

THE RELATIONSHIP BETWEEN EMPLOYMENT STATUS AND
NONVOCATIONAL OUTCOMES FOR PERSONS WITH SEVERE MENTAL
ILLNESS ENROLLED IN VOCATIONAL PROGRAMS: A LONGITUDINAL
STUDY

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ABSTRACT

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The primary purpose of the current study was to determine the relationship between employment and the nonvocational functioning of people with severe mental illness in a prospective 24 month study, as a partial replication of another study. An employment typology was utilized that was comprised of participants at four employment levels: no work (those who did not work the entire study period), minimal work (those who worked 24 weeks or less in competitive and/or noncompetitive, paid employment), paid work (those who worked 24 or more weeks, the majority of which was spent in noncompetitive, paid employment), and competitive work (those who worked 24 or more weeks, the majority of which was spent in competitive employment). Both objective and subjective outcomes were addressed, including quality of life, symptoms, psychiatric hospitalizations, social networks, and residential status. Participants consisted of persons with severe mental illness (most with a schizophrenia-spectrum disorder) who were receiving employment services at a large, urban psychiatric rehabilitation center. Mixed effects regression modeling and logistic regression were used to analyze the date. Results indicate that the competitive work group experienced an accelerated improvement in negative symptoms across time and was less likely to have psychiatric hospitalization days as compared with the no work group. The paid work group showed an accelerated improvement in social network scores across time as compared with the no work, minimal work, and competitive work groups. The full sample demonstrated improvements across the study period regardless of employment typology status in the

areas of overall quality of life, financial quality of life, cognitive symptoms, and social networks. In conclusion, this study adds to the growing body of evidence indicating that work, particularly periods of extended competitive work may lead to important benefits in clinical and social domains, although threats to internal validity that could not be ruled out preclude a causal link from being established. Future research is needed to further investigate this relationship, particularly in regards to those outcomes that are not well understood, such as residential status.

INTRODUCTION

Background

Persons with psychiatric disabilities often have difficulty obtaining and maintaining employment and other meaningful roles in the community, leading to an array of negative consequences (e.g., lack of income, dependence on others, etc.). Psychiatric disability is defined by a diagnosis of a severe mental illness (SMI), such as schizophrenia or a mood disorder, and an inability to achieve life goals. Psychiatric disabilities are characterized by a variable course that differs between individuals and within individuals across time (Corrigan, Mueser, Bond, Drake, & Solomon, 2008). Psychiatric disabilities are also often accompanied by other disorders, such as substance abuse. Further, despite the finding that the desire to work is high amongst this group (McQuilken et al., 2003), it has been estimated that at least 85% of people with a psychiatric disability in the United States are unemployed (National Organization on Disability, 1998). In response, vocational programs have emerged that are designed to help people with severe mental illness and psychiatric disabilities return to work and stay employed. Because of the crucial role employment plays in the rehabilitation of this group, research has been conducted in empirically validating vocational approaches.

Specifically, research has shown that supported employment, such as the Individual Placement and Support model, is an evidence-based practice used in the rehabilitation of people with SMI. To date, at least 15 randomized controlled trials have been conducted examining supported employment in comparison with other vocational models, all showing significantly better competitive employment outcomes for supported employment. These studies have been conducted around the world (Hong Kong, Europe, etc.) in demographically diverse groups (e.g., older adults, young adults). Reviews indicate that supported employment is more effective in helping clients with SMI obtain

competitive employment in the community as compared with other approaches, such as prevocational training or traditional vocational services (Bond, 2004; Crowther, Marshall, Bond, & Huxley, 2001), as supported employment has more than twice the competitive employment rates as comparison vocational programs, with typical rates of 60% and higher (Bond & Drake, 2008). Further, while these employment programs target vocational outcomes, researchers have also examined whether these programs might also have an impact on nonvocational outcomes. Nonvocational outcomes are defined as outcomes that are not directly related to employment or the workplace, such as social outcomes, clinical outcomes, changes in quality of life, and other objective outcomes, such as independence in living, which play large roles in the lives of clients and are essential to their community functioning and basic well being. Delineating the ways in which employment services may affect such outcomes is important to understanding the overall experience of people with mental illness receiving these services in the community. In other words, this information will help us understand the extent to which employment services have an impact above and beyond mere vocational outcomes to the lives of clients. This notion is consistent with the “work is therapy” belief of the 19th century, in which it was held that work itself holds life-affirming benefits separate from that of other treatment (Strauss & Carpenter, 1977), a notion that will be discussed in more depth in a later section. Given the potential benefits that work may provide, the current study undertook an investigation of the relationship between work and nonvocational outcomes in a prospective design. Furthermore, this primary research question, “Does work have a relationship with nonvocational outcomes among people with SMI across time?” was complemented by two secondary research questions. Specifically, the questions of “what are the client predictors of employment outcomes among people with severe mental illness?” and “do supported employment services have an impact on nonvocational outcomes?” were also addressed.

The following discussion will first review issues surrounding the primary research question and the link between work and nonvocational outcomes. Specifically, the history and theory underlying work and nonvocational outcomes will be discussed and the rehabilitation literature pertaining to various nonvocational outcomes and their link

with vocational outcomes and employment services will be delineated. Next, the shortcomings and limitations of prior studies in this area will be noted. In addition, a review of rationale and primary hypotheses will be put forth. Finally, the two secondary research questions will be discussed; specifically, the literature pertaining to predictors of work outcomes and the studies investigating the relationship between the receipt of supported employment services and nonvocational outcomes will be reviewed.

Primary Research Question: “Does Work Have a Relationship with Nonvocational Outcomes Among People with SMI Across Time?”

History and Background of Work and Nonvocational Outcomes

The notion of “work as therapy” or moral therapy began in the late 18th century and extended on into the 19th century in which institutionalized patients participated in productive activity in the form of simple work-related tasks or recreational activities. It was thought that these forms of activity would lead to overall improvement and eventually help to “cure” mental illness (Lamb, 1994). Unfortunately, the emphasis on work did not extend into the deinstitutionalization movement, dating from the late 1950s, in which individuals with SMI began moving from large state-run hospitals into the community. Instead, the dominant belief at this time was that work in the community would be too stressful for this group, based on the diathesis-stress model (work as the stressor). For example, it was posited that work would pose extreme stress beyond the individual’s capacity to cope, based on his or her personal level of vulnerability, resulting in an episode of increased schizophrenia symptoms and illness relapse (Zubin & Spring, 1977). Consequently, many people avoided work and led inactive, isolated day-to-day lives with little productivity or meaning. Clients who were involved with work were usually in a sheltered workshop or other protected settings, isolated from the rest of society. The original paternalistic philosophies that characterized typical work settings for people with SMI during this time were often as restrictive as institutions themselves (Becker & Drake, 1993). Hence, the original impetus behind research investigating the association between employment outcomes and nonvocational outcomes was to

understand the deleterious nature of work on various aspects of clients' lives. Unfortunately, some still hold this belief today, as attitudes of mental health professionals and clinicians remain a barrier to the implementation of supported employment services in the 21st century (Bond et al., 2001). Professionals often encourage individuals with SMI to participate in other forms of daily activities (e.g., day programs, clubhouses) in lieu of competitive work (Becker & Drake, 1993). However, there is a preponderance of evidence to suggest that work should *not* be avoided by people with SMI, as it does not lead to negative clinical outcomes. For example, competitive employment is not linked with higher rates of rehospitalization (Bond et al., 2001) as is often assumed by clinicians. In addition, studies have found that other rehabilitation programs, such as day programs, can be converted to supported employment programs without adverse client outcomes. For instance, such a conversion was carried out in New Hampshire in a naturalistic study involving 38 people with severe mental illness who expressed an interest in working. Researchers found that nonvocational outcomes, including psychiatric symptoms, self esteem, overall life satisfaction, and number of nonvocational activities were not adversely affected by the switch to supported employment and remained consistent across the subsequent 12 months. During the study period, vocational outcomes increased substantially, with competitive employment rates increasing from 12.9% to 64.5% over one year (Bailey, Ricketts, Becker, Xie, & Drake, 1998). A similar conversion in Rhode Island also found no negative effects on nonvocational outcomes, as hospitalization rates and overall social functioning were unchanged for clients who switched from a psychiatric day program to supported employment services, while not surprisingly, vocational outcomes and competitive employment rates were substantially enhanced (Becker et al., 2001).

Theories of Work and Nonvocational Outcomes

Given the findings that work is not harmful to nonvocational outcomes combined with the potential benefits associated with work, theorists in the field of psychiatric rehabilitation have turned their attention toward this issue, suggesting several avenues through which these variables may be related. Rosenfield (1987) posited that work

benefits the lives of people with SMI through its rehabilitative effects. For example, work leads to enhanced daily skills, which leads to increased perceptions of competence and mastery, which can help to improve self esteem, quality of life, and lower rehospitalization rates as individuals are better able to cope with their illness. Work can also lead to increased social support, as individuals forge friendships with others in the work place, which may then increase social competence and social skills, generalizing to other life domains. Similarly, through their empirical work, Dunn, Wewiorski and Rogers (2008) posited that work promotes recovery for persons with SMI through a sense of personal empowerment, increased pride and self esteem, facilitation of coping, and the imposition of routine and structure. Other theorists have proposed that work exerts positive effects on nonvocational domains through means such as the imposition of structure in daily life and interaction with others, which leads to an increased sense of well-being (e.g., Gahnstram-Strandqvist, Liukko, & Tham, 2003).

Qualitative research and first person accounts from people with SMI also provide further evidence regarding theoretical linkages proposed to explain the relationship between work and nonvocational functioning. One study found that work relates quality of life through perceived competence in daily tasks and increased pleasure in daily tasks. Clients in this study ascribed particular meaning and value to work as opposed to other forms of daily activities, which in turn enhanced their perceptions of competence and was associated with improved quality of life (Aubin, Hachey, & Mercier, 1999). Provencher, Gregg, Mead, and Mueser (2002) interviewed 14 people with severe mental illness and found that competitive work in the community is essential to the recovery of this group, as it facilitates feelings of self- empowerment, improved self efficacy, personal pride, and provides a forum for “self actualization.” The authors also found that work is a motivator (e.g., a reason to get out of bed in the morning) and it may act as a coping resource to deal with emotional problems, such as depression. Similarly, another qualitative study conducted with Australian participants demonstrated that working is associated with benefits including improved self-esteem, which is further linked with other benefits, such as perceptions of participating in meaningful activity and contributing to society,

financial benefits, increases in social status, and personal growth opportunities (e.g., improving oneself) (Honey, 2004).

Moreover, while it is evident through these accounts that work is beneficial to the lives of many and most people are able to effectively cope with work-related stress, there are undoubtedly those clients with mental illness who focus upon the negative aspects of work. For example, it has been found that there is a tendency for persons with schizophrenia who are unemployed to report fewer benefits of working in the community and to de-emphasize the overall importance of work to their lives (Priebe, Warner, Hubschmid, & Eckle, 1998). Other individuals tend to focus on the stressful aspects of work, especially when their jobs require fast-paced work or lofty supervisory demands (Scheid & Anderson, 1995). Additionally, some people with mental illness report that the stress *fearied* to be associated with work acts as a deterrent to seeking competitive employment. For example, nonworking clients tend to report the fear that work will worsen their symptoms, whereas working clients report that work actually ameliorates their mental illness symptoms or acts as a distraction to such symptoms (Van Dongen, 1996). Clients may also fear that they will not be able to function in community jobs, a notion that is associated with a low sense of personal empowerment and for those who are currently employed, such feelings may influence decisions to stop working (Provencher et al., 2002).

However, despite the emotional and mental stressors that are often an unavoidable byproduct of work for most people, mentally ill or not, it is likely that unemployment has far more adverse consequences than employment. For example, poverty and social isolation may result from a lack of income and contact with others. Unemployment may also lead to depression, self pity, self absorption, higher risk of substance abuse, and feelings of worthlessness (Marrone & Golowka, 1999). Some researchers in the field have gone so far as to state that work is the right and responsibility of every citizen in our society, including people with SMI. These researchers further posit that work is part of the human experience, and for people with SMI, it helps to minimize the losses that they experience as a consequence of their illness and can provide an avenue by which to enjoy

life and provide opportunities for new relationships, life possibilities, etc. (Marrone & Golowka, 1999).

While many different mechanisms have been discovered across studies that may explain the relationship between employment and nonvocational domains, the common underpinning in all of these involves importance of overall rehabilitation of the individual and the integral role that work plays (e.g., Rosenfield, 1987). Accordingly, this notion of overall rehabilitation of the individual with SMI has been further emphasized by researchers and theorists who propose that work should be a central component of every rehabilitation program. This philosophy is a core feature of the Fountain House model of psychiatric rehabilitation. Fountain House is a clubhouse model of rehabilitation begun in 1948 that is run by “members” or people with mental illness that promotes recovery via four core beliefs: every person has the potential to be productive; adequate and appropriate housing is important, social lives are important, and work is important. Hence, work is a central feature of Fountain House, in which members are given the opportunity to develop vocational skills and work in groups at levels at which they are comfortable. This process leads to an increased sense of personal purpose and provides a forum by which work may act as “a deeply generative and regenerative force in the life of every human being.” (Beard, Propst, & Malamud, 1982, p. 47). While supported employment programs for people with SMI deviate markedly from the Fountain House model, the underlying philosophy remains the same—work has the potential to have enormous benefits beyond mere employment outcomes.

The following sections will review the literature addressing work as a predictor of several domains of nonvocational functioning for people with SMI, with an emphasis on a select group of key studies and review articles. Next, the prospective longitudinal studies and their methodologies to which the current study is most closely related will be systematically reviewed, with special attention paid to Bond et al. (2001) of which this study is a partial replication.

Symptoms, General Functioning, Psychiatric Hospitalizations

Because clinical factors such as symptomatology and overall functioning are strongly linked with the well-being of persons with SMI, studies have addressed the role of work in influencing these variables. For instance, the Bond et al. (2001) longitudinal study described above found that participants with SMI who held competitive employment for an extended period of time over their 18-month study period had significantly fewer psychiatric symptoms, as compared with participants who worked minimally or not at all during the study. Burns et al. (2009) found that overall, participants who worked had fewer positive and negative symptoms and better global functioning, as assessed at the 18 month follow-up as compared with those participants who did not work. Results further demonstrate that working 90 days or more was associated with negative symptoms, general symptoms, and global functioning, such that work seems to lead to enhanced nonvocational functioning in these areas. Additionally, it was found that returning to work was related to decreases in depression six months later, whereas there was no significant association between concurrent depression and work, suggesting the possibility of a causal relationship between employment and this affective outcome. Lastly, this study demonstrated an association between work and hospitalization, such that participants who worked were less likely to have been hospitalized in the last six months of the study compared to participants who did not work during the study period (Burns et al., 2009). Similarly, Mueser et al. (1997) found that competitively employed persons with SMI had significantly better overall functioning and fewer symptoms, especially in regards to thought disorder and affect, as compared with clients who did not work during the 18-month study period. A study conducted by Bell, Lysaker, and Milstein (1996) randomized veterans with schizophrenia to pay or no pay protected work positions and it was found that participants working in paid jobs had not only greater symptom improvements, but also lower psychiatric rehospitalization rates as compared to the no-pay work group across the six-month study. Eklund et al. (2004) investigated several social and clinical variables from both the perspective of the client and an independent rater in a weaker cross-sectional study design. This study compared competitive employment with non-work community

activities and a control group of no daily activity; it was found that competitively working participants had better interviewer-rated general functioning consistent of psychiatric symptoms and psychosocial functioning, as well as self-rated satisfaction with their daily activities (work) as compared with the other two groups. In contrast, no differences were found between the groups on self-rated health or self-rated wellbeing.

Moreover, it must be noted that not all studies have found a significant relationship between work and clinical variables. For example, Gold et al. (2006) found no relationship between work and symptoms over time in a sample of people with severe mental illness enrolled in an RCT comparing IPS integrated with intensive case management services (assertive community treatment) to parallel vocational and mental health services. Mueser et al. (1997) found no differences in regards to psychiatric hospitalizations between participants who did and did not work during the 18-month study period. Consistent with these findings, Bond et al. (2001) found no significant differences in the number of psychiatric hospitalizations across the 18-month study between participants who worked competitively and those who worked minimally working or not at all.

Most of the research addressing the association between work and clinical outcomes in has been atheoretical. However, it is important to conceptualize the link between these variables from a theoretical standpoint. Specifically, it is plausible that work will exert a beneficial impact on those variables that would be most amenable to change from environmental influences. For instance, the Positive and Negative Syndrome Scale (PANSS) that is commonly used to assess psychiatric symptoms has five subscales, including an emotional discomfort scale. The emotional discomfort scale is comprised of four items assessing depression, anxiety, guilt and active social avoidance. Work may be linked with reduced levels of emotional discomfort for several reasons, for instance, work provides an avenue for interaction with others and the formation of new social relationships, effectively minimizing social avoidance. As previously noted, research has also supported the association between work and depression, such that participation in employment is related to subsequent decreases in depression (Burns et al., 2009). Further, many prior studies have illustrated an association between cognitive

functioning and work, although most studies and reviews have looked at cognitive functioning as a *predictor* of subsequent employment outcomes (e.g., McGurk & Mueser, 2004). The current study intended to address cognitive symptoms, based upon the underlying assertion that the opportunity provided by extended work participation allows for the use and practice of cognitive skills. It also seemed plausible that competitive work would show a particular advantage as compared with noncompetitive work, due to the increased cognitive demands (and thus, utilization of cognitive skills) imposed by an integrated, perhaps more fast-paced work environments. Thirdly, prior research in both quantitative and qualitative arenas has supported the inverse relationship between work and negative symptoms (e.g., Burns et al., 2009), although the exact conceptual links between these variables are not well understood. Most studies have looked at negative symptomatology as a predictor of vocational outcomes (e.g., McGurk, Mueser, Harvey, LaPuglia, & Marder, 2003), as negative symptoms likely make interacting and relating to others (vital to most jobs) difficult. Lack of motivation is often also a prominent negative symptom in SMI that may affect the propensity to work. This study sought to address this important symptom domain, based upon the notion that extended work may likely increase motivation and activation, thus resulting in lower negative symptom scores (i.e., PANSS negative subscale). Fourthly, many people with SMI experience significant positive symptoms on a daily basis, such as auditory hallucinations and delusional thoughts. Given the great frequency with which positive symptoms are experienced, much prior research has focused the relationship between this symptom type and employment, finding that greater positive symptomatology acts as a barrier to employment in SMI, although to a lesser degree than negative symptoms (e.g., Rosenheck, Leslie, Keefe, McEvoy, Swartz, et al., 2006). Few studies have looked at the specific impact of work on positive symptoms, although it is possible that work may act as a *distraction* to positive symptoms (e.g. work requires people to concentrate on the tasks at hand, while blocking out distressing thoughts and “voices”), thus allowing individuals to better cope with these symptoms. Better coping mechanisms may then lead to fewer positive symptoms over time, as individuals may gradually learn to ignore auditory hallucinations and become less paranoid of the environment around them, for

example. Given that these explanations are only speculative, this study sought to investigate the link between employment and positive symptoms.

Quality of Life Outcomes

Considering the challenges and personal losses that severe mental illness may impose, many studies in this area have investigated various proxies of quality of life for this group. For example, one study found that subjective quality of life was higher in employed persons with SMI than unemployed persons, as characterized by a moderate effect size (Marwaha et al., 2008). Nordt et al. (2007) found similar results in that for people with SMI who held a job, subjective quality of life improved over time and was higher than that of participants who did not work during the 30-month study period. Further, another cross-sectional study delved more deeply into the issue of the possible link between subjective client outcomes and work. In this study, the authors attempted to identify mediating factors in this relationship in which they proposed a model suggesting that psychiatric rehabilitation services assist individuals with SMI in changing their vocational status (from unemployed to employed), which in turn affects their life satisfaction via enhanced self-efficacy and self-esteem. While their model was not fully supported by the results, they did find that change in vocational status from not working to working was associated with improvements in life satisfaction, self-esteem, and self-efficacy (Arns & Linney, 1993). Longitudinal RCTs have also attempted to better understand the link between quality of life, self-esteem, and work. For instance, Bryson, Lysaker, and Bell (2002) randomized 97 veterans with a schizophrenia spectrum disorder into a pay or no pay work rehabilitation program spanning six months in duration. Results indicate that participants in the pay condition had higher overall quality of life and scored significantly higher on subtests measuring motivation, sense of purpose, and empathy and had significantly lower scores on an anhedonia subtest than participants in the no pay condition. Additionally, in the larger sample, degree of participation in the work rehabilitation program was positively associated with overall quality of life, and for those participants who participated in the work program the most, with the interpersonal relationships subscale of quality of life. A more recent study investigated a subset of 29

participants who were enrolled in an RCT comparing supported employment and traditional vocational services for older adults with schizophrenia. Global satisfaction with life, a dimension of quality of life, increased over time and was significantly higher for participants who worked competitively during the 12-month study period than for participants who worked in noncompetitive employment (Twamley & Narvaez, 2008). Similarly, Bond et al. (2001) found that participants who worked competitively scored higher on several quality of life dimensions, including more satisfaction with vocational services, finances, and leisure activities, as compared with clients who worked minimally or did not work at all; specifically, this latter group tended to deteriorate in these domains of nonvocational functioning over time.

However, not all studies have found a positive association between work and quality of life. For instance, Mueser et al. (1997) found that while working participants did report greater satisfaction with finances (a quality of life proxy), there were no differences in overall life satisfaction between participants who did and did not work during the study. Van Dongen (1996) addressed quality of life in a sample of 92 individuals with SMI, comparing working participants to non-working participants. Results indicate that there was no significant difference in overall quality of life between the groups. Fabian (1989) compared 41 working individuals and 40 non-working individuals with schizophrenia who were receiving psychiatric rehabilitation services and also found no overall difference between the groups on quality of life. Similarly, Lehman (1988) surveyed a group of 496 persons with severe mental illness, utilizing both inpatient and outpatient samples. This study found that employment status (working/not working) was not significantly associated with general life satisfaction, and likewise, hours worked per week was not significantly associated with quality of life for most participants. Another study that investigated the effects of IPS supported employment services integrated with intensive case management services in a rural setting also measured quality of life. In a secondary analysis, the researchers addressed the link between employment and this nonvocational outcome, failing to find significant improvements in quality of life across the 24-month study period, although they cite floor effects as a possible explanation for such insignificant results (Gold et al., 2006).

In summary, while there exists some inconsistencies regarding the relationship between work and quality of life, findings from the most methodologically rigorous studies suggest that there is a positive association between these variables. Furthermore, studies that have delved more deeply into this issue have found that dimensions of quality of life that are most closely related to employment conceptually are the ones that are most commonly associated with work, such as satisfaction with finances, satisfaction with leisure activities (Bond et al., 2001), and sense of purpose (Bryson et al., 2002). These findings are not surprising for several reasons. First, work increases income, which may naturally lead to increased satisfaction with finances and increased satisfaction with leisure activities, as individuals have more money to spend on entertainment and participating in activities that they find pleasurable. Secondly, in agreement with qualitative findings, work seems to add meaning to the lives of individuals and thus may provide an increased sense of personal purpose, as individuals have a reason to get up in the morning, go out into the community, and act as productive members of society. Another important distinction in this discussion involves the type of employment. Specifically, competitive employment may show a distinct advantage in regards to several quality of life dimensions in comparison with less independent, noncompetitive forms of employment. For instance, competitive employment typically offers a greater pay rate and may lead to increased sense of purpose and accomplishment, as individuals get the opportunity to not only work, but to develop a career in areas that they choose and in fields that they may have been interested in prior to the onset of their mental illness. Given these conceptual bases and past literature, the current study sought to undertake an investigation of the relationship between employment and quality of life outcomes.

