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# RELATIONSHIP BETWEEN CONTEXTUAL INFLUENCES AND QUALITY OF LIFE AMONG SUCCESSFUL STATE-FEDERAL VOCATIONAL REHABILITATION CONSUMERS

By

Roxane Minkus

# A DISSERTATION

Submitted to Michigan State University In partial fulfillment of the requirements for the degree of

# DOCTOR OF PHILOSOPHY

**Rehabilitation Counselor Education** 

# ABSTRACT

# RELATIONSHIP BETWEEN CONTEXTUAL INFLUENCES AND QUALITY OF LIFE AMONG SUCCESSFUL STATE-FEDERAL VOCATIONAL REHABILITATION CONSUMERS

# By

# Roxane Minkus

Livneh's (2001) concept of psychosocial adaptation to chronic illness and disability (CID) reflects the current understanding of adaptation as a multidimensional, flexible, and individual experience. The present study utilized Livneh's model of psychosocial adaptation to CID in order to examine the relationships between several contextual process influences and extrapersonal quality of life outcomes for individuals with CID. Furthermore, by restricting the sample to state-federal vocational rehabilitation (VR) consumers whose cases were closed as successfully rehabilitated, the investigation explored within-group variability of individuals with a focus on positive aspects of psychosocial adaptation. Process influences under consideration included CID-related functioning, psychological attributes (i.e., self-esteem and locus of control), available support systems (i.e., counselor support), and sociodemographic variables (i.e., gender, race, marital status and educational attainment). Quality of life outcomes were restricted to those found in Livneh's extrapersonal domain and included employment variables, community and recreational activities, and functioning associated with the living environment. Confirmatory analysis using structural equation modeling was employed to evaluate the relationships among and between variables.

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#### DEDICATION

To my dear friends Karen and Mike Sanford for their unending support, welcoming natures, and good humor while I struggled through the long dissertation process. I would especially like to thank Karen Sanford who guided me through my most difficult moments during my doctorate studies; thank you for your faith in me, your kind spiritual nature, your universal perspective, and your easy laughter.

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# LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
CDF1	Demographics and Disability Characteristics
CDF3	Quality of Services Factors
CFI	Applicant/Client Function Interview
CFI	Comparative Fit Index
CID	Chronic Illness and Disability
COPD	Chronic Obstructive Pulmonary Disease
FIML	Full Information Maximum Likelihood
LSVRSP	Longitudinal Study of the Vocational Rehabilitation Services Program
MAR	Missing at Random
QOL	Quality of Life
RMSEA	Root Mean Square Error of Approximation
RSA	Rehabilitation Services Administration
RTI	Research Triangle Institute
SCI	Spinal Cord Injury
SEM	Structural Equation Modeling
SI	Satisfaction Interview
SPSS	Statistical Package for the Social Sciences
SWB	Subjective Well-Being
TBI	Traumatic Brain Injury
TLI	Tucker-Lewis index

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VR	Vocational Rehabilitation
WHO	World Health Organization
WHOQOL	World Health Organization Quality of Life
WLSMV	Weighted Least Square Parameter Estimates

#### CHAPTER 1

#### INTRODUCTION

Throughout history, public opinion concerning people with disabilities has remained fluid. Individuals with disabilities have been, and continue to be, judged according to a variety of beliefs that reflect the economic, cultural, and sociopolitical climate of the times (Armstrong & Fitzgerald, 1999; Smart, 2001). The moral model found in many traditional cultures and religions has, for the most part, been replaced by a more modern medical model that regards individuals within a scientific framework and considers disability to be an inevitable consequence of physiological or mental deficiencies (Vehmas, 2004). This disease-centered approach, while not assigning blame, defices disabilities as functional deficits and locates limitations within the individual rather than the environment.

While individuals with disabilities continue to be viewed by many rehabilitation and medical professionals within the context of the medical model (also known as the "individual model"), rehabilitation counseling professionals and the disability community have generally rejected this unidimensional view (Hahn, 1991; Olkin, 1999; Smart, 2001; Wright, 1983; Vash, 1981, 1994; Wright, 1980). A more contemporary, although equally unidimensional, environmental model of disability (also known as the "social model") gained many supporters during the independent living movement of the 1970s. According to this model, while impairments are a consequence of functional limitations of the body and/or mind, disability results from limitations imposed upon persons by their disabling external physical and social environments. As such, disability is believed to reside entirely within external environments.

In an attempt to establish a more comprehensive and balanced view of disability, the World Health Organization (WHO) convened a task force during the 1970s. The resulting International Classification of Functioning, Disability, and Health (ICF), initially published in 1980, represents the WHO's attempt to integrate the opposing perspectives of medical and environmental models (Lutz & Bowers, 2005). Like the WHO, disability researchers and scholars within the United States have recognized that externt of disability and adaptation are ultimately determined by interactions between the inclividual and his or her social and physical environments (Bolton & Parker, 1992; Derrabo, Leviton, & Wright, 1956; Falvo, 1995; Garske & Turpin, 1998; Livneh & Artonak, 1999; Livneh, 2001; Roessler & Bolton, 1978; Rosenthal, 1996; Shontz, 1975; Vash, 1981, 1994).

As our understandings of the etiology and defining characteristics of disabilities have evolved from narrow, unidimensional views to more multidimensional models, so have our theories of adaptation to chronic illness and disability (CID). Early models of adaptation were based on a medical model that did not reflect the complex nature of adaptation. These theories did not consider interactions between the individual and his/her social and physical environments, nor did they allow for individual expressions of adaptation (Bishop, 2005a; Harrison & Kahn, 2004). During the 1970s and 1980s, stage theories of adaptation gained increasing acceptance (Bishop, 2005a). Although more encompassing, as with medically-based theories of adaptation to CID, stage theories have limited empirical support, do not allow for individual expression of the process, and do not reflect the complexity of adaptation (Kendall & Buys, 1998; Stanton, Revenson, & Tennen, 2007; Wortman & Silver, 2001). As a result, several ecological models of

psychosocial adaptation to CID have been proposed. These models conceptualize adaptation as an individual and highly complex, multidimensional process. Not only do they recognize the role that subjective experience plays in adaptation, but ecological models also acknowledge the influence that interactions between individuals and their social and physical environments have on psychosocial adaptation. The vast majority of modern theories of psychosocial adaptation to CID incorporate an ecological view of the process of adaptation. Examples include those proposed by Schlossberg (1981), Vash (1981), Moos and Schaefer (1984), Livneh (1988), Szymanski, Dunn, and Parker (1989), Rodin, Craven, and Littlefield (1991), Livneh and Antonak (1997), Kendall and Buys (1998), Stanton, Collins, and Sworowski (2001), and Livneh (2001).

Statement of the Problem and Significance of the Study

Theories of disability and adaptation, including the model considered by the **CUFFENT** study, are especially salient given that they impact how people with disabilities **are** regarded by rehabilitation professionals. Equally important, our conceptualizations of **disab**ility are directly linked to the remedies we choose to implement (Schriner & Scotch, **2001**). For example, modern ecological models proposed by Livneh (2001) and others **advoc**ate for rehabilitation efforts that are directed at both the individual and the **envir**onment within which the person lives.

In spite of their prominence, ecological theories of adaptation continue to be debated and there remain many competing models of adaptation. Indeed, for over 60 years disability researchers and scholars have investigated the likely mechanisms of DSychosocial adaptation to CID (Hannold, 2004). Although there seems to be general consensus that psychosocial adaptation to CID is multidimensional, dynamic, flexible, and uniquely individual (Kendall & Buys, 1998; Li & Moore, 1998; Livneh & Antonak, 1997, 2005; Livneh, 2001; Rosenthal, 1996; Parker, Schaller, & Hansmann, 2003; Shontz, 1975; Stanton, Collins, & Sworowski, 2001; Stanton & Revenson, 2007; Stanton, Revenson, & Tennen, 2007; Taylor & Aspinwall, 1996; Trieschmann, 1988; Vash, 1981), research has not yet clarified the dynamics of adaptation. Despite Livneh's attempt to provide a clarifying multidimensional framework, the concept of psychosocial adaptation to CID and its processes remains generally unclear and, therefore, the subject of cornt inuing discussion among disability scholars and researchers (Antonak & Livneh, 1995; Bishop, 2005a; Garske & Turpin, 1998; Livneh, 2001; Livneh & Antonak, 1997; Wright & Kirby, 1999).

While the manner by which individuals adapt to CID is one of the most significant and widely researched concerns in rehabilitation (Livneh, 2001; Livneh & Antonak, 1997; Livneh & Wilson, 2003; Parker, Schaller, & Hansmann, 2003; Trieschmann, 1988), many researchers and scholars acknowledge that there remain unresolved discrepancies between theories of adaptation and associated research efforts. For instance, Trieschmann (1998) noted that reliable and valid data demonstrating the existence, sequence, or duration of stages of psychosocial adaptation to CID is lacking. Garske and Turpin (1998) pointed out that, thus far, empirical research has not supported the existence of a universal model of adaptation that is applicable to all disabilities. Livneh and Antonak (1997) echoed this view and questioned whether a temporally ordered, hierarchical process of adaptation to CID corresponds to reality. Livneh and Antonak also expressed concern regarding the generalizability and possible bias of Current research given the extensive use of participants from institutions, hospitals, medical clinics, and university research centers. Antonak and Livneh (1995) observed that, rather than attempt to empirically validate the existence of a set of phases that define psychosocial adaptation to CID, the majority of research has studied reactions in isolation. This has practical implications, e.g., when research focuses on a single domain, the broad range of influences that impact community reintegration following CID are not adequately addressed (Boschen, Tonack, & Gargaro, 2003; Dijkers, 1997, 1998). Lastly, Starton and Revenson (2007) observed that acquiring an understanding of the environmental, interpersonal, and intrapersonal dynamics of individuals who have adjusted well to CID may improve our ability to identify protective factors. Conversely, focusing solely on psychopathology will limit our understanding of adjustment.

Given the complex, multifaceted, and uniquely individual nature of psychosocial adaptation to chronic illness and disability, it is not surprising that debates among researchers and scholars concerning the processes and outcomes of adaptation persist. In addition to conceptual disagreements, questions remain concerning the practical utility of Proposed models (Parker, Schaller, & Hansmann, 2003). Possibly as a result, adaptation theories have not translated well into clinical interventions and have demonstrated limited utility for practicing rehabilitation counselors (Bishop, 2005b; Parker, Schaller, & Hansmann, 2003). In light of the considerable impact that rehabilitation counseling Practices have on the daily lives of clients, continued empirical exploration of proposed theories of psychosocial adaptation to CID is essential.

Recommendations for future research include a call for studies that address ith in-group differences (i.e., examination of variability within cohorts), explore the **Posit**ive aspects of variables associated with psychosocial adaptation, obtain behavioral

indices of psychosocial reactions, examine the role that cognitive and/or perceptual styles (e.g., locus of control) play in the CID experience, expand sample pools to allow for greater generalization of research findings, and employ sophisticated analyses that can evaluate the multidimensional characteristics of contemporary models of psychosocial adaptation to CID (Livneh & Antonak, 1997; Livneh, Lott, & Antonak, 2004; McFarlene, 1999; Taylor & Aspinwall, 1996). Noting that disability issues have become a priority in health care research, Lutz and Bowers (2005) called for studies that can clarify the elements that influence quality of life perceptions and that identify important resources necessary for people with disabilities to maintain their functional independence. Similarly, in their review of disability research, Stanton, Collins, and Sworowski (2001) ar sured that theoretically grounded research of adjustment to chronic disease is needed so that we might (a) identify prospective interventions, (b) distinguish interventions that are effective and clarify the components that can be targeted for greatest client benefit, and (c) identify clients who may benefit from particular interventions. Lastly, Livneh (2001) **urged** researchers to examine the structural and predictive utility of his theory by considering, among other things, the relationships between quality of life outcome constructs found in his model (e.g., extrapersonal quality of life as reflected in one's work activities, recreational activities, and living environment functioning).

In an effort to enhance theoretical understandings of the multifaceted process of tation to CID and provide rehabilitation counselors with practical insights concerning the relationships between specific contextual influences and quality of life outcomes for someone living with chronic illness and/or disability, the preceding research

concerns and design suggestions were addressed by the current investigation. Therein lies the significance of the present research.

#### Theoretical Framework

Among the popular adaptation theories in the field of rehabilitation are models presented by Livneh and Antonak (1997) and Livneh (2001). According to Shontz (2003), Livneh and Antonak's (1997) model of psychosocial adaptation to CID is the most comprehensive of the contemporary theories. Their model modified earlier stage theories to incorporate current ecological thinking, with consideration given to multiple aspects of adaptation and enough flexibility to allow for individual expression throughout the process of adaptation. Similarly, Livneh's (2001) model assumes that many variables are necessary to accurately represent the complexity and variety of psychosocial Fesponses to CID (Parker, Schaller, & Hansmann, 2003). In addition, both models describe psychosocial adaptation as a dynamic, gradually evolving process by which the individual approaches an optimal state of person-environment congruence characterized by the ability to successfully manage one's subjective world and external experiences.

Livneh (2001) Model of Psychosocial Adaptation to Chronic Illness and Disability

Although they share much in common, Livneh's (2001) theory of psychosocial Although they share much in common, Livneh's (2001) theory of psychosocial Although they share much in common, Livneh's (2001) includes Although they share much in common, Livneh (2003). Along with the process variables found in Livneh and Antonak's (1997) model, Livneh (2001) includes antecedent and Outcome variables and allows for relationships within and between these constructs (Figure 1). For example, during the adaptation process, psychosocial reactions and Contextual influences interact to influence quality of life outcomes independently and in combination. Importantly, each of the elements among and within constructs reciprocally *interact* to define a sophisticated adaptation process that is unique to the individual, *flexible*, and multidimensional.

Perhaps in recognition of the complex and uniquely individual nature of **psychosocial adaptation**, Livneh chose not to unnecessarily restrict his model by **delimiting** each of the constructs in his model. Rather, he provides examples of the types **of** activities and experiences that reflect the components of his model. This allows for the **greatest** flexibility when interpreting and applying his model to real-life situations, as the **current** study attempted to do. A brief discussion of the elements that comprise Livneh's **(2001)** model of psychosocial adaptation to CID follows.

# Antecedent Variables

Antecedent variables include triggering events and contextual variables that were **Present** at the onset of CID. *Triggering events* are those factors that resulted in the **Chronic** illness and/or disability. *Contextual variables*, on the other hand, include **biolog**ical or biographical status variables, psychosocial status, and environmental **factors**.

# Process Variables

Process variables are comprised of psychosocial reactions to the CID and Contextual influences. *Psychosocial reactions*, although subjective in nature, are theorized to be influenced by physical and social experiences. Broadly classified as either adaptive or maladaptive, psychosocial reactions are organized into early, intermediate, or late reactions. Process *contextual influences*, while similar to antecedent contextual Variables, are considered to be more dynamic and interactive, and exert a more sustained

*influence*. Additionally, they are theorized to include variables associated with the CID, *sociodemographic characteristics, personality and psychological attributes, and variables associated with the external physical and social environments.* 

#### Quality of Life

Antecedent and process variables act to influence quality of life outcomes. The **three** functional domains of quality of life (intrapersonal, interpersonal, and **extrapersonal**) subsequently interact and, together, describe an individual's quality of life **outcomes**. One's *intrapersonal functioning* is impacted by both health/biomedical and **psychological** factors; *interpersonal functioning* is reflected in one's family and marital **life**, friendships and peer relations, and social activities; and *extrapersonal functioning* is **demonstrated** by work activities, functional limitations and abilities associated with one's **housing** or living environments, finances, learning or school activities, and recreational **pursuits**.

According to Livneh, the ultimate outcome of the adaptation process should be the reestablishment or improvement of quality of life. Consequently, successful PSychosocial adaptation to CID is evidenced by the individual's ability to effectively navigate the intrapersonal, interpersonal, and extrapersonal functional domains that Comprise Livneh's quality of life outcome construct.



Figure I. Livneh's (2001) model of psychosocial adaptation (Psychosocial adaptation to Chronic illness and disability: A conceptual framework, *Rehabilitation Counseling* Bulletin, 44, 2001, p. 155).

#### Purpose

The current study was motivated by the following considerations:

Livneh's (2001) theory of psychosocial adaptation to CID is arguably the most

Sophisticated, comprehensive, and flexible of the contemporary models of adaptation to

disability. Additionally, Livneh's model enjoys considerable popularity among disability

researchers and scholars.

(2) Further research is needed to document the processes of psychosocial adaptation (Hannold, 2004). Research that investigates the structural and predictive utility of *Livneh*'s (2001) model of psychosocial adaptation to chronic illness and disability is also needed (Livneh, 2001).

(3) Many disability scholars and researchers have called for research that examines
positive characteristics associated with psychosocial adaptation (Livneh & Antonak,
1997; McFarlene, 1999; Stanton, Collins, & Sworowski, 2001; Taylor & Aspinwall,
1996).

Additional research is needed that explores within-group differences (i.e., within Cohort research; Livneh & Antonak, 1997) and allows for consideration of the interrelationships among participant data (Antonak and Livneh, 1995).

(S) Research using data from the Longitudinal Study of the Vocational Rehabilitation Services Program (LSVRSP), a large scale national longitudinal study of Department of Rehabilitation consumers with a variety of disabilities, has the potential of providing USEFul rehabilitation insights (Kosciulek, 2004).

In view of the foregoing, the purpose of the present research was to investigate the efficacy of Livneh's (2001) theory of psychosocial adaptation to CID by examining relationships between several contextual process influences and extrapersonal quality of life components that comprise his model of adaptation (Figure 2). Moreover, the current effort attempted to extend previous research by clarifying within-group variability, evaluating the interrelationships among adaptation constructs with an emphasis on Positive aspects of psychosocial adaptation, and enhancing generalizability by utilizing diverse participants who reside within their communities.



Figure 2. Hypothesized structural model based upon Livneh's (2001) theory of **Psychosocial adaptation to chronic illness and disability** 

# **Research Questions**

Given the purpose of the current study, and considering results of prior research, the following questions were addressed by the study.

(1) To what extent is extrapersonal quality of life represented by employment variables, community and recreational activities, and functional limitations and abilities associated with the living environment?

(2) To what extent is extrapersonal quality of life effected by contextual process influences including client self-esteem, locus of control, perceived vocational rehabilitation counselor support, sociodemographic characteristics, and/or condition-related functioning?

(3) To what extent do contextual process influences (i.e., locus of control, perceived rehabilitation counselor support, condition-related functioning, and/or sociodemographic characteristics) interrelate with each other?

(4) To what extent do extrapersonal quality of life indicators (i.e., employment functioning, community and recreational activities, and living environment functioning) interrelate with each other?

#### CHAPTER 2

#### LITERATURE REVIEW

Every day, individuals with and without disabilities face demands that require they adapt to change. Considering the prominent role that adaptation plays in everyday life for disabled and nondisabled alike, it is not surprising that the process of psychosocial adjustment and adaptation to chronic illness and disability (CID) is one of the most important and heavily researched topics in rehabilitation (Parker, Schaller, & Hansmann, 2003). As evidence of its importance, disability scholars, researchers, and rehabilitation professionals have addressed the topic of psychosocial adaptation to CID for more than 60 years (Hannold, 2004). Based upon the resulting body of research, it is apparent that conceptions of disability and adaptation have evolved from a unidimensional understanding to a multidimensional perspective (Reese, 2004). Numerous scholars and researchers have concluded that psychological, environmental, and social variables are at least as important to rehabilitative efforts and adaptation as is the restoration of physical functioning (e.g., Black, 1984; Burton, Tillotson, Main, & Hollis, 1995; Devins, 1994; Heijn & Granger, 1974; Macleod & Macleod, 1998; Main, Richards, & Fortune, 2000; and Zalewska, Miniszewska, Chodkiewicz, & Narbutt, 2007).

