supported employment to mitigate the relationship between education and starting wages is limited to lower education only. In other words, the power of higher education to predict greater starting wages for state-federal VR consumers with schizophrenia is present regardless of the type of programming they might receive.

Race and ethnicity. This study found African American/black state-federal VR consumers with schizophrenia were predicted to have higher wages in both supported and non-supported employment groups. Previous literature has established a pattern in which non-white individuals with schizophrenia have higher wages than white counterparts; however, the interplay of race/ethnicity and severity usually moderates these effects. For example, Henry and colleagues (2014) found non-white individuals receiving IPS were more likely to make $9.00/hour or more than white counterparts, but only for participants without a diagnosis of psychotic disorder. Hall's (1993) dissertation found severity levels of schizophrenia and race were dominant variables in determining higher wages. For example, African American males with "non-severe" symptoms had higher wages than white males with severe symptoms (p. 81). This study's results imply the relationship between race and starting wage remains significant, regardless of severity. First, significant correlations between predictor variables suggested African American/black consumers with schizophrenia were more likely than White consumers with schizophrenia to have additional barriers to employment (e.g. greater severity or lower socioeconomic status, less education) regardless of supported employment programming. Despite this, African American/black consumers with schizophrenia were still predicted to have

higher starting wages in both the supported and non-supported employment groups. Furthermore, the magnitude of this relationship was stronger in the supported employment group (i.e. the more severe group) than in the non-supported employment group (.085 and .057 respectively).

Despite a paucity of research with similar results, there has been some evidence suggesting severity may be explaining less variance than race in starting wages. Mueser and colleagues (2014) studied the effects of supported employment on Latinx consumers with severe mental illness. Their sample included non-Latinx African Americans and non-Latinx whites. Prior to their primary analysis, they examined whether selected variables interacted with race/ethnicity in predicting work outcomes, including wages. Their results showed neither severity, or even a schizophrenia diagnosis, interacted with race/ethnicity in work. This trend continues into other populations as well. Giesen and Lang (2018) found African American state-federal VR consumers with visual impairments receiving SSDI had higher earnings, greater SSDI benefits, and achieved more return to work milestones than their white counterparts. It seems as if there may be a mediating variable possibly explaining the variance in starting wages more thoroughly than severity. Cook and colleagues (2008) cited studies suggesting African American's with psychiatric disabilities were more likely than white counterparts to engage in any kind of paid employment. Burke-Miller and colleagues (2006) found non-white individuals with psychotic disorders were more likely to work more hours in a month than white counterparts. Ultimately, the fact this positive predictive relationship between being African American/black and wages is trending across disabilities suggesting there may be some type of non-white, culturally relevant variable mediating the relationship between race and starting wages.

The relationship between ethnicity and starting wage seems to tell a different story than race. Although correlational analysis found Hispanic or Latinx state-federal VR consumers with schizophrenia were more likely than White counterparts to have increased employment barriers (e.g. greater severity or lower socioeconomic status, less education) regardless of supported employment engagement, Hispanic or Latinx consumers were predicted to have higher wages than white counterparts in the non-supported employment group (i.e. less severe group) only. Just as with race, this finding contradicts trends in the general population regarding the relationship between ethnicity and race. Since ethnicity was only significant for the non-supported employment group, initial interpretations suggest the interaction with severity may be contributing to this finding; however, this interpretation seems contrary to previous research.

As previously stated, Mueser and colleagues (2014) found severity did not interact with race/ethnicity when examining work variables. Mueser and colleagues also cited research indicating Latinx individuals seem to have more severe symptoms and worse functioning levels than non-Latinx white or black counterparts, suggesting the severity levels in the non-supported employment group may be comparable to the supported employment group. The results of their study also indicated with supported employment, rates of competitive work were comparable for all three racial/ethnic groups, suggesting if any relationship between ethnicity and wages existed, it would be in the supported employment group. Additionally, Cook and colleagues (2008) found in their multisite study younger, female, Latina individuals with psychiatric disabilities were more likely to hold competitive jobs than their non-Latinx white counterparts, even after controlling for study conditions and clinical characteristics (i.e. severity). The culmination of this study's results and previous research loosely suggests there may be other variables interacting

with ethnicity and influencing the relationship between starting wages for state-federal VR consumers with schizophrenia. One of those variables may or may not be severity of symptoms.