Social Outcomes

Because SMI (particularly schizophrenia) is associated with debilitating deficits in the social domain, many studies have addressed this variable in relation to work. Specifically, there is an extensive body of literature linking aspects of social functioning with later work outcomes (e.g., Mueser, Salyers, & Mueser, 2001), however, far fewer studies have looked at the relationship between work and subsequent social outcomes.

One study conducted by Strauss and Carpenter (1977) correlated the number of social contacts a person had with level of employment five years later; findings demonstrated a significant positive association between these variables. Another study that was conducted over seven years in Norway using a sample of former inpatients with schizophrenia found a low and nonsignificant correlation between work and the number of social contacts at baseline, whereas there was a moderate association between loss of employment and fewer social contacts at the follow-up (Melle, Friis, Hauff, & Vaglum, 2000). Burns et al. (2009) conceptualized impairments in social functioning in terms of social disability, or the inability to meet societal norms of social behaviors or roles, as measured by the Groningen Social Disabilities Schedule (Wiersma, DeJong, & Ormel, 1988). This study found that clients in the IPS supported employment condition who worked at least one day during the 18 month study had less social disability, especially in regards to the role of self care (e.g., proper hygiene and grooming), partner role (e.g., active in emotional and sexual relationships), and citizen role (e.g., participation, contribution to community) as compared with participants who did not work during the study. In addition, participants who worked at least 90 days during the 18-month study period had lower total social disability scores relative to those participants who did not work 90 days.

Moreover, there is rather clear conceptual link between work and social variables. Specifically, those who work have the opportunity to form relationships with others and enhance their social lives. Additionally, in regards to many jobs, social skills are necessary to function effectively and perform required job duties. Those who lack these skills may have the opportunity to develop them on the job. Further, similar to clinical domains, there may exist an important distinction between types of employment in regards to social variables. Specifically, competitive employment may offer a distinct social advantage as compared with less independent forms of employment. Individuals who participate in competitive employment work with a more diverse group of people, including those who do not have a mental illness, whereas those in paid employment in which the work positions are reserved for only those with SMI have a much more restricted availability of social relationships and possibilities. Given these theoretical

linkages, the current study sought to explore the relationship between employment and social networks.

Residential Status

Only a few studies past studies have examined the impact of employment on residential status or housing, with the vast majority finding no association between these variables. One such study that sought to address this outcome did so in a sample of people with SMI participating in a psychosocial rehabilitation program, in which it was found that change in vocational status (from not working to working) was unrelated to change in residential status (from less independent housing to more independent housing); work was also unrelated to community tenure of participants across six months (Arns & Linney, 1993). Similarly, Melle et al. (2000) found a low and insignificant association between work and independence in housing (homeless to living in house or apartment) in individuals with schizophrenia over 10 years. Bond et al. (2001) took a different approach to the housing question by dichotomizing the variable of homelessness (“yes” homeless in the prior 12 months, “no” homeless in the prior 12 months) finding no difference between competitively working participants, noncompetitive, paid working participants, and minimal work/non-working participants in homelessness across the 18-month study period. Another study also addressed homelessness in over 7,000 individuals with SMI, finding no association between homelessness and employment status (Pickett-Schenk et al., 2002). Only two studies found demonstrated any link between employment and residential status. One such study compared homeless participants with SMI to those who were not homeless, finding that homeless persons had significantly lower scores on the employment subscale of a quality of life measure as compared with domiciled persons (Lehman, Kernan, DeForge, & Dixon, 1995). A second study used a weak survey method and a sample of 1,620 persons with SMI finding that unemployment was frequently cited as a primary reason for a recent loss of housing and continued homelessness (Mojtabai, 2005). Given the scant amount of past studies that have addressed the relationship between these variables in people with SMI, the current study sought to investigate the association between work and residential

status, based on the premise that extended work, particularly competitive employment that offers higher wage rates, may lead to greater opportunities for independent housing.

Review of Main Prospective Studies Investigating Work and Nonvocational Outcomes

The current study is based on three prior RCTs of supported employment that undertook a careful investigation of the relationship between work and nonvocational outcomes. All of these studies addressed nonvocational outcomes as secondary to the primary interest involving the effects of supported employment, in which participants were randomly assigned to either supported employment or a control vocational condition. Indeed, these studies stand out in comparison with other prospective studies in this area because they involved the provision of supported employment services for a portion of the sample, thus maximizing employment opportunities. While this design does not completely alleviate the problems posed by lack of random assignment to work/no work conditions, it may have helped to reduce some degree of selection bias. The first of such studies used a sample of 143 persons with SMI, in which participants were randomly assigned to one of two employment groups, IPS or a prevocational training group (Group Skills training). Because the two vocational program groups did not differ in nonvocational outcomes, the groups were combined for the main analyses. Measures were collected over 18 months at semi-annual time periods, in which nonvocational functioning at baseline was associated with total hours worked and total wages earned after 18 months. The authors also found that nonvocational variables at baseline did not predict later work, with the exception of overall level of adjustment. In addition, concurrent levels of nonvocational functioning at each semi-annual time period were associated with concurrent working status for all participants, while controlling for baseline levels of functioning. In this study, nonworking participants were used as a comparison group to competitively working participants. The researchers further investigated this use of a comparison group, finding that working status was strongly related to total number of hours worked and wages earned over the previous six months. Further, utilizing this comparison group, researchers detected differences in several

nonvocational domains between the groups, but not in others (Mueser et al., 1997) (*see above literature reviews for detailed discussion of findings*).

Another important RCT in this area utilized a sample of 312 people with SMI in six European countries in which they compared IPS to “usual high-quality vocational rehabilitation” and followed participants for up to 18 months. The researchers first investigated the effects of nonvocational variables measured at baseline with a later return to work, finding no association with any nonvocational variables, with the exception of a positive association between being in disease remission and later work. They then attempted to look at differences between the vocational programs for working participants only on nonvocational outcomes after 18 months while controlling for baseline nonvocational functioning. Other primary analyses addressed the following: (1) the relationship between employment outcomes (job tenure, total duration of employment, and vocational status—having worked versus not working at all) across the study and nonvocational outcomes at 18 months while controlling for baseline levels, (2) the association between vocational status and concurrent levels of nonvocational functioning at each semi-annual follow-up period, and (3) the association between vocational status and nonvocational functioning at the end of the subsequent six months (i.e., working status at 6 months was associated with nonvocational functioning at 12 months). In regards to comparison groups, nonworking participants, defined as those who did not work at all during the study period, were contrasted with the working group, or those who had worked at least one day during the 18-month study period. Findings indicate that as discussed further previously, there were no differences between vocational programs on nonvocational outcomes in regards to all participants, whereas there were differences between working and nonworking comparison groups across 18 months. In addition, a positive association between employment outcomes and nonvocational functioning was found, providing evidence for the importance of work in some nonvocational domains, particularly, symptoms and global functioning (Burns et al., 2009) (*see above literature reviews for specific findings*).

Finally, Bond et al. (2001) utilized yet another set of comparison groups in their RCT comparing IPS supported employment services with traditional vocational

rehabilitation services. This study had a sample of 149 unemployed persons with SMI who were followed over 18 months. They used a level of employment typology approach consistent of four vocational categories based upon total wages earned across the study, which also correlated strongly with total hours worked and weeks worked across the study, demonstrating the adequacy of this proxy of vocational success used to determine the groups. These groups included (1) those who worked extensively in competitive employment during the study period and the majority of their earnings over the study period came from these means, (2) those who worked primarily in paid, sheltered workshops and who obtained the predominance of total earnings through these means (versus the majority of their income stemming from competitive employment), (3) those who worked a minimal period of time in either sheltered or competitive work across the study period, and (4) those participants who did not work during the 18 months. The majority of participants seemed to fit neatly into these categories, and despite the obvious sub-groups that existed within the minimal work group (those who worked minimally in sheltered employment and those who worked minimally in competitive employment), these participants did not differ from one another on important outcomes, including nonvocational variables at follow-up time periods or background characteristics. The authors further state that this classification typology was very useful and the results of their study shed light on the ways in which employment may exert its effect on nonvocational domains. For instance, participants who achieved extended periods of competitive employment tended to have distinct advantages in terms of symptom improvements as compared with participants who only worked minimally or not at all, characterized by large effect sizes for most variables. Contrary to expectations, there were no differences found between the competitive employment group and those who worked in paid, sheltered employment on nonvocational outcomes across the study, nor were significant differences found between the sheltered work group and the no work/minimal work group on these outcomes (*see above literature reviews for specific findings*).

Limitations of Past Studies

The studies that have investigated the association between work and nonvocational outcomes for people with SMI have been characterized by several limitations. Some of these shortcomings have already been noted, although more bare mentioning. Specifically, participants in these studies cannot be randomly assigned to a working condition because not all people have the desire or willingness to work and/or they are unsuccessful in finding or keeping a job. Participants cannot be assigned to no work conditions due to ethical concerns surrounding denying these individuals the opportunity to work. Thus, these studies are observational and a causal link between employment and nonvocational outcomes cannot be definitively demonstrated due to threats to internal validity that cannot be completely ruled out, particularly selection bias, or a combination of selection bias and other threats, such as history and maturation (Kazdin, 2003). Given the limitations introduced by the inability to use random assignment, researchers have taken different approaches to circumvent this problem and to investigate the relationship between employment and nonvocational outcomes. Many studies have merely utilized cross-sectional designs, in which employment status and nonvocational outcomes are assessed at one point in time (e.g., Lehman, 1988; Fabian, 1989; Eklund et al., 2004). The key point is that these studies fail to address the issues associated with the lack of random assignment and also face the issue of temporal contiguity; in other words, it cannot be determined whether nonvocational functioning lead to employment outcomes (e.g., fewer symptoms lead to easier employability), or whether employment had an impact on nonvocational outcomes. The methodologically stronger studies in this area use longitudinal prospective designs, in which nonvocational variables are assessed at baseline and across the study at various time points (e.g., Mueser et al., 1997; Bond et al., 2001; Burns et al., 2009). While some threats to internal validity still exist (e.g., history, maturation), these studies help to control for selection bias by statistically controlling for nonvocational functioning at baseline that is found to be related to later vocational outcomes. This strategy allows for more substantive conclusions to be formed regarding the complex relationship between these variables,

although the interpretability of causality is still constrained by the lack of random assignment (Kazdin, 2003).

While these longitudinal prospective studies addressing the relationship between employment and nonvocational functioning for people with SMI are stronger in design as compared with cross-sectional designs, they are characterized by their own set of limitations. For instance, both the Mueser et al. (1997) and Burns et al. (2009) used a control group for between-groups analyses consisting of nonworking participants and their procedure of grouping together any participants who worked any period of time ignored the fine gradations that occur between employment levels; these studies failed to consider that clients who work competitively for an extended period of time and are stable in employment may reap nonvocational benefits that clients who obtain a job and lose it very quickly do not receive. Further, the analytic strategy used in the Bond et al. (2001) study is stronger than the two aforementioned studies, particularly because of their use of more appropriate statistical analyses that properly handle longitudinal data, as well as their use of four comparison groups, including a comparison group with a modest amount of employment during follow-up. However, this comparison group may also be criticized in that this group consisted of persons working in sheltered workshops in a very controlled and restrictive setting, whereas, the use of a comparison group of paid (noncompetitive) working participants in the community, such as at an agency-run business, may be more useful and informative. Additionally, most prospective studies in this area have typically had relatively brief follow-up periods, of 18 months or less (e.g., Mueser et al., 1997). In regards to nonvocational outcome variables, studies have most often addressed subjective outcomes, such as quality of life, while largely ignoring objective outcomes that are no less important to clients (e.g., residential status).

Work and Nonvocational Outcomes Rationale Summary

In the early years following deinstitutionalization, it was thought that people with SMI should avoid work because it would be too “stressful” leading to a worsening of their symptoms. Fortunately, since then, the philosophy of care for people with SMI has shifted to an empowerment model in most circles, in which these individuals are thought

to have the capacity to be contributing members of society. Psychiatric rehabilitation programs have also arisen, in which work is considered a central component of recovery for this group with the strong belief that work has many overarching benefits to the lives of clients, via several different avenues, such as the imposition of daily structure, feelings of competence, and increased opportunities to practice social skills. Since the rise of these programs and supported employment services, studies have begun addressing predictors of employment outcomes, with empirical evidence supporting the importance of prior work history, and to a lesser degree, clinical (e.g., symptoms) and social variables (e.g., social skills). More recently, attention has shifted to empirically addressing work as a predictor of nonvocational outcomes. To date, while several studies support the beneficial link between work and various aspects of social and clinical functioning that are important to the lives of clients with SMI, still others do not. Many of the inconsistencies in findings can be attributed to methodological issues or short follow-up periods, in which changes in nonvocational outcomes are unable to be detected; this is especially problematic given the finding that changes in the functioning of people with SMI typically occurs changes in small increments (Strauss & Carpenter, 1977).

Moreover, considering the tentative link that has been established in prior rigorous studies, this study further explored and identified the association between work and nonvocational outcomes, as a partial replication of Bond et al. (2001). Taking into account the research findings demonstrating the importance of employment type to nonvocational functioning, particularly competitive employment, this study delved more deeply into this issue by addressing subgroups of participants. This typology addressed multiple employment statuses based upon a similar typology was used in the prior study (Bond et al., 2001), improving upon commonly utilized methodologies that merely dichotomize participants into working/not working categories. The study also used a longer follow-up period than most prior studies that were limited to 18 months or less. Furthermore, it was expected that competitive employment would show greater benefit in regards to nonvocational outcomes as compared to less independent forms of employment and the lack of employment. The comparison group of paid, noncompetitive

employment, consistent of participants who worked in agency-run businesses, protected work positions (i.e., work positions that are reserved for people with SMI), and group placements were utilized to shed further light on the relationship between employment and nonvocational functioning. Finally, the inclusion of a “minimal” work group was done to investigate the notion that extended work, rather than mere exposure to work, is necessary to ensure enhanced nonvocational outcomes, as shown in a previous study (Bond et al., 2001).

Given the preceding research questions, theoretical underpinnings, reviews of literature, and the rationale summary, the following hypotheses were formulated *a priori*.

Hypotheses: Work and Nonvocational Outcomes

1. Participants who work an extended period of time in competitive employment will have greater improvements in nonvocational outcomes (listed below) across 24 months as compared with participants who do not work.
2. Participants who work an extended period of time in competitive employment will have greater improvements in nonvocational outcomes (listed below) across 24 months as compared to participants who work a minimal period of time.
3. Participants who work an extended period of time in competitive employment will have greater improvements in nonvocational outcomes (listed below) across 24 months as compared to participants who work an extended period of time in noncompetitive paid employment across the study.
4. There will be no differences in nonvocational outcomes (listed below) between participants who work a minimal amount of time as compared with clients who do not work the study period.

Nonvocational Outcomes:

- Overall quality of life
- Financial quality of life
- Leisure quality of life
- Total Symptoms
- Positive Symptoms

- Negative Symptoms
- Cognitive Symptoms
- Emotional Discomfort Symptoms
- Hostility Symptoms
- Psychiatric Hospitalizations (fewer days of hospitalization)
- Social Networks
- Residential status (more independent living)

The largest effects in nonvocational outcomes are expected between the competitive work group and the no work group, followed by competitive work—minimal work differences, and finally, the smallest effects are expected in regards to competitive work—paid (noncompetitive) work differences. Further, the differences in nonvocational outcomes between participants working extended periods of time in paid (noncompetitive) employment and those who work minimally were investigated in an exploratory manner, given the lack of past research in this area. Similarly, because residential status has seldom been addressed in prior studies as a function of levels of employment among persons with SMI, the current study examined the relationship between these variables in an exploratory manner, with no specific *a priori* hypotheses set forth.

Secondary Research Question: “What are the client predictors of employment outcomes among people with SMI?”

Numerous studies have investigated the predictors of employment outcomes for persons with SMI including demographic and work history variables, as well as social and clinical variables. The following discussion will review key studies and review articles addressing each of these, with particular attention paid to the predictive value of the nonvocational variables that are of primary interest to the current study.

Demographic Variables

While much research has investigated the demographic predictors of employment, such as gender, race, age, education, many findings have been contradictory and few

studies have demonstrated significant relationships. For example, a recent meta-analysis of randomized controlled trials found that gender, race, and age were unrelated to competitive work outcomes for people with SMI participating in supported employment programs, whereas these demographics did show a stronger relationship with employment outcomes for participants in community samples who were not receiving SE services (Campbell, Bond, Drake, McHugo, & Xie, *in press*). However, a multi-site study found these demographics were indeed related to future employment outcomes, specifically, those who were female, Latino, and younger in age tended to have better employment outcomes (Burke-Miller et al., 2006). Another study demonstrated higher unemployment rates amongst a community sample of men with schizophrenia (Bond & Drake, 2008). A noteworthy review of studies cited both evidence supporting gender, race, and age as significant predictors of work outcomes as well as evidence demonstrating a nonsignificant relationship between these demographic variables and employment outcomes (Tsang, Lam, Ng, & Leung, 2000). Similarly, some studies have supported the role of advanced education as a significant predictor of work outcomes (i.e., Nordt, Muller, Rossler, & Lauber, 2007), whereas others have found no relationship (Campbell et al., *in press*). Further, a study addressing residential status, particularly homelessness, in a sample of dually diagnosed inpatients with SMI found that a history of homelessness for at least one year was associated with current unemployment (Leal, Galanter, Dermatis, & Westreich, 1999).

Work history has found to be a more consistent predictor of employment outcomes for community samples of people with SMI and those receiving vocational services as compared to other demographic variables, albeit with modest effect sizes in most studies (Bond & Drake, 2008). For example, Tsang et al. (2000) found in their review of studies that premorbid occupational performance was a significant predictor of post-hospital employment and that people with SMI who had been previously employed had better work skills as compared with persons who had not worked in the past. Other studies have found that a richer work history in the past 5 years leads to better employment outcomes for people with SMI (Burke-Miller et al., 2006; Thompson, Boeringa, Thornby, & Lewis, 1995).

Psychiatric Symptoms & Diagnosis

Many clinical variables play salient roles in the day-to-day lives of people with SMI. For instance, psychiatric symptoms can have a substantial impact on the functioning of this group, and thus, they have been a significant focus of research in regards their effects on the ability to work. One study found that psychiatric symptomatology at baseline and at follow-up periods accounted for a significant proportion of variance in employment outcomes over a substantial period of time in a sample of people with SMI (Rogers, Anthony, Cohen, & Davies, 1997). A recent RCT provided evidence for the important role of symptomatology on the ability to work with the finding that being in remission from severe mental illness was associated with more work subsequently (Catty et al., 2008). Other studies have formed similar conclusions, for example, Razzano et al. (2005) found that psychiatric symptoms were associated with increased difficulty in obtaining competitive employment and a lower likelihood of working 40 or more hours per week. Michon, Weeghel, Kroon, and Schene (2005) also found that severity of psychiatric symptoms was related to employment outcomes for clients in vocational rehabilitation programs, but to a lesser degree than other predictors (i.e., work performance). When looking more closely at the nature of psychiatric symptoms, studies have found that the findings vary according to the type of symptoms. For instance, McGurk and Mueser (2004) concluded that negative symptoms more so than positive symptoms have an inverse association with supported employment outcomes for people with severe mental illness. This finding has been replicated in other studies, underscoring the link between negative symptoms, such as anhedonia and flat affect, and poor employment outcomes and impaired functional skills in clients with schizophrenia (e.g., Hoffman, Kupper, Zbinden, & Hirsbrunner, 2003). Studies have also found that other symptom types are important in regards to vocational capacity; for example, one investigation found that cognitive disorganization symptoms as measured at baseline in a sample of persons with schizophrenia spectrum disorders enrolled in vocational programs related to poorer work performance 4 months later (Evans et al., 2004). Psychiatric diagnosis has also been extensively addressed in regards to work, with some studies concluding that a diagnosis of schizophrenia is associated with poorer employment

outcomes, while still another review of studies found no significant relationship (e.g., Bond & Drake, 2008; Tsang et al., 2000).

Psychiatric Hospitalizations

In regards to another important outcome for people with SMI, psychiatric hospitalizations, research has also established a link with employment outcomes in various studies. Most research has concluded that number of lifetime psychiatric hospitalizations, as well as recent hospitalizations, have a negative association with a variety of employment outcomes, ranging from the general ability to work and vocational status (Nordt et al., 2007) to more specific outcomes, such as the number of hours worked in a given period and total earnings across time (Razzano et al., 2005; Rogers et al., 1997; Salkever et al., 2007).

Social Variables

Finally, other pertinent variables related to deficits in SMI have also been found to associate with later employment outcomes. For example, a key review of empirical studies has demonstrated an association between better social functioning and enhanced vocational outcomes for persons with SMI engaged in vocational rehabilitation services (Michon et al., 2005). Another review also illustrated a link between social skills and work, such that higher levels of social adjustment, social competence, and ability to communicate were associated with better employment outcomes for people with SMI (Tsang et al., 2000). Similarly, a more recent review of literature concluded that social skills, social functioning, and social integration positively influence the likelihood that a person with schizophrenia will be employed (Marwaha & Johnson, 2004). Results from a study conducted by Mueser et al. (2001) were consistent with these findings, as social functioning at baseline was significantly associated with competitive employment outcomes at the 1-year and 2-year follow-up periods. One qualitative study discussed three ethnographic studies that focused upon persons with SMI. This review found that belonging to social networks (e.g., friendships, family) and actively participating in social groupings for significant portions of one's life is associated with better employment

outcomes and the propensity to put forth initiative to search for work (Alverson, Alverson, Drake, & Becker, 1998).

In summary, studies have demonstrated conflicting findings in regards to the predictors of employment outcomes, especially in regards to demographic variables, such as gender, race, ethnicity, age, and psychiatric diagnosis. The strongest findings have been in regards to symptoms and work history, such that fewer psychiatric symptoms as well as a richer competitive work history predict better employment outcomes for people with SMI. Social functioning has also been shown to relate to vocational outcomes, although studies are relatively few in this area.

Secondary Research Question: “Does enrollment in evidence-based supported employment improve nonvocational outcomes?”

Aside from looking at the association between employment and nonvocational functioning, others have looked at the relationship between the receipt of vocational services, such as the evidence-based Individual Placement and Support (IPS) model, and social and clinical outcomes for people with SMI. The following brief review of literature will discuss key studies that have addressed this research question.

