Predicting Employment Outcomes of Individuals with Disabilities: Attitudes and Perceived Barriers to Work

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Abstract -- The purpose of this study was to examine whether perceived physical, financial, and psychological barriers (e.g., negative attitudes about returning to work), demographic, social-support, and work-related variables predicted successful rehabilitation among clients exiting a state-federal vocational rehabilitation (VR) system. A logistic regression was conducted with successful employment as the outcome. Participants' age, employers' participation in a Tax Break program, and having Medicaid at application were significant predictors of successful rehabilitation in the full model, while the first two variables (i.e., age and employers' participation in a work incentive) were significant predictors in the trimmed model. These findings are briefly discussed in terms of rehabilitation implications and directions for future research.
Keywords: Employment, disability, age, incentives, rehabilitation

Restoration of employment for people with disabilities has been the central focus of the state-federal vocational rehabilitation (VR) system since its beginning (Rehabilitation Services Administration, 2007). Despite the systems in place to facilitate an entry or return to labor force participation for individuals with disabilities, the high unemployment and underemployment rate of individuals with a wide range of disabilities continues to be a challenge (e.g., for a breakdown of the unemployment data by severity of disability, see U.S. Department of Census data, 2007). The 2000 Harris Poll indicated a 32% employment rate among individuals with disabilities in the U.S., compared to 81% employment of those without disabilities (National Organization on Disability, 2002). Research that examines perceived physical barriers, financial barriers, and psychological barriers (e.g., negative attitudes about returning to work) is needed in order to help clarify what facilitates and hinders returning to the workforce.

Predictors of Returning to Work with a Disability

Decades of research have been conducted on employment outcomes among clients who have participated in the state-federal VR system in the U.S. (Bolton, Bellini, & Brookings, 2000; Gilmore, Schuster, Timmons, & Butterworth, 2000; Hayward & Schmidt-Davis, 2002, 2003). The following sections will provide a brief overview of factors that have been found to predict employment among individuals with disabilities.

A comprehensive review of research by Walls and Tseng (1987) noted that employment among individuals with disabilities was predicted best by age, education, and previous work experience. Bolton, Bellini, and Brookings (2000) studied the utility of three factors (personal history, functional limitations, and rehabilitation services) for prediction of employment outcomes (competitive employment and salary). Their research showed that both receiving training and job placement services strongly predicted competitive employment. Hayward and Schmidt-Davis (2002, 2003) examined data among VR clients and found that a substantial number of variables significantly predicted obtaining employment: type of disability, gross mo-

tor function, self-esteem, working at time of application to VR, the desire to obtain assistive technology devices or services, the desire to obtain help in attending vocational training or college, having dependents, being non-Caucasian, receipt of Supplemental Security Income (SSI), Social Security Disability Income (SSDI), or other types of financial assistance, job placement, supported employment, on-the-job training, vocational training, independent living services, and counseling.

Rogers, Crystal, and Bishop (2005) found that several service-related variables significantly predicted employment among individuals receiving SSI or SSDI: receiving job placement, on-the-job training, restoration services, or miscellaneous/other services. Those who received job placement were three times as likely to have a status 26 (i.e., case closed successfully) than those who did not receive job placement. Further, having more education and not being a member of an ethnic minority significantly predicted employment among individuals receiving SSI or SSDI. Smith (2007) examined predictors of employment outcome using national disability data and found that the following person-related variables were significant predictors of employment: gender, disability type, less need for help with personal care or routine needs, less length of time with limitation, greater education, and age. They also performed separate analyses for each gender; results showed that there was a trend of unemployment with increasing age among both genders.

Considerable research has focused on workforce return for populations with specific types of disabilities. Burns, Young, and Manniss (2006) investigated predictors of employment among 152 individuals living with HIV/AIDS and found that Latino ethnicity, higher age, better immune-system functioning, and greater mental and physical functioning predicted employment. Pluta and Accordino (2006) investigated returning to employment among individuals with psychiatric disabilities by analyzing the mean days spent on private disability insurance and found that not being self-employed, months of occupational experience, and younger age significantly predicted a shorter return-to-work period. Similarly, history of work experience has been shown to predict vocational rehabilitation success among individuals with emotional and learning disabilities (Mandes & Gessner 1986) and psychiatric disabilities (Cook & Rosenberg 1994). Other research has shown that higher age (Ponsford, Oliver, Curran, & Ng, 1995), being married (Anthony, 1994), and greater education (Gollaher et al., 1998) predict the likelihood of current employment among people with varying kinds of physical and mental disabilities.