The central role of the multiple variables that impact acceptance, adjustment, and adaptation to disability are reflected in the theories of disability scholars including those by Dembo, Leviton, and Wright (1956), Wright (1983), Trieschmann (1988), Livneh and Antonak (1997), and Livneh (2001). With this multidimensional view in mind, the following literature review will proceed under the assumption that, in addition to functional limitations, an examination of psychological, demographic, and social

variables will enhance the understanding of the many forces that affect psychosocial adaptation to CID.

# Exogenous Variables: Contextual Influences

# CID-Related Functioning

In Livneh's (2001) model of psychosocial adaptation to chronic illness and disability, CID-related functioning operates as a contextual influence that affects quality of life outcomes. As with the other contextual variables considered in the current study, the influence of functional limitations on adaptation to CID continues to be debated among disability scholars and researchers. For instance, whereas Lustig, Rosenthal, Stauser, and Haynes (2000) maintained that functional limitations do not uniformly correlate with adaptation, Livneh and Wilson (2003) noted that research has established a frequent link between the extent of functional limitations and psychosocial outcomes (e.g., Wineman, 1990; Shnek, Foley, LaRocca, Gordon, DeLuca et al.,1997; Lavigne & Faier-Routman, 1992, 1993; and Eide & Roysamb, 2002; as cited in Livneh & Wilson, 2003). Similarly, Stanton, Collins, and Sworowski (2001) argued that functional status can be indicative of adjustment CID.

Findings from studies such as those by Livneh, Lott, and Antonak (2004); MacCarthy and Brown (1989); and Reinhardt, Boerner, and Horowitz (2006) support assertions by Livneh and Wilson (2003) and Stanton, Collins and Sworowski (2001). Livneh, Lott, and Antonak examined the psychosocial adaptation of 121 individuals with disabilities. The perceived extent of functional limitation was found to differ significantly between the adaptive and nonadaptive groups of participants (p = .04). In a study of 136 patients with Parkinson's disease by MacCarthy and Brown (1989), functional limitations were found to correlate significantly with acceptance of illness (r = .51, p < .001), and the extent of functional limitations contributed significantly to acceptance of illness ( $\beta = .33$ , p < .001). Lastly, Reinhardt, Boerner, and Horowitz (2006) employed correlational and hierarchical regression analyses to analyze data from a sample of 570 older adults (65 years or older). Results revealed that the extent of functional disability correlated significantly with adaptation to vision loss (i.e., greater functional disability was associated with poorer adaptation; r = -.45, p < .01) and predicted adaptation to vision loss (i.e., greater functional disability or vision loss (i.e., greater functional disability predicted poor adaptation;  $R^2 = .16$ ,  $\beta = -.40$ ; p < .001).

In contrast to research that has affirmed a link between adaptation to CID and functional limitations, studies such as those by Broers, Kaptein, Le Cessie, Fibbe, and Hengeveld (2000); Chase, Cornille, and English (2000); and Whiteneck, Meade, Dijkers, Tate, Bushnik, and Forchheimer (2004) lend support to Lustig, Rosenthal, Stauser, and Haynes' (2000) argument that functional limitations are not uniformly associated with adaptation to CID. Broers et al. examined changes in quality of life and psychological distress in 125 individuals who underwent bone marrow transplantation. Results indicated that functional limitations neither correlated significantly nor predicted satisfaction with QOL. The authors also noted that almost 90% of participants reported a good to excellent QOL in spite of functional and somatic problems experienced following bone marrow transplantation. With the understanding that life satisfaction is arguably one aspect of QOL (Campbell, Converse, & Rodgers, 1976; Diener, 1984; and Frisch, 1999 as cited in Livneh, Lott, & Antonak, 2004; Whiteneck et al., 2004), two studies <sup>cons</sup>idered the association between functional limitations and satisfaction with life. In

their study of 158 adults with traumatic onset spinal cord injury (SCI), Chase, Cornille, and English found that while the extent of functional limitations correlated moderately with life satisfaction (r = .414, p < .01), they did not predict life satisfaction ( $\beta$ =-.004, p = .47). Likewise, using logistic regression to analyze results in a longitudinal crosssectional study of 2,762 individuals with SCI, Whiteneck et al. (2004) found that, when considered in isolation, functional limitations explained only 3% of variance in life satisfaction (p = .05). However, functional limitations did not influence life satisfaction when considered in conjunction with demographic characteristics, environmental factors, and societal participation.

The diverse findings such those discussed herein highlight the need for continued research that considers the effects CID-related functioning has on QOL outcomes. For this reason, they were included in the present study.

#### Sociodemographic characteristics

In Livneh's (2001) model of psychosocial adaptation to chronic illness and disability, sociodemographic characteristics are contextual factors that influence quality of life outcomes. In order to evaluate this relationship, the present investigation considered the influence that gender, race, education, and marital status have on the quality of life of a sample of state-federal vocational rehabilitation consumers. Though Livneh and Wilson (2003) concluded that considerable research exists demonstrating the impact sociodemographic characteristics have on adaptation to CID, other researchers have concluded that the results are either mixed (e.g., Mols, Vigerhoets, Coebergh, & van de Poll-Franse, 2005) or weak (e.g., Diener, Suh, Lucas, & Smith, 1999 and Judge, Locke, Durham, & Kluger, 1998).

Diener, Suh, Lucas, and Smith (1999) provided a thoughtful and comprehensive review of SWB research that included consideration of adaptation and coping research generally. Among other issues, the authors discussed the relatively small effect sizes of external variables, citing results from research by Campbell, Converse, and Rodgers (1976) who found that demographic factors accounted for less than 20% of the variance in SWB; Andrews and Withey (1976) who determined that only 8% of the variance in SWB was attributable to demographic factors; and Argyle (1999) who asserted that external circumstances account for about 15% of the variance in SWB research. According to Diener, Suh, Lucas, and Smith (1999), personality is one of the most robust predictors of SWB. Therefore, the small effect of demographic variables on subjective well-being may be due to interactions between one's personality and the environment. As an aside, it was hoped that the inclusion of two personality variables in the current study (locus of control and self-esteem) might help to shed some light on this interaction.

Although the primary focus of Diener, Suh, Lucas, and Smith's (1999) review of SWB research was not on disabilities, their findings with respect to the limited influence of sociodemographic variables on well-being and QOL have been supported by many disability investigators. Conversely, results obtained by other disability researchers provide support for the view that sociodemographic characteristics do indeed affect the well-being and QOL of individuals with disabilities. These mixed results, several of which are discussed below, made inclusion of sociodemographic variables in the current study all the more essential.

Gender. Based upon data from the 1994-1995 Survey of Income and Program
Participation, approximately 28.6 million women and 25.3 million men are living with a

disability in the United States (Jans & Stoddard, 1999; as cited in Nosek & Hughes, 2003). Compared to men with disabilities, these women report experiencing greater stress (Nosek & Hughes, 2003) and depressive symptoms (DeVellis, Revenson, & Blalock, 1997; Hagedoorn, Kuijer, Buunk, DeJong, Wobbes et al., 2000; and Stommel, Kurtz, Kurtz, Given, & Given, 2004; as cited in Stanton, Revenson, & Tennen, 2007). For example, Seibert, Reedy, Hash, Webb, Stridh-Igo et al. (2002) found significant gender differences in their study of 33 men and women with traumatic brain injury (TBI), i.e., significantly more women reported greater sadness (p < .05) and poorer post-injury QOL (p < .05). In addition gender driven psychological vulnerabilities, it has been shown that women earn less income than men, acquire less education, are less likely to be married or employed, and have less access to disability benefits programs (Nosek & Hughes, 2003). Given these data, it is not surprising that many studies have found gender differences in quality of life outcomes following onset of CID.

Clearly, while they do not compel, it is reasonable to expect that individual characteristics, including gender, will play a role in adaptation to CID (Garske & Turpin, 1998; Krause & Anson, 1997; Vash, 1981). Having said this, gender differences are generally not significantly associated with either psychosocial adaptation, subjective well-being, or the quality of life of individuals with CID (e.g., Dijkers, 1999; Heinemann & Whiteneck, 1995; Hicken, Putzke, Novak, Sherer, & Richards, 2002; Livneh, Lott, & Antonak, 2004; Shmotkin, 1990; Warren, Wrigley, Yoels, & Fine, 1996). Studies that did not detect a significant gender effect include those by Belgrave (1991); Hicken, Putzke, Novak, Sherer, and Richards (2002); Krause (1998); Li and Moore (1998); Livneh, Lott, and Antonak (2004); and Reinhardt, Boerner, and Horowitz (2006).

In Livneh, Lott, and Antonak's (2004) study of 121 individuals with disabilities, neither gender, race, or marital status were determined to significantly influence adaptation to disability and, in a study of 247 individuals with either TBI or SCI, Hicken, Putzke, Novak, Sherer, and Richards (2002) discovered that neither gender, marital status, education, nor race significantly predicted satisfaction with life. In an extensive investigation by Dijkers (1999) examined correlates of life satisfaction using 2,183 persons with SCI who were 1 to 20 years post-injury. Separate analysis of variance (ANOVA) procedures revealed that gender (p = .02; eta<sup>2</sup> = .00), race (p < .001; eta<sup>2</sup> = .02), marital status (p < .001; eta<sup>2</sup> = .02), and educational level (p < .001; eta<sup>2</sup> = .04) each contributed significantly but negligibly to reported life satisfaction. Gender, race, and marital status displayed especially weak relationships with life satisfaction. Subsequent to ANOVA, the data was analyzed using stepwise linear regression procedures; gender alone remained a significant predictor of satisfaction with life.

Belgrave (1991) and Li and Moore (1998) extended demographic research to include consideration of psychosocial variables. Each found that demographic resources (e.g., gender, education, age at disability, and income) were overshadowed by the influence of psychosocial variable. Based upon their results, Li and Moore concluded that psychosocial factors may be more important to adjustment to disability than sociodemographic variables.

In contrast to the above findings, several studies have supported the contention that gender differences exist (e.g., Brezinka and Kittel, 1995; Dijkers, 1997, 1999; Krause & Anson, 1997; Seibert et al., 2002; Tate, Riley, Perna, & Roller, 1997; and Wood & Rutterford, 2006). For instance, longitudinal research examining couples' patterns of

adjustment to cancers of the gastrointestinal tract indicate that adjustment is affected by both gender and the patient/partner role (Northouse, Mood, Templin, Mellon, & George, 2000; Schulz & Schwarzer 2004; and Tuinstra, Hagedoorn, Van Sonderen, Ranchor, Van den Bos et al., 2004; as cited in Stanton, Revenson, & Tennen, 2007). Brezinka and Kittel (1995) reviewed the research literature and concluded that following myocardial infarction, women exhibit poorer psychosocial adjustment as compared to men. They also observed that subsequent to either myocardial infarction or coronary artery bypass grafting, return to work rates of women are significantly lower, women enroll in cardiac rehabilitation at lower rates, display poorer adherence, and dropout of programs at significantly higher rates. Lastly, based upon results of their study, Tate, Riley, Perna, and Roller (1997) concluded that women and men emphasize different aspects of their lives (e.g., social, functional, etc.) when evaluating their level of QOL and life satisfaction. This may partially explain the gender differences found by many studies.

Race. According to U.S. Bureau of the Census data (1991; as cited in Uswatte & Elliott, 1997), major categories of ethnic groups in the United States include African Americans (31.1 million), Latinos (22.3 million), Asian/Pacific Islanders (7.3 million), and Native Americans (1 million). Stanton, Collins, and Sworowski (2001) asserted that ethnic and cultural factors influence illness vulnerability, attention to and interpretation of somatic and emotional changes, responses to symptoms, and subsequent adaptation. Krause and Anson (1997) concluded that gender and race, important aspects of our daily psychosocial environments, are likely characteristics that affect adjustment to SCI. Having said this, it is perhaps noteworthy that results of disability research do not universally support the influence of race on CID. Whereas several studies have indicated

that race is associated with life satisfaction and/or quality of life outcomes (e.g., Ferrin, 2002; Krause, 1998; Krause & Anson, 1997; Richards, Bombardier, Tate, Dijkers, Gordon et al. 1999; and Webb, Wrigley, Yoels, & Fine, 1995), other investigations have found that race does not significantly affect outcomes (e.g., Ashing-Giwa, Ganz, & Petersen, 1999; Clayton & Chubon, 1994; Li & Moore, 1998; Livneh, Lott, & Antonak, 2004; Putzke, Hicken, & Richards, 2002; Reinhardt, Boerner, and Horowitz, 2006; and Waters & Atkins, 1997).

For instance, Putzke, Hicken and Richards (2002) used case matching to control for individual differences between White and African American participants with SCI; no significant differences were found between the long-term life satisfaction ratings of the two groups. In their review of the literature, Putzke, Hicken and Richards noted that, with two exceptions (Richards et al., 1999; and Krause, 1998), when studies have controlled for other between-group demographic characteristics, race has been shown to be largely unrelated to life satisfaction. Results of Putzke, Hicken, and Richards' study appear to support earlier research.

In their study of 1, 266 adults with disabilities, Li and Moore (1998) found that race did not correlate significantly with acceptance of disability and exhibited a small predictive relationship in their regression model ( $\beta = -.074$ , p < .05), with Caucasians slightly more likely to have lower scores on the acceptance of disability measure. This correspondence between race and acceptance of disability disappeared completely when the model included all 13 psychosocial variables considered by Li and Moore ( $\beta = -.025$ , ns).
Marital status, Marital status has been evaluated in numerous chronic illness and disability studies. Many of these investigations have concluded that marital status is strongly associated with health and mortality (e.g., Carter & Glick, 1970; Helsing, Szklo, & Comstock, 1981; Ortmever, 1974; Revenson, 1994; and Thiel, Parker, & Bruce, 1973; as cited in Berkman, 1985) as well as subjective well-being, life satisfaction, and OOL (e.g., Andrews & Withey, 1976; Campbell, Converse, & Rodgers, 1976; Gurin, Veroff, & Feld, 1960 as cited in Dirksen, 1990; Glenn & Weaver, 1979; and Post, de Witte, van Asbeck, van Dijk, & Schrijvers, 1998), Glenn and Weaver (1979) observed that there is considerable empirical evidence supporting the influence of marital status on psychological well-being, and Turner (1983) concluded that empirical support for the relationship between marital status and mortality is widespread and robust. This early confidence in the importance of martial status as a significant predictor is reflected in later studies by, among others, Boschen, Tonack, and Gargaro (2003); Chase, Cornille, and English (2000); Ferrin (2002); Kemmler, Holzner, Neudorfer, Meise, and Hinterhuber (1997); Kim, Warren, Madill, and Hadley (1999); Kinney and Coyle (1992); Powell, Shaker, Jones, Vaccarino, Thoresen et al. (1993); Reinhardt, Boerner, and Horowitz (2006); Tate and Forchheimer (2002); and Wingate (1995).

Using stepwise multiple regression to analyze data from 344 adults with physical disabilities, Kinney and Coyle (1992) found that marital status explained a small but significant amount of variance in life satisfaction ( $R^2$ = .002; p < .001) and in a study by Chase, Cornille, and English (2000), marital status was established as a significant predictor of life satisfaction (p < .02) for a group of 158 persons with traumatic onset SCI. Similarly, in a group of 48 outpatients receiving maintenance treatment for

stabilized schizophrenia in Northern Italy, married or fixed partner status correlated significantly with general life satisfaction (r = .31, p < .05; Kemmler, Holzner, Neudorfer, Meise, & Hinterhuber, 1997). In his review of the research literature, Ferrin (2002) observed that many studies have demonstrated that both marital and employment status are positive predictors of life satisfaction. For example, in McColl, Stirling, Walker, Corey, and Wilkins' (1999) longitudinal study of 286 individuals with SCI, marital and employment status were determined to be significant predictors of functional independence (p = .004 and p < .0001, respectively) and satisfaction with life (p < .0001).

In spite of the many studies that have lent support to the influence of marital status on mortality, subjective well-being, and QOL, other studies have raised doubts (e.g., Belgrave, 1991; Dirksen, 1990; Ganz, Desmond, Leedham, Rowland, Meyerowitz, & Belin, 2002; Hicken, Putzke, Novak, Sherer, & Richards, 2002; Li & Moore, 1998; Livneh, Antonak, & Gerhardt, 1999; Livneh, Lott, & Antonak, 2004; and Mols, Vigerhoets, Coebergh, van de Poll-Franse, 2005). In her study of 96 women with prior myocardial infarction, Wingate (1995) found that neither marital status, severity of illness, duration of illness, age, nor socioeconomic status significantly effected QOL. Additionally, in a comprehensive review of 10 high quality studies of breast cancer survivors, Mols, Vingenhoets, Coeberg, and van de Poll-Franse (2005) reported that the empirical results are inconclusive, with marital status and education predicting QOL in some studies but not in others.

*Years of education*. As previously mentioned, numerous studies have suggested that, along with marital status, education may play an important role in satisfaction with life, quality of life, and adaptation to CID (e.g., Dijkers, 1999; Ferrin, 2002; Hicken,

Putzke, Novak, Sherer, and Richards, 2002; McColl, Stirling, Walker, Corey, & Wilkins, 1999; and Reinhardt, Boerner, & Horowitz, 2006). For instance, in a study of 570 older adults with visual impairments that interfered with functioning, Reinhardt, Boerner, and Horowitz (2006) found that both marital status and education correlated significantly with adaptation to vision loss (r = .17 and r = .30, respectively; p < .01). Hierarchical regression analysis revealed that, as a group, sociodemographic variables (gender, age, education, and marital status) explained 11% of the variance in adaptation to vision loss (p < .001). Yet, only education ( $\beta$  = .19, p < .001) and marital status ( $\beta$  = .10, p < .01) contributed significantly to these results, with education explaining the majority of the variance in adaptation. Overall, these results demonstrated that participants who were married and had greater education evidenced better adaptation to vision loss.

In spite of several studies that have established education's significant affects on the quality of life of individuals with disabilities, others have not found an association (e.g., Belgrave, 1991; Dirksen, 1990; Li & Moore, 1998; Hicken, Putzke, Novak, Sherer, & Richards, 2002; and Tate, Riley, Perna, & Roller, 1997). Mols, Vigerhoets, Coebergh, and van de Poll-Franse (2005) reviewed several studies and concluded that sociodemographic factors, including education, have produced inconsistent results. It is these contradictory findings that made inclusion of education in the current study all the more essential.

#### **P**sychological Attributes

Self-esteem. The concept of self-esteem dates back to the late 19<sup>th</sup> century when an American psychologist, William James, developed the first organized topology of the self. In his description of the *social self*, James (1890) acknowledged the impact that

interactions with others have on people's feelings about themselves. He also theorized that humans have the capacity to view themselves as objects (i.e., the self) and to develop feelings and attitudes toward that object (Challenger, 2005; Mruk; 1999; Turner, 1998).