Several randomized controlled trials (RCTs) that compared IPS to other models of vocational services longitudinally provide the strongest evidence elucidating this relationship. For instance, one randomized controlled trial of IPS supported employment compared inner-city participants receiving these employment services with clients receiving more traditional vocational rehabilitation services (“enhanced vocational rehabilitation”) on global functioning, self-esteem, quality of life, days of psychiatric hospitalization, and symptoms. Results indicate that while participants in both vocational groups had enhanced nonvocational outcomes over time, with improvements occurring after the first six months and remaining stable for the following 12 months of the study, the groups did not significantly differ on any outcomes (Drake et al., 1999). Another study found that IPS participants did not significantly differ from a control group on quality of life measures at follow-up (Gold et al., 2006), similarly, Twamley and Narvaez (2008) found that no differences in quality of life between participants receiving IPS

services and those receiving traditional vocational rehabilitation services. Other RCTs have also found no differences between IPS services and other vocational services on a range of nonvocational outcomes (i.e., Mueser et al., 1997; Mueser et al., 2004; Wong et al., 2008). A more recent randomized controlled study comparing IPS to traditional vocational services also found that the groups did not differ in overall nonvocational outcomes over time, however, IPS participants who worked had better social functioning as compared to the control group, although the effect size was very modest (Burns et al., 2009). IPS participants also had fewer psychiatric hospitalizations than participants in the control group. Additionally, it must be noted that one study (a weaker retrospective design) did find an advantage for IPS. Researchers found that clients in the IPS group had a lower number of inpatient psychiatric hospitalizations and psychiatric emergency services visits as compared with the control group receiving traditional vocational services, a finding that was especially strong for participants receiving high intensity mental health services (Henry, Lucca, Banks, Simon, & Page, 2004).

Given the preceding literature reviews in regards to these secondary research questions, the following hypotheses were formulated *a priori*.

Hypotheses: Predictors of Employment Outcomes

5. Prior work history (as assessed at baseline) will be positively related to future employment outcomes across 24 months.
6. Negative symptoms at baseline will be inversely related to future employment outcomes across 24 months.
7. Cognitive dysfunction symptoms at baseline will be inversely related to future employment outcomes across 24 months.
8. Demographic variables including gender, ethnicity, and age will not be significantly associated with employment outcomes across 24 months.

Hypothesis: Supported Employment Services and Nonvocational Outcomes

9. Participants in the IPS supported employment group will not differ from the comparison condition on nonvocational functioning across time.

Given the contradictory findings pertaining to education level, psychiatric diagnosis, past psychiatric hospitalizations, and other symptom domains (e.g., positive symptoms, emotional discomfort symptoms) and their association with future employment outcomes, these relationships were investigated in an exploratory fashion with no specific *a priori* hypotheses.

METHOD

Research Context

The current study was a secondary analysis of data from a randomized controlled trial examining two-year outcomes for clients enrolled in a psychiatric rehabilitation center. The original study, conducted between 1999 and 2004, was longitudinal in design and compared IPS and DPA in terms of employment outcomes, such as job tenure and number of hours worked, non-employment outcomes, such as quality of life, composition and quality of social networks, hospitalization rates, residential status, and symptoms. A more complete description of the study is provided in the main paper (Bond et al., 2007).

Overall Design

The parent study was conducted at an urban psychiatric rehabilitation program, Thresholds, at two day program sites. The final parent sample consisted of 187 participants with SMI who were mostly new admissions to Thresholds. Case managers encouraged new clients who were interested in working to attend two informational sessions about the study led by the research team. Clients then provided informed consent to participate in the study, completed a baseline interview, and were randomly assigned to one of the vocational programs—IPS or a comparison group called the Diversified Placement Approach (DPA), which is described below. At that time, participants began receiving employment services per the tenets of the program model and were followed for two years regardless of employment status. Data pertaining to the main variables of interest, nonvocational outcomes, were collected as follows: symptoms and quality of life were collected semi-annually (6, 12, 18, 24 months), residential status and social network data were collected at 3, 9, 15, 21 months, and hospitalization information was collected at 12 months and 24 months. Data on employment outcomes were gathered quarterly using self report from participants and were corroborated through

agency records and log sheets that were completed by vocational workers serving clients (Bond et al., 2007).

Setting

Thresholds is a large psychiatric rehabilitation agency in Chicago, Illinois. It has a staff of over 700 that provide a full array of services, including employment services, residential services, medication management, case management, and day programming. Thresholds serves over 2000 “members” (i.e., clients) per year, with 800 participating in employment services, resulting in over 1000 job placements. Thresholds has two large sites that provide day programming, Thresholds North and Thresholds South, located in those respective parts of the city.

Sampling

Participants of the parent study were clients over the age of 18 who met the state of Illinois’s criteria for SMI. Most were newly admitted to one of the two day programs at Thresholds North and South. Participants also included other current Thresholds clients who had not received DPA employment services from the agency in the last three months. Other inclusion criteria consisted of an interest in working and a goal of paid employment, attendance to two of the weekly informational sessions about the study, a minimum of 30 days receiving Thresholds services, an absence of competitive employment within the past 90 days, no physical illness that would prevent participation throughout the two years of the study data collection period, client agreement to be excluded from being provided services from the nonassigned vocational program for the duration of the study (2 years), and the willingness to give informed consent to participate in the study. During the 24-month enrollment period, 400 clients were newly admitted to Thresholds (or identified as eligible by virtue of not receiving DPA services) and 296 attended informational sessions about the original study. Two hundred participants were then randomly assigned to the DPA and IPS groups within site (Thresholds North and Thresholds South), with stratified assignment done on the basis of work history (greater than one year of work experience prior to admission to Thresholds

versus less than one year of work experience). After initial study enrollment, 6 participants (4 in the IPS condition, 2 in the DPA condition) out of 200 participants were dropped from the final sample because they were found to be ineligible based on study inclusion criteria. One hundred seventy-one out of 194 participants then completed the final follow-up interview at 24 months and employment outcome data were obtained from 16 other participants, yielding a final employment sample of 187 participants that will be utilized as the primary sample in the proposed study. This final employment sample consisted of 92 participants in the IPS condition and 95 participants in the DPA condition. In regards to study sites, there were 126 participants at Thresholds North and 61 participants at Thresholds South. Follow-up rates for interviews varied according to the time of the interview. Specifically, the interview sample had a reduced sample size because not all participants completed interviews at each follow-up time period.

Vocational Programs

The following sections will review the tenets of the two vocational program models that were utilized in the parent study, the Diversified Placement Approach (DPA), and the Individual Placement and Support (IPS) model.

Diversified Placement Approach

The Diversified Placement Approach (DPA) is a highly regarded employment model of psychiatric rehabilitation. DPA originated out of the clubhouse model and was developed at Thresholds, a psychiatric rehabilitation center in Chicago, Illinois. This model is characterized by an emphasis on paid employment, offering a broad array of employment opportunities, including not only competitive employment, but also sheltered employment, work crews, and agency-run businesses. Clients often begin in a group placement that is less threatening than an individual placement and brings the opportunity to increase vocational outcomes, such as work-related skills, and nonvocational factors, such as social networks. These placements may be permanent or temporary and vary in duration, with job movement made at the discretion of the client and team in accordance with his or her progress, limitations, and the availability of jobs.

In other words, clients typically progress through a series of job placements spanning from a less independent position to a completely independent competitive job at a rate commensurate with factors such as their comfort level, work skills, symptom severity, and transportation availability. However, it is important to note that DPA is flexible enough to allow for movement in the other direction, from more independent to less independent job placements when appropriate. In addition, other noteworthy tenets of DPA include small case loads (15 clients or less), an emphasis on communication between team members, prevocational activities and formal assessment aimed at gauging the client's readiness for work, broad job development that takes advantage of disability hiring initiatives and may involve placing several clients at the same community business, on-the-job training, and indefinite, on-going follow along support (Koop et al., 2004).

Individual Placement and Support Model

The Individual Placement and Support (IPS) model of supported employment was developed by (Becker & Drake, 1993) to be implemented in the services of people with SMI and reviews of randomized control trials have shown it to be a more effective approach in terms of job attainment and retention as compared to other employment approaches (Bond, 2004; Twamley, Jeste, & Lehman, 2003). The components of the model include first and foremost, the integration of mental health treatment with employment services and the goal of competitive employment *only*. Other central principles of IPS include a rapid job search with a de-emphasis on prevocational activities, a focus on client choice and abilities, on-the-job training when necessary, and time-unlimited, ongoing follow along support provided by the vocational worker. On-going follow along support means that the vocational worker will engage in activities with the client, such as the teaching of job tasks, training of co-workers and supervisors addressing effective ways of working with the client, modification of the work environment to meet client's needs and address the limitations set forth by his/her disabilities throughout their tenure at a job. The model also advocates for small caseload

sizes of the vocational worker as well as an emphasis on vocational activities only (as opposed to case management duties) (Bond, 1998).

Procedures

Vocational Worker Characteristics

Study participants received employment services from vocational workers within the two models; IPS staff members were new hires for the purpose of the study and DPA staff were current employees of Thresholds. In the DPA condition, all vocational workers had at least a bachelor's degree and were supervised by senior rehabilitation staff. In the IPS condition, the team included a supervisor and three vocational workers at North and a supervisor and two vocational workers at South. All vocational workers had at least a bachelor's degree and past experience working with persons with mental illness and were supervised by a master's level rehabilitation professional. Additionally, it should be noted that there was staff turnover in the IPS condition; after the initial six months, all staff members at the IPS North site had resigned; there was no additional IPS turnover during the remainder of the study (Bond et al., 2007).

Vocational Worker Training

In the IPS condition, the vocational workers received orientation and were trained on the implementation of the new employment model at the two sites (North and South). Specifically, IPS workers underwent an off-site three-day training including a one day job shadow at an established IPS model site, and received ongoing training and support from IPS specialists throughout the period of the study. In the DPA condition, vocational workers had long been implementing the employment model prior to the study, so no additional training was provided.

Model Implementation

Participants in both the IPS and DPA conditions were eligible for the complete array of Thresholds nonvocational services, including residential services, case

management, medication management, and day programming. Further, the IPS teams were housed in a separate office space from DPA components, in order to protect against between treatment diffusion.

After randomization, each participant in the DPA group was assigned a case manager who provided services throughout the duration of the study in most cases. At this time, participants usually began a brief prevocational assessment in the form of a pre-vocational work crew supervised by a Thresholds staff member. Once participants reached the level of satisfactory prevocational performance, they were offered a variety of placements, such as a position working at an agency-run business or an individual placement, in which they received support from a job coach. Participants seeking independent competitive employment received job development assistance from Thresholds staff and were served by job support team members (i.e., case manager, job coach) while in their community placement. (*See section in Introduction for further description of DPA*).

Subsequent to random assignment, participants in the IPS condition were assigned a case manager at their respective site (Thresholds North or Thresholds South). Per the tenets of IPS, participants were encouraged to pursue competitive employment and a rapid, individualized job search typically began within one month after program enrollment. Once the client obtained a community job, indefinite, ongoing follow along support was provided by the vocational worker. Overall, IPS vocational workers spent the majority of their time in direct service provisions working with clients in the community. Specifically, approximately 50% of their time was spent in job development and job support with the other half of their time spent on various employment related activities, such as collaboration with team members.

Data Collection

All study interviewers received the same initial training and supervision from the project coordinator, including interview observation and ratings to check interrater reliability. In addition, weekly phone calls were also made to monitor on-going interviewer performance and to problem-solve various research issues. At study

admission, all participants underwent a baseline interview in which information pertaining to demographic and clinical history, diagnosis, preference for vocational services, job preferences, employment history, and income status was collected. Participants were paid \$15 for this interview. Participants then completed a job satisfaction checklist two weeks after a job start. Participants in the parent study also underwent brief (15 minute) quarterly interviews either at their home or at Thresholds, in which data pertaining to vocational activities, hours worked, wages, and job satisfaction were collected. If participants could not be located or were unable to participate in this interview for any reason (i.e., incarcerated), attempts were made to locate them through significant others. When necessary, interviews were conducted by telephone, or at the soonest possible time once they became available for a face-to-face interview. Participants were paid \$5 for this short interview. Semi-annual interviews (6, 12, 18, 24 months) were lengthier than monthly interviews (75 minutes), collecting data pertaining to the working alliance, current symptoms, social networks, quality of life, substance abuse, finances, entitlements (i.e., Social Security), and insurance. Participants were paid \$15 for these interviews.

Measures

See Table 1 for a list of nonvocational variables and their measures. See Table 2 for a list of background variables investigated in regard to 24-month employment outcomes.

Quality of Life

An abbreviated version of Lehman's Quality of Life Interview (QOLI) was used to measure quality of life of patients. Abbreviated versions of the QOLI have been widely used to assess quality of life in the population of people with severe mental illness. The version of the QOLI used in the current study was a self-report measure that has thirteen sections consisting of 35 total items, in which participants respond on a Likert scale for all items. Two different Likert scales were used; the first Likert scale ranged from 1, "terrible" to 10 "delighted." This scale was used on items which asked

the participant to respond on how they feel about various aspects of their lives (i.e., “How do you feel about your life in general?”, “How do you feel about: the amount of relaxation in your life?”). The second scale, or the “other relationships” scale, ranged from 1, “not at all” to 5, “at least once a day.” This scale was used on items that addressed the frequency and types of social contacts of participants (i.e., “About how often do you do the following: Visit with someone who does not live with you?” “About how often do you do the following: Spend time with someone who you consider more than a friend, like a spouse, boyfriend, or girlfriend?”). The QOLI assesses objective and subjective quality of life indicators and includes such areas as leisure activities, social relationships, living situations, health, employment and vocational services, and finances. Scoring was performed by adding up scores on all items to obtain a total quality of life score. Additionally, due to the wide heterogeneity in subscales, item scores on each subscale are summed to form subscale totals in order to provide a richer detail of an individual’s quality of life. Further, the current abbreviated version is based upon a core version (143 items) (Lehman, Ward, & Linn, 1982) that has been found to have adequate psychometric properties, including moderate to high internal consistency and test-retest reliability, as well as good construct and predictive validity (Lehman, 1996).

Hospitalization

Number and days of psychiatric hospitalizations during the baseline year (i.e., one-year before study admission) were obtained from participant self-report, case manager reports, client charts, hospital discharge records (available from intake records), and verified through Medicaid claims (for participants who were Medicaid clients). Psychiatric hospitalization data for the 2-year follow-up period were obtained in a similar manner. The days of hospitalization were aggregated to yearly totals.

Symptoms

The Positive and Negative Syndrome Scale (PANSS) (Kay, Fiszbein, & Opler, 1987) was used to assess participants symptoms at baseline, 6 months, 12 months, 18 months, and 24 months. The PANSS is comprised of 30 items with five subscales

including the Positive syndrome (six items), Negative syndrome (seven items), Emotional discomfort (four items), Hostility or poor impulse control (four items), and Cognitive (seven items) (Bell, Lysaker, Beam-Goulet, Milstein, & Lindenmayer, 1994). The administration of the instrument was conducted via a multi-part interview/behavioral observation and the items were rated by a trained clinician on a severity scale ranging from 1 to 7, with “1” representing the absence of an item to “7” representing the extreme presence of an item. For each item and each of the seven rating points, definitional and criterion information are provided. For example, item P1 on the PANSS is as follows: “Delusions. Beliefs which are unfounded, unrealistic, and idiosyncratic. Basis for rating: thought content expressed in the interview and its influence on behavior.” The total PANSS score is obtained by adding up the item ratings on all 30 items (Kay et al., 1987, p. 274). Extensive research addressing the psychometric properties of the PANSS in samples of people with schizophrenia has found the instrument to have good internal consistency, adequate criterion-related validity, good inter-rater reliability at the level of the subscale and lower but adequate inter-rater reliability at the level of the item (Bentsen et al., 1996). While the underlying structure of the symptom clusters has been challenged by various factor analytic studies, it appears to have acceptable construct validity (Kay et al., 1987). Inter-rater reliability for the PANSS was examined in the parent study. Two interviewers conducted independent interviews with a random sample of 71 participants. The intraclass correlation for the total scale was .90. In regards to the subscales, the intraclass correlations were .81 for the Positive syndrome, .63 for the Negative syndrome, .94 for the Emotional Discomfort scale, .54 for the Hostility scale, and .74 for the Cognitive scale (Bond et al., 2007).

Social Networks

Social Network Analysis (SNA) (Diman & McCoy, 1998) was utilized to assess the social networks of participants at baseline, 3 months, 9 months, 15 months, and 21 months. The SNA measures quality and quantity of social networks. The SNA was originally developed by the Thresholds Research Department as a variation of several instruments designed to measure social support and social networks: Social Support

Questionnaire – Short Form (SSQ6) (Sarason, Sarason, Shearin, & Pierce, 1987), Social Support Questionnaire (SSQ) (Sarason, Levine, Basham, & Sarason, 1983), Social Support Behavior Scale (SSB) (Vaux, Riedel, & Stewart, 1987), Perceived Social Support (PSS) (Procidano & Heller, 1983), Social Support Network Inventory (SSNI) (Flaherty, Gaviria, & Pathak, 1983), and Norbeck Social Support Questionnaire (NSSQ) (Norbeck, Lindsey, & Carrieri, 1981). On the SNA, participants were asked to nominate up to 5 persons in their social network as facilitated by the instructions, “The following questions ask about people who provide you with help or support. First, you will list up to five people you know, excluding yourself, who are important in your life at this moment, whether liked or disliked. Some categories of people that other people list are: spouse or partner, neighbor, counselor or therapist, minister/priest/rabbi, other Threshholds member, family or relative, friend, or work or school associate.” Potential nominees included friends, coworkers, family, clergy, mental health staff, etc. in which six follow-up questions were then asked about the nominee in regards to the (1) frequency of contact, (2) amount of companionship offered, (3) satisfaction with companionship offered, (4) ability to count on the nominee to care, (5) satisfaction with ability to count on the nominee to care, and (6) the amount of criticism characterizing this relationship (Rollins, 2002). Participants made ratings on a 1 to 5 Likert scale for most items (e.g., “satisfaction with companionship offered” item: 1—“very dissatisfied” to 5—“very satisfied”). In this study, the SNA had good internal consistency as assessed at baseline (α coefficient=.82) and modest test-retest reliability (r values ranging from .36 to .56) for most items.

Residential Status

Residential status was assessed at baseline, 3 months, 9 months, 15 months and 21 months. Based on client self-report, case manager report, and client charts, participant's residence was obtained and classified according to the following categories: independent living, semi-independent living, institutional living, living with family, and homeless. Independent living refers to living on one's own or with a spouse/roommate with complete independence in daily tasks and responsibilities (i.e., financial management, cooking, etc.). Semi-independent living refers to living in a supervised group home in

which individuals are provided some assistance with daily tasks and responsibilities. Institutional living refers to residence in a structured facility that provides care and significant support in daily activities for the individual, such as a hospital or long-term residential facility. Living with family refers to residing with one's family who provide more than minimal assistance in daily tasks and responsibilities. Homeless refers to the lack of stable and consistent housing, such as living in a homeless shelter or on the streets. The data at follow-up time periods (3, 9, 15, 21 months) were dichotomized into "independent" and "non-independent" categories. Independent living were included the "independent" category and all other classifications were collapsed in the "non-independent" category.

Employment Typology

The employment typology used in the current study was determined using total weeks worked across the 24-month study period. Total weeks worked was used to determine the typology because it is a standard outcome measure that has been used extensively in supported employment research, given the notion that employment for people with SMI tends to be episodic, in which it is most informative to examine employment longitudinally rather than at one point in time (Campbell et al., in press). Total weeks worked has also been found to be highly associated with other important vocational outcomes proxies such as wages earned in past studies of supported employment. For example, Bond et al. (2001) used total wages earned to determine a similar typology and demonstrated that total earnings correlated highly with total hours worked and total weeks worked in order to provide additional support for the determination of the groups. The following section describes the ways in which the four employment groups were determined, including the "no work" group consistent of participants who did not work in any type of paid employment during the study, the "minimal work" group consistent of those participants who worked very little in noncompetitive paid work and/or competitive employment during the 24 month study period, "paid work" consistent of those participants who worked extensively in non-competitive paid employment positions (i.e., agency-run businesses, group placements,

sheltered workshops) for the majority of the total weeks they worked across the study (as opposed to competitive work positions), and the “competitive work” group consistent of those participants who worked extensively in competitive job positions for the majority of the total weeks they worked across the study (as opposed to noncompetitive paid work positions).

Across 24 months, 42 participants did not obtain paid or competitive work, comprising the “no work” group. The remaining 145 participants worked during the study period, comprised of 43 participants who worked in non-competitive paid work only, 78 participants who worked in competitive employment only, and 23 participants who worked in both non-competitive paid employment and competitive employment at some point during the 24-month study period. In regards to all working participants (N=145), they worked a mean of 47.67 weeks (SD=35.03) weeks) with a large range of 103.86 weeks. Due to this considerable range in weeks worked in addition to important differences that may exist between clients who worked minimally compared with clients who worked extensively, these clients will be split into the “minimal work” group, the “paid work” group, and the “competitive work” group, a method that is consistent with that used by Bond et al. (2001). Upon close examination of the frequency distribution for total number of weeks worked in any paid employment (competitive employment and noncompetitive, paid employment), it appears as if there is a sharp division between those participants who worked 24 weeks or more (N=97) and those participants who worked less than 24 weeks (N=48) across the study. Specifically, the group who worked greater than 24 weeks in any paid employment had a mean of 70.86 weeks worked (SD=38.98), whereas the group who worked less than 24 weeks across the study had a mean of 9.68 weeks worked (SD=6.92). These extensively working participants (greater than 24 weeks) worked significantly more weeks in any paid employment (competitive work and noncompetitive paid work) as compared with the minimally working participants (less than 24 weeks), $t(142)=-14.98$, $p=.00$. The benchmark of 24 weeks worked was also chosen because it represents 6 months worked out of the 24-month study follow-up period. Therefore, these 48 participants who worked little (less than 24 weeks) comprised the “minimal work” group. Of the remaining 97 participants who

worked “steadily” – defined as 24 weeks or more –) during the study period, they were sub-divided into “paid work” and “competitive work” groups. Specifically, 30 of these 97 participants worked only in noncompetitive paid employment and were included in the “paid work” group. Forty-nine of these 97 steady workers worked only in competitive employment, comprising a portion of the “competitive work” group. The remaining 18 of these 97 steady workers worked in both paid noncompetitive employment and competitive employment during the study period. Decisions were then made based on total weeks worked in each employment category in order to place these 18 “mixed employment” participants into the correct group, either noncompetitive “paid work” or “competitive work.” Specifically, because 8 of these 18 participants worked the majority of the time in noncompetitive, paid employment ($M=49.11$ weeks, $SD=13.39$ weeks) rather than competitive employment ($M=7.25$ weeks, $SD=8.36$ weeks), they were placed into the noncompetitive “paid work” group, and conversely, because the remaining 10 participants worked primarily in competitive employment ($M=70.61$ weeks, $SD=83.81$ weeks) as opposed to noncompetitive, paid employment ($M=6.76$ weeks, $SD=12.57$), they were placed into the “competitive work” group. Overall, the “paid work” group ($N=38$) worked a mean of 66.82 weeks ($SD=27.10$ weeks) in paid (noncompetitive) employment positions and similarly, the “competitive work” group ($N=59$) worked a mean of 71.33 weeks ($SD=45.25$ weeks) in competitive employment positions.