Service Predictors of Starting Wage

Service variables were entered second as predictors for both of the regression models. In the final models, these variables alone explained 2.0% of the variance in starting wages for the non-supported employment group and 3.9% of the variance in starting wages for the supported employment group. Significant predictors for the non-supported employment group included job readiness training, job search assistance, job placement assistance, and transportation services. Significant predictors for the supported employment group included diagnosis and treatment, transportation, maintenance, and information and referral services.

The discussion of the direction and strength of the relationships between these predictors and starting wages must recognize that every participant in this study received a successful employment outcome as a function of state-federal VR services. The additional variance explained by these predictors was relatively small, yet still significant, because of their ability to detect differences between those who were successfully employed. An examination of the supported employment and non-supported employment results in tandem suggests services affect starting wage by moderating severity, providing inclusive health treatment, and possibly increasing stability and flexibility.

Moderating severity. The cumulative results between supported and non-supported employment groups implies a complex relationship between severity, service decisions, and starting wage. In the non-supported employment group, three services were negatively correlated with starting wage: job readiness training, job search assistance, and job placement assistance. These services represent work basics, most likely provided to consumers in need of greater

assistance just to achieve an employment outcome (e.g. more severe symptoms, less work experience), let alone higher wages. While consumers in the non-supported employment group are generally assumed to have less severe symptoms than individuals in supported employment, it is possible those in need of supported employment programming did not have access (Bond & Drake, 2008). Thus, rehabilitation counselors are tasked with selecting services to compensate for symptom severity and work deficiencies in a way similar to supported employment. The results of this study suggest that, while these compensatory work basics services may be successful in facilitating employment outcomes, they do not overcome gaps in compensation as supported employment appears to do.

For the supported employment group, information and referral services were negatively correlated with starting wage. As with the non-supported employment group, the negative relationship between services and wages may signal other barriers such as increased symptom severity or lower socio-economic status. According to the U.S. Department of Education (2013), information and referral services are provided to, "individuals who need services from other agencies (e.g. cooperative agreements) not available through the VR program" (p.33). While it is possible that these services would result directly in lower wages, a much more viable explanation is that they convey increased limitations as a result of symptom severity, socio-economic status, or other potential barriers.

Inclusive health treatment. The integration of mental health services is a well-known, vital component of psychiatric vocational rehabilitation. One of the foundational components of any supported employment model is simultaneous mental health treatment. So, the fact that diagnosis and treatment of impairment services were positively correlated with starting wage in the supported employment group only offers some unique possibilities. First, diagnosis and

treatment of impairment services are designed to provide targeted treatment of any medical or psychiatric barrier to employment. As stated in Chapter 3, this can include dentistry, nursing services, drugs and supplies, prescription eye glasses, inpatient or outpatient hospitalization, treatment of acute or chronic medical conditions, treatment of emotional disorders, and mental health services. These services represent the kind of treatment individuals with psychiatric disabilities receive when they are paired with a wraparound case management program such as Assertive Community Treatment (ACT). Diagnosis and treatment of impairment services ensure the consumer is treated holistically, addressing every aspect of their health and well-being. The results of this study suggest this increased attention to health needs beyond what is already addressed through supported employment may help state-federal VR consumers with schizophrenia achieve that next level of quality employment. Since diagnosis and treatment of impairment services were not significant for the non-supported employment consumers, the implication is stronger that these targeted health services really must be in addition to the mental health treatment already offered with supported employment programming.