Since James' early depictions of the self, the concept of self-esteem has been variously defined depending upon the theoretical perspective employed. Despite more than 100 years of attention and thousands of published studies, attempts to establish a universally accepted definition of self-esteem have been unsuccessful, thereby leaving the construct illusive, ambiguous, and poorly defined (Challenger, 2005; Hewitt, 1998; Leary, 1999). Extant theories of self-esteem and their supporters are too numerous to list here. Suffice it to say that concepts of self-esteem have been, and continue to be, colored by theoretical perspectives including those of developmental psychology, social Psychology, humanistic psychology, ethological studies, and a variety of other theoretical orientations (Challenger, 2005; Leary, 1999).

A case in point, Rosenberg (1965), like James (1890), based his theory on the assumption that people are social entities and self-esteem a function of the social environment. Also like James (1890), Rosenberg (1965, 1986) theorized that self-concept represents the totality of one's thoughts and feelings about the object *self*. Self-esteem, One component of self-concept, is shaped by social input and reflects an overall (i.e., global) evaluation of one's worth or value and contains both cognitive and affective components. High self-esteem is characterized by feelings of self-respect and worthiness, while low self-esteem reflects self-rejection and self-dissatisfaction.

Whereas Rosenberg believed self-esteem to be a unidimensional construct, others have argued that self-esteem is bi- or multi-dimensional (e.g., Kaplan & Pokomy, 1969

and Shahani, Dipboye, & Phillips, 1990). Additionally, Rosenberg's scale is thought to be a measure of explicit self-esteem. In contrast, some researchers are now speculating that, as with global and domain-specific self-esteem, explicit and implicit self-esteem represent different characteristics of the same construct (Suls & Krizan, 2005). Findings from research, such as those by Greenwald and Farnham (2000), support the existence of explicit and implicit dimensions. Using both correlational analysis and confirmatory factor analysis, Greenwald and Farnham found that implicit and explicit self-esteem may represent distinct constructs that are weakly correlated.

While there remains considerable disagreement concerning the definition of selfesteem, there is general agreement in the literature that self-esteem refers to self-referent evaluations of character, abilities, and behavior. Additionally, self-esteem is generally recognized as an important variable in the psychosocial response to chronic illness. Whether global or domain-specific; explicit or implicit; uni-, bi-, or multi-dimensional, self-esteem has repeatedly demonstrated moderate to strong relationships with acceptance of disability, adjustment and adaptation to disability, and quality of life (e.g., Anderson, 1995; Belgrave, 1991; Burckhardt, 1985; Dirksen, 1989, 1990; Heinemann & Shontz, 1982; Kemmler, Holzner, Neudorfer, Meise, & Hinterhuber, 1997; Li & Moore, 1998; Linkowski & Dunn, 1974; Livneh, Lott, & Antonak, 2004; Marini, Rogers, Slate & Vines, 1995; Ritsner, Gibel, & Ratner, 2006; Rondorf-Klym & Colling, 2003; Rucklidge, Brown, Crawford, & Kaplan, 2007; Starr & Heiserman, 1977; and Wingate, 1995). Given the vast quantity of self-esteem research, the current review will not address the topic in its entirety. Rather, it is anticipated that the following sampling of relevant studies will serve to highlight the importance of continued research into the utility of self-esteem as a

factor impacting adaptation and its associated quality of life for individuals with chronic illness and/or disability.

In a study by Li and Moore (1998) of 1,266 consumers of state-federal vocational rehabilitation services, self-esteem, emotional support, and marital status correlated significantly with acceptance of disability. Of the psychosocial indicators assessed by Li and Moore, self-esteem correlated most strongly with acceptance of disability (r=.531, p < .001) followed by perceived emotional support (r=.347, p < .001). In addition to **corre**lational analysis, Li and Moore conducted four separate multiple regression **analyses**. Self-esteem emerged as the single most important predictor (p < .001) in the two models that explained the greatest amount of variance in acceptance of disability.

As with research exploring the impact of self-esteem on acceptance, adjustment, and adaptation to disability, research has frequently demonstrated a link between selfesteem and quality of life outcomes. For example, in a sample of 96 women with a history of myocardial infarction, Wingate (1995) found self-esteem to be correlated moderately with quality of life (r=.40, p < .001). Additionally, ANOVA results demonstrated that, of the nine variables considered, self-esteem (p = .04), along with social support (p < .01) and employment (p < .01), explained the majority of variance in Quality of life (45%).

Employing an ex post facto cross-sectional design, Burckhardt (1985) explored the ability of several psychosocial and environmental variables to predict quality of life in 94 subjects with rheumatic disease. Results of stepwise regression analysis indicated that variance in quality of life among participates was primarily accounted for by self-esteem,

followed by internal health locus of control and perceived social support (25%, 20%, and 10% respectively).

Using 126 patients with chronic obstructive pulmonary disease (COPD), Anderson (1995) investigated the relationship between several psychosocial variables and quality of life. Of the 10 variables employed by this study, self-esteem correlated most strongly with quality of life (r=.64, p < .05), followed by depression (r=-.58, p < .05) then social support (r=.47, p < .05). Path analysis was also performed on the data. Of the significant paths (p < .05), self-esteem demonstrated the greatest direct effect on quality of life ( $\beta$  = .395), followed by depression ( $\beta$  = .278) then social support ( $\beta$  = .225).

In an effort to clarify the relationships between quality of life and several psychological and environmental variables, including self-esteem and locus of control, May and Warren (2002) studied 98 individuals with spinal cord injuries (SCI) who had been living within the community an average 15.5 years since onset of SCI. In their sample, higher self-esteem and greater community participation were associated with significantly better quality of life (r=.609 and .654 respectively,  $p \le .01$ ). Clearly, self-esteem is one construct that may prove useful to the understanding of quality of life as represented in Livneh's (2001) model of psychosocial adaptation to CID and, therefore, was included in the current study.

Locus of control. Attribution theories are causal theories that distinguish between individuals who perceive events in their lives to be caused by their own actions from those who attribute causes to external factors. Early studies used attribution theories to design locus of control scales that assessed skill-chance perceptions. Individuals who perceived events as the result of their skill were said to have an internal locus of control,

while individuals who perceived events to have been the result of chance were said to have an external locus of control.

The original focus on attributions was gradually supplanted by the contemporary concept of generalized expectancy derived from social learning theory. The important distinction between contemporary locus of control constructs and those based upon attribution theories lies in their temporal analyses of events. Attribution theories apply to past events and distinguish between individuals who perceive themselves as having been in control of or responsible for events in their lives. In contrast, according to modern theory, locus of control orientation exerts its influence prior to an outcome and reflects an *a priori* belief that reinforcements are contingent either upon one's own behaviors or external influences (Zuroff, 1980).

First expressed by Rotter (1966) using generalized expectancy theory, locus of control was theorized to reflect one's beliefs about the contingency of reinforcements. According to Rotter, locus of control is unidimensional with "external" and "internal" poles. Individuals who hold an internal locus of control view reinforcements as resulting directly from their behaviors. Those with an external locus of control, on the other hand, believe events are not entirely contingent on their own actions. Rotter recognized that although locus of control is characterized by two opposing poles, gradations in locus of control are to be expected.

Whereas Levenson (1981) agreed with Rotter's (1966) general definition of locus of control, she considered the locus of control construct to be multidimensional. Levenson maintained a unidimensional internal locus of control, but theorized that external locus of control is multidimensional. An external orientation can result either

from a belief that the world is unordered and random or a belief that, while the world is ordered and predictable, powerful others control events in one's life. Levenson's view of external locus of control as a multidimensional construct leads to another point of difference between the theories of Rotter (1966) and Levenson (1981). Unlike Rotter, Levenson's locus of control dimensions are not mutually exclusive, i.e., individuals may score high on one, two, or all three dimensions (Dickson, Dodd, Carrieri, & Levenson, 1985). Importantly, research has provided support for Levenson's argument that locus of control is a multidimensional construct (e.g., Berzins & Ross, 1973; Brosschot, Gebhardt, & Godaert, 1994; Lefcourt, 1991; Levenson, 1973, 1981; Parkes, 1985; and Watson, 1983).

The locus of control construct, whether conceptualized using earlier attributional theories or based upon expectancy beliefs about the origin of reinforcements, has been extensively researched for the past 40 years (Martz, Livneh, & Turpin, 2000) and includes many studies that examine the impact of locus of control orientation on adjustment and adaptation to chronic illness and/or disability. Given the expanse of locus of control research, for practical reasons, the current literature review will be necessarily restricted in scope. Instead, several relevant studies will be highlighted for consideration. Prior to discussing these studies, however, selected control concepts require clarification.

*Perceived control, personal control,* and *locus of control* appear throughout the literature. According to Wallston, Wallston, Smith, and Dobbins (1987), the concept of *perceived control* has been poorly defined, especially in empirical research. It has often been used to refer to locus of control or self-efficacy, but can also refer more generally to control over behavior, outcomes, reinforcements, situations, and/or processes. In contrast

to their earlier work, Wallston, Wallston, Smith, and Dobbins (1987) chose to define **perceived** control broadly as "the *belief* that one can determine one's own internal states and behavior, influence one's environment, and/or bring about desired outcomes" (p. 5). Using this definition, the authors posited that perceived control encompasses locus of control, self-efficacy, and causal attribution constructs. Martz, Livneh, and Turpin (2000), on the other hand, maintained that self-efficacy, causal attribution, and perceived control are distinct from locus of control. They argued that the former reflect control beliefs concerning past behaviors or anticipation of control over future behaviors, while the latter reflects beliefs regarding control over reinforcements or rewards in one's life. Conversely, based upon his review of the literature, Lent (2004) concluded that trait-like control beliefs include locus of control, perceived control, and generalized self-efficacy. as well as judgments about one's competence and environmental mastery. Each of these characterizations reflect established beliefs concerning the extent of control one has, or can have, over important events in his or her life (Lightsey, 1996 and Thompson, 2002; as cited in Lent. 2004).

Many health and disability researchers appear to ignore these distinctions, preferring instead to equate *perceived control* both with *personal control* (a unique term that appears to have been adopted by some researchers) and with *internal locus of control* (e.g., Carver, Harris, Lehman, Durel, Antoni, Spencer, & Pozo-Kaderman, 2000; Chase, Cornille, & English, 2000; Schulz & Decker, 1985; and Taylor, Helgeson, Reed, & Skokan, 1991). Having said this, not to include research that considers locus of control in this manner would result in the elimination of many otherwise well-designed

investigations. Therefore, the current literature review included studies that equated internal locus of control with perceived control and/or personal control.

One of the more central and pervasive psychological losses associated with CID is the diminishment of a sense of personal control that frequently results in feelings of powerlessness (Sidell, 1997; Thompson & Kyle, 2000). Indeed, irrespective of whether an illness is curable, a degree of perceived control is essential to enable the person to cope (Larner, 2005). According to Krantz (1980), helplessness is a major feature of chronic illness, while coping is the process of regaining a sense of control. The ability to both predict and control aversive events has been demonstrated to affect stress responses in a wide variety of circumstances. Clearly, the perception of control is a critical element that needs to be considered when addressing issues of adaptation to chronic illness and disability. As Thompson and Spacapan (1991) noted, there are several documented advantages to maintaining a belief in personal control including emotional well-being, increased likelihood of engaging in health promoting behaviors, and improved performance. Livneh, Lott, and Antonak (2004) observed that several studies have linked internal locus of control to lower levels of emotional distress and better psychosocial adaptation in individuals with life-threatening conditions (e.g., Holahan, Moos, Holahan, & Brennan, 1995; Levine, Warrenburg, Kerns, Schwartz, Delaney et al., 1987; Mikulincer & Florian, 1996; Stanton & Snider, 1993; and Terry, 1992). Likewise, for individuals with non life-threatening conditions, studies have found that internal locus of control is associated with lower levels of psychosocial distress and greater psychological well-being (e.g., Hanson, Buckelew, Hewett, & O'Neal, 1993; Kemp, Morley, & Anderson, 1999; Kennedy, Lowe, Grey, Short, 1995; Summerfeldt & Endler, 1996;

Wineman, Durand, & Steiner, 1994; and Zeidner & Saklofske, 1996; as cited in Livneh, Lott, & Antonak, 2004).

Thompson and Kyle (2000) provided an exceptional review of extant research examining the impact of locus of control on psychosocial adjustment to illness. Their review focused primarily on longitudinal studies that were designed to control for confounds that can cause spurious relationships between perceived control and outcomes. Despite enormous variations in methodology and participants, nearly all of these studies found perceived control to be significantly correlated with better psychosocial outcomes. According to reviews of contemporary research by Thompson and Kyle (2000) and others, perceived control has been shown to be significantly associated with better adjustment in individuals with cancer (e.g., Blood, Dineen, Kauffman, Raimondi, & Simpson, 1993; Newsom, Knapp, & Schulz, 1996; and Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993), rheumatoid arthritis (e.g., Affleck, Tennen, Pfeiffer, & Fifield, 1987; and Chaney, Mullins, Uretsky, Doppler, Palmer et al., 1996), chronic fatigue (e.g., Ray, Jefferies, & Wier, 1997), cardiac disease (e.g., Helgeson, 1992; Kugler, Tenderich, Stahlhut, Posival, Korner et al., 1994; Mahler & Kulik, 1990; and Moser & Dracup, 1995); HIV and AIDS (Reed, Taylor, & Kemeny, 1993; and Thompson, Nanni, & Levine, 1994), spinal cord injuries (e.g., Fuhrer, Rintala, Hart, Clearman, & Young, 1992; Schulz & Decker, 1985; and Shnek et al., 1997), multiple sclerosis (e.g., Brooks & Matson, 1982; and Shnek et al., 1997), chronic pain (e.g., Wells, 1994), Parkinson's disease (e.g., Wallhagen & Brod, 1997), and diabetes (e.g., White, Tata, & Burns, 1996).

In spite of many studies linking perceived control with better adjustment, a few investigations reviewed by Thompson and Kyle (2000) did not find a significant relationship between perceived control and psychosocial adjustment. In some instances, Thompson and Kyle discovered that these studies had measurement problems (e.g., Malcarne, Compas, Epping-Jordan, & Howell, 1995; and Berckman & Austin, 1993), while others employed analyses with limited power (e.g., MacCarthy & Brown, 1989). For a detailed understanding of the research examined by Thompson and Kyle, the reader is encouraged to peruse their comprehensive review. Additional studies that did not identify an association between locus of control and outcomes include those by May and Warren (2002) and Zalewska, Miniszewska, Chodkiewicz, and Narbutt (2007).

While some studies have failed to find a significant relationship between perceived control and adjustment, others have discovered that perceived control may have both positive and negative effects, depending on the focus of the control (e.g., Wallhagen & Brod, 1997). Yet others have found that external locus of control can exert a positive influence on individuals with traumatic or chronic injury and/or illness (e.g., Burish, Carey, Wallston, Stein, Jamison, et al., 1984; and Rothbaum, Weisz, & Snyder, 1982). Burish et al. noted that patients with an external locus of control may be more receptive to advice from health professionals and, as a result, may be more likely to play a productive role in promoting their health care than internally oriented patients. Wortman and Dunkel-Schetter (1979) posited that individuals with an internal locus of control may become frustrated and feel helpless when they cannot change their condition. Externally oriented individuals, on the other hand, may fare better psychologically

because they do not try to control their environment, resulting in less frustration than internally oriented individuals.

As a point of contrast, Larner (2005) argued that when an illness or disability cannot be cured, a degree of perceived control is essential to assist the person to cope with their circumstances; and Weinstein and Quigley (2006) pointed out that research literature suggests that, compared to individuals with an external orientation, people with an internal locus of control display better emotional adjustment and may be less impacted by stressful events. Similarly, Thompson and Kyle (2000) noted that both perceived control and the ability to assess its effectiveness are important aspects of coping with stressful and traumatic experiences. Livneh, Lott, and Antonak (2004) and Reese (2004) also expressed confidence in the important role internal locus of control plays in adaptation to CID. Indeed, notwithstanding several studies that suggest an external locus of control may be beneficial in certain health-related circumstances, the vast majority of studies appear to support the hypothesis that internal locus of control is the better predictor of adaptation to chronic illness and/or disability (e.g., Boschen, Tonack & Gargaro, 2003; Chan, Lee, & Lieh-Mak, 2000; Chase, Cornille, & English, 2000; Schulz and Decker, 1985; and Zalewska, Miniszewska, Chodkiewicz, & Narbutt, 2007). Having said this, the remaining diversity of findings from locus of control research combined with the continuing conceptual debates among scholars highlights the complexity of the locus of control construct and the importance of its inclusion in the current study.

Variables associated with the external environment

Available support systems, counselor support. Social support has been variously defined, but is generally comprised of both supportive interactions and the recipient's

perceptions of social support (Demange, Guillemin, Baumann, Suurmeijer, Moum et al., 2004). Social support has repeatedly demonstrated that it can play an important role in well-being, health, and adaptation to chronic illness and disability (Abraido-Lanza, 2004; Li & Moore, 1998; Mancini & Bonanno, 2006; Rutterford & Wood, 2006). Additionally, an extensive search of the research literature by this researcher revealed numerous studies and theoretical discussions of the counselor-client working alliance, some of which make specific reference to the counselor-client bond that traditionally forms one leg of the client-counselor alliance. However, with extraordinarily few exceptions, extant literature does not examine the impact of counselor support as a dimension of social support, rather only as an implied aspect of the counselor-client bond. This leads to a relevant comment concerning the current study. Rather than focusing on the counselor-client alliance commonly discussed in rehabilitation counseling literature, the present investigation utilized consumer perceptions of counselor support to evaluate an important contributor to adaptation to CID, i.e., received social support. This decision was made for two reasons.

First, the present study was designed to examine several adaptation and outcome variables associated with Livneh's (2001) theory of psychosocial adaptation to CID. According to Livneh, available social supports impact quality of life outcomes and, as a result, are included in his model. In Livneh's (2001) model, available social support systems are operative during the process of adaptation and serve as a contextual variable associated with the external environment. Social support may be defined to include comfort, assistance, and/or information one receives through formal or informal contacts with individuals or groups (Wallston, Alagna, DeVellis, & DeVellis, 1983 as cited in

Flannery, 1990). Additionally, support provided by professionals can serve to buffer individuals from the potentially negative effects of stressful circumstances (Flannery, 1990). Like Flannery (1990), Blanchard, Albrecht, Ruckdeschel, Grant, and Hemmick (1995) included professionals as possible sources of social support and Carpenter (2002) observed that research supporting the influence of acquaintances is growing. Both Taylor (1983) and Blanchard, Albrecht, Ruckdeschel, Grant, and Hemmick (1995) concluded that, based upon research results, emotional support appears to be most important from intimate others whereas informational support may be more valuable when provided by professionals. Equally important, according to Kessler, Kendler, Heath, Neale, and Eaves (1992; as cited in de Ridder, 2004), individuals who are less socially competent and have poor self-disclosure skills are less effective at mobilizing support from their established social networks. This would seem to make social support from rehabilitation professionals all the more important for these individuals as they attempt to adapt to their illness and/or disability. Clearly, rehabilitation counselors, while engaged in the practical concern of assisting clients with CID to return to work and/or to their daily activities, also serve as an important social resource for clients.