In summary, the final employment groups included 42 participants (22.4%) in the “no work” group, 48 participants (25.7%) in the “minimal work” group, 38 participants (20.3%) in the noncompetitive “paid work” group, and 59 participants (31.6%) in the “competitive work” group. Further, the employment typology groups did significantly differ in regards to vocational program, $\chi^2(3)=4.04$, $p=.00$; the majority of the competitive work group was comprised of IPS participants, whereas the majority of the paid work group was comprised of DPA participants, as consistent with the program models.

Statistical Design

Power Analysis

Comparable studies in the area of work and nonvocational outcomes over time have found large effect sizes for quality of life dimensions more closely related to employment ($ES=.80$), as well as moderate to large effect sizes in regards to symptom change between clients working in competitive employment and clients working minimally or not at all (effect sizes ranging from=.28 to .55) (e.g., Bond et al., 2001). Given a moderate to large effect size and an alpha level set at .05, in regards to end point analyses, power in the current study was above .90 for pairwise comparisons of the “competitive work” group ($n=59$) with the “no work” group ($n=42$) and the “minimal work” group ($n=48$) (Lipsey, 1990). Further, the studies that have demonstrated significant improvements in psychiatric hospitalization rates and social functioning associated with employment have gleaned small effect sizes (Bell et al., 1996; Burns et al., 2009). In regards to residential status, few known studies have examined the relationship between this variable and work, thus, any significant relationships found between the employment groups and these nonvocational outcomes in the current study were hypothesized to be of a modest effect size. Given small effect sizes, in regards to end point analyses and an alpha level set at .05, power in the current study would be approximately .30 for comparisons between the “competitive work” group ($n=59$) and the “no work” group ($n=42$) as well as the “minimal work” group ($n=48$) in regards to hospitalization and residential outcomes (Lipsey, 1990).

Moreover, it is important to note that the use of mixed effects regression modeling (*described further in the section below*) yielded higher statistical power than the use of simple end point analyses, however, conducting a formal power analysis was difficult for this complex statistical technique. It must also be noted that effect sizes and therefore power may have been affected by the comparison groups utilized, with the greatest effects expected between participants in the competitive work group when compared with participants in the no work group, yielding higher statistical power in regards to the main analyses. Conversely, smaller effect sizes were expected when comparing the

competitive work group with the paid work group on nonvocational outcomes, yielding somewhat lower statistical power.

Preliminary Analyses

Descriptive statistics including frequency distributions, histograms, boxplots, scatterplot matrices, homogeneity tests, and residual plots were produced to characterize the data and evaluate adherence to the assumptions of the parametric tests, particularly normality of distributions and homogeneity of variance. The nonvocational variables of symptoms, quality of life, and social networks were relatively normal, thus no further action was needed. In regards to psychiatric hospitalizations, the data was very skewed, thus the data were dichotomized and logistic regression analyses were used (See next section for further information). Exploratory analyses were also used to identify missing data pertaining nonvocational outcomes. Missing data pertaining to the four employment typology groups are shown in Table 19.

Baseline Predictors of Employment Outcomes

The relationships between variables collected at baseline and 24-month vocational outcomes were investigated. The employment outcome addressed was the total number of weeks in all paid employment (sum of weeks in competitive and noncompetitive employment). The relationship between age and the total weeks of all paid employment was assessed using zero-order correlations. T tests for independent groups were used to determine differences in employment for dichotomous variables: vocational programs (IPS/DPA), site (Thresholds North, Thresholds South), gender, and work history variables (participant who had worked competitively in the past, participant had not worked competitively in the past). Analyses of variance (ANOVAs) was used to determine differences in employment for non-dichotomous nominal variables: ethnicity, psychiatric diagnosis, educational attainment, and marital status as assessed at baseline. Zero order correlations were used to determine the association between total weeks in any paid employment and clinical variables assessed at baseline: total symptoms, symptom dimensions (i.e., positive, negative, cognitive, emotional discomfort, hostility),

overall quality of life and quality of life facets (i.e., financial quality of life, leisure quality of life), prior psychiatric hospitalizations, and social networks.

Nonvocational Differences Between IPS and DPA

The differences between vocational programs (IPS, DPA) on nonvocational outcomes across the study (i.e., at each follow-up period) were investigated using t-tests for independent means in regards to continuous outcome variables, including symptoms (PANSS total scores and symptom subscales), quality of life (overall quality of life and quality of life dimensions), and social networks. To determine differences between IPS and DPA on the variable of residential status (i.e., independent living, nonindependent living) at measurement periods across the study, chi square analyses were utilized due to the categorical nature of the variables. More detailed descriptive analyses were then performed in order to characterize the housing/residential status of IPS and DPA participants at follow-up time periods throughout the study, i.e., the residential variable was not collapsed. Further, chi square analysis was used to assess differences in hospitalization rates (0 days of hospitalization; 1 or more days of hospitalization) due to the skewed sampling distribution. All p significance levels were set at .05, two-tailed.

Main Analyses: Employment Typology and Nonvocational Outcomes

In order to test the hypotheses and to determine the relationship between employment (independent variable) and continuous, normally distributed, nonvocational outcomes (dependent variable), mixed effects regression (MER) modeling was used using the “SPSS 16.0” MIXED procedure (Peugh & Enders, 2005). This statistical technique is standard in this area of research and has been utilized in similar studies addressing employment and nonvocational outcomes longitudinally (e.g., Bond et al., 2001). Restricted maximum likelihood was used as the analytic technique in MER, as it is widely used to analyze this type of repeated measures, nested data (Tabachnick & Fidell, 2006). In regards to the longitudinal nature of the data, participant data was collected at multiple time-points throughout the study, hence, measurement occasions (level 1) were nested within participants (level 2). Further, mixed effects regression

analyses determined the rate of change in nonvocational outcomes amongst the employment groups (“no work,” “minimal work,” “noncompetitive paid work,” “competitive work”) across time, as well as differences that existed between the groups at baseline. Baseline between-groups differences were determined through estimation of intercepts, whereas differences in the rate of change over time were determined through estimation of slopes, allowing the groups to be compared longitudinally, independent of baseline differences that may have existed. That is, if baseline differences were found between the employment typology groups at baseline, these were controlled for when looking at differences in the rate of change over time. There were separate mixed-effects regression analyses run for each nonvocational continuous outcome variable, including total symptoms and symptom dimensions (i.e., positive symptoms, negative symptoms, cognitive dysfunction, emotional discomfort, hostility), overall quality of life and quality of life dimensions (i.e., financial quality of life, leisure quality of life), and social networks. Due to the constraints imposed by the use of a categorical predictor variable in MER modeling, three models were run for each outcome variable in order to compare all four employment typology groups with one another, in accordance with *a priori* hypotheses set forth. Specifically, this method allowed the competitive work group to be compared with the no work group, the minimal work group, and noncompetitive paid work group (hypothesis testing). This method also compared groups in which there were no *a priori* hypotheses put forth, for instance, a comparison of the noncompetitive paid work group with the minimal work group and no work group (exploratory testing). Three dummy variables were created. The matrix of group-wise comparisons is presented in Table 3. In the first model, the no work group was the comparison group; in the second model, the minimal work group was the comparison group, and so on. Additionally, the interaction between employment typology groups and time was included as a fixed effect in all models. Confounding variables were only included in the models if they were to be found to be significantly related to nonvocational outcomes in prior analyses. Specifically, vocational program (i.e., IPS, DPA) was included in the model explaining social networks and financial quality of life, as IPS and DPA differed on these outcomes at some follow-up time periods (see Table 10).

It should be noted that MER modeling was utilized in the current study because it has several advantages over other statistical techniques that could have been used to analyze the data. Specifically, this technique incorporates more information and uses all available data in contrast to repeated measures techniques that often require listwise deletion of participants with missing data. While repeated measures techniques (e.g., repeated measures analysis of variance) simply account for fixed effects, mixed effects regression considers fixed effects, random effects, and the correlated nature of the repeated measures data. Additionally, mixed effects regression uses all follow-up data points, rather than simply looking at the final end point (i.e., 24 months), which increases statistical power and reliability. Finally, this technique has more flexible statistical assumptions in comparison with the rigid assumption of a repeated measures ANOVA that are often times violated.

Because residential status (housing) is a categorical variable, logistic regression was used to determine the relationship between work and this variable at each time period (3, 9, 15, and 21 months), in which employment group categorization was the independent variable and residential status was the dependent variable. Residential status was collapsed into two categories: independent living and nonindependent living. Further, study site and vocational program were considered as possible confounds and were entered in at the first step of the sequential logistic regression model. It was thought that study site may have an effect on residential status because the north and south sides of the city (where the two study sites were located) have different economic character and thus the possibility exists that participants being served at Thresholds South (poorer economic conditions) may have had a higher rate of homelessness and nonindependent living.

The investigation of the hypotheses regarding psychiatric hospitalizations was also conducted using logistic regression analyses. The decision to use this non-parametric test was made because preliminary analyses revealed a skewed sampling distribution, precluding the use of mixed effects regression analyses. Specifically, a sizable portion of the sample had no days of hospitalization across the study. The psychiatric hospitalization variable was collapsed into two categories: 0 days of

hospitalization and 1 or more days of hospitalization. Because preliminary analyses revealed that severity of psychiatric symptoms (i.e., total PANSS score) at baseline was significantly negatively correlated with the number of hospitalizations in the year prior to the study, PANSS total score at baseline was considered to be a confound and controlled for in main analyses.

Significance (p) levels were set at .05 (two-tailed) for all hypothesis testing. Characterization of effect sizes were made according to the standards set by Cohen (1992), with $d=.20$ representing a small effect size, $d=.50$ representing a medium effect size, and $d=.80$ representing a large effect size.

RESULTS

Sample Descriptive Statistics

Demographic and clinical characteristics of the four work groups are reported in Table 4. In the total sample, the majority of participants received employment services at Thresholds North (67.4%), 63.6% were male, and approximately 87% were white or African American. The sample was heterogeneous in regards to diagnosis, with the majority having a schizophrenia-spectrum disorder (56.1%) and most of the remainder with a mood disorder (41.2%). Participants had a mean age of 38.9 years, most participants had a high school education or above (82.4%), and the majority had never been married (74.3%). Most participants worked in a paid job in the five years prior to study admission (74.9%), and 71.1% had worked in prior competitive employment for at least 12 months.

Demographic Differences Between Employment Typology Groups

The employment typology groups (no work, minimal work, paid work, competitive work) did not significantly differ in regards to study site, $\chi^2(2)=4.33$, gender, $\chi^2(1)=.64$, race, $\chi^2(3)=4.84$, psychiatric diagnosis, $\chi^2(3)=1.55$, or work history in regards to at least 12 months of prior competitive employment, $\chi^2(3)=2.87$. The employment typology groups differed according to age, $F(3,183)=3.37$, $p=.02$, such that the no work group ($M=41.90$, $SD=8.47$) had a significantly higher mean age than the minimal work group ($M=35.71$, $SD=9.49$). There were no other significant differences between the groups based upon age. The groups also significantly differed in regards to educational background, $\chi^2(3)=7.84$, $p=.049$. Specifically, the no work group had a higher percentage of participants who had not completed high school (30.95%) as compared to the paid work (10.5%) and competitive work (11.9%) groups. Further, the competitive work group had a significantly higher percentage of participants who had never been

married (86.4%) as compared with the other groups, $\chi^2(3)=8.31$, $p=.04$. Finally, the groups differed according to work history, such that the competitive work group (84.8%) had a higher percentage of participants who had participated in prior paid employment in the last five years as compared with the no work (59.5%), $\chi^2(3)=8.36$, $p=.04$.

Baseline Predictors of Employment Outcomes

Demographic and Work History Variables

The following results are presented in Tables 5 and 6. As shown in Table 6, there were no significant differences between participants on total months of paid employment at 24 months based upon their gender, racial/ethnic classification, psychiatric diagnosis, residential status, or prior work history as measured by the sum of paid weeks worked during the five years prior to the study. As displayed in Table 5, age also was not significantly correlated with total months of paid employment at 24 months. However, total weeks worked in all paid employment (competitive and noncompetitive paid jobs) did differ according to past education, such that those participants who completed some college or an associate degree worked significantly more weeks than participants who did not graduate high school. Also, participants who had a paid job at some point during the five year period prior to the study worked significantly more total weeks in all paid employment (competitive and noncompetitive paid jobs) during follow-up as compared with those who had no work history. Similarly, participants who had worked in a competitive job for at least 12 months at some point in the past worked significantly more total weeks across the study period. In summary, demographic variables were not significantly related to total weeks worked across the study, with the exception of educational background. In addition, both paid and competitive work history variables were significantly associated with this employment outcome.

Quality of Life, Clinical Variables, and Social Variables

As seen in Table 5, baseline variables of overall quality of life, financial quality of life, leisure quality of life, PANSS emotional discomfort factor score, PANSS negative factor score, and social functioning were not significantly correlated with total weeks work in all paid employment across the study. PANSS total score, PANSS positive scores, PANSS cognitive scores and PANSS hostility scores as assessed at baseline were significantly negatively correlated with total weeks worked, as was the number of psychiatric hospitalizations during the year prior to the study. These significant correlations were characterized by small effect sizes for all variables, with the exception of the correlation with cognitive symptoms, which was characterized by a medium effect size.

Vocational Programs (IPS and DPA) and Nonvocational Outcomes

As seen in Table 7, the IPS and DPA groups did not differ on symptoms (PANSS total score, PANSS symptom subscales), overall quality of life, leisure quality of life, and the number of psychiatric hospitalizations at baseline or at any time period across the study. Participants in the IPS group had significantly better financial quality of life as compared with the DPA group at 6 months, whereas no differences were found between the groups on this variable at the other time periods (baseline, 12, 18, 24 months). The IPS group also showed an advantage in regards to social networks with significantly higher total scores on the social network analysis as compared with the DPA group at baseline and at 3 months. No significant difference in total social network scores between the employment groups were found at the later time periods including 9, 15, and 21 months. Finally, IPS and DPA did not differ according to residential status as a dichotomous variable (i.e., independent living/nonindependent living) at baseline, $\chi^2(1)=2.36$, $p=.12$; 3 months, $\chi^2(1)=1.70$, $p=.19$; 9 months, $\chi^2(1)=.22$, $p=.64$; 15 months, $\chi^2(1)=1.08$, $p=.30$; or 21 months, $\chi^2(1)=.46$, $p=.50$. A more nuanced descriptive analysis of residential status across the study period according to vocational program is presented in Table 11.

In summary, assignment to vocational program largely did not affect nonvocational outcomes across the study.

Work and Quality of Life Outcomes

Overall Quality of Life

As shown in Table 13 and Figure 1, the pattern of scores across time is variable across the three work groups and the no work group. As seen in Table 14, the time variable was significant, as there were changes (i.e., improvements) in overall quality of life scores across the study period for the full sample. However, the employment group variable was not significant, as the employment groups did not differ in quality of life across time. The interaction variable between time and employment typology was also not significant, indicating that the groups did not significantly differ in their linear trajectory of scores across time.

Financial Quality of Life

As seen in Table 13 and Figure 2, the pattern of quality of life scores across times suggests that all groups of participants reported improved financial quality of life, i.e., participants were increasingly satisfied with the amount of money they were earning as time progressed through the study, with a slight drop-off in scores at the 24-month follow-up period. As shown in Table 14, consistent with this graphical pattern, time was significant, as financial quality of life scores did significantly change (i.e., increase) across time. After controlling for the confound of vocational program (i.e., IPS, DPA), the employment typology variable was not significant in the model and no significant interactions between variables were found. The employment typology variable was still not significant when vocational program was not controlled for in the model.

Leisure Quality of Life

As seen in Table 13 and Figure 3, the pattern of leisure quality of life scores was variable across time. In all, the work groups (i.e., minimal work, noncompetitive paid work, competitive work) tended to report better leisure quality of life from baseline to the 24-month follow-up, whereas the no work group reported poorer leisure quality of life across time, although these trends were not statistically significant. As shown in Table

14, time was not significant, as scores did not significantly change across the study period. There were also no significant differences between employment typology groups, nor was a significant interaction found between time and the employment typology variable.

Work and Clinical Outcomes

PANSS Total

Table 13 and Figure 4 illustrate the variable pattern of PANSS total scores across employment groups. As seen in Table 14, time was not significant, i.e., symptom scores did not significantly change across the study period for the full sample. The interaction between time and the employment typology variable was not significant, indicating that the employment typology groups did not differ in their trajectory of symptoms across time. Further, main effects were found for the employment typology group variable, such that the competitive work group had fewer symptoms as compared with the no work group $t(182.08)=-2.83$, $p=.01$, $d=.42$ and the minimal work group, $t(169.65)=-2.63$, $p=.02$, $d=.40$. As seen in Table 18, the competitive work group had lower symptomatology at 6 months, 12 months, 18 months, and 24 months as compared with the no work group. In comparison with the minimal work group, the competitive work group had fewer symptoms at baseline.

PANSS Positive Subscale

As displayed in Table 13 and Figure 5, the pattern of PANSS positive subscale scores is also quite variable across time and across employment typology groups. As shown in Table 14, time was not significant, as PANSS positive subscale scores did not significantly change across the study period. The interaction between time and the employment typology variable was also not significant, indicating that the groups did not significantly differ in their trajectory of positive symptoms across the study. However, the employment typology variable was significant in the regression model, such that the competitive work group had fewer positive symptoms as compared with the no work

group, $t(183.23)=2.83$, $p=.01$, $d=.42$. The noncompetitive paid work group also had fewer positive symptoms as compared with the no work group, $t(181.11)=3.15$, $p=.00$, $d=.47$. As seen in Table 18, in comparison with the no work group, the competitive work group had lower positive symptomatology at 6 months, 12 months, and 18 months. The paid work group had fewer positive symptoms than the no work group at 12 months.

PANSS Negative Subscale

As displayed in Table 13 and Figure 6, the pattern of PANSS negative subscale scores varied across employment groups. Specifically, the competitive work group tended to have reduced negative symptoms across the study, whereas the no work group had increased negative symptoms across the 24-month study period. The minimal work group and paid work group had variable patterns of negative symptom scores across time. As shown in Table 14, time was not significant in the regression model, nor was a significant main effect found for the employment typology variable. However, a significant interaction was found between the employment typology variable and time. Consistent with the graphical pattern described above, the competitive work group showed accelerated improvement (i.e., a decrease) in negative symptoms as the study progressed, as compared with the no work group, $t(167.03)=-2.85$, $p=.01$, $d=.44$. No other significant interactions between employment typology groups and time were found.

PANSS Cognitive Subscale

As displayed in Table 13 and Figure 7, the pattern of PANSS cognitive subscale scores is variable across time; however, it is evident that participants in all four employment groups had a reduction (of varying degrees) in cognitive symptoms from the baseline assessment to the 24-month follow-up. As shown in Table 14, consistent with this graphical trend, time was significant, as PANSS cognitive scores significantly declined across the study period for the full sample. However, the employment typology groups did not significantly differ in PANSS cognitive scores, nor was a significant interaction between time and the employment typology variable found, i.e., the groups did not differ in their linear trajectory of cognitive scores across time.

PANSS Emotional Discomfort Subscale

As displayed in Table 13 and Figure 8, the pattern of emotional discomfort symptoms is variable across time and across employment typology groups. As seen in Table 14, time was not significant, as scores did not significantly change across the study. Employment typology groups did not significantly differ in PANSS emotional discomfort scores, nor was a significant interaction between time and the employment typology variable found.

PANSS Hostility Subscale

As displayed in Table 13 and Figure 9, the pattern of hostility symptoms is also quite variable across time and across employment typology groups. As seen in Table 14, the time variable was not significant, as PANSS hostility scores did not significant change across the study period. Employment typology groups did not significantly differ in PANSS hostility scores, nor was a significant interaction found between time and the employment typology variable.

Work and Psychiatric Hospitalization

Frequencies and percentages pertaining to psychiatric hospitalizations for each employment typology group at each follow-up time period are presented in Table 11. As displayed in Table 11 and Figure 10, the general trend of the data indicates that participants in the three work groups reduced their rates of psychiatric hospitalization as the study progressed, in contrast to participants in the no work group who did not show this decline in psychiatric hospitalizations across time. As seen in Table 12, the overall model of two predictors (PANSS total scores at baseline, employment typology) did not significantly explain the days of psychiatric hospitalization in the year prior to the study. The employment typology groups did not significantly differ in regards to this variable at baseline. At the 12 month follow-up, the overall model of variables also did not significantly predict hospitalizations. However, the employment typology variable was significantly associated with hospitalizations. Specifically, the competitive work group and minimal work group were significantly more likely to have no days of hospitalization

as compared with the no work group during the first 12 months of the study. During the second 12 months of the study, the overall model of predictors did significantly predict hospitalizations. PANSS total scores (as assessed at 12 months) significantly contributed to the model explaining this outcome. Similar to the first follow-up period, the employment typology groups differed, such that the competitive work group and the minimal work group were significantly more likely to have no days of hospitalization as compared with the no work group during the second 12 months. Across the entire 24 month study period, the model significantly predicted the days of psychiatric hospitalization. PANSS total scores averaged across the study significantly associated with the likelihood of hospitalizations across the study. In regards to employment typology groups, the competitive work group was more likely to have no hospitalization days as compared with the no work group across the entire 24 month study period.

In summary, the competitive work group had an advantage in regards to psychiatric hospitalizations at several follow-up time periods, including 24 months. Further, the minimal work group was also less likely than the no work group to have hospitalizations at isolated follow-up periods.

Work and Social Outcomes

As shown in Table 13 and Figure 11, an examination of the pattern of social network scores across time suggests that participants tended to report higher quality of social networks across semi-annual measurement periods, with a general plateau in scores reached by 18 months. Consistent with this graphical pattern, as seen in Table 14, time was significant, as social network scores did change (i.e., they generally improved) across the study period. After controlling for the confound of vocational program (IPS, DPA), the employment typology variable did not significantly explain the improvement in social networks scores across time. The employment typology variable was still not significant when the confound of vocational program was not considered in the model. However, a significant interaction was found between employment typology variable and time. Specifically, the noncompetitive paid work group showed accelerated growth in social

network scores as the study progressed, as compared with the other groups, including the no work group, $t(162.90)=-2.49$, $p=.01$, $d=.39$, the minimal work group, $t(163.09)=-3.06$, $p=.00$, $d=.48$, and the competitive work group, $t(154.78)=-2.95$, $p=.00$, $d=.47$.

Work and Residential Status

Frequencies and percentages pertaining to residential status for each employment typology group at each follow-up time period are presented in Table 9. As displayed in Table 9 and Figure 12, the overall trend of the data is variable across time. A higher percentage of participants were living independently at the 24 month follow-up, with the sharpest increase in the number of participants living independently evident after 3 months in the minimal work group, paid work group, and competitive work group. As seen in Table 10, the overall model of predictors (site, vocational program, employment typology groups) did not significantly associate with residential status at baseline and independently, none of the three variables, including employment typology were significantly associated with this residential status at baseline. The model of three predictors also did not significantly predict residential status at 3 months and again, none of the predictors were significant in relationship to residential, including the employment typology group variable. At the 9 month follow-up period, the overall model of predictors did significantly predict residential status. The employment typology variable was significant in the model, specifically, the minimal work group were more frequently living independently as compared with the no work group. At the 15 month follow-up period, the overall model of predictors did not significantly predict residential status and none of the variables significantly predicted residential status at 15 months, including the employment typology variable. Similarly, at the 21 month follow-up period, the overall model of predictors did not significantly predict residential status. The three variables in the model, including the employment typology, were not independently significant.