While there is some research on the attitudes of employers toward disability (Popovich & Scherbaum, 2003; Thomas, 2001), relatively little research has been conducted on the attitudes about work that clients bring when utilizing services in the VR system. Hence, the purpose of the study was to examine whether perceived physical. financial, and psychological barriers, in addition to demographic, social-support, and work-related variables, are salient predictors of a successful employment outcome among clients exiting a state-federal VR system. Such information may assist in understanding what factors play a role in facilitating employment among clients of VR.

Method

Participants

Seven hundred and sixty individuals with disabilities who were clients of the VR system in Iowa in 2002 were eligible to participate in this study (see Marmé, Crandall, Schiro-Geist, Broadbent, Kundu, Dutta, et al., 2005 for more details about recruitment for the study). Of these, 540 consented to complete the survey. The group of participants was composed of 48.4% females and 51.6% males. Their marital status was as follows: 41.5%, never married; 28.4%, married; 23.0%, divorced; 4.2%, separated; and 2.9%, widowed. The ethnic composition was disproportionately Caucasian (94.2%), followed by 4.7% African-American, 3.3% American Indian, 1.6% Hispanic, and .8% Asian or Hawaiian. The mean age was 37.15 years (SD = 11.4). The highest level of education included the following: 18.4% with less than a high school education, 44.3% with a high school diploma or equivalent, 20.7% with some post-secondary education (no college degree), 9.6% with an Associate's degree, and 6.3% with at least a Bachelor's degree.

Instrument

The Attitude and Opinion Survey (Marmé et al., 2005) was used in this research. This 38-item instrument identifies 25 client motivation and attitude-toward-work indicators. The development, which was conducted by means of focus groups and information from literature reviews, and the testing of the instrument are described in Marmé and colleagues' 2005 publication.

Procedure

Agency staff members were trained in regional group sessions to collect data from VR consumers at the time of intake by using Marmé et al.'s (2005) Attitude and Opinion Survey. Web-based data collection was created for the VR agency staff to utilize as part of their intake procedure. A toll-free phone number was made available for the VR agency staff support during the process of data collection. Upon collection, anonymous data were transmitted electronically to a central location, where they were stored for merger with other data derived from the VR system. All other data used in this research were abstracted from data that were routinely collected in the state using the CSR-300 form, which were then linked with the survey data using an anonymous code generated by the VR system. The researchers had no access to any personally-identifying information.

Results

In order to investigate the factorial structure of the Attitude and Opinion Survey, the following Exploratory Factor Analyses (EFA) were conducted. An initial principle-components analysis (PCA) of the 38 items showed 11 components with eigenvalues greater than one, indicating 11 common factors. The scree plot was examined; it reflected four factors above the break in the plotted factors. Hence, a 4-factor EFA was run, which was not interpretable. Based on the intention of the instrument's authors of developing a single questionnaire, a 1-factor EFA was run to study the structure of the survey instrument. The 1-factor model exhibited multiple items that had small communalities based on this solution, which suggested that many items were not well-explained by this solution. Thus, twenty-nine items with communalities less than .45 were dropped from further consideration.

An EFA was rerun on the remaining 9 items. The solution accounted for 49.65% of the variance in the nine items. The principle-components analysis (PCA) indicated two components with eigenvalues greater than one. Thus, a final EFA was run, forcing a 2-factor solution using oblimin rotation with Kaiser normalization. All factor loadings (on at least one of the factors) for every item was greater than .45; hence, this solution was retained (see Table 1). These two factors exhibited a correlation of .445. Inspection of the item-content suggested that Factor 1 involved perceived physical and financial barriers to employment (including health-related, income, and insurance factors), and hence was named Physical/Financial Barriers. Factor 2 involved mental barriers (e.g., doubt, negative views about working), and thus was named Psychological Barriers. The Cronbach's alpha of the final 9-item scale was .79, which was an increase from .71 of the 38-item scale. The 5-point scaling for the items was 1 (*strongly agree*) to 5 (*strongly disagree*).