Given the foregoing, it is proposed that within the context of the current study, counselor support can reasonably be considered to represent one type of social support available to consumers of the state-federal vocational rehabilitation program. Unfortunately, a thorough search of rehabilitation, social sciences, and counseling databases returned extraordinarily few studies that have examined the relationship between counselor support and acceptance, adjustment, or adaptation CID. When discussed in rehabilitation literature, counselor support it is typically implied as either a

theoretical dimension of the counselor-client alliance (i.e., the counselor-client bond) or as an important component aiding the empowerment of clients (e.g., Kosciulek, 2004; Lustig, Stauser, Rice, & Rucker, 2002; and Rigger, 2003). Theoretical discussions of the bond between clients and counselors exists, yet empirical investigations of the link between perceptions of rehabilitation counselor support and adaptation to CID appear to be essentially nonexistent. With this in mind, the current study may be partially viewed as an attempt to evaluate a slice of the client-counselor alliance theory, i.e., counselor support that forms a basis for the client-counselor bond.

Considering the limited research within the field of rehabilitation that has explored the relationship between counselor support and adaptation, the present literature review will be necessarily broad and will include a discussion of the influence social support has on physical and psychological well-being; quality of life; and acceptance, adjustment and adaptation to CID. Where available, findings from research that investigated the affects that support from medical professionals and/or counselors can have on clients will be included, and disability research that examined the role of social support will be highlighted. It is hoped that the evidence provided here from a variety of disciplines will serve to underscore the need for additional empirical research within the rehabilitation counseling profession. That said, this review will begin by establishing a historical context within which the concept of social support arose. Next, theories frequently seen in the literature will be presented, followed by a discussion of empirical research including relevant findings from selected studies.

Philosophers have long emphasized the essential role relationships play in human existence. Indeed, Bowlby (1969; 1973) and others (e.g., Flannery, 1990; Goldsmith &

Campos, 1982; House, Umberson, & Landis, 1988; Mendoza, 1984; and van der Kolk, 1987) have maintained that human need for social support is innate and biologically rooted. This appreciation for the significance of social bonds became a principal component of sociological theory and has been the topic of considerable theoretical debate and research interest within a wide variety of disciplines for several decades. The social support construct was initially addressed in mental health literature (House, Landis, & Umberson, 1988) and has roots in the attachment theories of John Bowlby and Mary Ainsworth, and in early research studying the effects of social environments on health (McColl & Skinner, 1988). In addition to attachment theories, Shumaker and Czajowski (1994) acknowledged contributions to social support theory made by Cooley's (1909) concept of the primary group, Durkhiem's (1951) advancement of the idea of anomie, Rogers' (1942) conception of the therapeutic process, and Likert's (1961) emphasis on social support as the primary element in the supervisory process.

Numerous theories and models have been proposed and, not surprisingly, how social support is ultimately conceptualized and measured depends upon one's theoretical perspective. For example, community psychologists and epidemiologists, traditionally interested in the structural features of social networks, measure the health-related effects of interactions among friends, neighbors and relatives; participation in church and social groups; and employment outside the home (Gottlieb, 1983). Behavioral medicine researchers, on the other hand, often conceptualize support as the perception that one is loved and esteemed by others (Turner, Jay, Frankel, & Levin, 1983) and create measurements to reflect this focus. In their review of social support literature, McColl and Skinner (1988) made note of the considerable diversity of social support definitions,

highlighting those by Caplan (1976); Cobb (1976); Kaplan, Cassel, and Gore (1977); House (1981); Turner (1983); Lazarus and Folkman (1984); Kahn (1985); and Thoits (1986). Regardless of one's theoretical perspective, social support is generally recognized to be a complex, multidimensional construct characterized both by dimensions and sources of support, several of which are discussed below.

Two concepts associated with social support that appear throughout the literature are perceived and received support. Studies have demonstrated that perceived and received support are independent of each other and are not closely related (Reinhardt, Boener, & Horowitz, 2006). *Perceived support* has been defined as the perception that support will be available if needed (Helgeson, 2003). *Received support*, on the other hand, refers to support that has been delivered (Manne, 2003; Reinhardt, Boerner, & Horowitz, 2006).

Helgeson (2003) argued that because received support is typically measured using the recipient's perception of whether they received support, what is really being measured is *perceived receipt*. Reinhardt, Boerner, and Horowitz (2006) opined that perceived support may be comforting thereby assisting the individual to more effectively cope with a stressful situation. They further speculated that chronic needs for instrumental assistance (i.e., actions or materials provided by others) may have a detrimental effect on the recipient's future functional abilities, which could then negatively affect well-being. Alternatively, Bolger, Foster, Vinokur, and Ng (1996) observed that received support seems to be beneficial when used to aid practical difficulties that are associated with a delimited stressor.

In her review of chronic illness literature, de Ridder (2004) noted that studies have found perceived social support to be a better predictor of adjustment to chronic illness than actual support received. She further suggested that this may be due partially to the fact that not all enacted support is experienced as beneficial by the recipient. Similarly, Reinhardt, Boerner, and Horowitz (2006) concluded that available research suggests that perceived social support is positively associated with well-being while received support is either unrelated or negatively related to well-being outcomes. Extending the analyses of de Ridder (2004), Reinhardt, Boerner, and Horowitz (2006) explored the impact personality has on one's judgments about perceived and received social support. The authors noted that reactions to support may be enmeshed with one's sense of independence and dependence. Like Reinhardt, Boerner, and Horowitz (2006), Helgeson (2003) posited that one's personality may affect how support is perceived. Numerous social support researchers and scholars (e.g., Ford, Babrow, & Stohl, 1996; Manne, 2003; and McColl, Lei, & Skinner, 1995) have echoed the findings of de Ridder (2004); Helgeson (2003); and Reinhardt, Boerner, and Horowitz (2006). Although a discussion of potential reactions to social support is beyond the scope of the present review, it is important to realize that there is considerable research demonstrating that interpersonal relationships and the supports they offer are strong predictors of adjustment to chronic illness and disability (Stanton & Revenson, 2007).

As with the distinction between perceived and received support, the concepts of *social buffers* and *social networks* are important aspects both of social support theories and the current study. Social exchanges are generally thought to either serve as buffers or occur within the context of networks. *Networks* are social connections provided by the

environment (Procidano and Heller, 1983) and include, among others, one's biological and extended families, marital partners and children, church and community links, and work relationships (Flannery, 1990). It is thought that these networks make available daily exchanges with others that provide perceptual stability, general problem-solving information, and enhanced self-worth resulting from individual and group acceptance. *Buffers*, on the other hand, are contacts with others that cushion or mitigate potentially negative consequences of life stress. Flannery (1990) contended that buffers may or may not be present in one's network and suggested that they include, among others, physicians, lawyers, and rehabilitation professionals.

Theorized elements comprising social networks vary widely resulting in confusing and, sometimes, conflicting taxonomies. In his review of the research literature, Turner (1983) acknowledged this diversity, noting the divergent collections of Dean and Lin (1977); House (1981); Pinneau (1975); and Schaefer, Coyne, and Lazarus (1981). Various other taxonomies have been proposed including those by Procidano and Heller (1983) and Cohen and Syme (1985). In reviews of social support literature, Helgeson (2003) and Cohen (2004) concluded that contemporary taxonomies generally differentiate between three modes of support: emotional, instrumental, and information support.

Beyond the myriad taxonomies of social support lies an essential observation. Both House (1981) and Turner (1983) discerned that the common thread, and perhaps the most important ingredient, found across all conveyances of social support is the presence of an emotionally supportive relationship between the provider and recipient. This leads to a second important point. Support may be verbal or nonverbal but, in order to have

advantageous results, it must be perceived as helpful by the recipient (Blanchard, Albrecht, Ruckdeschel, Grant, & Hemmick, 1995; Bolger, Foster, Vinokur, & Ng, 1996; Bolger, Zuckerman, & Kessler, 2000; Cohen & Wills, 1985; Flannery, 1990). Not all social support has been demonstrated to be beneficial to health or adaptation (de Ridder, 2004; Flannery, 1990; Ford, Babrow, & Stohl, 1996; Kessler, Kendler, Heath, Neale, & Eaves, 1994; Reinhardt, Boerner, and Horowitz, 2006) and studies have reached mixed conclusions concerning the types of support that most effectively buffer functional disability (Mancini & Bonanno, 2006).

As the foregoing discussion alludes to, the concept of social support is exceedingly complex, with taxonomies and dimensions that vary according to the theoretical orientation of the scholar. It is hoped that this introduction has left the reader with a hint of the complexity and some of the remaining issues associated with the social support construct. That said, a brief discussion of the evolution of social support research will be presented followed by a review of relevant studies.

Historically, social support research was conducted primarily by biomedical and psychological researchers (House, Umberson & Landis, 1988) and, with coping, is currently among the most widely researched topics in health psychology (Manne, 2003). Interest in the importance of social support grew as clinicians observed the health benefits that social support provided to their patients (Shumaker & Czajkowski, 1994) and was largely motivated by two physician epidemiologists with strong interests in psychosocial issues, John Cassel and Sidney Cobb. Cobb (1974) was one of the earliest researchers to propose a model explaining individual differences in responses to stress. He proposed that personal factors, coping style, and social support act as buffers or

modifiers of the effects of stress. Indeed, most early research was guided by the commonly held opinion that social support acts as a buffer to stress. Many other models have since been offered that attempt to explain the complicated role social support plays in physical and psychological health. Unfortunately, research has been hampered by methodological problems concerning both the definition and measurement of social support (Blanchard, Albrecht, Ruckdeschel, Grant, & Hemmick, 1995; Coyne & DeLongis, 1986; Flannery, 1990; Schwarzer & Leppin, 1991; Taylor & Aspinwall, 1996), the predominance of cross-sectional designs (Blanchard, Albrecht, Ruckdeschel, Grant, & Hemmick, 1995; House, Umberson, & Landis, 1988), and confounded outcome measures (Taylor & Aspinwall, 1996). On a brighter note, Stanton, Revenson, and Tennen (2006) observed that research designs have begun to improve over the past decade, with increased longitudinal studies that use samples of sufficient size to allow for reliable analyses.

In spite of some continuing limitations, whether assessed quantitatively or qualitatively, social support has repeatedly been found to be associated with noticeable physical and psychological benefits (Berkman, 1995; Calabrese, Kling, & Gold, 1987; Manne, 2003; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Indeed, the abundance of available research that has explored relationships between social support and physical health, including onset and progression of illness, is impressive. While a comprehensive examination of this literature is not within the purview of the present review, those who are inclined to pursue this worthwhile avenue of study are encouraged to consider the exceptional literature reviews provided by Antonuci and Akiyama (1997); Calabrese,

Kling, and Gold (1987); Manne (2003); and Uchino, Cacioppo, and Kiecolt-Glaser (1996).

In addition to the many biomedical studies that have focused on the relationship between social support and physical health, empirical research has provided us with a rich set of findings that demonstrate the important role psychological factors, including perceptions of support, play in adaptation to illness and disability (Manne, 2003). A review of this research also reveals areas of needed improvement within the discipline of rehabilitation. For example, according to McColl and Skinner (1988), the field of rehabilitation needs to increase its awareness of the social support construct, improve methods of measurement, and develop specific social interventions for use with rehabilitation populations. Based upon this researcher's review of the rehabilitation counseling literature, these recommendations appear to be as relevant today as they were when McColl and Skinner proposed them 19 years ago.

Although findings from extant studies suggest that social support has a positive effect on adjustment to disability (McColl & Skinner, 1988), the results of are not without exception (Stanton, Collins, & Sworowski, 2001). For example, studies of individuals with arthritis have typically found a significant association between support (both perceived and received) and adaptation, while results from research using individuals with cancer have been less consistent (Manne, 2003). It should be noted, however, that the majority of the studies involving cancer patients were cross-sectional, and many utilized relatively small sample sizes. In spite of these contradictory results, findings from numerous other studies suggest that social support is related to well-being, quality of life, and adaptation for individuals with CID. For instance, social support has been shown to

be significantly associated with better adjustment and quality of life in individuals with cancer (e.g., Baker, 1992; Blanchard, Albrecht, Ruckdeschel, Grant, & Hemmick, 1995; Bolger, Foster, Vinokur, & Ng, 1996; Ford, Babrow, & Stohl, 1996; Helgeson & Cohen, 1996; Holland & Holahan, 2003; Manning-Walsh, 2005; Zemore & Shepel, 1989), cardiovascular disease (e.g., Corace & Endler, 2003; Duits, Boeke, Taams, Passchier, & Erdman, 1997; Friedman & King, 1994; and Wingate, 1995), chronic obstructive pulmonary disease (e.g., Anderson, 1995) diabetes (e.g., Willoughby, Kee, & Demi, 2000), epilepsy (e.g., Amir, Roziner, Knoll, & Neufeld, 1999), multiple sclerosis (e.g., Crigger, 1992; Ryan, Rapport, Sherman, Hanks, Lisak, & Kahn, 2007; and Wineman, 1990), rheumatic diseases (e.g., Abraido-Lanza, 2004; Burckhardt, 1985; DeVellis, Revenson, & Blalock, 1997; Fitzpatrick, Newman, Lamb, & Shipley, 1988; Hallal, 1991; Lambert, Lambert, Klipple, & Mewshaw, 1990), spinal cord injuries (Fuhrer, Rintala, Hart, Clearman, & Young, 1992; McColl, Lei, & Skinner, 1995), stroke (e.g., Kim, Warren, Madill, & Hadley, 1999; and King, 1996), and visual impairment (e.g., Magilvy, 1985; and Reinhardt, Boerner, and Horowitz, 2006).

Given the magnitude of available social support research, this review cannot hope to address the topic in its entirety. With this in mind, the subsequent sampling of empirical findings will focus first on studies that assessed social support's general effect on the well-being of individuals with CID as well as its influence on the acceptance, adjustment, and/or adaptation to CID. Second, findings will be presented from studies that explored the affects that social support from professionals, including counselors, and medical staff has on clients.

In their study of 1,266 consumers of state-federal vocational rehabilitation services, Li and Moore (1998) found that the presence of emotional support correlated significantly with acceptance of disability (r=.347, p < .001). Likewise, Linkowski and Dunn (1974) found that satisfaction with social support evidenced a low but significant association with acceptance of disability (r=.34, p < .05). Corace and Endler (2003) conducted a prospective study of participants undergoing cardiac rehabilitation and found that social support was positively related to participants' psychological well-being (referred to as the *mental component* of quality of life by the authors) at baseline (r = .36, p = .003) and again three months later (r = .56, p < .001). Psychological well-being in this study was indicated by levels of psychological distress, affect, and social/role limitations resulting from emotional difficulties. In another study that evaluated the effect of social support on psychological well-being, Holland and Holahan (2003) explored the effects of perceived social support and coping styles on psychological well-being of 56 breast cancer patients who had been diagnosed with Stage I or Stage II breast cancer. Among the variables studied, not only did social support exhibit a strong correlation with wellbeing (r = .65, p < .001), but it also displayed the strongest path coefficient ( $\beta$  = .49, p < .01). As an aside, social support demonstrated both a direct effect on psychological wellbeing and an indirect effect mediated by coping. ( $\beta = .38$ , p < .01).

Studies that have examined the relationship between social support and QOL have yielded similar findings to those that have explored the association between social support and well-being. For example, in an ex post facto study of 85 women with a history of myocardial infarction, Wingate (1995) found social support to be strongly correlated with QOL (r=.56, p < .001). Additionally, analysis of variance (ANOVA)

revealed that social support, employment status, and self-esteem accounted for 48% of the variance in quality of life (p < .0001). Using a cross-sectional survey design, Rondorf-Klym and Colling (2003) examined the physical and psychosocial factors affecting quality of life of a men 12 to 24 months after they underwent radical prostatectomy treatment for prostate cancer. Data analyses revealed that perceived social support significantly predicted QOL ( $\beta$ =.553, p< .05). Additionally, only social support and self-esteem correlated strongly with QOL (r=.765 and .669, respectively; p < .01).

Having touched upon the apparent effects of social support on well-being, adjustment, and QOL, the more specific influence of counselor support will now be explored. As mentioned previously, an extensive search of the literature by this researcher revealed few studies addressing counselor support. Not surprisingly, Anderson and Niles (2000) concluded that the contribution of emotional support to counseling effectiveness needs to be further examined by researchers. Studies that touched upon counselor support include those by Anderson and Niles (2000); Balcazar, Lardon, Keys, Jones, and Davis (2005); Carpenter (2002); and Svensson and Hansson (1999).

Balcazar, Lardon, Keys, Jones, and Davis (2005) conducted a longitudinal study designed to assess the effects of training on client goal attainment within the state-federal vocational rehabilitation program. Participants were randomly assigned to one of four groups: training only, training and counselor support, counselor support only, and control. Balcazar and colleagues found that not only did participants in the support only group significantly improve their help-recruiting skills (p < .01), but goal attainment for those who received training and counselor support was significantly better compared to participants who received training but no counselor support (p < .04). These results seem

to demonstrate that social support from rehabilitation counselors can have important positive effects on client outcomes within a vocational rehabilitation environment.

Anderson and Niles (2000) obtained similar results in their qualitative study of 43 participants receiving career counseling from student counselors in a university counseling center. Participants were asked to describe what they thought had been most helpful, most important, and least helpful to them. In response to questions concerning the most helpful and important aspects of their career counseling experience, participants selected the social support categories emotional support and educate/suggest (31% and 11%, respectively), second only to self-exploration (52%). Although Anderson and Niles did not draw an explicit connection between the social support construct and their definitions of support and educate/suggest, it is clear from their descriptions and from the authors' mixed use of *support* and *emotional support* that these categories map closely onto the social support construct (i.e., the support category corresponds closely to affective social support and educate/suggest is representative of informational social support). Although data analyses was limited, the results suggest that social support (i.e., emotional and information support) from professionals may be an important aspect of career counseling.

Lastly, using 32 nursing home patients, Carpenter (2002) evaluated the influence of social support from staff, peers, and family. Satisfaction with support from staff (i.e., received social support; Procidano & Heller, 1983) correlated significantly with patients' happiness (r = .65, p < .001); positive affect (r = .43, p < .05); and motivation to participate in treatment, therapies, and self-care (r = .39, p < .05). Conversely, hierarchal linear regression analysis did not find a significant effect of staff support on

psychological well-being ( $\beta = .18$ ,  $r^2 = .06$ , *ns*). Carpenter conjectured that while staff support may be important, it may not be primary due to the professional, task-oriented approach that staff often take in their relationships with patients.

As the preceding discussion of the social support construct indicates, there is considerable research demonstrating the positive effects social support can have on individuals with disabilities. Although quite limited, a few studies have explored the influence of social support from professionals, including counselors. Given the general lack of empirical investigations aimed at discovering the effects social support from counselors can have on adaptation to CID, it was hoped that the present investigation would add both to the understanding and interest in this construct within rehabilitation counseling profession.