DISCUSSION

Conclusions Regarding Work and Nonvocational Outcomes

The purpose of this study was multifold. First, the primary purpose was to determine the relationship between employment and nonvocational functioning across 24 months in persons with SMI newly enrolled in vocational programs. The foundation for this research question was set by prior research and theoretical positions that suggest that work may lead to a greater sense of life meaning and purpose that translate into improvements in nonvocational domains of life. Conversely, some studies have found that it is not *working* that leads to improved outcomes, but rather, it is *not working* that leads to decline in clinical and social functioning (e.g., Bond et al., 2001). Given this reasoning, it was expected that the work groups, particularly the competitive work group, would have better functioning as compared with those who did not work or only worked a minimal period of time. In addition, it was hypothesized that the normative experience and financial advantage of working competitively in integrated settings in the community would be associated with personal benefits not seen in paid, noncompetitive work. Thus, it was also expected that the competitive work group would have enhanced nonvocational outcomes as compared with the paid work group.

These hypotheses were only partially supported; in general, findings were mixed. Specifically, contrary to *a priori* hypotheses, no differences were found between employment typology groups in regards to overall quality of life, financial quality of life, leisure quality of life, symptoms of emotional discomfort, cognitive symptoms, or residential status. In other words, there was no evidence to support the notion that working individuals were more satisfied with their lives, leisure activities, or finances, experienced less affective symptoms (e.g., depressive symptomatology), lesser cognitive symptoms, or were living more independently than participants who did not work a substantial portion of time in competitive employment over a two-year period.

Moreover, the relationship between work and cognitive symptoms is worthy of note, as cognitive problems are a particularly debilitating consequence of SMI (Rund, 1998). In this study, it was reasonable to hypothesize that work itself may lead to benefits in cognitive symptoms, as cognitive skills are utilized and practiced on the job. While this hypothesis was not confirmed, it was evident that the full sample experienced lesser cognitive symptoms over time. In other words, both participants who worked and those who did not experienced significant improvements in cognitive symptoms. It is possible that the mere receipt of psychosocial rehabilitation services led to the amelioration of cognitive symptoms, although this explanation is speculative. In addition, it is unclear as to which aspect of the receipt of rehabilitation services may have led to this benefit. Thus, it is imperative the future research focus upon this area to best understand the relationship between vocational and other rehabilitation services and cognitive symptomatology of clients.

Important differences between employment groups were found in regards to PANSS negative scores, with an advantage for the competitive work group. These results are consistent with the *a priori* hypotheses set forth; the competitive work group showed an accelerated *improvement* in negative symptoms across time compared with the no work group. In contrast, the no work group had worsening negative symptoms across time. These differences were characterized by medium effect sizes. In other words, it appears as if extended competitive employment was associated with improved negative symptomatology across time, as consistent with Burns et al. (2009), whereas, those who did not work *deteriorated* in regards to this symptom domain, as consistent with findings of Bond et al. (2001). In regards to total symptoms and positive symptoms, the competitive work group had fewer symptoms as compared with the no work group at the beginning of the study and these differences were maintained over time. Given the ambiguous temporal sequence, the direction of causality cannot be established; it is unclear whether competitive work contributed to stable symptoms over time (and the lack of work contributed to more severe symptoms over time). This interpretation is consistent with findings of past studies addressing the relationship between work and symptomatology longitudinally (e.g., Mueser et al., 1997; Bond et al., 2001). However, it

may be that individuals with more serious symptoms at the beginning of the study had difficulty finding and maintaining employment over time. Thirdly, this relationship may be a feedback loop in which fewer symptoms make finding and keeping a job easier and in turn, the process of working may then protect against worsening symptoms.

In addition, the findings from this study suggest that the competitive work group was less likely to have psychiatric hospitalization days as compared with the no work group in the first year of the study, the second year of the study, and across all 24 months, similar to the findings of Burns et al. (2009). The noncompetitive paid work group did not demonstrate the same advantage. These are very important findings, especially since no differences were found between employment typology groups at the baseline assessment, which assessed for days of psychiatric hospitalization in the year prior to the study. These findings tentatively suggest that time spent in extended periods of competitive employment may help to protect against subsequent psychiatric hospitalizations. Practically, these findings are important in regards to the problem of “revolving door” hospitalizations, which describes the frequent inpatient hospitalizations that plague the SMI population. This study provides preliminary support for the assertion that this problem may be partially ameliorated by helping people with SMI to attain and keep competitive jobs in the community. This notion is supported by findings from a recent study that suggested a relationship between steady competitive employment obtained with the assistance of supported employment services and lower mental health service utilization costs, partially comprised of inpatient hospitalization costs (Bush, Drake, Xie, McHugo, & Haslett, 2009). Additionally, the current study found that the minimal work group was significantly less likely to have hospitalization days as compared with the no work group in the first year of the study and in the second year of the study. This set of findings is more difficult to interpret. Future research is needed to replicate this finding and better understand the relationship between employment and psychiatric hospitalizations for those who work only a short period of time.

Further, all of the employment groups demonstrated a significant improvement in social networks across the 24-month study period. Again, it is possible that the mere receipt of rehabilitation services played a role in this outcome. For instance, participation

in services at the rehabilitation center on a frequent basis likely provided opportunities for participants to meet new people and enhance their social networks (e.g., increased quantity of social networks). In regards to the employment typology groups, the noncompetitive, paid work group showed accelerated improvement in social network scores across the study, as compared with the other groups. However, as noted previously, the average social network score for the paid work group was much below that of the other groups at the baseline assessment. The accelerated improvement in scores at subsequent follow-up time periods may reflect a regression toward normative levels, already achieved by that of the other groups.

Conclusions Regarding the Predictors of Employment Outcomes

This study also aimed to identify the baseline correlates of vocational outcomes across time; this research question is important to answer in order to identify factors that may lead to vocational success and/or failure in a population that is extremely vulnerable to deficits in important areas of vocational functioning, as individuals often experience difficulty obtaining and maintaining employment. Prior studies have found that work history (Bond & Drake, 2008), as well as psychiatric symptomatology (i.e., negative and cognitive symptoms in particular) (McGurk & Mueser, 2004) are important predictors of vocational outcomes, whereas demographic variables (e.g., gender, ethnicity, age, diagnosis) are not strong predictors (e.g., Campbell et al., *in press*). The *a priori* hypotheses put forth were partially consistent with these findings. Demographic variables were largely not associated with the total amount of time worked, whereas richer competitive and paid work histories were associated with better vocational outcomes across the study. Education attainment was also related to enhanced employment outcomes across time, such that those who had completed some college, worked more weeks across the study as compared with those who had not completed high school. This relationship is consistent with the pattern found in the general population, in which there seems to be a positive relationship between education level and vocational achievement (United States Census Bureau, 2003). These findings also have implications

for the area of supported education, which strives to assist persons with SMI in achieving postsecondary education goals (Corrigan et al., 2007).

In regards to clinical history, this study found that persons with fewer positive and total psychiatric symptoms at baseline worked more weeks over time, albeit with somewhat modest effect sizes. These findings provide further evidence for the notion that the employment-symptom relationship may be bi-directional; work may influence symptoms and symptoms may have an impact on vocational outcomes, although this interpretation is tentative. In addition, contrary to *a priori* hypotheses and inconsistent with findings from previous studies (e.g., Hoffman et al., 2003), PANSS negative scores were unrelated to vocational outcomes at the 24-month follow-up period. This finding combined with that indicating that the competitive work group had a significantly accelerated improvement in negative symptoms across time may indicate that, at least in this sample, the relationship is unidirectional. However, because the competitive work group in the current study included participants who worked at varying time periods during the study (some worked early in the study, others in the middle, and still others toward the end of the study), future research should be undertaken in order to replicate these findings in a fashion that allows a more definitive temporal sequence to be established in regards to competitive work and negative symptoms. In other words, the current methodology prevents a firm conclusion regarding this association; does competitive employment (or the lack of employment) impact negative symptoms, do negative symptoms impact vocational attainment, or is it both?

Conclusions Regarding the Relationship Between Supported Employment Services and Nonvocational Outcomes

Lastly, this study intended to examine the association between the receipt of supported employment services and nonvocational functioning. This was accomplished by identifying differences between two vocational programs (Individual Placement and Support model of supported employment and the Diversified Placement Approach) in regards to the nonvocational outcomes of clients across time. These program-related factors are essential to identify and understand in order to tailor successful vocational

services that maximize the potential nonvocational benefits for clients. The current investigation did not expect to find differences between the vocational programs in these domains. In general, this hypothesis was supported; no differences were found between the groups in regards to the majority of outcomes, including PANSS total scores, PANSS subscale scores, quality of life in general, leisure quality of life, psychiatric hospitalization rates, and residential status, as consistent with findings of prior work in this area (e.g., Drake et al., 1999; Mueser et al., 2004; Wong et al., 2008). The only differences were found in regards to financial quality of life at the 6-month follow-up period and social networks as assessed at baseline and the 3-month follow-up period. Both of the significant group differences favored the IPS program. Because these differences are marked by small effect sizes, the differences only occurred at limited time periods early in the study, and the differences were not seen across the study, the overall conclusion is that programmatic variations between these vocational models do not have a substantial impact on nonvocational functioning. Interestingly, the isolated finding regarding an advantage in social network scores for IPS is consistent with that of Burns et al. (2009). It is unclear as to what mechanism might account for these findings, especially since they were limited to only one early follow-up period and were not sustained across the study. Future research should attempt to gain a richer understanding of the relationship between the receipt of high quality IPS supported employment services and social variables.

Study Limitations

This study has limitations that must be mentioned. First and foremost, the primary target of this study was to discover the relationship between work and nonvocational outcomes, which was made more difficult, given that work could not be randomized. Therefore, threats to internal validity could not be ruled out and a causal link could not be demonstrated in such a correlational design. As previously mentioned, because employment outcomes across the two year study period were linked with nonvocational outcomes across the study, causality also could not be established, despite the use of advanced multivariate statistical techniques. The use of a categorical

employment typology is also noteworthy; while this approach to conceptualizing the variable of employment is a replication of a previous important study in this area (Bond et al., 2001), the use of a continuous employment variable (e.g., total number of weeks worked) would provide rich information in regards to the dose-response relationship of employment and nonvocational outcomes. Additionally, some analyses (e.g., residential status) may have had low statistical power given the modest sample sizes for some groups (e.g., paid work group), increasing the likelihood of type II error. For instance, the lack of findings between IPS and DPA on many nonvocational outcomes may possibly reflect this methodological issue, rather than the real absence of between-group differences. Future studies should address this research question using a large sample size in order to ensure adequate statistical power. type I error rate, or the probability that chance difference between the groups will be discovered, may have been inflated due to the use of multiple comparisons in order to test several nonvocational domains. Another limitation involves clinical importance; statistical significance is not the same as clinical significance and improvements in nonvocational outcomes, such as the increased social network scores over time, may not denote a real-world change in the lives of participants. Further, because this study was a secondary analysis of data collected in the parent study, constraints exist in regards to the variables that were investigated. For instance, self esteem has been widely hypothesized to be related to employment for people with SMI, however, the current study was unable to investigate this possible link. In addition, there were other unmeasured variables in this study that may have affected nonvocational outcomes, including the receipt of other rehabilitation services, such as intensive case management (i.e., Assertive Community Treatment). There are further issues regarding specific variables that *were* measured. For instance, social functioning was operationalized in terms of the quality and quantity of social networks, whereas other important facets of this outcome were not assessed, for example, social skills and communication ability. Further, cognitive symptoms were addressed using the PANSS, rather than state of the art neuropsychological instruments. This is an area that has been given much attention in recent years, as efforts are being made such that a standard battery of neuropsychological tests is used across research studies investigating

schizophrenia (Marder & Fenton, 2004). As noted briefly already, the dichotomization of variables due to non-normal sampling distributions, e.g., psychiatric hospitalizations, resulted in the loss of important and useful information regarding their relationship with employment. In addition, residential status was collapsed into independent living and nonindependent living. Certainly, the choice to dichotomize this variable in such a way may have lead to the loss of valuable information, thus precluding the discovery of differences between employment typology groups on this outcome. The overall generalizability of study findings is also of concern, given that participants were from a large urban area and were mostly white and African American, thus, findings may not generalize to other settings and groups of people with SMI. Finally, the issue of missing data must be discussed. In several nonvocational domains (e.g., symptoms), there was missing data pertaining to follow-up time periods. The no work group had a greater percentage of missing data in comparison with the other three groups (see Table 19). This discrepancy in the amount missing data between employment typology groups may have implications in regards to between-group differences on nonvocational functioning across time. For instance, it may have lead to more modest estimates of the difference between the no work group and competitive work group in some areas, e.g., negative symptoms. In other words, it may be that those who did not find work and were functioning at a low level failed to complete follow-up interviews.

Future Research

Several areas of needed future research have already been commented upon, however, others bear mentioning. Even though this study did not find a significant association between work and cognitive symptoms, future research should investigate this area, given the practical significance and potential benefits for the day-to-day functioning of clients with SMI. Similarly, despite the lack of significant findings regarding work and residential status, this outcome should be the focus of future research; adequate independent housing is the desire of most people with SMI, thus, further examination of the ways in which residential status outcomes may be enhanced (i.e., through work) is imperative. Additionally, future research is needed to replicate the

relationships between work and nonvocational outcomes that were discovered in this study, e.g., the advantage for competitive work in regards to improvements in negative symptomatology across time. Moreover, considering the inconsistent findings in regards to some employment typology groups (e.g., differences between those who achieve competitive employment and those who achieve noncompetitive, paid employment), future investigation is necessary to better delineate these relationships. Future studies addressing this research question should consider using methodology that allows for a stronger temporal sequence between employment and nonvocational outcomes to be established. For example, the use of continuous employment outcomes in the first year of a study as predictors of nonvocational outcomes in a subsequent follow-up period (e.g., second year) is one possible alternative to the statistical model used in the current study. While this study utilized a 24-month follow-up that improved upon shorter periods in past research, future investigations should consider the use of lengthier follow-up periods that extend beyond two years in order to understand the long-term impact of sustained employment on people's lives. In other words, such research will demonstrate whether incremental improvements in nonvocational outcomes occur beyond two years. Additionally, future studies should consider the role of concurrent psychosocial rehabilitation services that persons may be receiving, in order to better elucidate the contribution of work alone (versus other services) on nonvocational functioning. Given the restrictions imposed by the limited sample size in the current study, future research is also needed to more closely examine the relationship between employment and nonvocational functioning across demographic sub-groups. For instance, is this relationship the same for males and females, African Americans and Caucasians, those living in urban settings versus those living in rural areas? Finally, future studies in this area should address important nonvocational outcomes that were not assessed in the current study, such as self esteem, self efficacy, hope, and optimism.

Summary and Overall Conclusions

Overall the findings of this study contribute to the burgeoning evidence suggesting that extended periods of competitive employment are associated with

nonvocational benefits in important domains, whereas the lack of work seems to be associated with a deterioration in some areas of social and clinical functioning over time. Obviously, such findings underscore the importance of supported employment programs that put forth diligent effort in helping people with SMI obtain work quickly and sustain it long term. Another main purpose of this study was to delineate differences between competitive work and paid work on such outcomes, however, this goal was only partially accomplished. While it seems as though extended periods of competitive employment as opposed to unemployment relate to benefits in regards to reductions in negative symptoms, similar advantages were not found for competitive employment in comparison with noncompetitive paid employment. Given these mixed findings, future research should investigate this area in order to provide increased understanding regarding the role of competitive, integrated work in the community versus paid work in protected, homogeneous settings. In addition, this study adds to the existing evidence (e.g., Drake et al., 1999) demonstrating that persons with SMI enrolled in vocational and concurrently in other rehabilitation services tend to show improvements in some nonvocational domains across time, regardless of employment status. In the current investigation, this effect was found in the areas of overall quality of life, financial quality of life, cognitive symptoms, and social networks. Finally, despite the strong statistical approach used in the current study, the methodological limitations make it impossible to definitively conclude whether extended work leads to enhanced nonvocational outcomes or whether nonvocational functioning impacts the ability to work long-term (or both). It is also difficult to rule out other explanations, such as the receipt of other rehabilitation services that may influence outcomes. Only much further research will contribute to the current body of evidence, as a pattern of results across studies will provide the most persuasive evidence regarding the true nature of the relationships between work and nonvocational functioning.

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TABLES

Table 1: Nonvocational variables and measures

Nonvocational Variable	Measure	Measurement Schedule
Psychiatric Symptoms	Positive and Negative Syndrome Scale (PANSS)	Baseline, 3, 9, 15, 21 months
Hospitalization	Participant self report; objective records (hospital discharge forms, Medicaid claims)	Baseline, 12 months, 24 months
Residential Status	Participant self report; objective records, coded by level of independence	Baseline, 3, 9, 15, 21 months
Quality of Life	Lehman's Quality of Life Interview (QOLI)	Baseline, 6, 12, 18, 24 months
Social Networks	Social Network Analysis (SNA)	Baseline, 3, 9, 15, 21 months

Table 2: Background variables tested as predictors of employment outcomes

Background Variables Assessed at Baseline	Measure/Data Source
Gender	Participant self-report/observation
Race	Participant self-report
Prior Work History (years of past employment)	Participant self-report, agency records when available
Years of Education	Participant self-report
Psychiatric Diagnosis	Structured clinical interview (SCID) and rating criteria for DSM-IV
Social Security Entitlement Status	Participant self-report, objective data (Social Security documentation)

Table 3: Group-wise comparisons in mixed effects regression modeling

	Comparison Group	Group 1	Group 2	Group 3
Analysis 1	No Work	Minimal Work	Paid Work	Competitive Work
Analysis 2	Minimal Work	No Work	Paid Work	Competitive Work
Analysis 3	Paid Work	No Work	Minimal Work	Competitive Work

Table 4: Descriptive statistics of participant background characteristics

Variable	No Work, N=42 N (%)	Minimal Work, N=48 N (%)	Paid Work, N=38 N (%)	Competitive Work, N=59 N (%)	Total, N=187 N(%)
Site:					
Thresholds North	24 (57.1%)	32 (66.7%)	30 (78.9%)	40 (67.8%)	126 (67.4%)
Thresholds South	18 (42.9%)	16 (33.3%)	8 (21.1%)	19 (32.2%)	61 (32.6%)
Employment Group					
IPS	18 (42.9%)	29 (60.4%)	3 (7.9%)	42 (71.2%)	92 (49.2%)
DPA	24 (57.1%)	19 (39.6%)	35 (92.1%)	17 (28.8%)	95 (50.8%)
Gender:					
Male	24 (57.1%)	30 (62.5%)	28 (73.7%)	37 (62.7%)	119 (63.6%)
Female	18 (42.9%)	18 (37.5%)	10 (26.3%)	22 (37.3%)	68 (36.4%)
Race:					
African American	24 (57.1%)	28 (58.3%)	17 (44.7%)	26 (44.1%)	95 (50.8%)
Hispanic	2 (4.8%)	5 (10.4%)	4 (10.5%)	4 (6.8%)	15 (8.0%)
White	14 (33.3%)	12 (25.0%)	15 (39.5%)	27 (45.8%)	68 (36.4%)
Other	2 (4.8%)	3 (6.2%)	2 (5.3%)	2 (3.4%)	9 (4.8%)
Diagnosis:					
Schizophrenia	13 (31.0%)	26 (54.2%)	15 (39.5%)	19 (32.2%)	73 (39.0%)
Schizoaffective disorder	11 (26.2%)	4 (8.3%)	6 (15.8%)	11 (18.6%)	32 (17.1%)
Bipolar disorders	8 (19.0%)	10 (20.8%)	8 (21.1%)	19 (32.2%)	45 (24.1%)
Depression/ Dysthymia	7 (16.7%)	8 (16.7%)	8 (21.1%)	9 (15.3%)	32 (17.1%)
Other	3 (7.1%)	0	1 (2.6%)	1 (1.7%)	5 (2.7%)
Education:					
Not Graduated H.S.	13 (31.0%)	9 (18.8%)	4 (10.5%)	7 (11.9%)	33 (17.6%)
H.S. graduate or GED	7 (16.7%)	18 (37.5%)	11 (28.9%)	13 (22.0)	49 (26.2%)
Some College or Associates	16 (38.1%)	20 (41.7%)	17 (44.7%)	31 (52.5%)	84 (44.9%)
College Graduate	4 (9.5%)	0	3 (7.9%)	6 (10.2%)	13 (7.0%)
Beyond College	2 (4.8%)	1 (2.1%)	3 (7.9%)	2 (3.4%)	8 (4.3%)
Marital Status:					
Never Married	27 (64.3%)	32 (66.7%)	29 (76.3%)	51 (86.4%)	139 (74.3%)
Married	4 (9.5%)	1 (2.1%)	1 (2.6%)	1 (1.7%)	7 (3.7%)

Variable	No Work, N=42	Minimal Work, N=48	Paid Work, N=38	Competitive Work, N=59	Total, N=187
	N (%)	N (%)	N (%)	N (%)	N(%)
Separated, divorced, or widowed	11(26.2%)	15(31.2%)	8 (21.1%)	7 (11.9%)	41 (21.9%)
At least 12 months of prior competitive employment:					
Yes	28 (66.7%)	31 (64.6%)	28 (73.7%)	46 (78.0%)	133 (71.1%)
No	14 (33.3%)	17 (35.4%)	10 (26.3%)	13 (22.0%)	54 (28.9%)
Prior Paid Job in the last 5 years:					
Yes	25 (59.5%)	36 (75.0%)	29 (76.3%)	50 (84.7%)	116 (62.0%)
No	17 (40.5%)	12 (25.0%)	9 (23.7%)	9 (15.3%)	71 (38.0%)

Table 5: Zero order correlations between continuous baseline variables and employment outcomes at 24-month follow-up

Variables:	Total weeks at all Paid Employment (Competitive and Noncompetitive)
Demographics:	
Age	.11
Work History:	
Total paid weeks worked in the past 5 years	.08
Longest weeks worked in a past paid job	.06
Clinical and Social Variables:	
Prior psychiatric hospitalizations (year prior to the study)	-.17*
PANSS total score	-.20**
PANSS positive subscale	-.21**
PANSS negative subscale	-.05
PANSS cognitive subscale	-.25**
PANSS emotional discomfort subscale	.03
PANSS hostility subscale	-.17*

Variables:	Total weeks at all Paid Employment (Competitive and Noncompetitive)
Quality of Life Variables	
Quality of life in general	-.03
Financial quality of life	.02
Leisure quality of life	-.06
Social Variable:	
Social networks	-.09

*p<.05

**p<.01

Table 6: Between-group analyses of baseline variables and total weeks worked at all jobs (competitive and noncompetitive paid jobs) at the 24 month follow-up