An examination of the correlation matrix indicated the following: While age was not significantly correlated with weekly earnings at application, hours working at application, or Psychological Barriers, an increasing age was significantly correlated with greater perceived Physical/Financial Barriers (r = -.10, p = .025) [note the aforementioned direction of coding of the items in the scale]. The factor of Physical/Financial Barriers was significantly correlated with weekly earnings at application (r = .13, p = .003) and hours working at application (r = .16, p < .001), which indicated that lesser barriers were related with higher weekly earnings and hours at application. The factor of perceived psychological barriers was significantly correlated with hours working at application (r = .28, p = .009), which indicated that lower levels of psychological barriers were associated with higher earnings and hours worked at application.

Next, a logistic regression was conducted, with the categorical dependent variable of successful rehabilitation (i.e., status 26). Due to missing data on some independent variables and because some individuals were still in the system (typically in school), the final numbers for the logistic regression were 290 as not rehabilitated and 117 as rehabilitated, totaling 407 participants (i.e., 75% of the 540 clients who completed the entry survey.) The model utilized for the logistic regression included the following: (a) demographic variables (age, gender, marital status, education, whether client ever had an Individualized Education Plan in school); (b) social support variables (previous closure in the VR system, dollar levels of social support received from various agencies, such as SSI, SSDI, Worker's Compensation, Medicaid, Medicare); (c) work-related variables (work status at referral, receipt of a Ticket to Work); (d) participation in a Tax Break program for employers; and (e) the two factors of psychological barriers and physical/financial barriers.

Table 1

Factor Loadings of Barriers toward Returning-to-Work Survey

Factor 1: Physical/Financial Barriers	
1. Trying to work could cause me to have pain,	λ = .53
2. A disability check is the best way that I can be certain of having a reliable income,	λ = .72
3. I am afraid that if I go back to work, I will lose coverage for the medical care that I need,	λ = .76
4. I do not know how I could find time to get my medical care if I had a full-time job,	λ = .77
5. I could handle a part-time job, but not a full time job,	λ = .66
Factor Two: Psychological Barriers	
1 Going to work would just complicate my life,	λ = .68
2. I don't have the concentration needed to hold a job,	λ = .80
3. Since I can't return to my old job, there really isn't anything else that I could do to make a living,	λ = .57
4. I think that I could get a job but I don't know if I could keep it,	λ = .67

The first model was significant, (X^2 = 132.55, p < .001), Nagelkerke R^2 = .40, with 79.1% correctly classified, which was different than the constant-only model that correctly classified 71.3%. Three independent variables were significant predictors of successful closure (age, having Medicaid at application, and participation in a Tax Break program for employers; while perceived physical and financial barriers approached significance).

The first model was trimmed to include the significant variables (age, having Medicaid at application, and participation in a Tax Break program), and the factor of physical and financial barriers (because it approached significance). The trimmed model was significant (X^2 = 43.85, p < .001), Nagelkerke R^2 = .13, with 78.5% correctly classified, which was greater than the null model of 76.3% cor-

rectly classified. In the trimmed model, the following were noted: (a) the variables of age and employer participation in a Tax Break program were still significant, (b) the variable having Medicaid at application was no longer significant, and (c) the trend previously noted between the variable of physical and financial barriers and successful rehabilitation was not significant. The explanatory power of both the first model and the trimmed model was significantly different than the null model.

Discussion

The purpose of this exploratory research was to examine whether perceived physical and financial barriers and psychological barriers toward returning to work, demographic variables, social-support variables, and work-related variables were significant predictors of a successful VR outcome among clients in a state-federal VR system. In the first model, only three variables were found to be significant predictors of employment outcomes: age, having Medicaid at application, and participation in a Tax Break program for employers. In the trimmed model, two variables were found to be significant predictors of employment outcomes: age and participation in a Tax Break program for employers.

Being older was a significant predictor of employment, which concurs with the findings of other research using logistic regression (Honeycutt & Brucker, 2006; Kennedy & Olney, 2006). In a Bayesian Network analysis of the Longitudinal Study of the Vocational Rehabilitation Services Program's data, Xu and Martz (2010) also found that age was a strong predictor of employment at case closure. They suggested several reasons why age was a significant predictor of employment, such as an older age indicating greater maturity, more awareness of the intrinsic and extrinsic rewards of work, greater responsibility for one's life, or greater fiscal responsibilities.

In this study, employers' participation in a Tax Break program was a significant predictor of employment outcomes, which suggests that some environmental intervention (i.e., incentive programs for employers) facilitated employment among individuals with disabilities in this sample. Ethnicity was not a significant predictor, which is a finding that is distinct from some research (Burns, Young, & Mann, 2006; Rogers, Crystal, & Bishop, 2005). Having Medicaid at application was a significant predictor in the full model (but not in the trimmed model); this finding may reflect the general need for some kind of medical coverage among many individuals with disabilities who are in the VR system.