# Endogenous Variable: Quality of Life

Conceptual notions of quality of life can be traced back to Aristotle who conjectured that a happy man both lives well and does well. Likewise, according to traditional Chinese thinking, QOL may be possible if Yin and Yang are balanced (Zhan, 1992). In modern history, researchers began to utilize assessments of QOL during the 1960s (Zhan, 1992), with QOL issues coming to the forefront among practitioners near the end of World War II (Hall, Knudsen, Wright, Charlifue, Graves et al., 1999). Prior to 1979, QOL was assessed almost entirely using medical indicators that reflected whether disease was present and whether the patient was still living; from 1977 to 1989, medical citations of QOL outnumbered psychological citations by 10 to 1 (Taylor & Aspinwall, 1996).

Within both the healthcare and rehabilitation arenas, restoration of quality of life following onset of chronic illness and/or disability has been increasingly recognized as a important outcome of services (Boswell, Dawson, Heiniger, 1998). For example, Livneh, Lott, and Antonak (2004) and Rubin, Chan and Thomas (2003) argued that reestablishment of one's QOL following onset of a chronic illness or disability is a primary goal of rehabilitation; and Callahan (1995; as cited in Tate & Forchheimer, 2002) asserted that, by focusing on quality of life rather than longevity, rehabilitation adds "life to years." Employing a pragmatic perspective, Murphy and Williams (1999; as cited in Rubin, Chan, & Thomas, 2003) conjectured that the likelihood of compliance with rehabilitation service interventions may be dependent upon the client's expectation that such services will positively affect their sense of well-being or life satisfaction. Given its apparent importance to the practice of both acute healthcare and rehabilitation, it is remarkable that the concept of QOL remains ambiguous and in contention.

More than 50 years after it was first recognized by researchers and practitioners, the domains, definitions, and assessment of QOL continue to vary both within and between disciplines. Notwithstanding the general consensus that QOL is a multidimensional construct (Bishop & Feist-Price, 2001; Kim, Warren, Madill, & Hadley, 1999; Livneh, Lott, & Antonak, 2004; May & Warren, 2002; Taylor & Aspinwall, 1996; Wingate, 1995) that is both subjective in nature and includes positive and negative dimensions (World Health Organization Quality of Life Group, 1995), a universally accepted definition is yet to be found (Dennis, Williams, Giangreco, & Cloninger, 1993; Lent, 2004; McKevitt, Redfern, La-Placa, & Wolfe, 2003; Rubin, Chan, & Thomas, 2003; World Health Organization Quality of Life Group, 1995). Perhaps, its

ambiguity is at least partially attributable to the highly subjective nature of QOL as well as its sensitivity to personal values, cultural values, and individual beliefs and expectations (Dennis, Williams, Giangreco, & Cloninger, 1993; Gerhart, 1997). Adding to the confusion, QOL appears to be a conceptual umbrella that encompasses an array of constructs reflecting physical, social, and emotional functioning (Gladis, Gosch, Dishuk, & Crits-Christop, 1999), with well-being (a complex, heterogeneous concept in its own right) as one of many QOL indicators (Lent, 2004).

The lack of consensus concerning the defining characteristics of QOL has complicated the operationalization of the construct as an outcome criterion (Kim, Warren, Madill, & Hadley, 1999). Hall and Johnson (1994) went so far as to recommend that researchers should instead focus on life satisfaction because QOL remains so nebulous. Numerous researchers have attempted to identify the defining dimensions of QOL. For instance, based upon survey results, Campbell, Converse, and Rodgers (1976) and Flanagan (1978) concluded that QOL factors can be categorized into five general domains: physical and material well-being; relations with others; social, community, and civic activities; personal development and fulfillment; and recreation. To this list, Burckhardt, Woods, Schultz, and Ziebarth (1989) added the domain of independence. Wingate (1995) argued that the multidimensional concept of OOL broadly reflects satisfaction with physical, social, and emotional needs and aspirations. In 1995, the World Health Organization Quality of Life (WHOQOL) Group identified six broad domains of quality of life including physical domain, psychological domain, degree of independence, social relationships, environment, and spirituality/religion/personal beliefs. Similarly, based upon his review of the literature, Bishop (2005b) concluded that physical

health, psychological or emotional health, social support, employment or other productive activity, and economic well-being represent the most frequently and consistently identified domains of QOL. To this list, Ferrin (2002) added functional ability. Also according to Ferrin, work is the overarching value. This addition is supported by research demonstrating the presence of an interaction between quality of work life and overall quality of life (Murphy & Williams, 1999; as cited in Ferrin, 2002).

In addition to its defining features, the nature of QOL remains in contention. Today, few researchers focus strictly on objective indicators of QOL, and there appears to be general consensus that QOL is subjective (Bishop, 2005b; Dennis, Williams, Giangreco, & Cloninger, 1993; WHOQOL Group, 1995). However, several researchers and scholars (e.g., Diener, 1984; Kosciulek, 2005; Livneh, 2001; Livneh, Lott, & Antonak, 2004; and Muldoon, Barger, Flory, & Manuck, 1998) maintain that QOL encompasses both objective (e.g., health, employment, housing, and finance) and subjective (e.g., psychological well-being, and life satisfaction) elements. Kosciulek (2005) observed that QOL reflects an overall perception of well-being that is based upon both objective and subjective evaluations of one's physical, material, social, and emotional well-being; objective evaluations are made based upon external life conditions while subjective evaluations reflect one's degree of personal satisfaction with life conditions.

As with its overall nature and defining attributes, appropriate measurements of QOL continue to be a source of debate. Given the disparity of opinion concerning the dimensions of QOL, it is perhaps not unexpected that QOL instruments vary in their design, with many demonstrating poor psychometric properties (May & Warren, 2002).

Moons, Van Deyk, Marquet, Raes, De Bleser et al. (2005) describe needs and wants assessments as characterizing the two primary approaches to QOL measurement. Needs assessments reflect a belief that QOL is dependent upon fulfillment of basic needs (e.g., good health, shelter, employment, sufficient mobility, and adequate nutrition), whereas wants assessments are based upon the assumption that QOL is affected solely by factors important to the individual (e.g., lifestyle, prior experiences, ambitions, and dreams). According to Moons et al., over the past decade measurement of QOL has gradually shifted from a need to a want approach. In concert, researchers have begun to stress the importance of incorporating clients' values and preferences into any realistic assessment of QOL (e.g., Gill & Feinstein, 1994; as cited in King, 1996), and several studies have been designed to discover aspects of QOL that are important to clients. For example, Duggan and Dijkers (2001) studied individuals with SCI who rated themselves as having high QOL and found that participants identified social support and relationships, financial independence, and freedom to pursue desired activities as major contributors to their QOL. In a qualitative study of 12 individuals with SCI conducted by Boswell, Dawson, and Heininger (1998), participants characterized QOL as subjective (i.e., QOL means different things to different people), developmental (i.e., QOL changes throughout life as priorities change), and impacted by the experience of disability (i.e., disability changes QOL perceptions). Additionally, participants overwhelming equated QOL with life satisfaction (i.e., the extent to which desired life goals are achieved) and identified attitudes toward life, work opportunities, and level of resources (e.g., housing, food, transportation, and financial income) as the three primary domains that influence QOL. It is important to note that participants also acknowledged the presence of significant

interactions between domains. For example, participants generally reported that attitudes toward life are influenced by the opportunity to work. This finding is supported by other research that has found an interaction between quality of work life and quality of life generally (Murphy & Williams, 1999; as cited in Ferrin, 2002). These and other interactions reflect the complexity of the QOL construct and point to a need to further investigate QOL using statistical approaches that can address the multidimensionality of the construct.

As the foregoing discussion illustrates, QOL of life may reflect objective aspects of life, yet it is essentially a subjective concept effected by a variety of psychosocial factors including those effected by chronic illness and disability. Unfortunately, few studies have considered QOL concerns of individuals with disabilities (Kinney & Coyle, 1992). A better understanding of the affects CID and its treatments have on QOL is needed (Taylor & Aspinwall, 1996). With this in mind, the current study was designed to incorporate subjective values and preferences of individuals with CID by utilizing selfratings of several objective QOL dimensions including employment, community and recreational activities, and functional limitations and abilities. Additionally in order to broaden our understandings of QOL, its precursors, the possible interactions between components of QOL, and its relationship to adaptation to disability, the study employed advanced statistical methods that allowed for complex analyses of QOL domains.

# **CHAPTER 3**

#### METHODOLOGY

The purpose of the current study was to investigate the efficacy of Livneh's (2001) model of psychosocial adaptation to chronic illness and disability (CID) by examining the relationships between several contextual process influences and extrapersonal quality of life outcomes for individuals with CID. Furthermore, by restricting the sample to state-federal vocational rehabilitation (VR) consumers whose cases were closed as successfully rehabilitated, the present investigation explored within-group variability of individuals with a focus on positive aspects of psychosocial adaptation. Since the vast majority of consumers in public rehabilitation programs live within their communities, the present research attempted to increase generalizability beyond studies that have focused on participants from institutions, hospitals, medical clinics, and university research centers. Additionally, rather than studying reactions in isolation, the use of structural equation modeling (SEM) enabled analyses of the interrelationships between the adaptation constructs found in Livneh's model.

The following research questions were addressed by the study:

(1) To what extent is extrapersonal quality of life represented by employment variables, community and recreational activities, and functional limitations and abilities associated with the living environment?

(2) To what extent is extrapersonal quality of life effected by contextual process influences including client self-esteem, locus of control, perceived vocational rehabilitation counselor support, sociodemographic characteristics, and/or condition-related functioning?

(3) To what extent do contextual process influences (i.e., locus of control, perceived rehabilitation counselor support, condition-related functioning, and/or sociodemographic characteristics) interrelate with each other?

(4) To what extent do extrapersonal quality of life indicators (i.e., employment functioning, community and recreational activities, and living environment functioning) interrelate with each other?

Keeping in mind the purpose of the current research, the subsequent discussion will first provide an overview of the Longitudinal Study of the Vocational Rehabilitation Services Program (LSVRSP). Next, descriptions of the data source, participants, variables and measures, procedures, and data analyses utilized by the present study will be provided.

# Overview of the LSVRSP

As ordered by Congress in Section 14 of the 1992 Amendments to the Rehabilitation Act, a longitudinal study of the state-federal vocational rehabilitation (VR) program was conducted by the Research Triangle Institute (RTI) under contract from the Rehabilitation Services Administration (RSA, United States Department of Education). The purpose of the LSVRSP was to assess the efficacy of the state-federal VR program with respect to its ability to assist individuals with disabilities to achieve positive, longterm economic and noneconomic outcomes (Kosciulek, 2005).

The study began in Fall 1992 and was completed in Fall 2000, with sample acquisition and data collection occurring between January 1995 and January 2000. A two-stage stratified random probability sampling design was employed that provided a nationally representative sample of VR consumers and allowed for evaluations of VR and
post-VR experiences for up to three years following case closure. The probability of an office being selected to participate was proportional to the total number of consumers the office served. Although the initial design included 40 local VR offices in 30 states, due to attrition 37 offices participated in the study (Hayward & Schmidt-Davis, 2005; Kosciulek, 2004, 2005; Wadsworth & Kampfe, 2004).

Participants were recruited for the LSVRSP using a probability cohort design, thereby permitting investigation of state-federal VR experiences of consumers during application for services, receipt of services, and after exiting the federal-state VR system. Data was collected as part of routine VR service administration and was accomplished via computer-aided interviews with study participants, abstraction of data from consumer's case records (i.e., archival data), and mailed surveys to VR agencies. Baseline surveys of participants were conducted at the start of the study, with follow-up interviews administered during each of the three subsequent years that comprised data collection. RTI personnel developed and pilot-tested the instruments and data-collection procedures used by the LSVRSP study, and all surveys were conducted by trained RTI field staff (Capella-McDonnall, 2005; Hayward & Schmidt-Davis, 2005; Kosciulek, 2004, 2005; Wadsworth & Kampfe, 2004). It should be noted, however, that documentation detailing the psychometric properties of the instruments used in the LSVRSP has not yet been published (E. Stapleton, personal communication, May 2, 2003 as cited in Wadsworth & Kampfe, 2004).

## Data Source and Participants

Archival and ex post facto data from the LSVRSP study were extracted to examine the relationships between contextual process influences and extrapersonal QOL

outcomes found in Livneh's (2001) theory of psychosocial adaptation to chronic illness and disability. Data files were obtained through the Cornell University Rehabilitation Research and Training Center, School of Industrial and Labor Relations website (www.lsvrsp.org). This database of 8,818 current and former applicants and consumers of state-federal VR services served as the population of interest for the present research. Since the LSVRSP database does not contain information that can be used to identify participants, confidentiality was not an issue for the present investigation.

Participants in the present study consisted of consumers between the ages of 18 and 60 years whose cases were closed as successfully rehabilitated by the state-federal VR system (closure code 26) and for whom data was collected using the Demographics and Disability Characteristics (CDF1), Quality of Services Factors (CDF3), Applicant/Client Function Interview (CFI), and Satisfaction Interview (SI) questionnaires. Below is a brief description of these data files and their applicability to the current study:

- The CDF1 data file contains basic demographic information (e.g., type of disability, race, gender, marital status, years of education, birth date). Only one CDF1 observation per participant exists; data was obtained from individuals at entry into the LSVRSP study. For the current investigation, sociodemographic information was obtained from this file.
- The CDF3 data file contains various information including changes in vocational goals, dates and circumstances of case closure, employment information, and information concerning the relationship between the participant and their vocational rehabilitation counselor. Observations obtained at case closure were

used by the present study to assess perceived counselor support and employment functioning.

- The CFI data file contains information related to the participant's physical and psychological functioning (e.g., locus of control, self-esteem, CID-related functioning, community and recreational functioning, and living environment functional limitations and abilities). For the present study, data from the first administration of questionnaires was used to assess locus of control, self-esteem, and CID-related functioning. However, in order to properly reflect the longitudinal design of the current study, the final administration of the CFI questionnaire was used to assess community and recreational functioning as well as functioning within the living environment.
- The SI data file contains participants' opinions concerning the quality of services they received (e.g., perceived counselor support, client choice, and transportation issues). Data obtained via the questionnaire nearest to the closure date was used in the current study to assess perceived counselor support. This later data was chosen in an effort to enhance the validity of participant responses concerning their perceptions of rehabilitation counselor support during the life of their case.

## Variables and Measures

According to Livneh (2001), contextual process influences present during adaptation include those that are associated with the CID itself (e.g., affected body parts, medication side-effects, functional limitations, etc.), personality and psychological attributes (e.g., self-efficacy, hardiness, optimism, self-esteem, locus of control, etc.), characteristics of the environmental (e.g., architectural and attitudinal barriers, frequency

and duration of hospitalizations, financial resources, available social supports, etc.), and sociodemographic characteristics of the individual (e.g., age, religion, gender, ethnicity, marital status, etc.). Quality of life outcomes, on the other hand, are reflected in one's intrapersonal, interpersonal, and extrapersonal functioning. Intrapersonal functioning is influenced by health/biomedical and psychological variables. Interpersonal functioning is reflected in the individual's family and marital life, friendships and peer relations, and social activities. Lastly, extrapersonal functioning is demonstrated by work activities, housing or living environments, finances, learning or school activities, and recreational pursuits. Considering the complexity of Livneh's (2001) conceptual model of psychosocial adaptation to CID and the need for research that explores manifest outcomes that can offer practice guidelines to assist rehabilitation counselors, the present investigation was purposely restricted to extrapersonal quality of life.

To evaluate relationships between and among Livneh's (2001) contextual process influences and extrapersonal quality of life, the study utilized three latent variables (locus of control, self-esteem, and perceived VR counselor support) and five sets of manifest variables (sociodemographic characteristics, condition-related functioning, employment functioning, community and recreational activities, and functional limitations and abilities associated with the external environment). These variables were selected from the LSVRSP database because they closely correspond to Livneh's theorized process influences and extrapersonal QOL outcomes.

In the current study, apart from sociodemographic characteristics, answers were summed according to the process influence they reflected. This resulted in continuous variables that reflected the magnitude of the process influence for that participant. With

regard to Locus of Control, Self-Esteem, and Perceived Counselor Support, higher composite scores reflected a greater presence of the factor (e.g., greater internal locus of control, positive self-esteem, etc.). Likewise, higher composite scores on the CID-Related Functioning questionnaire, reflected greater functional ability. Since Sociodemographic Characteristics (gender, race, marital status, and education) are not comprised of composite questions, summations were not necessary. Instead, gender and race were recoded into categorical variables of 0 and 1; marital status was recoded into 0, 1, and 2; and years of education was left as an integer variable (Appendix, Table 27).

# Exogenous Variables

According to Livneh (2001), contextual influences that are operative during the adaptation process impact QOL outcomes. Therefore, in the present investigation, process contextual influences served as exogenous variables. The LSVRSP database contains data that supports measurement of the following process contextual influences: *CID-related functioning* 

Activities an individual cannot perform due to chronic illness or disability are considered functional limitations. In the present study, the CID-Related Functioning variable consisted of answers to eight dichotomous questions concerning functional limitations and abilities (Appendix, Table 27). Five of the questions related to mobility limitations while three reflected cognitive/sensory limitations. These two groups were summed separately to serve as indicators of the extent of functional impact due to the CID; higher scores indicated greater functional capability.

#### Sociodemographic characteristics

Sociodemographic variables in the current investigation included gender, marital status, years of education, and race (Appendix, Table 27). Gender was a dichotomous variable, Marital Status was a categorical variable consisting of three groups that reflects overall status (i.e., Married or Widowed, Separated or Divorced, and Never Married), and Years of Education was an integer ranging from 0 to 23. Given the severely limited number of American Indian/Alaskan Native and Asian/Pacific Islander participants, combined with the overwhelming number of White participants, Race was recoded as a categorical variable with two groups (i.e., White and All Others).

## **Psychological Attributes**

Self-Esteem. Rosenberg (1965) defined self-esteem as a favorable or unfavorable attitude toward the self. His self-esteem scale, a measure of one's feelings of self-worth or self-acceptance, is the most widely used measure of global self-esteem (Judge, Erez, Bono, & Thoresen, 2002; Marsh, 1996; Ranzijn, Keeves, Luszcz, & Feather, 1998; Sung, Puskar, & Sereika, 2006). The LSVRSP study implemented a modified Rosenberg (1965) Self-Esteem Scale (Appendix, Table 27).

In contrast to Rosenberg's 4-point Likert answer format, the LSVRSP instrument used a 3-point Likert response scale with 1=agree, 2=no opinion, and 3=disagree. Also, the wording of one question used by Rosenberg was slightly altered in the LSVRSP (i.e., "I feel that I'm a person of worth, at least on an equal plane with others" versus "I feel that I am a person of worth, at least equal with others"). In spite of their differences, Rosenberg's scale and the self-esteem measure used by the LSVRSP are based upon the same general concepts and employed the same general format. The modified instrument

found in the LSVRSP database was used to assess participant self-esteem in the present study; responses were summed, with higher scores indicating higher self-esteem.

Locus of control. Levenson (1981) differentiated between three sources of control, one internal (internality) and two external (chance/fate and powerful others). Internal locus of control reflects the belief that one has control over his or her life. External locus of control, on the other hand, is considered to be multidimensional (Levenson, 1981; Presson, Clark, & Benassi, 1997). Individuals may hold an external orientation due to a belief that events are beyond their control because the world is unordered and random. They may also hold an external orientation due to a belief that, while the world remains ordered and predictable, powerful others control events in his or her life.