Variables	N	M	SD	t	F
Gender					0.09
Male	119	37.15	35.78		
Female	68	36.65	38.55		
Race/Ethnicity					2.18
African American	95	30.96	33.88		
Hispanic	15	35.70	33.04		
White	68	45.70	39.77		
Other	9	14.00	22.22		
Diagnosis					.38
Schizophrenia	73	37.28	38.30		
Schizoaffective	32	31.53	34.22		
Mood Disorder ¹	32	39.59	38.03		
Bipolar I disorder	40	39.83	35.97		
Bipolar II disorder	5	41.60	40.87		
Other	5	22.77	32.33		
Education					3.02*
Did not graduate high school	33	22.58	31.20		
High school graduate or GED	49	30.31	31.71		
Some college or Associates degree ²	84	43.91	38.53		
College graduate	13	50.19	43.16		
Beyond College	8	42.61	37.94		

Variables	N	M	SD	t	F
Residential Status					1.95
Homeless	6	27.48	39.49		
Living not independent ³	116	33.49	33.68		
Living independently ⁴	65	44.04	40.93		
Work History					-2.00*
Paid job in the past 5 years	140	40.05	37.09		
No paid job in the past 5 years	47	27.76	34.30		
Work History					-2.49*
Prior Competitive employment \geq 1 year	133	41.17	38.43		
Prior Competitive employment \leq 1 year	54	26.62	29.98		

¹Depression, dysthymia, or drug mood disorder

²Participants who completed some college or an Associates degree worked significantly more total days in employment than participants who did not graduate high school

³Living with and dependent on family or group home

⁴Living alone or with spouse

*p<.05

Table 7: Descriptive statistics and independent groups t-tests for differences in nonvocational outcomes between IPS and DPA across time

Variables:	IPS N=92		DPA N=95		t	p	d
	M	SD	M	SD			
Symptoms							
PANSS total score baseline	59.24	13.84	61.56	15.83	-1.07	.29	
PANSS total score 6 months	58.15	16.61	61.56	16.11	-1.34	.18	
PANSS total score 12 months	52.00	25.14	51.16	28.64	0.21	.83	
PANSS total score 18 months	50.07	28.30	47.32	31.98	0.62	.54	
PANSS total score 24 months	59.90	15.97	62.95	19.16	-1.12	.27	
PANSS positive subscale score baseline	12.16	5.22	13.68	6.26	-1.80	.07	
PANSS positive subscale score 6 months	12.35	4.97	13.71	6.14	-1.57	.12	
PANSS positive subscale score 12 months	12.78	5.17	12.83	6.09	-0.06	.96	
PANSS positive subscale score 18 months	12.47	6.14	13.13	5.93	-0.68	.50	
PANSS positive subscale score 24 months	13.43	5.82	13.45	6.33	-0.02	.98	
PANSS negative subscale score baseline	14.84	5.07	15.18	5.54	-0.44	.66	

Variables:	IPS N=92	DPA N=95	M	SD	M	SD	t	p	d
PANSS negative subscale score 6 months	14.65	5.81	14.58	5.73	0.09	.93			
PANSS negative subscale score 12 months	14.95	5.57	14.52	5.44	0.50	.62			
PANSS negative subscale score 18 months	14.42	5.76	14.91	5.58	-0.54	.59			
PANSS negative subscale score 24 months	14.20	6.29	15.87	8.00	-1.50	.14			
PANSS cognitive subscale score baseline	36.65	4.76	36.68	4.75	-0.05	.96			
PANSS cognitive subscale score 6 months	34.92	5.96	34.18	6.94	0.79	.43			
PANSS cognitive subscale score 12 months	34.36	6.27	34.71	7.23	-0.35	.73			
PANSS cognitive subscale score 18 months	34.82	7.11	33.79	7.45	0.96	.34			
PANSS cognitive subscale score 24 months	34.54	6.27	35.74	7.15	-1.21	.23			
PANSS emotional discomfort score at baseline	10.54	4.43	10.66	4.97	-0.17	.86			

Variables:	IPS N=92		DPA N=95		t	p	d
	M	SD	M	SD			
PANSS emotional discomfort score at 6 months	10.54	4.95	11.35	4.71	-1.08	.28	
PANSS emotional discomfort score at 12 months	8.66	7.65	8.38	8.34	0.53	.81	
PANSS emotional discomfort score at 18 months	8.07	8.52	7.22	9.25	0.65	.52	
PANSS emotional discomfort score at 24 months	10.88	4.99	10.71	4.52	0.23	.27	
PANSS hostility scores at baseline	5.89	2.34	6.13	2.32	-0.69	.49	
PANSS hostility scores at 6 months	6.06	2.14	6.26	2.36	-0.58	.56	
PANSS hostility scores at 12 months	5.85	1.95	6.41	2.34	-1.67	.10	
PANSS hostility scores at 18 months	5.92	2.40	6.18	2.24	-0.70	.49	
PANSS hostility score at 24 months	6.09	2.26	6.26	2.25	-0.50	.62	
Quality of Life:							
Life in general at baseline	4.57	1.60	4.39	1.72	0.70	.48	

Variables:	IPS N=92		DPA N=95		t	p	d
	M	SD	M	SD			
Life in general at 6 months	4.71	1.48	4.58	1.64	0.56	.58	
Life in general at 12 months	4.76	1.55	4.80	1.62	-0.19	.81	
Life in general at 18 months	4.96	1.45	4.82	1.61	0.59	.56	
Life in general at 24 months	4.70	1.54	4.71	1.47	-0.05	.96	
Leisure QOL at baseline	4.77	1.16	4.56	1.24	1.15	.25	
Leisure QOL at 6 months	4.86	1.08	4.73	1.16	0.76	.45	
Leisure QOL at 12 months	4.67	1.18	4.64	1.02	0.14	.89	
Leisure QOL at 18 months	4.70	1.25	4.72	1.23	-0.08	.94	
Leisure QOL at 24 months	4.81	1.20	4.79	1.14	0.08	.94	
Financial QOL at baseline	3.20	1.48	3.30	1.46	-0.44	.66	
Financial QOL at 6 months	4.11	1.73	3.55	1.48	2.19	.03*	
Financial QOL at 12 months	4.05	1.63	3.94	1.41	0.46	.64	
Financial QOL at 18 months	4.01	1.63	3.98	1.52	0.10	.92	
Financial QOL at 24 months	3.91	1.50	3.81	1.51	0.41	.68	
Psychiatric Hospitalizations							
Hospitalizations year prior to the study	14.90	25.39	13.74	25.97	0.31	.76	
Hospitalizations first year of the study	4.86	12.71	8.32	22.60	-1.28	.20	
Hospitalizations second year of the study	5.59	13.31	9.69	24.24	-1.43	.15	

Variables:	IPS N=92		DPA N=95		t	p	d
	M	SD	M	SD			
Social Networks							
SNA total baseline	19.82	3.16	18.54	3.55	2.60	.01*	
SNA total 3 months	21.99	2.74	20.51	3.70	2.94	.00**	
SNA total 9 months	21.74	2.76	20.94	3.83	1.52	.13	
SNA total 15 months	21.97	3.03	21.32	3.01	1.33	.19	
SNA total 21 months	21.99	3.37	21.28	3.04	1.36	.18	

*p<.05

**p<.01

Table 8: Residential status frequencies according to vocational program

Variable/Group	IPS, N=92		DPA, N=95	
	Frequency	Percent	Frequency	Percent
Residential Status at baseline				
Homeless				
Homeless	3	3.3%	3	3.2%
Nursing Home	11	12.0%	3	3.2%
Clinically Supervised Housing	23	25.0%	16	16.8%
Non-Clinical With Supervision	5	5.4%	5	5.3%
Living with Family (not spouse)	23	25.0%	30	31.6%
Own Apartment with Spouse or Roommates	5	5.4%	10	10.5%
Own Apartment— Alone	19	20.7%	20	21.1%
Hotel, unsupervised	3	3.3%	8	8.4%
<i>Missing</i>	0	0	0	0
Residential Status at 3 months				
Independent Living				
Independent Living	24	26.1%	32	33.7%
Semi-independent Living	15	16.3%	12	12.6%
Institutional Living	25	27.2%	15	15.8%
Living with Family (not spouse)	20	21.7%	25	26.3%
Homeless	1	1.1%	1	1.1%
<i>Missing</i>	7	7.6%	10	10.5%
Residential Status at 9 months				

Variable/Group	IPS, N=92	DPA, N=95	Variable/Group	IPS, N=92
	Frequency	Percent		Frequency
Semi-independent Living	20	21.7%	18	18.9%
Institutional Living	19	20.7%	10	10.5%
Living with Family (not spouse)	20	21.7%	29	30.5%
Homeless	0	0	0	0
<i>Missing</i>	11	12.0%	13	13.7%
Residential Status at 15 months				
Independent Living	21	22.8%	27	28.4%
Semi-independent Living	20	21.7%	17	17.9%
Institutional Living	18	19.6%	9	9.5%
Living with Family (not spouse)	18	19.6%	25	26.3%
Homeless	1	1.1%	0	0
<i>Missing</i>	14	15.2%	17	17.9%
Residential Status at 21 months				
Independent Living	28	30.4%	24	25.3%
Semi-independent Living	15	16.3%	16	16.8%
Institutional Living	17	18.5%	14	14.7%
Living with Family (not spouse)	18	19.6%	22	23.2%
Homeless	0	0	2	2.1
<i>Missing</i>	14	15.2%	17	17.9%

Table 9: Residential status frequencies among employment typology groups across measurement periods

Variable/Group	Independent Living		Nonindependent Living¹	
	Frequency	Percent	Frequency	Percent
Residential Status at baseline				
No Work				
No Work	18	57.1%	24	42.9%
Minimal Work	11	22.9%	37	77.1%
Paid Work	13	34.2%	25	65.8%
Competitive Work	23	39.0%	36	61.0%
Total	65	34.8%	122	65.2%
Residential Status at 3 months				
No Work	21	50.0%	14	33.3%
<i>Missing=7</i>				
Minimal Work	33	68.8%	8	16.7%
<i>Missing=7</i>				
Paid Work	24	63.2%	14	36.8%
Competitive Work	36	61.0%	20	33.9%
<i>Missing=3</i>				
Total	114	61.0%	56	29.9%
<i>Missing=16</i>				
Residential Status at 9 months				
No Work	20	46.7%	11	26.2%
<i>Missing=11</i>				
Minimal Work	35	72.9%	4	8.3%
<i>Missing=7</i>				
Paid Work	23	60.5%	14	36.8%
<i>Missing=1</i>				
Competitive Work	38	64.4%	18	30.5%
<i>Missing=3</i>				
Total	116	62.0%	47	25.1%
<i>Missing=22</i>				

Variable/Group	Independent Living		Nonindependent Living¹	
	Frequency	Percent	Frequency	Percent
No Work	21	50.0%	9	21.4%
<i>Missing=12</i>				
Minimal Work	29	60.4%	8	16.7%
<i>Missing=7</i>				
Paid Work	20	52.6%	13	34.2%
<i>Missing=5</i>				
Competitive Work	38	64.4%	18	30.5%
<i>Missing=3</i>				
Total	108	57.8%	48	25.7%
<i>Missing=27</i>				
Residential Status at 21 months				
No Work	23	54.8%	9	21.4%
<i>Missing=10</i>				
Minimal Work	29	60.4%	7	14.6%
<i>Missing=7</i>				
Paid Work	22	57.9%	14	36.8%
<i>Missing=2</i>				
Competitive Work	30	50.8%	22	37.3%
<i>Missing=7</i>				
Total	104	55.6%	52	27.8%
<i>Missing=26</i>				

¹Nonindependent living refers to living in a group home, institutional living, semi-independent living, or living with family

Table 10: Logistic regression summary table for residential status hypotheses

Predictor Variables:	Overall %	Model Test of Significance	-2 Log Likelihood	B	Wal d	p	Exp(B)
Residential Status at baseline:							
Vocational Program Study Site	65.2%	$\chi^2 (5)=9.29$	232.29			.10	
Employment typology groups				-.62	3.02	.08	.54
No work group (constant)				.45	1.62	.20	1.56
Minimal work group						5.54	.14
Paid work group							.75
Competitive Work group							.41
							.51
							.97
Residential Status at 3 months:	67.1	$\chi^2 (5)=8.44$	211.86			.13	
Vocational Program Study Site				.48	1.52	.22	1.61
Employment typology groups				-.57	2.27	.13	.56
No work group (constant)						4.44	.22
Minimal work group							1.70
Paid work group							2.77
Competitive Work group							1.55
							1.13

Predictor Variables:	Overall %	Model Test of Significance	-2 Log Likelihood	B	Wal d	p	Exp(B)
Residential Status at 9 months:	71.2	$\chi^2 (5)=11.88^*$	183.94			.04*	
Vocational Program				-.024	.003	.96	.98
Study Site				0			
Employment typology groups				-.50	1.48	.22	.61
No work group					7.38	.06	
(constant)					.93	3.60	.06
Minimal work group					1.60	6.01	.01*
Paid work group					-.028	.003	.96
Competitive					.20	.17	.68
Work group							1.22
Residential Status at 15 months:	69.2	$\chi^2 (5)=3.27$	189.31			.66	
Vocational Program					.28	.48	.49
Study Site					-.14	.13	.72
Employment typology groups						1.86	.60
No work group					.81	2.69	.10
(constant)					.41	.52	.47
Minimal work group					-.29	.26	.61
Paid work group							.75
Competitive					-.16	.11	.75
Work group							.85

Predictor Variables:	Overall %	Model Test of Significance	-2 Log Likelihood	B	Wal d	p	Exp(B)
Residential Status at 21 months:	66.7	$\chi^2 (5)=7.25$	191.35			.20	
Vocational Program Study Site				-.44	1.09	.30	.65
Employment typology groups				.05	.01	.90	1.05
No work group (constant)					6.20	.10	
Minimal work group				1.11	5.19	.02*	3.04
Paid work group				.58	.97	.32	1.79
Competitive Work group				-.66	1.40	.24	.52
				-.52	1.10	.30	.59

*p<.05

Table 11: Psychiatric hospitalization frequencies across measurement periods

Variable/Group	No days of hospitalization		1 or more days of hospitalization	
	Frequency	Percent	Frequency	Percent
One year prior to the study (baseline)				
No Work				
No Work	20	47.6%	22	52.4%
Minimal Work	20	41.7%	28	58.3%
Paid Work	21	55.3%	17	44.7%
Competitive Work	31	52.5%	28	47.5%
Year 1				
No Work	21	50.0%	21	50.0%
Minimal Work	35	72.9%	13	27.1%
Paid Work	27	71.1%	11	28.9%
Competitive Work	44	74.6%	15	25.4%
Year 2				
No Work	22	52.4%	20	47.6%
Minimal Work	36	75.0%	12	25.0%
Paid Work	28	73.7%	10	26.3%
Competitive Work	46	78.0%	13	22.0%
Across the study (24 months)				
No Work	17	40.5%	25	59.5%
Minimal Work	29	60.4%	19	39.6%
Paid Work	23	60.5%	15	39.5%
Competitive Work	38	64.4%	21	35.6%

Table 12: Logistic regression summary table for psychiatric hospitalization hypotheses

Outcomes and Predictor Variables:	Overall %	Model Test of Sig.	-2 Log Likelihood	B	Wald	p	Exp(B)
Days of Hosp. in the one year prior to study	54.5%	$\chi^2 (4)=2.20$	256.99		.70		
PANSS total scores at baseline				.0050	.24	.62	1.01
Employment typology groups					2.13	.55	
No work group (constant)				-.41	.33	.57	.66
Minimal work group				-.24	.33	.57	.78
Paid work group				.33	.53	.47	1.39
Competitive				.23	.32	.57	1.26
Work group							
Days of Hosp. in year one	67.9%	$\chi^2 (4)=8.01$	226.68		.09		
PANSS total scores at 12 months				-.003	.24	.62	.99
Employment typology groups					7.78	.049*	
No work group (constant)				.15	.12	.73	1.16
Minimal work group				.98	4.77	.03*	2.67
Paid work group				.90	3.62	.06	2.46
Competitive				1.08	6.32	.01*	2.95
Work group							
Days of hosp. in year two	70.1%	$\chi^2 (4)=16.10$	187.76		.00**		

Outcomes and Predictor Variables:	Overall %	Model Test of Sig.	-2 Log Likelihood	B	Wald	p	Exp(B)
PANSS total scores at 24 months				-.028	7.43	.01*	.97
Employment typology groups					6.17	.10	
No work group (constant)				1.84	5.92	.02*	6.32
Minimal work group				1.03	4.04	.04*	2.80
Paid work group				.99	3.63	.06	2.70
Competitive				.98	4.26	.04*	2.67
Work group							
Days of hosp. total (across 24 months)	57.8%	$\chi^2 (4)=10.40$	244.92			.03*	
PANSS total scores averaged across the study ¹				-.015	3.84	.049*	.99
Employment typology groups					6.25	.10	
No work group (constant)				.40	.61	.44	1.49
Minimal work group				.81	3.39	.07	2.24
Paid work group				.87	3.51	.06	2.39
Competitive				.99	5.50	.02*	2.69
Work group							

Table 13: Descriptive statistics of continuous nonvocational outcomes across employment typology groups

Variable	No Work, N=42	Minimal Work, N=48	Paid Work, N=38	Competitive Work, N=59	Total, N=187
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Quality of Life					
overall:					
Baseline	4.71 (1.63)	4.31 (1.67)	4.84 (1.50)	4.22 (1.75)	4.48 (1.66)
6 months	4.53 (1.63)	4.67 (1.64)	5.05 (1.49)	4.42 (1.48)	4.64 (1.55)
12 months	4.52 (1.70)	4.66 (1.65)	5.34 (1.49)	4.67 (1.48)	4.78 (1.58)
18 months	4.58 (1.61)	4.91 (1.56)	5.19 (1.47)	4.85 (1.51)	4.89 (1.53)
24 months	4.38 (1.52)	4.68 (1.82)	5.14 (1.18)	4.64 (1.42)	4.71 (1.50)
Quality of Life financial:					
Baseline	3.20 (1.46)	3.31 (1.56)	3.68 (1.44)	2.97 (1.37)	3.25 (1.46)
6 months	3.46 (1.74)	3.66 (1.76)	4.05 (1.48)	4.02 (1.57)	3.84 (1.63)
12 months	3.97 (1.65)	3.90 (1.67)	4.36 (1.40)	3.84 (1.42)	3.99 (1.53)
18 months	3.71 (1.45)	3.86 (1.80)	4.40 (1.34)	3.98 (1.62)	4.00 (1.57)
24 months	3.51 (1.57)	4.02 (1.61)	4.08 (1.35)	3.83 (1.48)	3.86 (1.50)
Quality of Life Leisure:					
Baseline	4.94 (1.15)	4.60 (1.36)	4.80 (1.22)	4.44 (1.05)	4.66 (1.20)
6 months	4.81 (1.19)	4.83 (1.19)	5.16 (1.10)	4.54 (0.99)	4.80 (1.12)
12 months	4.49 (1.06)	4.68 (1.13)	5.07 (0.97)	4.48 (1.14)	4.66 (1.10)
18 months	4.34 (1.37)	4.80 (1.16)	5.15 (1.12)	4.57 (1.22)	4.71 (1.24)
24 months	4.61 (1.35)	4.91 (1.20)	5.05 (1.00)	4.67 (1.12)	4.80 (1.17)
PANSS total scores:					
Baseline	63.21 (15.60)	63.79 (15.94)	59.00 (12.86)	56.59 (14.00)	60.42 (14.89)
6 months	66.43 (15.03)	61.46 (20.46)	57.73 (16.33)	56.47 (12.70)	59.80 (16.41)
12 months	68.64 (17.98)	61.18 (14.38)	57.40 (14.56)	55.98 (12.89)	60.07 (15.35)
18 months	65.69 (16.90)	64.20 (17.72)	59.72 (15.85)	55.58 (14.01)	60.57 (16.31)
24 months	66.67 (19.29)	64.47 (19.00)	59.76 (16.17)	57.18 (15.74)	61.46 (17.68)

Variable	No Work, N=42	Minimal Work, N=48	Paid Work, N=38	Competitive Work, N=59	Total, N=187
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
PANSS positive subscale scores:					
Baseline					
6 months	13.79 (6.70)	14.75 (6.35)	12.61 (5.30)	11.07 (4.35)	12.94 (5.81)
12 months	15.17 (6.56)	13.93 (6.10)	12.59 (4.98)	11.51 (4.64)	13.01 (5.60)
18 months	15.33 (6.86)	13.77 (6.00)	11.51 (4.47)	11.47 (4.65)	12.80 (5.63)
24 months	15.26 (5.80)	14.40 (6.85)	12.64 (5.43)	10.77 (4.42)	12.94 (5.79)
Baseline					
6 months	14.58 (5.11)	15.05 (7.19)	12.41 (6.16)	12.29 (5.49)	13.44 (6.07)
PANSS negative subscale scores:					
Baseline	15.79 (6.34)	14.65 (4.75)	15.13 (5.14)	14.68 (5.09)	15.01 (5.30)
6 months	15.97 (6.67)	14.48 (5.19)	14.24 (5.87)	14.25 (5.58)	14.62 (5.75)
12 months	16.69 (5.94)	14.87 (5.36)	14.97 (5.89)	13.37 (4.79)	14.74 (5.49)
18 months	16.41 (6.98)	14.37 (5.31)	15.25 (5.63)	13.37 (4.77)	14.66 (5.66)
24 months	17.81 (9.99)	15.00 (6.33)	15.32 (6.86)	13.13 (5.30)	15.05 (7.24)
PANSS cognitive subscale scores					
Baseline	37.61 (5.08)	37.56 (5.00)	36.50 (4.28)	35.37 (4.35)	36.67 (4.74)
6 months	33.90 (9.08)	34.94 (7.28)	34.89 (4.83)	34.46 (4.19)	34.55 (6.47)
12 months	34.98 (8.94)	34.17 (7.24)	34.79 (6.10)	34.36 (4.86)	34.54 (6.76)
18 months	34.12 (8.70)	34.23 (8.53)	35.21 (5.49)	33.88 (6.13)	34.29 (7.28)
24 months	35.88 (8.37)	34.17 (7.65)	36.34 (5.43)	34.66 (5.27)	35.15 (6.75)
PANSS emotional discomfort subscale scores					
Baseline	10.36 (4.48)	11.40 (5.25)	9.76 (4.42)	10.68 (4.55)	10.60 (4.70)
6 months	11.03 (5.20)	11.58 (5.22)	10.32 (4.67)	10.82 (4.54)	10.93 (4.84)
12 months	12.85 (5.74)	10.18 (5.27)	9.57 (4.23)	11.30 (4.00)	10.98 (4.84)
18 months	12.45 (5.46)	11.26 (5.45)	10.44 (4.64)	10.94 (4.10)	11.20 (4.84)
24 months	11.06 (5.08)	11.21 (5.06)	9.76 (3.79)	11.02 (4.89)	10.79 (4.74)
PANSS hostility subscale scores					