Increased stability and flexibility. Transportation and maintenance services are both compensatory services designed to address deficits and facilitate state-federal VR participation and/or provide greater job opportunity for individuals with disabilities. Transportation assists in building skills to allow an individual to participate in state-federal VR services (e.g. get to the counselor's office, meet with a job developer) and affords more geographical flexibility in job placement. Maintenance covers fees inhibiting a person from participating in state-federal VR (e.g. location, housing utilities) and necessary start-up fees possibly inhibiting a consumer from taking a higher paying job. In this study, transportation is positively correlated with starting wages for both supported and non-supported employment groups, while maintenance is

positively correlated with starting wages for only the supported employment group. Based on these results, rehabilitation counselors serving this population would do well to appreciate the potential benefits of transportation and maintenance services for starting wages. Although it is not possible to provide a sure reason for the relationship between these services and starting wages among all that were included, it may simply be that these services, appropriately provided, result in an increased stability and flexibility to allow consumers the opportunity to maximize their employment potential.

IPS Promoting States and Starting Wage

IPS promoting states were entered into the third step for both of the regression models. In the final non-supported employment model, this variable explained an additional 0.2% of the variance in starting wages. The standardized coefficient revealed a positive correlation with starting wage, meaning state-federal VR consumers with schizophrenia receiving non-supported employment in an IPS promoting state are predicted to have higher wages than counterparts in a non-IPS promoting state. This finding suggests rehabilitation counselors in IPS promoting states may be making service decisions differently than rehabilitation counselors in non-IPS promoting states. It is possible the principles of IPS extend into service provision choices that have positive relationships with starting wages (e.g. skipping job readiness training, using diagnosis and treatment to facilitate mental health services).

For state-federal VR consumers with schizophrenia in supported employment, receiving services in an IPS promoting state was not a significant predictor of starting wages. When viewed through the lens of differences in outcome variables, this result is not unusual. IPS supported employment is an evidenced based practice and is perhaps the best predictor of successful employment for individuals with schizophrenia; however, this does not mean fidelity

to the IPS model is going to influence all work outcomes similarly. Henry and colleagues (2014) found fidelity to IPS was unrelated to wages, but not to job acquisition and working more than 20 hours per week. Similarly, the results of this study merely suggest adherence to IPS supported employment may not be as important to improving wages as simply receiving supported employment programing.

Final Conclusions

Overall, it appears as if demographic predictors explain the most variance in starting wages for state-federal consumers with schizophrenia in both supported and non-supported employment; the relatively small amount of variance explained by services is likely related to starting wages being a cumulative result requiring a previously positive employment outcome; and receiving non-supported employment services in an IPS promoting state may influence counselor's decisions in a way favorable to higher starting wages.

The strongest service predictor of higher starting wages for both groups was transportation, followed by post-secondary education or training. Supported employment appeared able to moderate the relationship between lower education and lower starting wages; but the trend discontinued when a consumer reached higher education. Predictors of lower starting wages were either demographic variables commonly associated with lower starting wages (i.e. age, cash benefits, lower education), or likely a function of symptom severity requiring the use of basic work services or other agency referrals in order to compensate.

The importance of symptom severity was a reoccurring theme throughout the analysis. The interaction of severity with demographic and service variables, and its impact on starting wages, is a mix of results subject to interpretation. While it seems relatively clear the relationship between African American/black consumers with schizophrenia and higher starting wages is

mediated by something more than severity, the effect of intersectionality between severity and ethnicity on starting wages is unclear.

Limitations

A limitation of this study is the utilization of RSA-911 data. This archival dataset is designed to be a reporting tool, not a prediction tool. The variables are all predetermined and cannot be manipulated. Some empirically relevant factors, such as severity information, could not be directly collected and instead had to be inferred. This means no causal information can be determined and interpretations remain tentative as opposed to conclusive.

Further limitations of the RSA-911 data include possible unknown entry errors. Although there is an 18-point cross-check system in place to reduce input error, rehabilitation counselors may input data solely from memory without consulting the case file which would result in incorrect information (Chan et al., 2006). Additional input errors are, however, assumed to be random and should not create systematic bias (Wilson, 2000).