The logistic regression results did not support the importance of psychosocial or physical and financial barriers as being predictive of employment status at closure when considering other factors. The direction of zero-order correlations indicated several significant associations, such as the greater the physical and financial barriers reported, the lower the weekly income and the fewer the hours worked at application. In addition, another zero-order correlation reflected a significant association between greater perceived psychological barriers and lower hours worked at application. These significant zero-order correlations suggest that more successful experiences of work, as reflected by the applicant's actual work status at application, are associated with lower perceived physical and financial and psychological barriers. Clients' perceived barriers may appear to be less of an obstruction to employment if a person already is working, possibly because the individual with a disability has adopted new coping skills and learned which accommodations are necessary for navigating the work setting.

In summary, the two factors of physical and financial barriers and psychological barriers were not predictive of successful rehabilitation, but several zero-order correlations suggested that perceived physical and financial barriers and psychological barriers were associated with the extent of work activity at the time of application. Two other factors, age and employers' participation in a Tax Break program, were better predictors of a successful employment outcome.

Limitations

This research is limited by several factors. The fact that subjects available for analysis were clients exiting the VR program in Iowa restricts its geographical generalizability. Further, the collected data may have not assessed important areas that would help to predict successful closures. In addition, the fact that the sample was only from one part of the United States might influence the outcomes; for example, the specific labor-market conditions in Iowa may prompt individuals to reflect certain perspectives about barriers to returning to work.

The finding in this study that ethnicity is an inconsequential factor in the return-to-work for this particular population, while contradicting previous studies (Burns, Young, & Mann, 2006; Hayward & Schmidt-Davis, 2002, 2003; Rogers, Crystal, & Bishop, 2005), is an important factor to note for this geographic location. Because the population of the State of Iowa is not highly diverse and this specific sample was more homogeneous at 94.2% Caucasian, the issues of return-to-work were not explained by this demographic aspect, which may be an artifact of the sample's composition.

Implications for Rehabilitation Counselors

One factor that has meaning for rehabilitation counselors is the significant trend that older workers were more likely to return to work than their younger colleagues, which may reflect a level of vocational maturity (e.g., interest in and identity from working) and possibly a greater need to work (e.g., due to fiscal obligations). While there may be multiple factors, as previously mentioned, that can explain the association between age and successful employment, one interpretation of this is that having a work history, which can be generally assumed among older individuals, predicts the tendency to reengage in the work force

and succeed (Martz, 2003; Schiro-Geist, 1990; Xu & Martz, 2010); hence, successful work experience is generally predictive of future work success. With awareness of this age-related factor, rehabilitation counselors can be more aware of and thus assess for the struggles that younger participants may be experiencing in the rehabilitation process.

The significant finding of a higher rate of return-to-work when employer tax incentives are used in the job acquisition process is a finding that has implications for future policy development. Some research has found that tax incentive programs have often been unsuccessful for job creation and acquiring competitive employment among most of the targeted populations, which may be partially explained by the stigma related to use of wage-subsidy vouchers (Burtless, 1985; W. E. Upjohn Institute for Employment Research, 1991). Another multi-faceted study, which examined vocational rehabilitation among individuals with vision impairment or blindness, asked 203 private-sector employers about hiring such individuals. The employers indicated that two types of financial incentives were viewed as "very or somewhat effective," namely receiving federal or state tax credits for hiring individuals with disabilities and for on-the-job training of such individuals (Kirchner, Johnson, & Harkins, 1997). The findings of the present study indicate that incentives for employers clearly promoted enhanced opportunities for individuals with a range of disabilities to enter competitive employment. The results of this study add more information to the research on about factors that predict successful rehabilitation.

Conclusion

The results of this research indicated that in the full model, age, having Medicaid at application and employers' participation in a Tax Break program were significant predictors of employment, when considering demographic variables, social support variables, work-related variables, and physical, financial, and psychological barriers. In the trimmed model, only age and employers' participation in a Tax Break program remained significant predictors of employment among a sample of individuals with disabilities in Iowa. Although the two factors of physical and financial barriers and psychological barriers did not predict the employment outcome, those two factors exhibited significant associations with several work-related variables. Future research could focus more closely on examining incentives for employers, rather than just investigating individuals' perceived barriers, in order to examine The factors that influence whether individuals with disabilities are working at the end of their VR process.

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