Variable	No Work, N=42	Minimal Work, N=48	Paid Work, N=38	Competitive Work, N=59	Total, N=187
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Baseline	6.36 (2.58)	6.33 (2.63)	5.71 (1.80)	5.69 (2.14)	6.01 (2.33)
6 months	6.30 (1.93)	6.73 (2.49)	6.03 (2.29)	5.77 (2.15)	6.16 (2.25)
12 months	6.06 (2.22)	6.31 (1.94)	6.34 (2.48)	5.93 (2.10)	6.13 (2.16)
18 months	5.97 (1.99)	6.29 (2.46)	6.14 (2.34)	5.88 (2.44)	6.05 (2.32)
24 months	5.78 (2.02)	6.66 (2.81)	6.08 (2.18)	6.16 (2.00)	6.17 (2.25)
Social Networks:					
Baseline	19.79 (3.66)	19.39 (3.66)	17.85 (3.80)	19.40 (2.53)	19.18 (3.41)
3 months	21.49 (3.43)	21.52 (3.67)	20.37 (3.84)	21.51 (2.49)	21.25 (3.33)
9 months	21.56 (3.07)	21.39 (2.95)	21.03 (4.68)	21.40 (2.78)	21.34 (3.35)
15 months	22.43 (2.39)	21.43 (4.26)	21.55 (2.59)	21.44 (2.63)	21.65 (3.03)
21 months	21.28 (4.39)	21.28 (4.39)	22.16 (3.10)	21.56 (2.65)	21.63 (3.22)

Table 14: Mixed effects regression modeling summary table for continuous nonvocational outcomes comparing all employment typology groups

Outcomes and Predictor Variables:	-2 Restricted Log Likelihood	df	Type III Tests of Fixed Effects	p
			F	
Overall Quality of Life	2848.98			
Time (6, 12, 18, 24 months)		1, 169.52	5.12	.03*
Employment typology groups		3, 180.58	1.68	.17
Interaction Term: Employment Typology x Time		3, 169.06	.98	.41
Financial Quality of Life	2830.57			
Time (6, 12, 18, 24 months)		1, 170.14	23.82	.00**
Employment typology groups		3, 180.95	1.40	.24
Interaction Term: Employment Typology x Time		3, 169.62	.26	.85
Vocational Program		1, 181.35	4.46	.04*
Leisure Quality of Life	2305.81			
Time (6, 12, 18, 24 months)		1, 165.08	.85	.36
Employment typology groups		3, 180.54	2.12	.10
Interaction Term: Employment Typology x Time		3, 162.91	2.13	.10
PANSS Total Scores	6266.72			
Time (6, 12, 18, 24 months)		1, 160.09	.80	.37

Outcomes and Predictor Variables:	-2 Restricted Log Likelihood	df	Type III Tests of Fixed Effects	
			F	p
Employment typology groups		3, 179.71	3.46	.02*
Interaction Term: Employment Typology x Time		3, 159.87	.33	.81
PANSS Positive Subscale Scores	4850.18			
Time (6, 12, 18, 24 months)		1, 167.69	.46	.50
Employment typology groups		3, 181.58	4.24	.01*
Interaction Term: Employment Typology x Time		3, 167.49	.33	.81
PANSS Negative Subscale Scores	4987.80			
Time (6, 12, 18, 24 months)		1, 167.80	.17	.69
Employment typology groups		3, 180.49	.39	.76
Interaction Term: Employment Typology x Time		3, 167.60	2.90	.04*
PANSS Cognitive Subscale Scores	5861.80			
Time (6, 12, 18, 24 months)		1, 183.00	6.31	.01*
Employment typology groups		3, 183.00	.96	.41
Interaction Term: Employment Typology x Time		3, 183.00	1.55	.21
PANSS Emotional Discomfort Scores	4597.04			
Time (6, 12, 18, 24 months)		1, 166.99	.48	.49

Outcomes and Predictor Variables:	-2 Restricted Log Likelihood	df	Type III Tests of Fixed Effects	
			F	p
Employment typology groups		3, 181.47	.64	.59
Interaction Term: Employment Typology x Time		3, 166.68	.51	.68
PANSS Hostility Scores	3540.79			
Time (6, 12, 18, 24 months)		1, 159.85	.43	.51
Employment typology groups		3,177.45	1.62	.19
Interaction Term: Employment Typology x Time		3,159.58	1.02	.39
Social Networks	4037.94			
Time (3, 9, 15, 21 months)		1, 163.86	78.57	.00**
Employment typology groups		3, 188.43	1.02	.38
Vocational Program		3, 184.27	8.08	.01*
Interaction Term: Employment Typology x Time		3, 163.29	3.98	.01*

*p<.05

**p<.01

Table 15: Statistically significant post hoc tests (Tukey HSD) of symptoms by employment typology group

Variable/Employment Typology Group	F	df	Mean Difference	Standard error	p
PANSS Total Scores at Baseline	2.81	3, 183			.04*
Competitive Work Group—Minimal Work Group			-7.20	2.85	.04*
					.04*
PANSS Total Scores at 6 months	2.84	3, 161			
Competitive Work Group—No Work Group			-9.96	3.64	.04*
PANSS Total Scores at 12 months		3, 160			.00**
Competitive Work Group—No Work Group			-12.65	3.22	.00**
PANSS Total Scores at 18 months	3.44	3,151			.02*
Competitive Work Group—No Work Group			-10.11	3.58	.03*
PANSS Positive Subscale Scores at 6 Months	3.42	3, 160			.02*
Competitive Work Group—No Work Group			-3.66	1.24	.02*
PANSS Positive Subscale Scores at 12 Months	4.55	3, 160			.00**
Competitive Work Group—No Work Group			-3.86	1.19	.01*
Paid Work Group—No Work Group			-3.82	1.32	.02*
PANSS Positive Subscale Scores at 18 Months	3.85	3, 151			.01*
Competitive Work Group—No Work Group			-3.73	1.32	.03*

*p<.05

**p<.01

Table 16: Missing data across the study according to employment typology groups

Nonvocational Variable	No work N=42	Minimal Work N=48	Paid Work N=38	Competitive Work N=59	Total
	N(%)	N(%)	N(%)	N(%)	N(%)
Quality of Life overall:					
Baseline					
6 months	0	0	0	0	0
12 months	12 (28.6%)	8 (16.7%)	1 (2.6%)	2 (3.4%)	23 (12.3%)
18 months	10 (23.8%)	10 (20.8%)	3 (7.9%)	2 (3.4%)	25 (13.4%)
24 months	11 (26.2%)	14 (29.2%)	2 (5.3%)	7 (11.9%)	34 (18.2%)
24 months					
Quality of Life financial:					
Baseline					
6 months	1 (2.3%)	0	1 (2.6%)	0	1.1%
12 months	12 (28.6%)	8 (16.7%)	1 (2.6%)	2 (3.4%)	23 (12.3%)
18 months	10 (23.8%)	10 (20.8%)	3 (7.9%)	2 (3.4%)	25 (13.4%)
24 months	11 (26.2%)	14 (29.2%)	2 (5.3%)	7 (11.9%)	34 (18.2%)
24 months					
Quality of Life Leisure:					
Baseline					
6 months	0	1 (2.1%)	1 (2.6%)	0	1 (1.1%)
12 months	12 (28.6%)	8 (16.7%)	1 (2.6%)	2 (3.4%)	23 (12.3%)
18 months	10 (23.8%)	10 (20.8%)	3 (7.9%)	2 (3.4%)	25 (13.4%)
24 months	11 (26.2%)	14 (29.2%)	2 (5.3%)	7 (11.9%)	34 (18.2%)
24 months					
PANSS total scores:					
Baseline					
6 months	0	0	0	0	0
12 months	12 (28.6%)	8 (16.7%)	1 (2.6%)	2 (3.4%)	23 (12.3%)
18 months	9 (21.4%)	9 (18.8%)	3 (7.9%)	2 (3.4%)	23 (12.3%)
24 months	10 (23.8%)	13 (27.1%)	2 (5.3%)	7 (11.9%)	32 (17.1%)
24 months					
PANSS positive subscale scores:					
Baseline					
6 months	0	0	0	0	0
12 months	12 (28.6%)	8 (16.7%)	1 (2.6%)	2 (3.4%)	23 (12.3%)
18 months	9 (21.4%)	9 (18.8%)	3 (7.9%)	2 (3.4%)	23 (12.3%)
24 months	10 (23.8%)	13 (27.1%)	2 (5.3%)	7 (11.9%)	32 (17.1%)
24 months					

Nonvocational Variable	No work N=42	Minimal Work N=48	Paid Work N=38	Competitive Work N=59	Total
PANSS					
negative subscale scores:					
Baseline	0	0	0	0	0
6 months	12 (28.6%)	8 (16.7%)	1 (2.6%)	2 (3.4%)	23 (12.3%)
12 months	9 (21.4%)	9 (18.8%)	3 (7.9%)	2 (3.4%)	23 (12.3%)
18 months	10 (23.8%)	13 (27.1%)	2 (5.3%)	7 (11.9%)	32 (17.1%)
24 months	6 (14.3%)	10 (20.8%)	1 (2.6%)	3 (5.1%)	20 (10.7%)
PANSS					
cognitive subscale scores					
Baseline	0	0	0	0	0
6 months	0	0	0	0	0
12 months	0	0	0	0	0
18 months	0	0	0	0	0
24 months	0	0	0	0	0
PANSS					
emotional discomfort subscale scores					
Baseline	0	0	0	0	0
6 months	12 (28.6%)	8 (16.7%)	1 (2.6%)	2 (3.4%)	23 (12.3%)
12 months	9 (21.4%)	9 (18.8%)	3 (7.9%)	2 (3.4%)	23 (12.3%)
18 months	11 (26.2%)	14 (29.2%)	2 (5.3%)	7 (11.9%)	34 (18.2%)
24 months	5 (11.9%)	9 (18.8%)	1 (2.6%)	3 (5.1%)	18 (9.6%)
PANSS					
hostility subscale scores					
Baseline	0	0	0	0	0
6 months	4 (9.5%)	0	0	0	4 (2.1%)
12 months	2 (4.8%)	0	0	0	2 (1.1%)
18 months	3 (7.1%)	0	0	0	3 (1.6%)
24 months	0	0	0	0	0
Social Networks:					
Baseline	1 (2.3%)	0	1 (2.6%)	0	2 (1.1%)
3 months	7 (16.7%)	7 (14.6%)	0	4 (6.8%)	18 (9.6%)
9 months	13 (31.0%)	11 (22.9%)	3 (7.9%)	2 (3.4%)	29 (15.5%)

Nonvocational Variable	No work N=42	Minimal Work N=48	Paid Work N=38	Competitive Work N=59	Total
15 months	12 (28.6%)	14 (29.2%)	5 (13.2%)	3 (5.1%)	34 (18.2%)
21 months	10 (23.8%)	11 (22.9%)	2 (5.3%)	7 (11.9%)	30 (16.0%)
Psychiatric Hospitalizations:					
Year prior	0	0	0	0	0
Year 1	0	0	0	0	0
Year 2	0	0	0	0	0
Residential Status					
Baseline	0	0	0	0	0
3 months	7 (16.7%)	7 (18.4%)	0	3 (5.1%)	17 (9.1%)
9 months	11 (26.2%)	9 (18.8%)	1 (2.6%)	3 (5.1%)	24 (12.8%)
15 months	12 (28.6%)	11 (22.9%)	5 (13.2%)	3 (5.1%)	31 (16.6%)
21 months	10 (23.8%)	12 (25.0%)	2 (5.3%)	7 (11.9%)	31 (16.6%)

Table 17: Summary of overall findings

Variable	Significant Differences
Nonvocational Outcomes	
PANSS Negative Scores	<u>Trajectory</u> of improved negative symptoms over time for competitive work group; worsening symptoms over time for no work group
Social Networks	1. Improvements over time in full sample 2. <u>Trajectory</u> of improved social network scores for noncompetitive paid work group as compared with no work group, minimal work group, competitive work group
Psychiatric Hospitalizations	1. Competitive work group < no work group after first year of study, second year of study, across 24 months of study 2. Minimal work group < no work group after first year of study, second year of study
PANSS Total Scores	Competitive work group < no work group at baseline, maintained across study
PANSS Positive Scores	Competitive work group < no work group at baseline, maintained across study
PANSS Cognitive Scores	1. Improvements over time in full sample 2. No differences between employment typology groups
Overall Quality of Life	1. Improvements over time in full sample 2. No differences between employment typology groups
Financial Quality of Life	1. Improvements over time in full sample 2. No differences between employment typology groups
Significant Baseline Predictors of Total Weeks Worked in All Paid Employment Across 24 Months	1. Work history (prior competitive work, noncompetitive paid work) 2. Education 3. PANSS total score 4. PANSS positive score 5. PANSS cognitive scores
IPS/DPA and Nonvocational Outcomes	
	Advantage IPS— 1. Financial Quality of life at 6 months 2. Social Networks at baseline, 3 months

FIGURES

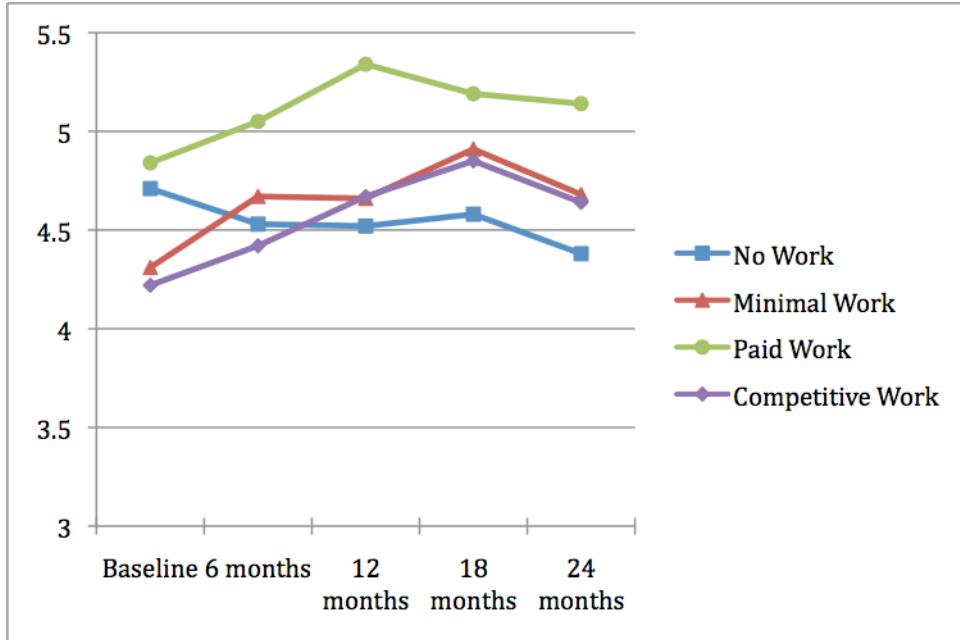


Figure 1: Overall quality of life scores in employment typology groups across the study

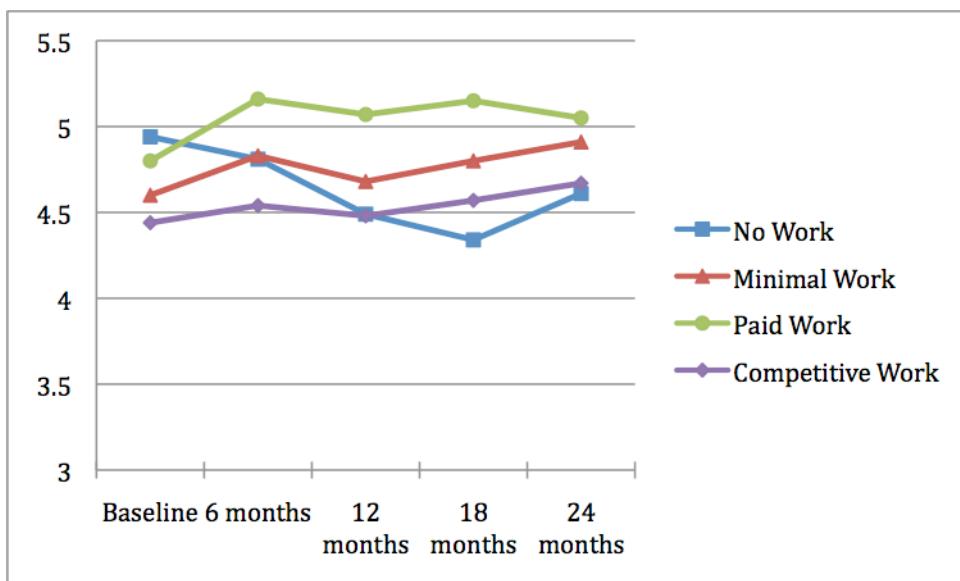


Figure 2: Financial quality of life scores in employment typology groups across the study

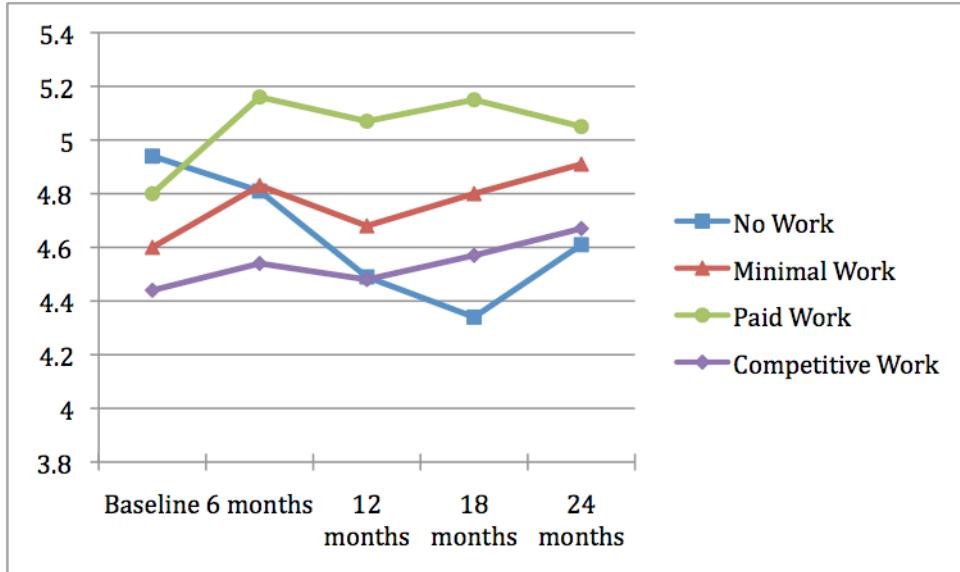


Figure 3: Leisure quality of life scores by employment typology groups across the study

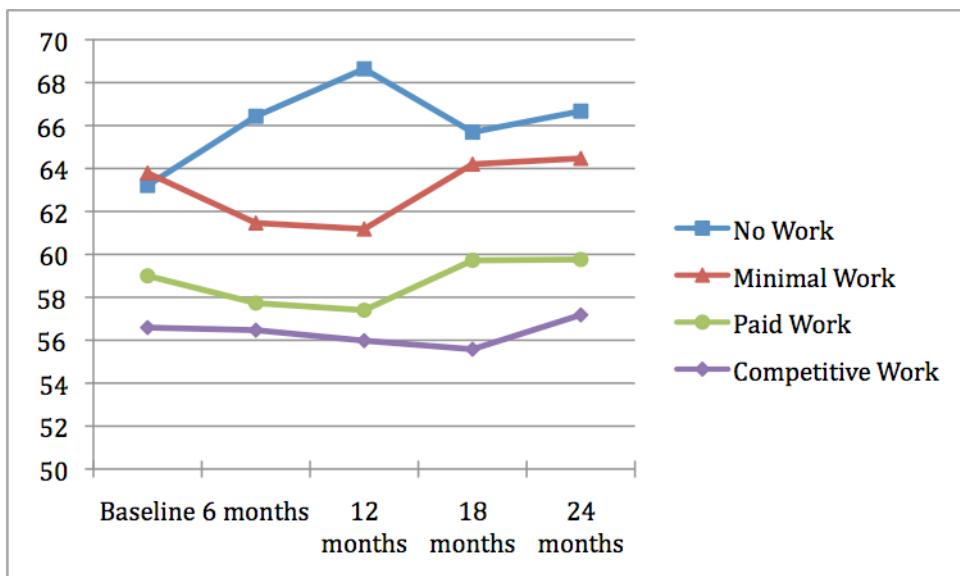


Figure 4: PANSS total scores by employment typology groups across the study

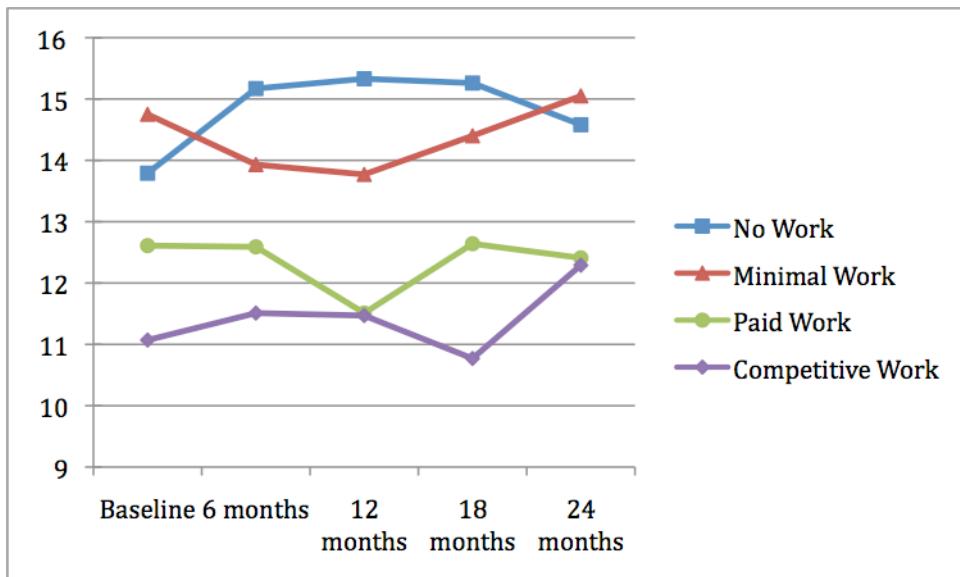


Figure 5: PANSS positive subscale scores by employment typology groups across the study

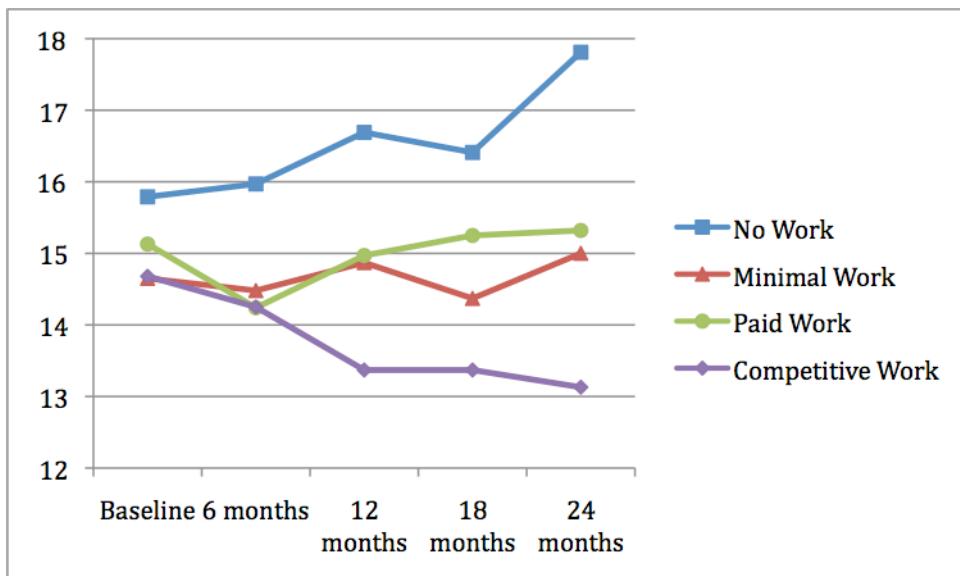


Figure 6: PANSS negative subscale scores by employment typology groups across the study