Finally, generalizability remains a limitation of this study. Although the RSA-911 data allows a national level sample, the population for this study is relatively specific. In other words, results from this study can only be generalized to U.S. state-federal VR consumers with schizophrenia. Additionally, this sample represents a self-selected, convenience sample. People who choose to participate in state-federal VR, may be fundamentally different than those who do not. This is evident in the relatively low numbers of American Indian or Alaska Natives, Native Hawaiian or Pacific Islanders, and Asian individuals in the sample.

Future Implications

The significance of this study lies in the potential for results to reach state-federal vocational rehabilitation practitioners, stakeholders, and policy makers with the goal of

improving services and policies ultimately benefiting the state vocational rehabilitation consumer. To this end, the results of this study offer several implications for future vocational rehabilitation practice, research, and system changes.

Vocational Rehabilitation Practice

Rehabilitation counselors are highly skilled and well versed in utilizing available state-federal VR resources and services to produce a successful placement for consumers with schizophrenia. The results of this study were intended to provide insight into services that may advance the success of job placement to a meaningfully paid position. The findings of this study revealed three major points.

First, despite a consumer's will and motivation, despite a counselor's best efforts, despite programming designed to compensate for deficits, some factors (e.g. severity) are continuing hurdles to overcome. The services identified in this study as negatively correlating with wages are most likely a reflection that services have limits and that services can act as a signal to increased employment barriers or limitations. Assisting in successful job placement may be all these services are able to do, and since this is what they were initially designed for, this is not a deficit in services.

Second, services contributing to flexibility in placement and stability in attendance (i.e. transportation) were predictive of increasing starting wages for consumers with schizophrenia, regardless of their participation in supported employment. The importance of transportation services cannot be understated. Not only did it have the strongest positive relationship with starting wages for both groups, it was the only service positively correlating with starting wages in the non-supported employment group. Clearly, providing transportation will continue to be an important part of service delivery for consumers with schizophrenia.

Lastly, although supported employment programming is a comprehensive set of services, this study found that providing three additional services could help advance successful placement by improving starting wages. As discussed, transportation appears to be a key service; however, maintenance and diagnosis and treatment of impairment services also positively correlated with starting wages. Individuals in supported employment specifically, seem to benefit from increased financial assistance which may contribute to employment flexibility and stability. They also seem to benefit from more inclusive health treatment that addresses not just mental health needs, but physical health needs. For individuals in supported employment, the additional treatment may simulate wraparound case management services, which have historically been successful in vocational rehabilitation and mental health treatment (McGurrin, 1994).

Vocational Rehabilitation Research

The finding that consumers with schizophrenia in supported employment benefit from additional health services is relevant to not just to practitioners, but to researchers as well. When coupled with the integrated mental health services provided through supported employment, diagnosis and treatment of impairments services, seem representative of wrap-around case management programs. For example, a typical assertive community treatment (ACT) program would use psychiatric nurses to treat physical health concerns (e.g. dentistry, glasses, chronic conditions), rehabilitation case managers to treat vocational concerns (e.g. job placement, financial management, benefits management), social workers and occupational therapists to treat functional concerns (e.g. housing, activities of daily living skills), psychologists to treat mental health conditions, and psychiatrists to prescribe medication and treat psychotic symptoms. While this is certainly more extensive than the combined intervention of supported employment and

diagnosis and treatment services, it raises the question about the effects a more intensive, integrated program could have on starting wage for individuals with schizophrenia.

In a review of traditional vocational rehabilitation services, McGurrin (1994) highlighted the PACT program as an, "Individualized placement model" touting work as, "both treatment and outcome." (p. 45). The PACT model recognizes the complex relationship between symptoms and vocational functioning and uses intensive, team case management to enact a place, train, and follow-up placement procedure similar to supported employment. McGurrin cited back then, PACT clients were employed at not just a higher rate, but a higher level, than the national average. Numbers included, "40-50% of PACT clients employed at any given time and 80% engaged in vocational interventions." (p. 46). While more current research regarding the PACT model has focused primarily on reducing hospitalizations, the results of this study indicate it is perhaps time to reevaluate these more extensive models of mental health and vocational rehabilitation.