The LSVRSP study implemented a modified Levenson (1981) Locus of Control Scale (Appendix, Table 27). Similar to Levenson's scale, the LSVRSP instrument is comprised of three subscales (i.e., Internality, Powerful Others, and Chance). Unlike Levenson's (1981) measure, however, the LSVRSP instrument employed a 3-point Likert response scale with 1=agree, 2=no opinion, and 3=disagree. Additionally, the LSVRSP eliminated one question contained in Levenson's Chance subscale, and slightly altered the wording of several statements in Levenson's instrument. In spite of their differences, Levenson's (1981) Locus of Control Scale and the locus of control measure used by the LSVRSP are based upon the same general concepts and employed the same general format.

In the current study, the modified instrument found in the LSVRSP database was used to evaluate participant locus of control orientation. The LSVRSP Internality subscale is comprised of eight statements that measure the extent to which individuals

believe they have control over their own lives, the Chance subscale contains seven statements that measure the degree to which people believe chance or fate affects their experiences and outcomes, and the Powerful Others subscale appraises the strength of the belief that other persons control events in one's life. In the current investigation, higher summed scores on the subscales denoted greater belief in the assessed construct. *Variables Associated with the Environment* 

Available support systems: Counselor support. Five items from the LSVRSP database were used to measure participant perception of VR counselor support (Appendix, Table 27). This construct contains mixed data types (i.e., LSVRSP responses were coded as either dichotomous data or on either a 3-point or 4-point Likert scale). Data was recoded to reflect increasing values with increasing perceived support then answers were summed to form a continuous variable for each participant. Higher totals indicated greater perceived VR counselor support.

## Endogenous Variables: Extrapersonal Quality of Life

Quality of life is a multidimensional construct that refers to an individual's perception of overall well-being. Quality of life perceptions are the result of one's objective and subjective assessments of his or her physical, material, social, and emotional well-being (Bishop & Feist-Price, 2001; Kosciulek, 2005; Lehman, Postrado, & Rachuba, 1993; Parent, 1993 ). In Livneh's (2001) theory of psychosocial adaptation to CID, these underlying constituents of quality of life are represented by the intrapersonal, interpersonal, and extrapersonal functional domains. Given that an intent of the present investigation was to explore explicit characteristics associated with successful adaptation, extrapersonal indicators of quality of life were the exclusive focus of the study.

Extrapersonal functioning was measured using 24 questions from the LSVRSP database (Appendix, Table 28). Three of these questions addressed employment, 9 questions examined community and recreational activities, and 12 questions assessed functional limitations and abilities associated with the living environment. These three measures reflect three of the four major aspects that Livneh (2001) associated with extrapersonal QOL (i.e., work activities, housing or living environments, recreational activities, and learning or school activities). Note, the present study did not include learning or school activities because they were not readily available in the LSVRSP database.

#### Procedure

Following approval of the project by Michigan State University's Institutional Review Board, variables were extracted from LSVRSP data files CDF1, CDF3, CFI, and SI using SPSS 15.0 (Statistical Package for the Social Sciences; SPSS, Inc., 2006). CFI baseline observations (i.e., initial LSVRSP measurements) were employed to measure locus of control, self-esteem, and CID-related functional limitations and abilities. Conversely, CFI and CDF3 observations at case closure were used to measure perceived counselor support, community and recreational activities, functional limitations and abilities associated with the living environment, and employment functioning. Because CDF1 does not contain multiple observations, all sociodemographic information for the present study reflects LSVRSP baseline data.

Following data capture, files were merged to form a single database containing the variables of interest in the current study. Due to problems with CFI data for those who entered the LSVRSP study in 'Closed' status, only individuals who began the

LSVRSP study in either 'Applicant' or 'Active' status and who were subsequently closed as rehabilitated (Status 26) were included in the current investigation. Once the files were merged, data were "cleaned" prior to start of analysis, e.g., missing data was recoded to '-9', individuals younger than 18 years or older than 60 years of age at the start of the LSVRSP study were removed, and measurement instruments were recoded in accordance with Tables 27 and 28 (Appendix). Recoding of instruments was required in order to ensure that directionality of all scales was uniform. Following data cleaning, descriptive analysis of the data was conducted. Both instrument recoding and descriptive analysis were conducted using SPSS 15.0 (2006).

#### Data Analysis

To examine Livneh's (2001) model of psychosocial adaptation to chronic illness and disability, confirmatory factor analysis was conducted using multilevel structural regression modeling to test the hypothesized model (Figure 3). Confirmatory analysis is a general modeling approach that evaluates the correspondence of an *a priori* model with empirical data (Raykov & Marcoulides, 2000). Adequacy of the model was tested using goodness-of-fit indices that evaluate the extent to which the proposed model aligned with the sample covariance matrix. Sufficiently high agreement between the model and empirical data supports a conclusion that the proposed model provides a plausible explanation of the phenomenon under investigation; low concurrence, suggests that the model should be rejected.



Figure 3. Measurement model based upon Livneh's (2001) theory of psychosocial adaptation to chronic illness and disability

Prior to model analysis, missing data were evaluated using the assumption that data was missing at random (MAR), and full information maximum likelihood (FIML) estimations were employed to replace missing data. Both FIML estimations and structural model analyses were achieved using Mplus 5.1 (Muthén & Muthén, 2007). However, before either of these activities could be accomplished, LSVRSP measurement instruments were recoded as needed to ensure that directionality of all scales is uniform in the current study (reference Appendices A and B). Following recoding, descriptive analysis of the data was conducted; instrument recoding and descriptive analysis were each carried out using SPSS 15.0 (2006).

After measurement scale recoding, descriptive analysis, and FIML estimation of missing data were complete, Mplus was utilized to conduct confirmatory analysis using structural equation modeling (SEM) of Livneh's (2001) hypothesized model. All SEM analyses were performed using weighted least square parameter estimates (WLSMV). This approach establishes its estimates using a diagonal weight matrix with standard errors as well as mean- and variance-adjusted chi-square test statistics that use a full weight matrix. As an aside, WLSMV is the default estimator in Mplus when categorical and continuous factor indicators are employed, such as was done in the current study. Given its advanced ability to examine complex models, Mplus was selected to perform the multilevel structural analyses required by the design of the present research.

Structural equation modeling (SEM) is a comprehensive, flexible statistical methodology that is suited to both experimental and non-experimental data. Additionally, it allows researchers to quantify and test multidimensional theories using empirical data while also accounting for measurement error (Flora & Curran, 2004; Kline, 2005;

Pugesek, Tomer, & Von Eye, 2003; Raykov & Marcoulides, 2000). Specification of the initial measurement SEM model for this study (Figure 3) was based upon both Livneh's (2001) theory of psychosocial adaptation to CID and adaptation research literature. Model fit was assessed using chi-square and normed chi-square fit indices, root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI). Fit indices allow the researcher to assess how well the hypothesized model fits a data set; several goodness-of-fit indices should be considered when deciding whether to retain or reject a model.

Given the effects that sample size, violations of multivariate normality, and model complexity have on the chi-square statistic, normed chi-square  $(\chi^2 / df)$  was also considered when evaluating overall fit of the model. Unfortunately, interpretation of normed- $\chi^2$  is not universal. For example, according to Martz, Livneh, Priebe, Wuermser, and Ottomanelli (2005), a normed chi-square value of three or less indicates excellent model fit while a value of five or less is indicative of a reasonable model. Conversely, Schermelleh-Engel and Moosbrugger (2003) assert that a ratio of two or less indicate good data-model fit while a ratio of three or less is indicative of acceptable fit.

Along with the chi-square statistics, two common fit indices, RMSEA and CFI, were used to analyze how well the model fit the data. Both of these indices are products of the noncentrality parameter and, unlike the chi-square statistic, are less affected by sample size. RMSEA incorporates a correction for model complexity (i.e., simpler models will be favored by this fit index). As a rule of thumb, RMSEA values  $\leq .05$  are indicative of good data-model fit, values between .05 and .08 represent adequate fit, and values  $\geq .10$  reflect poor model fit with the data (Browne & Cudeck, 1993 as cited in

Kline, 2005). The CFI assesses improvement of data fit with the researcher's model as compared to the baseline model (often called the "independence" model). As a rule of thumb, CFI values  $\geq$  .97 reflect good data-model fit relative to the independence model, while values between .95 and .97 indicate acceptable fit (Schermelleh-Engel & Moosbrugger, 2003).

Lastly, the TLI was also considered when evaluating model fit. Like the RMSEA, the TLI is relatively independent of sample size and incorporates a correction for model complexity such that more parsimonious models result in better fit. Values  $\geq$  .90 are generally considered to be indicative of good data-model fit.

#### **CHAPTER 4**

#### RESULTS

The present study utilized Livneh's (2001) model of psychosocial adaptation to CID to examine relationships between contextual influences and extrapersonal QOL outcomes for individuals living with chronic illness and/or disability. Furthermore, in order to explore within-group variability with a focus on positive aspects of psychosocial adaptation, the sample was restricted to state-federal vocational rehabilitation (VR) consumers whose cases were closed as successfully rehabilitated (Status 26). Process influences considered by the present study included CID-related functional limitations and abilities, psychological attributes (i.e., self-esteem and locus of control), available support systems (i.e., counselor support), and sociodemographic variables (i.e., gender, race, marital status and educational attainment). Quality of life outcomes were restricted to those found in Livneh's extrapersonal domain and included employment functioning, community and recreational activities, and functional limitations associated with the living environment. Confirmatory analysis using structural equation modeling was employed to evaluate the relationships among factors.

#### **Participant Characteristics**

The present study was restricted to state-federal vocational rehabilitation consumers between the ages of 18 and 60 years whose cases were closed as successfully rehabilitated by the state-federal VR system and for whom data was collected using the Demographics and Disability Characteristics (CDF1), Quality of Services Factors (CDF3), Applicant/Client Function Interview (CFI), and Satisfaction Interview (SI) questionnaires. It should be noted here that sociodemographic factors were measured

once at the start of the LSVRSP study. Therefore, changes in status that may have occurred during the longitudinal study are not reflected in the database.

Sociodemographic characteristics of the 2,170 participants differed to varying degrees (Table 1). For example, more males than females were included in the study (52.8% versus 47.2%). Likewise, the majority of participants in the study completed 12 years of education (51.3%), with many more receiving greater than 12 years of education (26.1%). A greater number of participants never married (42.8%) than were either married or widowed (34.7%) or divorced or separated (22.5%). Ages of participants, on the other hand, were more evenly distributed between those who were 18 through 30 years (34.2%), 31 through 40 years (32.3%), and greater than 40 years of age (33.5%).

The greatest discrepancy in participant characteristics can be observed in classifications of race. White participants were markedly overrepresented in the study, with 73.2% of individuals identified as being White. Individuals classified as Black or Hispanic formed the second and third most prevalent racial groups (14.3% and 10.9%, respectively; 25.2% combined). Lastly, participants identifying as either Asian or Pacific Islander (1.1%) or American Indian or Alaskan Native (0.5%) were minimally represented in the present investigation. Given the predominance of White participants, combined with the small representation of the other races (especially those of American Indian or Alaskan Native origin and those of Asian or Pacific Islander origin), race was combined into two groups: White and All Others.

Once participants were classified into one of these two racial groups, race was found to correlate significantly with education (r = -.147,  $p \le .01$ ), with Whites obtaining slightly more years of education than the other races. For example, White participants

averaged 12.29 years of education, whereas all other races combined obtained an average of 11.49 years of education. The only other significant relationship among the sociodemographic characteristics of participants occurred between marital status and education (r = -.056,  $p \le .05$ ). This correlation was negligible but indicates that individuals who were married at the start of the LSVRSP study also acquired slightly more years of education than the remaining participants.

Table 1.

Characteristics of the sample

	Frequency	Valid %	Cumulative %
Gender			
Male	1,146	52.8	52.8
Female	1.024	47.2	100.0
Total	2.170		
Race	_,		
White	1.586	73.2	73.2
Black	310	14.3	87.5
American Indian or Alaskan Native	11	0.5	88.0
A sian or Pacific Islander	24	1.1	89.1
Hispanic	236	10.9	100.0
Total	2.167	1017	10010
a <b>rital</b> Status at Program Entry	_,,		
Married	710	32.7	32.7
Widowed	43	2.0	34.7
Divorced	357	16.5	51.2
Separated	129	6.0	57.2
Never Married	928	42.8	100.0
Total	2.167	.2.0	
ucation at Program Entry	2,107		
0-6 years	59	2.8	2.8
7-9 years	136	<b>2</b> .0 6 6	9.4
10 - 11 vers	274	13 3	22.7
12 years	1.065	51.3	74.0
13-16 years	483	23.2	97.2
more than 16 years	58	2.8	100.0
Total	2.075	2.0	10010
ge at Program Entry	2,070		
18-30 years	744	34 3	34 3
31-40 years	699	32 3	66.6
41-50 years	478	22.0	88.6
51-60 years	249	114	100.0
	<b>2</b> 77	11.7	100.0

#### **Descriptive Statistics**

With few exceptions, each of the variables used in the study were highly skewed and displayed considerable kurtosis; several variables were severely nonnormal (Tables 2 through 9). It is also of note that categorical variables were summed, as appropriate, to form the latent factors considered by the present investigation (e.g., internal locus of control, self-esteem, perceived counselor support, etc.). The resulting continuous latent factors were generally more normally distributed and were the focus of analyses during structural equation modeling of the data. Yet, because of the severe non-normality of the individual variables, the data upon which conclusions have necessarily been drawn remains suspect and a primary limitation of the current study.

A bright spot with respect to the data used in the study involves the relatively minimal amount of missing data. Aside from the Perceived Counselor Support instrument, data coverage for all variables was greater than 90%. Even those exceptions found in the Perceived Counselor Support measure maintained full data coverage of 75% or greater.

## Internal Consistency of Instruments

As a measure, internal consistency reflects the degree to which a group of items associate, and is therefore an index of the reliability of the instrument. In the present investigation, prior to considering the theorized model, internal consistency of instruments was evaluated by reviewing Pearson's bivariate correlations (Tables 10 through 19) as well as factor loadings of indicators and Cronbach's alpha reflecting overall internal consistency of the measures (Tables 20 and 21), all of which were obtained using SPSS 15.0.

Before proceeding with a discussion of the individual instruments, a few cautionary notes must be made. First, instruments used in the study contained discrete items with few categories. Therefore, Pearson's bivariate correlations should be viewed as representing conservative estimates of actual relationships between these discrete items. As an aside, because they are continuous, the same does not hold true when composite scores of instruments were interpreted, as was done during SEM analyses of the full and modified models (pp. 106-126). In these instances, Pearson's bivariate correlations approximated relationships between latent constructs.

Second, variations among factor loadings of an instrument are to be expected and, except in the extreme, should not necessarily be regarded as indicative of internal difficulties. Instead, these variations provide insight into the degree of correspondence between indicators and the construct they were purported to measure for a particular sample of individuals.

Third, it is important to mention that Cronbach's alpha has been demonstrated to underestimate reliability under certain conditions, especially in behavioral research (T. Raykov, personal communication, February 16, 2009). This should be kept in mind when viewing low alpha values.

With these caveats in mind, below is a brief analysis of the internal consistency of each measure used in the present study.

## Locus of Control

Among the three aspects of Levenson's (1981) locus of control scale as modified in the LSVRSP, the 8-item Internal Locus of Control instrument proved to be the weakest measure for participants in the current study. Not only were the majority of relationships

between items negligible (i.e.,  $0 < r \le .20$ ), but four did not reach significance. Overall, associations varied widely with correlations ranging between -.006 (ns) and .303 (p  $\le$  .01). Factor loadings provide further evidence that the instrument used to measure internal locus of control may be suspect. Also, Cronbach's alpha was calculated to be .561.

One potential reason for the lower than anticipated alpha for the Internality subtest of **the** Locus of Control construct, involves two indicators (CF\_F05 and CF\_F11). These two indicators exhibited low correspondence with their fellow scale items, loaded negligibly on the construct they were designed to represent, and explained a minimal amount of the variability in internal locus of control. Consequently, it is likely that for participants of the present study, CF\_F05 and CF\_F11 explained another as yet unidentified psychological attribute rather than the latent construct they were intended to reflect (i.e., internal locus of control).

In contrast to the internal locus of control measure, both measures of external locus of control (i.e., Chance/Fate and Powerful Others) were found to be more consistent and reliable measures of their constructs. Although each measure generally displayed low inter-item correlations and variable factor loadings, good overall internal consistency was established by calculated Cronbach's alphas for these measures (.745 and .744, respectively). Having said this, one indicator (CF\_F25) is of some concern, loading at .328 on the Powerful Others measure of externality and explaining only 10.8% of the variance in that factor. In spite of this indicator, it remains that in the present investigation both the Chance/Fate and Powerful Others measures of external locus of control proved to be relatively reliable, albeit less than ideal measures.

As an aside, when both externality scales were combined, Cronbach's alpha rose to .841, indicating good overall internal consistency of the combined measure of externality. Indeed, contrary to Levenson's (1981) argument, the combined measure appears to have been a more reliable assessment of externality in participants of the current study.

## Self-Esteem

The 10-item combined measure of self-esteem evidenced strong internal consistency as evidenced by its low to moderate correlations, a calculated Cronbach's alpha of .810, and generally high factor loadings. Overall, it appears that for participants, the self-esteem instrument used in the current study provided reliable estimates of the construct it was designed to measure.

# Perceived Counselor Support

As demonstrated by item correlations, factor loadings, and variance explained, the internal consistency of this 5-item measure appears to have been compromised by use of  $CDF_42$ . Indeed, with a factor loading of .164,  $CDF_42$  alone displayed noticeably poor correspondence with the latent construct of Perceived Counselor Support. Also, for participants of the present investigation, this item explained a meager 2.7% of the variance in perceptions of counselor support (p = .099). Conversely, substantial variance in the latent factor was explained by the remaining indicators. Lastly, Cronbach's alpha was calculated to be .697 when  $CDF_42$  was included in the Perceived Counselor Support instrument, versus .770 when it was excluded. Although, according to Cronbach's alpha, the measure of perceived counselor support used by the current study

appears to be relatively good even with CDF\_42 is included, the reliability of the measure improves noticeably when this indicator is removed.

The disconnect between CDF\_42 and the remaining items of the Perceived Counselor Support scale may be due to the timing of the questions. Whereas CDF\_42 was administered at the time of case closure, the remaining scale items were administered during the first follow-up subsequent to case closure. Given this time differential, it is possible that opinions of participants changed. Unfortunately, divergence in the amount of construct variance explained by these two groups of indicators is likely not due simply to the timing of administrations. It seems that a closer look at this instrument may be warranted.

# CID-Related Functioning

In the current study, the 3-item assessment of mobility was clearly the stronger of the two measures of CID-related functioning. Not only was Cronbach's alpha calculated to be .723 for CID-Related Mobility, but magnitudes of correlations among scale items were generally moderate to high and each indicator explained a sizable amount of variance in the measurement of limitations and abilities associated with mobility (Range: 81.2% to 94.3%).

As compared to its companion measure, the 7-item assessment of CID-Related <sup>Cognitive</sup> and Sensory Functioning evidenced weaker internal consistency. For example, <sup>correlations</sup> among items were primarily negligible to low in magnitude. Conversely, <sup>factor</sup> loadings and amount of variance explained by the indicators were generally <sup>adequate</sup> to substantial. Additionally, Cronbach's alpha was calculated to be .606,

indicating a less than ideal, but not exceptionally poor, instrument for the current sample of individuals.