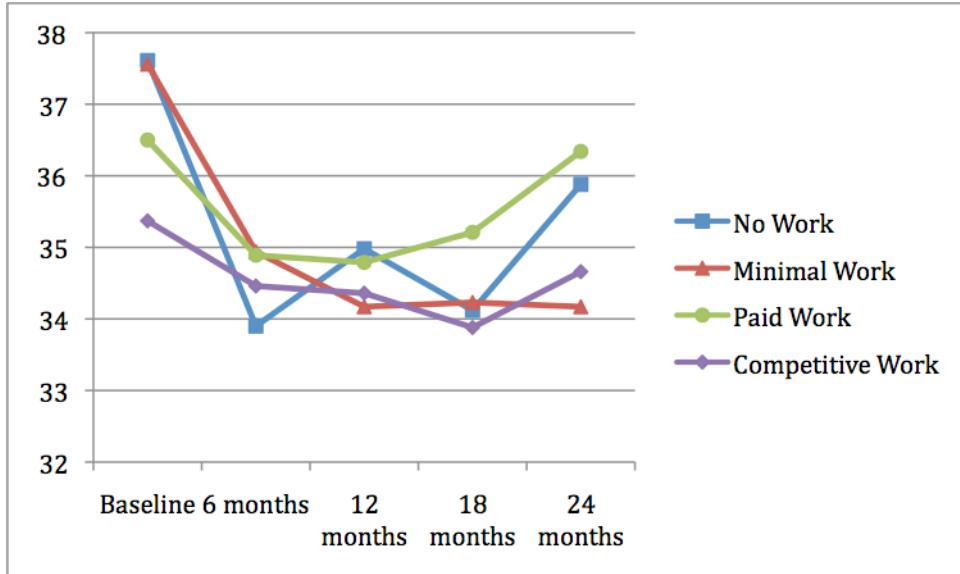


Figure 7: PANSS cognitive subscale scores by employment typology groups across the study

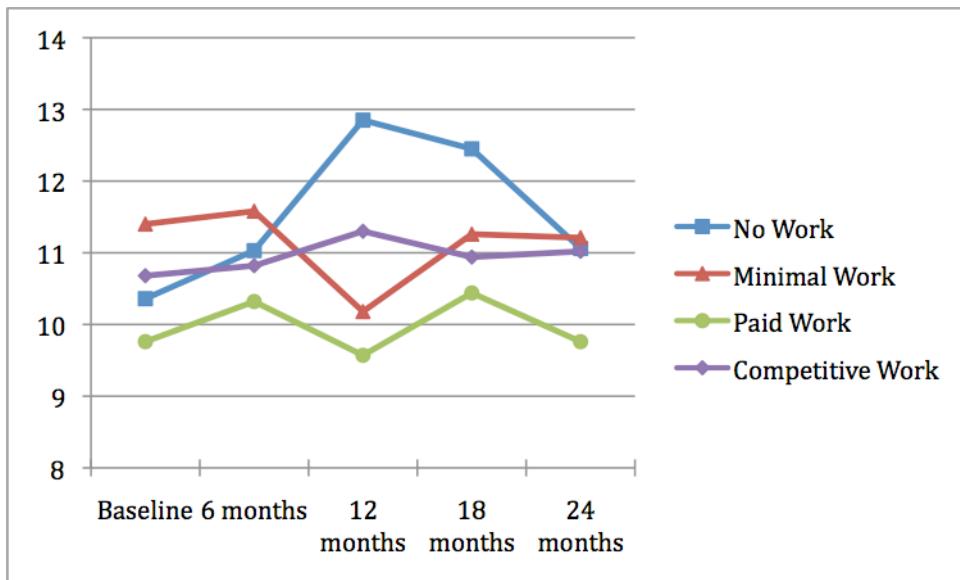


Figure 8: PANSS emotional discomfort subscale scores by employment typology groups across the study

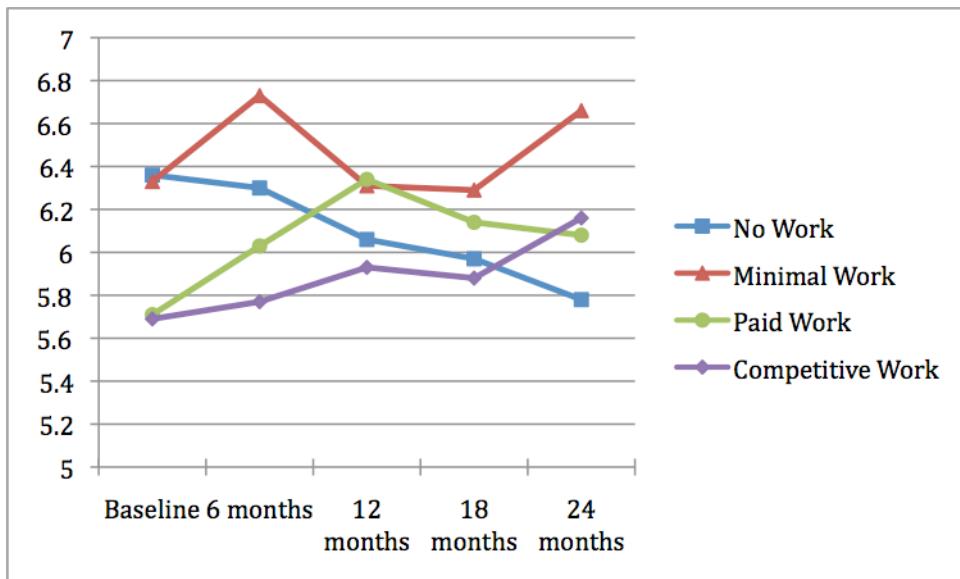


Figure 9: PANSS hostility subscale scores by employment typology groups across the study

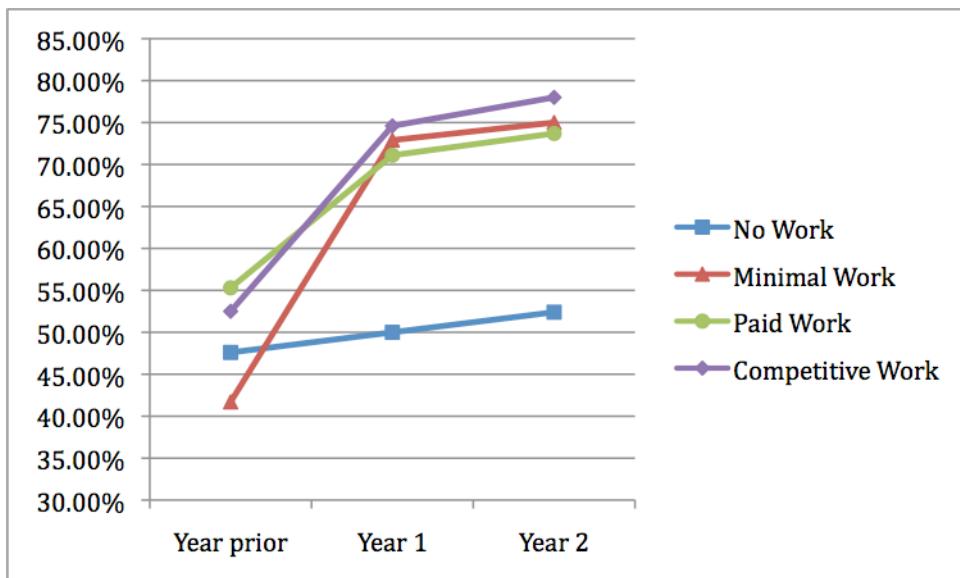


Figure 10: Percentage rates of no days of psychiatric hospitalization by employment typology groups across the study

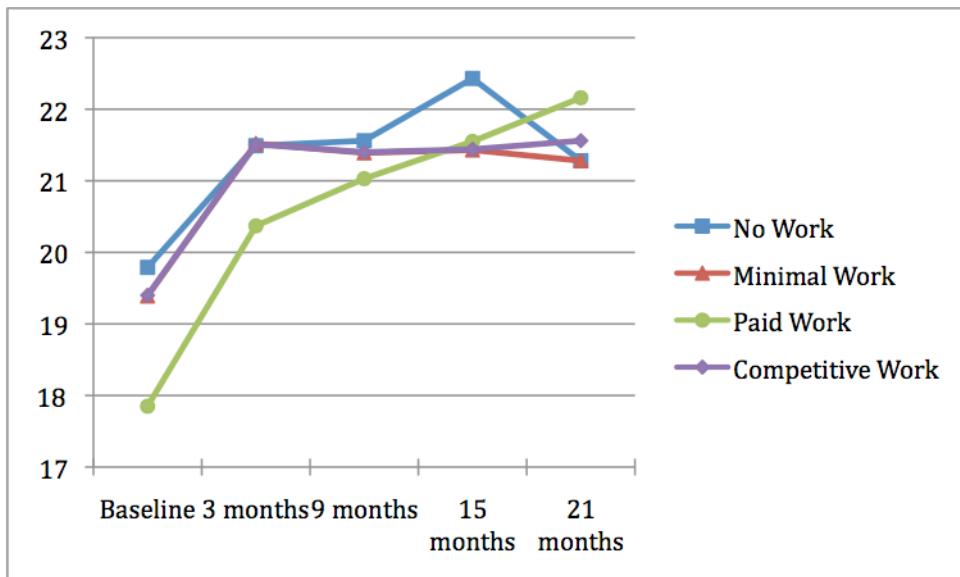


Figure 11: Social network scores by employment typology groups across the study

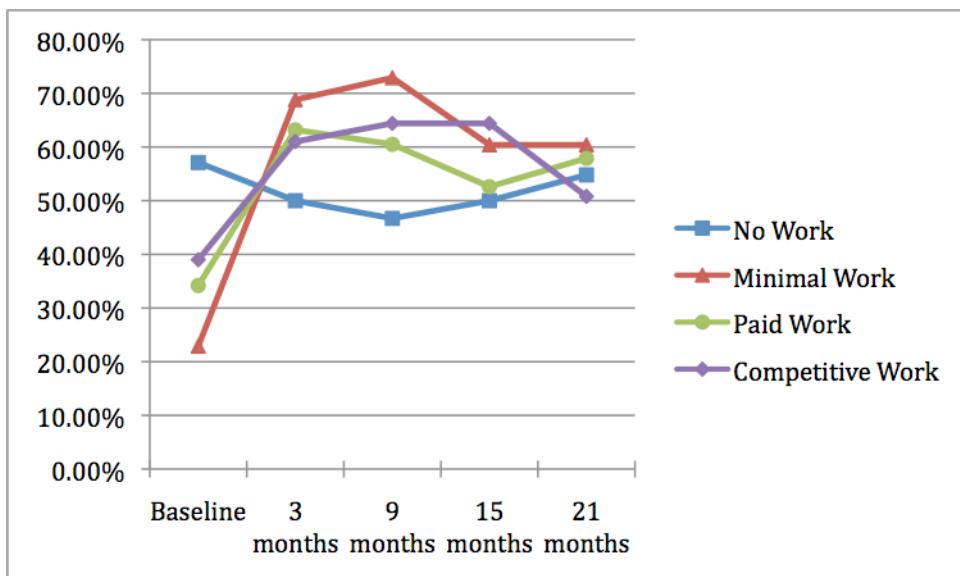


Figure 12: Percentages of participants living independently by employment typology groups across the study

VITA

VITA

Marina Elizabeth Kukla

Education

August 2010

Ph.D., Clinical Psychology
Indiana University Purdue University Indianapolis (IUPUI)
Major Advisor: Gary R. Bond, Ph.D.

Dissertation Title: The Relationship Between Employment Status and Nonvocational Outcomes for Persons with Severe Mental Illness Enrolled in Vocational Programs: A Longitudinal Study

August 2007

M.S., Clinical Rehabilitation Psychology
Indiana University Purdue University Indianapolis (IUPUI)

Thesis Title: The Impact of the Working Alliance on Vocational Outcomes for People with Severe Mental Illness Enrolled in Employment Programs

May 2004

B.A., Psychology (*summa cum laude*)
Marian College
Indianapolis, IN

Honors, Awards, and Fellowships

Outstanding Clinical Ph.D. Student of the Year Award, Psychology Department, IUPUI, 2009

School of Science Fellowship, IUPUI, 2005 - 2008
 School of Science Graduate Student Council Travel Award, IUPUI, 2008
 Indiana Psychological Association Fall Conference Outstanding Poster Award, Third Place, 2007
 Alumni Association Distinguished Senior Award, Marian College, 2004
 Joseph N. Hingtgen Distinguished Senior in Psychology Award, Marian College, 2004
 Senior Class Award, Marian College, 2004
 Mary Stockten Chemistry Scholarship Recipient, Marian College, 2003 - 2004
 USA Funds Scholar, 2002 - 2004
 Marian College Scholarship Recipient, 2000 - 2004
 Cooling Service Scholarship Recipient, 2000 - 2004

Publications

- Bond, G. R., & Kukla, M. (2008). Service intensity and job tenure in supported employment. In P. Wehman & J. Kregel & V. Brooke (Eds.), *Research in review* (pp. 145-155). Richmond, VA: Virginia Commonwealth University.
- Kukla, M., & Bond, G. R. (2009). Supported employment. In A. Roberts (Ed.), *Social Workers' Desk Reference*. New York: Oxford University Press.
- Kukla, M., & Bond, G. R. (2009). The working alliance and employment outcomes for people with severe mental illness receiving vocational services. *Rehabilitation Psychology*, 54, 157-163.
- Williams, K., Kukla, M., Bond, G. R., McKasson, M., & Salyers, M. P. (2009). Can a nurse practitioner serve in the prescriber role on an assertive community treatment team? *American Journal of Psychiatric Rehabilitation*.
- Kukla, M., & Bond, G. R. (in press). Psychiatric Disabilities. In S.R. Flanagan, H. Zaretsky, & A. Moroz (4th Ed.), *Medical Aspects of Disability*. New York: Springer.

Presentations

- Crider, N., Karim, R., Kukla, M., & Sylvester, J. (2004, April). *A driver behavior study: Differences in the levels of aggressive driving behavior as a function of driver anger and gender*. Paper presented at the Butler University Undergraduate Research Conference, Indianapolis.

- Kellogg, J. S., Bracken, L., Gall, D., Kukla, M., McAtee, T. J., Nolan, J., et al. (2004, July). *Demographic, personality and prejudicial correlates of antifat attitudes*. Poster session presented at the Annual Meeting of the American Psychological Association, Honolulu.
- Kukla, M., & Bond, G. R. (2007, November). *Job satisfaction among persons with severe mental illness receiving supported employment services*. Poster session presented at the Indiana Psychological Association Fall Conference, Indianapolis.
- Kukla, M., & Bond, G. R. (2008, May). *The working alliance and employment for people with mental illness*. Paper presented at the Midwestern Psychological Association Annual Meeting, Chicago.

Research Experience

Job Retention Study Virginia Commonwealth University

Supervisor: Gary Bond, Ph.D., Psychology Department, IUPUI, Indianapolis, IN
8/05 - 2/10

Research Assistant: Project examining the impact of employment specialist provided follow-along support on job tenure and vocational outcomes for people with severe mental illness enrolled in supported employment programs. Experiences include completion of all data collection, data entry, design and management of online surveys, coordination of four nationwide study sites, data analysis, data management, preparation of reports, fiscal management, administrative duties

Supported Employment Fidelity: Community Mental Health Center of Batesville, IN

Supervisor: Gary Bond, Ph.D., Psychology Department, IUPUI, Indianapolis, IN
8/06 - 4/07

Research Assistant: Project examined fidelity to program and then provided consultation to the CMHC about future implementation of evidence-based supported employment services. Experiences include fidelity site visits and evaluation of program fidelity based on empirically-validated standards, preparation of fidelity reports, presentation and consultation with site officials in regards to fidelity report and future practice recommendations/changes, administrative duties

Teaching Experience

Instructor, Psychology as a Social Science (PSY B-104)

Supervisor: Lisa Ehrmann, Ph.D., IUPUI
8/08 - 5/09

Full responsibilities of teaching undergraduate courses of introductory psychology across multiple sections (two semesters).

Teaching Assistant, Statistics (PSY B-305)

Supervisor: Gary Bond, Ph.D., IUPUI

8/08 - 12/08

Assisted instructor in conducting an undergraduate statistics class. Duties include the grading of homework, conducting in-class review sessions, and maintenance of gradebook.

Clinical Experience*Pre-doctoral Clinical Psychology Intern – University of California San Diego/Veteran Affairs San Diego Internship Program**VA Schizophrenia Psychosocial Rehabilitation Program. Veterans Affairs San Diego Healthcare System, San Diego, CA*

Supervisor: Eric Granholm, Ph.D.

7/09 - present

Responsibilities include: (1) comprehensive assessment of veterans with psychosis referred to the Schizophrenia Psychosocial Rehabilitation Program for evaluation, including biopsychosocial assessment and treatment formulation; (2) Comprehensive assessment of veterans in an inpatient setting with acute psychotic symptoms, including treatment planning upon discharge to an outpatient setting (3) providing individual psychotherapy for veterans with schizophrenia-spectrum disorders; (4) co-facilitation of weekly cognitive behavioral therapy groups for veterans with schizophrenia and other psychotic disorders; (5) co-facilitation of cognitive behavioral and social skills training groups for veterans with schizophrenia and other psychotic disorders

Outpatient Psychiatric Services – Gifford Clinic. University of California, San Diego Medical Center, San Diego, CA.

Supervisors: Giovanna Zerbi, Psy.D. & Elizabeth Twamley, Ph.D.

7/09 - present

Responsibilities include: (1) weekly comprehensive intake evaluations of severely mentally ill, including biopsychosocial assessment, treatment planning, care coordination and case presentation at weekly interdisciplinary treatment team meetings; (2) providing individual psychotherapy with patient case-load of 8-10 patients; (3) co-facilitation of manualized dialectical behavior therapy group for individuals with borderline personality disorder; (4) neuropsychological assessment of patients' cognitive functioning and personality to assist in diagnosis and treatment planning.

Graduate Practicum Student – Indiana University Purdue University Indianapolis

Practicum, Indiana University Department of Psychiatry Neuropsychology Clinic

Supervisors: Daniel Rexroth, Psy.D., Kyle Harvison, Ph.D., Indianapolis, IN

5/08 - 10/08

Conducted outpatient neuropsychological evaluations for psychiatry and neurology patients and outside referrals (self-referred, insurance companies, worker's compensation

claims, etc.). Observed and conducted clinical interviews. Administered, scored, interpreted, and wrote psychological reports to referring physicians on tests of intelligence, memory, general cognitive functioning, personality, and academic skills. Diagnoses included Alzheimer's disease and other dementias, mild cognitive impairment, Parkinson's disease, multiple sclerosis, seizure disorders, bipolar disorder, depression, anxiety disorders and medical illnesses, such as cancer, diabetes, heart disease, stroke. Supervision included weekly individual meetings with Dr. Harvison and Dr. Rexroth.

Practicum, St. Vincent Hospital Stress Center.

Supervisors: John Guare, Ph.D., Nancy White, LCSW, Indianapolis, IN

1/08 - 5/08

Acute mental health crisis center. Conducted intake assessments of mental health and substance use patients, formed diagnostic impressions, recommended a level of care for patients, staffed patient cases with physicians, made referrals to inpatient and outpatient programs. Provided phone assessment and counseling to mental health and substance use disorder patients and families. Coordination with health insurance and managed care personnel. Diagnoses included depression, anxiety, self mutilation, personality disorders, bipolar disorders, schizophrenia spectrum disorders, substance use disorders.

Supervision included bi-weekly individual meetings and monthly group supervision with Dr. Guare, twice weekly individual supervision meetings with Ms. White.

Practicum, Pike Township School Corporation

Supervisor: Pamela June, Ph.D., Indianapolis, IN

8/07 - 12/07

Conducted psychoeducational evaluations of elementary, middle school, high school students receiving special education services for learning disabilities and emotional disabilities. Administered, scored, interpreted, and wrote reports on tests of intelligence, memory, achievement, personality (including projective tests), problem solving, adaptive behavior, social skills, reading ability. Supervision included weekly individual meetings with Dr. June.

Practicum, Richard L. Roudebush VA Medical Center

Supervisor: Paul Lysaker, Ph.D., Indianapolis, IN

1/07 - 8/07

Outpatient unit for veterans with mental illness. Conducted group, family, and individual psychotherapy. Participated in interdisciplinary team meetings for treatment plan review and patient care monitoring. Assisted in developing treatment plans for new patients. Diagnoses included schizophrenia spectrum disorders, bipolar disorders, depression, anxiety disorders, personality disorders, PTSD, obsessive-compulsive disorder, substance use disorders. Supervision included weekly individual meetings and weekly group supervision meetings with Dr. Lysaker.

Other Clinical Experience

Employment Consultant, Supported Employment, Noble of Indiana

Supervisor: Jackie Tijerina, M.Ed., Indianapolis, IN

7/04 - 8/05

Provided direct service in the areas of vocational rehabilitation and case management to adults with a variety of disabilities on a full-time basis. Duties included vocational assessments, job development and liaison with employers, on site-job training, follow-along job support, treatment planning and coordination across a variety of service domains. Diagnoses included developmental disabilities, mental illness, learning disabilities, physical disabilities.

Undergraduate Practicum, Larue D. Carter Memorial Hospital

Supervisor: Fred Malloy, M.S., Indianapolis, IN

1/04 - 5/04

Inpatient unit for adults with severe mental illness nonresponsive to treatment. Co-lead healthy living and exercise group therapy. Observed cognitive, mental status, intake, psychodiagnostic assessments. Diagnoses included schizophrenia spectrum disorders, other psychotic disorders, bipolar disorders, depression, personality disorders, obsessive-compulsive disorder, substance use disorders.

Leadership Positions Held

Commencement Speaker, Marian College Commencement Ceremony, 2004

President of the Senior Class, Marian College, 2003 - 2004

Treasurer of the Psychology Club/Psi Chi Chapter, Marian College, 2002 - 2004

Marian College Student Association Junior Class Representative, Marian College, 2002 - 2003

Secretary of the Sophomore Class, Marian College, 2001 - 2002

Professional Affiliations and Committee Activities

American Psychological Association Student Affiliate, 2008 - current

Midwestern Psychological Association Student Member, 2007 - current

Department of Psychology Representative, IUPUI School of Science Graduate Student Council, 2007 - 2008