While service predictors provided more insight into clinical vocational rehabilitation practice, the results regarding demographic predictors offered potential avenues for future research. The potential presence of a mediating variable between race and starting wage for individuals with schizophrenia needs more exploration. Similarly, the relationship between ethnicity and starting wage is also in need of clarification. The rehabilitation field has already issued a call for more research regarding racial and ethnic disparities in utilizing mental health services (Mueser et al., 2014), but research regarding vocational rehabilitation interventions with minorities with severe and persistent mental illness is especially limited.

The findings of this study seem to suggest examining culturally relevant variables may be of particular importance. Other studies have found this to be true. For instance, Mausbach and

colleagues (2008) found a social skills training program for adults with severe and persistent mental illness was more effective with older Latinx individuals when the procedures and curriculum were adapted to the Mexican American culture prominent in the communities where consumers lived. Alverson & Vicente (1998) found IPS specialists had more success meeting with Latinx families than the individual participant to make decisions about employment. As stated previously, research has suggested African American/black and Latinx populations have different values around work that may contribute to results such as taking any paid work (Cook et al., 2008), working more hours (Burke-Miller et al., 2006; Mueser et al., 2014), and earning more competitive wages (Mueser et al., 2014). Ultimately, the results for race and ethnicity as predictors harken to an idea confirmed through multiple ethnographic studies: racial and ethnic groups differ in their beliefs about work, and these differences have implications for the design of employment services.

State-Federal Vocational Rehabilitation System Changes

RSA-911 data represents the intersection between research and practice. This database catalogues extensive pre and post information about state-federal VR participants and tabulates intervention specifics that capture in the field clinical work of rehabilitation counselors across the nation. This dataset holds information that a single research project would be hard pressed to achieve, and a new updated set of data comes out every year. Yet, using this dataset still represents a limitation in predictive research. As previously stated, this dataset was designed by administrators and policy makers to be a reporting tool. Variables needed for cleaner prediction studies are simply not there, yet.

The role of symptom severity is a reoccurring theme throughout this study, as well as, previous literature regarding VR with individuals with schizophrenia. The ability to add

measures of psychological stability into predictive models could add clarity to the interpretation of statistically significant relationships and enable service provision to be more individualized.

Although it did not arise in this study, social or interpersonal skills has been highlighted as an important factor in work outcomes for people with schizophrenia (Hoffman & Kupper, 1997;). Functional and cognitive capacities are an important consideration for VR in this population (McGurk & Wykes, 2008). Some studies have used work history as an indication of motivation (Campbell et al., 2010); however, since work history is the gold standard predictor of employment outcomes, assessing motivations separately may yield more accurate results and provide an inclusive measure for individuals without a work history. This study highlighted the need to examine culturally relevant values about work as possible predictors of employment outcomes. Adding information about these variables to the RSA-911 dataset could make prediction studies more effective.

One possible way to do this, is to create a section of the dataset allowing discrete assessment data to be catalogued. Rehabilitation counselors already provide assessment services funded through VR, Title I fund, or Title VI Part B fund. These services are done in-house or referred out to other sources. They can encompass psychological assessment, personality assessments, interest inventories, assessments of interpersonal skills, intelligence, functional capacities, personal and social adjustments, as well as pertinent cultural, social, recreational, and environmental factors (RSA, 2013). If the raw data from these assessments could be either added to the RSA-911 dataset, prediction studies could use these variables in conjunction with the pre and post state-federal VR service data to attempt to define best state-federal VR practices for consumers with schizophrenia, and other disabilities.

To conclude, this study sought to address the concerns of state-federal VR stakeholders by potentially discovering patterns in demographics and service delivery that indirectly reduce the cost of schizophrenia. This study sought to highlight state-federal VR services performing above and beyond the required job placement outcome in order to assist state-federal VR counselors with tough service delivery decisions. This study sought to provide insight into future research directions to advance best practices for individuals with schizophrenia. Most importantly, this study has been about providing one small, additional piece of knowledge to help policy makers, administrators, counselors, and researchers improve the lives of state-federal VR consumers with schizophrenia.

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