Overall, it appears that the assessment of mobility was relatively more effective at measuring CID-related functioning in participants than was the evaluation of cognitive and sensory capabilities. Yet, both instruments generally displayed adequate internal consistency.

## Employment Functioning

Both the Employment Functioning and the Community and Recreational Activities instruments evidenced poor overall internal consistency and appear to be the least reliable measures used in the present investigation. As respects the three items that comprise the Employment Functioning instrument, the calculated Cronbach's alpha of .232 indicates that the Employment Functioning measurement was unreliable for participants of the current research. Conversely, factor loadings and associated explained variances for this instrument, while not superior were also not entirely deficient. Interestingly, based upon its factor loading and amount of explained variance, hourly wage appears to have most appropriately reflected employment functioning in the current group of participants.

# Community and Recreational Activities

As with employment functioning, the instrument used to measure community and recreational participation evidenced poor internal consistency. Not only were item correlations found to be exceedingly low, but factor loadings evidenced low correspondence with the construct they were intended to measure. Moreover, Cronbach's alpha was calculated to be .324 for this instrument, revealing an instrument with poor

overall internal consistency. Based upon the combined data, it appears that the Community and Recreational Activities measure did not perform especially well with participants of the present research.

# Living Environment Functioning

Although item correlations varied widely, factor loadings were generally strong and Cronbach's alpha was calculated to be .797 for the 12-item Living Environment Functioning instrument used in the current study. Overall, the instrument evidenced good internal consistency and appears to have reliably measured perceived functional abilities associated with the living environment.

Table 2.

ocus of Control	
: Variables: Lo	
i, Exogenous	
Descriptives	

		95%	CI				Sk	kew	Kurt	osis
	Mean	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	Zskew	Kurtosis	ZKurtosis
				LC.	ocus of Control,	Internal				
CF_F01	2.59	2.55	2.61	.016	1/3	1992	-1.375	-25.00	0.427	3.882
CF_F05	2.12	2.08	2.15	.020	1/3	1980	-0.228	-4.145	-1.731	-15.74
CF_F07	2.55	2.52	2.58	.017	1/3	2000	-1.293	-23.51	-0.023	-0.209
CF_F11	2.30	2.26	2.34	.020	1/3	2005	-0.620	-11.27	-1.497	-13.61
CF_F22	2.13	2.09	2.17	.021	1/3	1997	-0.251	-4.564	-1.768	-16.07
CF_F24	2.71	2.68	2.74	.014	1/3	2000	-1.983	-36.05	2.408	21.89
CF_F26	2.87	2.85	2.89	.010	1/3	2003	-3.407	-61.94	10.547	95.88
CF_F29	2.75	2.73	2.78	.014	1/3	1996	-2.254	-40.98	3.515	31.95
Composite -	- Internal: 20.0	19.9	20.1	2.86	8 / 24	1950	-0.703	-12.78	0.245	2.207
				<u>Lo</u>	ocus of Control.	Chance/Fate				
CF_F03	1.74	1.71	1.78	068.	1/3	1992	0.522	9.491	-1.535	-13.95
CF_F08	1.89	1.85	1.93	606.	1/3	1996	0.224	4.073	-1.754	-15.94
CF_F09	1.51	1.47	1.54	806.	1/3	2000	1.126	20.47	-0.515	-4.682

		95%	CI				Sk	ew	Kurt	osis
	Mean	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	Zskew	Kurtosis	ZKurtosis
CF_F17	1.86	1.82	1.90	.903	1/3	1990	0.273	4.963	-1.720	-15.64
CF_F19	1.71	1.67	1.74	.862	1/3	1999	0.606	11.02	-1.383	-12.57
CF_F30	1.55	1.52	1.59	.806	1/3	1995	0.977	17.76	-0.758	-6.891
CF_F31	1.52	1.49	1.56	.759	1/3	1990	1.041	18.93	-0.483	4.391
Composite -	Chance/Fatt	:.								
	11.8	11.6	11.9	3.73	7/21	1963	0.477	8.673	-0.721	-6.554
					<u>Powerful (</u>	<u> </u>				
CF_F04	1.61	1.57	1.64	.848	1/3	1993	0.844	15.34	-1.079	-9.809
CF_F10	1.95	1.91	1.99	.910	1/3	1996	060.0	1.636	-1.786	-16.24
CF_F13	1.48	1.45	1.52	.795	1/3	1995	1.207	21.94	-0.331	-3.009
CF_F16	1.83	1.80	1.87	.851	1/3	1985	0.326	5.927	-1.543	-14.03
CF_F20	1.44	1.41	1.47	.742	1/3	1998	1.324	24.07	0.109	0.991
CF_F25	1.77	1.74	1.81	.858	1/3	1982	0.450	8.182	-1.494	-13.58
CF_F28	1.69	1.65	1.73	.845	1/3	1987	0.640	11.64	-1.299	-11.81
CF_F33	1.81	1.77	1.85	006.	1/3	1998	0.387	7.036	-1.655	-15.04
Composite -	Powerful Ot	thers:								
	13.5	13.4	13.7	4.04	8 / 24	1940	0.502	8.964	-0.630	5.676

Table 2 (cont'd)

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Self Esteem
Variables:
Exogenous
Descriptives,

		<b>65%</b>	CI				Sk	Wa	Kurt	osis
	Mean	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	ZSkew	Kurtosis	ZKurtosis
CF_F02	2.85	2.83	2.87	.484	1/3	2002	-3.243	-58.96	9.109	83.57
CF_F06	1.84	1.79	1.88	.944	1/3	2002	0.332	6.036	-1.796	-16.48
CF_F12	2.59	2.56	2.63	.751	1/3	2006	-1.467	-26.67	0.381	3.495
CF_F14	2.63	2.60	2.66	.728	1/3	2007	-1.605	-29.18	0.810	7.431
CF_F15	2.93	2.91	2.94	.330	1/3	2005	-4.861	-88.38	23.52	215.8
CF_F18	2.30	2.26	2.34	116.	1/3	2002	-0.623	-11.33	-1.504	-13.80
CF_F21	2.72	2.69	2.75	.627	1/3	2002	-2.052	-37.31	2.661	24.41
CF_F23	2.14	2.10	2.19	939	1/3	1999	-0.290	-5.273	-1.805	-16.56
CF_F27	2.55	2.51	2.58	.782	1/3	2002	-1.301	-23.65	-0.101	-0.927
CF_F32	2.68	2.65	2.71	.668	1/3	2001	-1.827	-33.22	1.714	15.72
Composite -	Self-Esteem: 25.2	25.0	25.4	4.50	10/30	1974	-1.039	-18.89	0.525	4.772

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Descriptives, Exogenous Variables: Perceived Counselor Support

		<b>95%</b>	, CI				Sk	ew	Kur	osis
	Меап	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	ZSkew	Kurtosis	ZKurtosis
CDF_42	2.42	2.40	2.45	.547	1/3	2010	-0.198	-3.600	-0.996	-9.138
SI_A02	1.82	1.80	1.84	.383	1/2	1754	-1.676	-28.90	0.810	6.923
SI_A05	1.84	1.82	1.85	.369	1/2	1754	-1.831	-31.57	1.356	11.59
SI_A08	3.65	3.61	3.68	717.	1/4	1749	-2.217	-37.58	4.444	37.98
SI_A09	3.72	3.69	3.75	.636	1/4	1752	-2.574	-44.38	6.662	56.94
Composite -	Perceived C 13.5	Counselor Sur 13.4	pport: 13.6	1.80	5 / 15	1586	-1.807	-29.62	3.347	27.21

		95% (	CI				Sk	ew	Kur	tosis
	Mean	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	ZSkew	Kurtosis	ZKurtosis
				<b>CID-Related</b>	Functioning, C	ognitive and Ser	ISOLY			
CF_A01A	1.95	1.94	1.96	.225	1/2	2113	-3.972	-74.94	13.79	130.1
CF_A17A	1.86	1.84	1.87	.351	1/2	2110	-2.029	-38.28	2.117	19.78
CF_A19A	1.90	1.89	1.91	.298	1/2	2110	-2.704	-51.02	5.317	49.69
CF_A20A	1.96	1.95	1.97	.195	1/2	2113	-4.715	-88.96	20.25	191.0
CF_A23A	1.89	1.87	1.90	.317	1/2	2109	-2.441	-46.06	3.964	37.05
Composite .	- Cognitive a 9.55	and Sensory: 9.52	9.59	.880	5 / 10	2100	-2.121	-40.02	4.074	38.07
				CD-1	<u>Related Functio</u>	<mark>ning, M</mark> obility				
CF_A09A	1.97	1.96	1.98	.165	1/2	2110	-5.730	-108.1	30.87	288.5
CF_A10A	1.97	1.97	1.98	.162	1/2	2114	-5.845	-110.3	32.19	303.7
CF_A12A	1.98	1.97	1.99	.141	1/2	2113	-6.799	-128.3	44.27	417.6
Composite	- Mobility: 5.93	5.91	5.94	.374	3 / 6	2109	-5.870	-110.7	37.04	346.2

Descriptives, Exogenous Variables: CID-Related Functioning

Table 5.

Table 6.

<b>Characteristics</b>
Sociodemographic
Variables:
Exogenous
Descriptives,

		<b>65%</b>	CI				Sk	kew	Kur	tosis
	Mean	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	Zskew	Kurtosis	ZKurtosis
Gender	1.47	1.45	1.49	.499	1/2	2170	0.113	2.132	-1.989	-18.94
Race	1.25	1.23	1.28	.443	1/2	2167	1.048	19.77	-0.903	-8.600
Marital Status	3.24	3.17	3.31	1.74	1/5	2167	-0.258	4.868	1.660	15.81
Education	12.1	12.0	12.2	2.41	0 / 23	2075	-0.674	-12.48	5.276	49.31

Table 7.

Functioning
Employment
Variables:
Endogenous
Descriptives,

		<b>65%</b>	CI				S	kew	Kur	tosis
	Mean	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	ZSkew	Kurtosis	ZKurtosis
CDF_49	2.89	2.88	2.91	399	1/3	2145	-3.874	-73.09	14.29	134.8
CDF_54	33.9	33.4	34.3	10.3	66 / 0	2018	- 0.679	-12.57	1.943	17.83
Hourly Wage	7.25	7.07	7.43	4.14	0 / 35.03	2007	2.212	40.22	8.224	75.45

		<del>6</del> 5%	CI				Sk	œw	Kur	tosis
	Mean	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	ZSkew	Kurtosis	ZKurtosis
CF_C04A	4.26	4.21	4.30	.995	1/5	1943	-1.374	-24.54	1.330	11.98
CF_C04B	4.04	4.00	4.08	.937	1/5	1945	-1.182	-21.49	1.592	14.34
CF_C04C	3.38	3.33	3.43	1.18	1/5	1944	-0.306	-5.464	-0.695	-6.261
CF_C04D	2.76	2.69	2.82	1.42	1/5	1942	-0.013	-0.232	-1.477	-13.31
CF_C05	1.61	1.57	1.64	.781	1/3	1940	0.815	14.55	-0.891	-8.027
CF_C07A	4.66	4.26	5.06	8.99	0 /100	1929	4.418	78.89	26.32	237.1
CF_C07B	1.48	1.27	1.69	4.64	06 / 0	1914	9.098	162.5	118.0	1053
CF_C07C	0.52	0.44	09.0	1.74	0/36	1885	9.423	168.3	138.4	1224
CF_C07D	3.45	3.02	3.89	9.77	06 / 0	1925	6.023	107.5	45.77	408.7
Composite -	Community 26.0	y & Recreatio 25.3	nal Activitie 26.8	s: 17.1	5 / 165	1845	3.040	53.33	13.12	115.1

Descriptives, Endogenous Variables: Community and Recreational Activities

Table 8.

		<b>65%</b> (	CI				SI	(ew	Kur	tosis
	Mean	Lower Limit	Upper Limit	Standard Deviation	Min / Max	Valid N	Skew	ZSkew	Kurtosis	ZKurtosis
CF_A03A	1.88	1.87	1.90	.323	1/2	1969	-2.365	-43.00	3.597	32.70
CF_A04A	1.86	1.84	1.87	.349	1/2	1965	-2.059	-37.44	2.242	20.38
CF_A05A	1.88	1.86	1.89	.328	1/2	1968	-2.298	-41.78	3.284	29.85
CF_A06A	1.95	1.94	1.96	.213	1/2	1971	-4.248	-77.24	16.06	146.0
CF_A07A	1.97	1.96	1.98	.173	1/2	1972	-5.423	-98.60	27.43	249.4
CF_A13A	1.89	1.87	1.90	.318	1/2	1969	-2.427	-44.13	3.893	35.39
CF_A14A	1.84	1.83	1.86	.365	1/2	1970	-1.873	-34.05	1.509	13.72
CF_A15A	1.95	1.94	1.96	.223	1/2	1968	4.023	-73.14	14.20	129.1
CF_A16A	1.76	1.74	1.78	.426	1/2	1972	-1.232	-22.40	-0.481	-4.373
CF_A18A	1.97	1.96	1.98	.176	1/2	1972	-5.327	-96.85	26.40	240.0
CF_A21A	1.76	1.74	1.78	.427	1/2	1964	-1.220	-22.18	-0.513	-4.664
CF_A22A	1.90	1.88	1.91	.304	1/2	1928	-2.620	-46.79	4.868	43.86
Composite -	Living Envi 22.6	ironment Fun 22.5	ctioning: 22.7	2.09	12 / 24	1896	-2.139	-38.20	4.888	43.64

Descriptives, Endogenous Variables: Living Environment Functioning

Table 9.

		CF_F01	CF_F05	CF_F07	CF_F11	CF_F22	CF_F24	CF_F26	CF_F29
CF_F01	Correlation Sig. 2-tailed N	1 1992	.125** .000 1968	.113** .000 1988	.126** .000 1990	.098** .000 1983	.150** .000 1985	.121** .000 1987	.156** .000 1985
CF_F05	Correlation Sig. 2-tailed N	.125** .000 1968	1 1980	.055* .015 1976	.138** .000 1978	.076** 001. 1971	.028 .209 1972	006 .774 1976	.054* .017 .017
CF_F07	Correlation Sig. 2-tailed N	.113 <b>**</b> .000 1988	.055* .015 1976	1 2000	.020 .368 1997	.204** .000 1990	.303** .000 1992	.187** .000 1995	.233** .000 1991
CF_F11	Correlation Sig. 2-tailed N	.126** .000 1990	.138** .000 1978	.020 .368 1997	1 2005	.083 <b>**</b> .000 1994	002 .943 1997	.072** .001 2000	.045 <b>*</b> .043 1994
CF_F22	Correlation Sig. 2-tailed N	.098 <b>**</b> .000 1983	.076** 001 1971	.204** .000 1990	.083 <b>**</b> .000 1994	1 1997	.230** .000 1992	.155** .000 1996	.210** .000 1990
CF_F24	Correlation Sig. 2-tailed N	.150 <b>**</b> .000 1985	.028 .209 1972	.303 <b>**</b> .000 1992	002 .943 1997	.230** .000 1992	1 2000	.239** .000 1998	.282** .000 1990
CF_F26	Correlation Sig. 2-tailed N	.121 <b>**</b> .000 1987	006 .774 1976	.187** .000 1995	.072 <b>**</b> .001 2000	.155 <b>**</b> .000 1996	.239** .000 1998	1 2003	.284** .000 1994
CF_F29	Correlation Sig. 2-tailed N	.156** .000 1985	.054* .017 1971	.233 <b>**</b> .000 1991	.045 <b>*</b> .043 1994	.210** .000 1990	.282** .000 1990	.284** .000 1994	1 1996
** Correlation	is significant at the is significant at the	e 0.01 level (2-ta e 0.05 level (2-ta	iled). iled).						

Pearson Correlations: Locus of Control, Internal

Table 10.

		CF_F03	CF_F08	CF_F09	CF_F17	CF_F19	CF_F30	CF_F31
CF_F03	Correlation Sig. 2-tailed N	1 1992	.319** .000 1986	.300** .000 1988	.311** .000 1980	.259** .000 1988	.193** .000 1982	.201** .000 1979
CF_F08	Correlation Sig. 2-tailed N	.319** .000 1986	1 1996	.311** .000 1995	.379** .000 1986	.262** .000 1992	.259** .000 1985	.241** .000 1983
CF_F09	Correlation Sig. 2-tailed N	.300** .000 1988	.311** .000 1995	1 2000	.346** .000 1987	.413** .000 1994	.354** .000 1989	.262** .000 1985
CF_F17	Correlation Sig. 2-tailed N	.311** .000 1980	.379** .000 1986	.346** .000 1987	1 1990	.353** .000 1988	.321** .000 1982	.209** .000 1980
CF_F19	Correlation Sig. 2-tailed N	.259** .000 1988	.262** .000 1992	.413** .000 1994	.353** .000 1988	1 1999	.340** .000 1990	.241** .000 1987
CF_F30	Correlation Sig. 2-tailed N	.193** .000 1982	.259** .000 1985	.354** .000 1989	.321** .000 1982	.340** .000 1990	1 1995	.290** .000 1982
CF_F31	Correlation Sig. 2-tailed N	.201** .000 1979	.241** .000 1983	.262** .000 1985	.209** .000 1980	.241** .000 1987	.290** .000 1982	1 1990
** Correlation is si	gnificant at the 0.01 l	evel 2-tailed.						

Pearson Correlations: Locus of Control, Chance/Fate

Table 11.

		CF_F04	CF_F10	CF_F13	CF_F16	CF_F20	CF_F25	CF_F28	CF_F33
CF_F04	Correlation Sig. 2-tailed N	1 1993	.283 <b>**</b> .000 1987	.532** .000 1987	.342 <b>**</b> .000 1975	.268** .000 1985	.174** .000 1972	.326** .000 1979	.296** .000 1983
CF_F10	Correlation Sig. 2-tailed N	.283 <b>**</b> .000 1987	1 1996	.277** .000 1988	.318 <b>**</b> .000 1979	.236** .000 1989	.188** .000 1975	.173 <b>**</b> .000 1980	.207** .000 1987
CF_F13	Correlation Sig. 2-tailed N	.532** .000 1987	.277** .000 1988	1 1995	.373 <b>**</b> .000 1981	.325** .000 1988	.145** .000 1976	.318** .000 1981	.356** .000 1987
CF_F16	Correlation Sig. 2-tailed N	.342** .000 1975	.318** .000 1979	.373** .000 1981	1 1985	.297** .000 1978	.156** .000 1966	.263 <b>**</b> .000 1974	.261** .000 1978
CF_F20	Correlation Sig. 2-tailed N	.268 <b>**</b> .000 1985	.236** .000 1989	.325 <b>**</b> .000 1988	.297** .000 1978	1 1998	.151** .000 1976	.254 <b>**</b> .000 1982	.286** .000 1991
CF_F25	Correlation Sig. 2-tailed N	.174** .000 1972	.188** .000 1975	.145 <b>**</b> .000 1976	.156** .000 1966	.151** .000 1976	1 1982	.136 <b>**</b> .000 1969	.138** .000 1979
CF_F28	Correlation Sig. 2-tailed N	.326** .000 1979	.173** .000 1980	.318 <b>**</b> .000 1981	.263 <b>**</b> .000 1974	.254 <b>**</b> .000 1982	.136** .000 1969	1 1987	.486** .000 1981
CF_F33	Correlation Sig. 2-tailed N	.296** .000 1983	.207** .000 1987	.356** .000 1987	.261** .000 1978	.286** .000 1991	.138** .000 1979	.486 <b>**</b> .000 1981	1 1998
** Comolotion in a		Lation Claurel 10							

Pearson Correlations: Locus of Control, Powerful Others

Table 12.

Correlation is significant at the 0.01 level 2-tailed.
		CF_F02	CF_F06	CF_F12	CF_F14	CF_F15	CF_F18	CF_F21	CF_F23	CF_F27	CF_F32
CF_F02	Correlation	-	.154**	.239**	.301**	.302**	.226**	.328**	.213**	.288**	.311**
	Sig. 2-tailed		000	000.	000 <sup>.</sup>	000	000	000	000	000 <sup>.</sup>	000.
	z	2002	1998	2000	2000	1999	1995	1995	1993	1996	1995
CF_F06	Correlation	.154**	1	.275**	.222	.102**	.465**	.289**	.331**	.332**	.299**
I	Sig. 2-tailed	000		000	000	000.	000.	000 <sup>.</sup>	000	000.	000.
	Z	1998	2002	2000	2000	1998	1997	9661	1993	1995	1995
CF_F12	Correlation	.239**	.275**	1	.194**	.207**	.397**	.455	.405**	.336**	.429**
	Sig. 2-tailed	000	000		000	000	000	000	000	000.	000.
	z	2000	2000	2006	2005	2003	2000	2000	1997	2000	2000
CF_F14	Correlation	:301 **	.222**	.194**	-	.270**	.189**	.212**	<b>**</b> 261.	.297**	.296**
	Sig. 2-tailed	000	000	000 <sup>.</sup>		000.	000.	000	.004	000.	000.
	z	2000	2000	2005	2007	2004	2001	2001	1998	2001	2000
5 CF_F15	Correlation	.302**	.102**	.207**	.270**	1	.164**	.280**	.166**	.212**	.275**
5	Sig. 2-tailed	000	000	000.	000		000	000.	000	000.	000
	Z	1999	1998	2003	2004	2005	1999	1999	9661	2000	6661
CF_F18	Correlation	.226**	.465**	.397**	<b>.</b> 189**	.164**	-	.431**	.481**	.369**	.361**
	Sig. 2-tailed	000	000	000	000	000		000	000	000.	000.
	z	1995	1997	2000	2001	1999	2002	1998	1994	1997	1996
CF_F21	Correlation	.328	.289	.455**	.212**	.280**	.431**	1	.371**	.402**	.450**
	Sig. 2-tailed	019.	.229	000.	000 <sup>.</sup>	000	000 <sup>.</sup>		000	000	000
	Z	1995	1996	2000	2001	1999	1998	2002	1994	1998	9661
CF_F23	Correlation	.213**	.331**	.405**	.197**	.166**	.481**	.371**	-	.353**	.379**
	Sig. 2-tailed	000 <sup>.</sup>	000 <sup>.</sup>	000	000 <sup>.</sup>	000	000	000.		000.	000.
	Z	1993	1992	1997	1998	1996	1994	1994	1999	9661	1993
CF_F27	Correlation	.288**	.332**	.336**	.297**	.212**	.369**	.402**	.353**	-	.535**
	Sig. 2-tailed	000	000	000	000	000	000.	000	000		000.
	z	1996	1995	2000	2001	2000	1997	1998	9661	2002	9661
CF_F32	Correlation	.311**	.299**	.429**	.296**	.275**	.361**	.450**	.379**	.535**	1
	Sig. 2-tailed	000	<b>0</b> 00 <sup>.</sup>	000	000	000	000 <sup>.</sup>	000	000	000	
	Z	1995	1995	2000	2000	6661	1996	9661	1993	1996	2001

Pearson Correlations: Self-Esteem

Table 13.

**\*\*** Correlation is significant at the 0.01 level 2-tailed.

## Table 14.

		CDF_42	SI_A02	SI_A05	SI_A08	SI_A09
CDF_42	Correlation	1	.097**	.075**	.149**	.123**
_	Sig. 2-tailed		.000	.003	.000	.000
	N	2010	1615	1614	1609	1612
SI A02	Correlation	.097**	1	.634**	.448**	.325**
	Sig. 2-tailed	.000		.000	.000	.000
	N	1615	1754	1744	1736	1737
SI A05	Correlation	.075**	.634**	1	.469**	.346**
-	Sig. 2-tailed	.003	.000		.000	.000
	Ν	1614	1744	1754	1736	1737
SI A08	Correlation	.149**	.448**	.469**	1	.715**
-	Sig. 2-tailed	.000	.000	.000		.000
	Ν	1609	1736	1736	1749	1742
SI A09	Correlation	.123**	.325**	.346**	.715**	1
	Sig. 2-tailed	.000	.000	.000	.000	
	N	1612	1737	1737	1742	1752

Pearson Correlations: Perceived Counselor Support

\*\* Correlation is significant at the 0.01 level 2-tailed.

#### Table 15.

# Pearson Correlations: CID-Related Functioning, Cognitive/Sensory

		CF_A01A	CF_A17A	CF_A19A	CF_A20A	CF_A23A
CF_A01A	Correlation Sig 2-tailed	1	.391**	.264**	.028	.009
	N	2113	2108	2108	2111	2107
CF_A17A	Correlation Sig. 2-tailed N	.391** .000 2108	1 2110	.547** .000 2107	.241** .000 2109	.245** .000 2106
CF_A19A	Correlation Sig. 2-tailed N	.264** .000 2108	.547** .000 2107	1 2110	.203** .000 2109	.200** .000 2106
CF_A20A	Correlation Sig. 2-tailed N	.028 .195 2111	.241** .000 2109	.203** .000 2109	1 2113	.134** .000 2108
CF_A23A	Correlation Sig. 2-tailed	.009 .679	.245** .000	.200** .000	.134** .000	1
	N	2107	2106	2106	2108	2109

\*\* Correlation is significant at the 0.01 level 2-tailed.

## Table 16.

	·····	CF_A09A	CF_A10A	CF_A12A
CF_A09A	Correlation	1	.473**	.552**
	N	2110	.000 2110	.000 2109
CF_A10A	Correlation Sig. 2-tailed	.473** .000	1	.390** .000
	N	2110	2114	2113
CF_A12A	Correlation Sig. 2-tailed	.552** .000	.390 <b>**</b> .000	1
	N	2109	2113	2113

## Pearson Correlations: CID-Related Functioning, Mobility

\*\* Correlation is significant at the 0.01 level 2-tailed.

## Table 17.

### Pearson Correlations: Employment Functioning

		CDF_49	Hr_Wage	CDF_54
CDF_49	Correlation Sig. 2-tailed N	1 2146	.214 <b>**</b> .000 2002	.182** .000 2013
Hr_Wage	Correlation Sig. 2-tailed N	.214** .000 2002	1 2007	.239** .000 1980
CDF_54	Correlation Sig. 2-tailed N	.182** .000 2013	.239** .000 1980	1 2018

\*\* Correlation is significant at the 0.01 level 2-tailed.

		CF_C04A	CF_C04B	CF_C04C	CF_C04D	CF_C05	CF_C07A	CF_C07B	CF_C07C	CF_C07D
CF_C04A	Correlation	-	.190**	.250**	.112**	.180**	<b>**</b> 060 <sup>.</sup>	.101**	.076**	**160.
	Sig. 2-tailed		000 <sup>.</sup>	000	000.	000	000	000	.001	000
	Z	1943	1937	1937	1935	1932	1922	1907	1878	1918
CF C04B	Correlation	.190**	1	.244**	.117**	.088**	.041	.057*	014	.061**
I	Sig. 2-tailed	000 <sup>.</sup>		000 <sup>.</sup>	000	000	690.	.012	.535	.007
	Z	1937	1945	1940	1937	1935	1924	1910	1881	1920
CF C04C	Correlation	.250**	.244**	1	.107**	<b>**</b> 620.	.186**	.107**	.135**	.152**
l	Sig. 2-tailed	000	000		000	000.	000 <sup>.</sup>	000	000	000
	Z	1937	1940	1944	1938	1935	1924	1909	1880	1920
CF C04D	Correlation	.112**	.117**	.107**	1	.307**	.054*	.052*	**070.	.111**
I	Sig. 2-tailed	000	000	000		000	.018	.023	.002	000
	z	1935	1937	1938	1942	1933	1924	1909	1880	1920
CF C05	Correlation	.180**	.088**	<b>**</b> 620.	.307**	1	.052*	.051*	.127**	.148**
I	Sig. 2-tailed	000	000	000	000		.023	.026	000.	000
	z	1932	1935	1935	1933	1940	1923	1908	1879	1919
CF_C07A	Correlation	<b>**</b> 060 <sup>.</sup>	.041	.186**	.054*	.052*	1	.110**	.185**	.134**
I	Sig. 2-tailed	000	.069	000	.018	.023		000	000 <sup>.</sup>	000 <sup>.</sup>
	z	1922	1924	1924	1924	1923	1929	1910	1880	1920
CF_C07B	Correlation	.101**	.057	.107**	.052*	.051*	.110**	1	.216**	.113**
l	Sig. 2-tailed	000	.012	000	.023	.026	000		000 <sup>.</sup>	000
	Z	1907	1910	1909	1909	1908	1910	1914	1878	1907
CF C07C	Correlation	.076**	014	.135**	••020.	.127**	.185**	.216**	1	.137**
I	Sig. 2-tailed	.001	.535	000	.002	000 <sup>.</sup>	000	000		000
	Z	1878	1881	1880	1880	1879	1880	1878	1885	1876
CF_C07D	Correlation	**160.	.061**	.152**	.111**	.148**	.134**	.113**	.137**	1
	Sig. 2-tailed	000	.007	000	000	000	000	000	000 <sup>.</sup>	
	z	1918	1920	1920	1920	1919	1920	1907	1876	1925
** Correlation	is significant at t is significant at t	the 0.01 level 2 the 0.05 level 2	e-tailed. P-tailed.							

Pearson Correlations: Community and Recreational Activities

Table 18.

		CF_A0 3A	CF_A04A	CF_A05A	CF_A06A	CF_A07A	CF_A13A	CF_A14A	CF_A15A	CF_A16A	CF_A18A	CF_A21A	CF_A22A
CF_A03A	Correlation	-	.367**	.389**	.289**	.235**	.255**	.040	900. 200	.424**	.273**	.163**	.235**
	JIB. 2-Maileu N	1969	.000 1963	 1965		.000	 1965	1966		.000.	 1968		.000
CF_A04A	Correlation	.367**		**109.	.442**	.382**	.309**	.027	024	.428**	.311**	.141**	.316**
I	Sig. 2-tailed	000.		000.	000.	000.	000.	.229	.295	000.	000.	000	000.
	Z	1963	1965	1961	1963	1964	1961	1962	1960	1965	1964	1955	1921
CF_A05A	Correlation	.389**	**109.	-	.453**	.425**	.250**	.00	011	.444**	.310**	.136**	.285**
	Sig. 2-tailed	000.	000.		000	000.	000.	.747	.626	000.	000.	000	000.
	Z	1965	1961	1968	1966	1961	1964	1966	1963	1961	1961	1958	1922
CF_A06A	Correlation	.289**	.442**	.453**	1	<b>**</b> 689.	.429**	**670.	.065**	.311**	.501**	.226**	.421**
	Sig. 2-tailed	000.	000	000		000.	000.	000.	.00	000.	000	000	000.
	Z	1967	1963	1966	161	1970	1961	1968	1966	1970	1970	1961	1925
CF_A07A	Correlation	.235**	.382**	.425**	**689.	1	.388**	.035	.050	.244**	.484**	.182**	.350**
I	Sig. 2-tailed	000.	000.	000.	000.		000.	.123	.026	000.	000.	000.	000.
	Z	1968	1964	1967	1970	1972	1968	1969	1961	1971	1971	1962	1926
CF_AI3A	Correlation	.255**	.309**	.250**	.429**	.388**	1	.423**	.212**	.241**	.370**	.468**	.551**
	Sig. 2-tailed	000	000.	000.	000	000.		000.	000	000.	000	000	000.
	Z	1965	1961	1964	1967	1968	1969	1967	1965	1968	1968	1959	1925
CF_A14A	Correlation	.040	.027	.00	**670.	.035	.423**	1	.180**	.052*	.087**	.414**	.318**
	Sig. 2-tailed	.079	.229	.747	000	.123	000		000	.022	000	000.	000
	z	1966	1962	1966	1968	6961	1967	1970	1966	1969	1969	1960	1925
CF_A15A	Correlation	900.	024	011	.065**	.050	.212**	.180**	1	.029	.087**	.159**	.212**
	Sig. 2-tailed	.806	.295	.626	.004	.026	000	000		.196	000	000	000
	Z	1965	1960	1963	1966	1967	1965	1966	1968	1967	1967	1958	1923
CF_A16A	Correlation	.424**	.428**	.444**	.311**	.244**	.241**	.052	.029	1	.291	.122**	.272**
	Sig. 2-tailed	000	000	000 <sup>.</sup>	000	000	000 <sup>.</sup>	.022	.196		000.	000 <sup>.</sup>	000.

Pearson Correlations: Living Environment Functioning

Table 19.

Table 19	(cont'd)												
		CF_A03A	CF_A04A	CF_A05A	CF_A06A	CF_A07A	CF_A13A	CF_A14A	CF_A15A	CF_A16A	CF_A18A	CF_A21A	CF_A22A
CF_A18A	Correlation	.273**	.311**	.310**	.501**	.484**	.370**	**/80.	<b>**</b> 280.	.291**		.209**	.345**
	Sig. 2-tailed	000.	000	000	000.	000	000.	000.	000	000.		000.	000
	Z	1968	1964	1967	1970	1971	1968	1969	1967	1971	1972	1962	1927
CF_A21A	Correlation	.163**	.141**	.136**	.226**	.182**	.468**	.414**	.159**	.122**	.209**	1	.401
I	Sig. 2-tailed	000	000	000	<b>00</b> .	000	000.	000	000.	000.	000		000.
	Z	1959	1955	1958	1961	1962	1959	1960	1958	1962	1962	1964	1918
CF_A22A	Correlation	.235**	.316**	.285**	.421**	.350**	.551**	.318**	.212**	.272**	.345**	.401**	1
	Sig. 2-tailed	000	000.	000.	000.	000	000.	<b>0</b> 00.	000.	000.	000	000	
	Z	1923	1921	1922	1925	1926	1925	1925	1923	1927	1927	1918	1928
** Correla	tion is significa	ant at the 0.	01 level 2-ti	ailed.									

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\*\* Correlation is significant at the 0.01 level 2-tailed.
 \* Correlation is significant at the 0.05 level 2-tailed.

Table 20.

Exogenous Factors: Standardized Factor Loadings and Variance Explained

Factor	Variable	Factor Loading	Significance (2-tailed)	Variance Explained (R <sup>2</sup> )	Significance (2-tailed)
Locus of Control, Internal	CF_F01	.401	p ≤ .0001	.161	p ≤ .0001
	CF_F05	.224	p ≤ .0001	.050	p = .021
	CF_F07	.589	p ≤ .0001	.347	p ≤ .0001
	CF_F11	.204	p ≤ .0001	.042	<b>p</b> = .043
	CF_F22	.522	p ≤ .0001	.272	p ≤ .0001
	CF_F24	.643	p ≤ .0001	.413	p ≤ .0001
	CF_F26	.637	p ≤ .0001	.405	<b>p</b> ≤ .0001
	CF_F29	.716	p ≤ .0001	.513	p ≤ .0001

Factor	Variable	Factor Loading	Significance (2-tailed)	Variance Explained (R <sup>2</sup> )	Significance (2-tailed)
Locus of Control, Chance/Fate	CF_F03	.571	p ≤ .0001	.326	p ≤ .0001
	CF_F08	.662	p ≤ .0001	.439	<b>p</b> ≤ .0001
	CF_F09	.766	p ≤ .0001	.587	<b>p</b> ≤ .0001
	CF_F17	.717	p ≤ .0001	.514	<b>p</b> ≤ .0001
	CF_F19	.705	p ≤ .0001	.496	p ≤ .0001
	CF_F30	.664	p ≤ .0001	144.	<b>p</b> ≤ .0001
	CF_F31	.546	p ≤ .0001	.298	p ≤ .0001
Locus of Control, Powerful Others	CF_F04	.772	p ≤ .0001	.596	p ≤ .0001
	CF_F10	.552	p ≤ .0001	.304	p ≤ .0001
	CF_F13	.830	<b>p</b> ≤ .0001	.689	<b>p</b> ≤ .0001
	CF_F16	.653	p ≤ .0001	.426	<b>p</b> ≤ .0001
	CF_F20	.643	p ≤ .0001	.413	<b>p</b> ≤ .0001
	CF_F25	.328	p ≤ .0001	.108	p ≤ .0001
	CF_F28	.702	p ≤ .0001	.492	<b>p</b> ≤ .0001
	CF_F33	.733	p ≤ .0001	.537	<b>p</b> ≤ .0001
		~			
Self-Esteem	CF_F02	.664	p ≤ .0001	.441	p ≤ .0001
	CF_F06	.706	p ≤ .0001	.499	<b>p</b> ≤ .0001
	CF_F12	.757	p ≤ .0001	.573	<b>p</b> ≤ .0001
	CF_F14	.558	p ≤ .0001	.312	<b>p</b> ≤ .0001
	CF_F15	.718	p ≤ .0001	.516	<b>p</b> ≤ .0001
	CF_F18	.799	p ≤ .0001	.638	p ≤ .0001

Table 20 (cont'd)

Factor	Variable	Factor Loading	Significance (2-tailed)	Variance Explained (R <sup>2</sup> )	Significance (2-tailed)
	CF_F21	.818	p ≤ .0001	.669	p ≤ .0001
	CF_F23	.740	<b>p</b> ≤ .0001	.547	p ≤ .0001
	CF_F27	.771	<b>p</b> ≤ .0001	.594	p ≤ .0001
	CF_F32	.831	p ≤ .0001	.693	p ≤ .0001
Perceived Counselor Support	CDF_42	.164	p ≤ .001	.027	p= .099
	SI_A02	.865	p ≤ .0001	.749	p ≤ .0001
	SI_A05	.867	<b>p</b> ≤ .0001	.752	<b>p</b> ≤ .0001
	SI_A08	.917	p ≤ .0001	.841	<b>p</b> ≤ .0001
	SI_A09	.879	p ≤ .0001	.772	p ≤ .0001
CID-Related Functioning, Cognitive					
and Sensory	CF_A01A	868.	p ≤ .0001	.806	p ≤ .0001
	CF_A17A	868.	p ≤ .0001	.806	p ≤ .0001
	CF_A19A	.901	<b>p</b> ≤ .0001	.811	<b>p</b> ≤ .0001
	CF_A20A	.580	p ≤ .0001	.337	<b>p</b> ≤ .0001
	CF_A23A	.454	<b>p</b> ≤ .0001	.206	p ≤ .0001
CID-Related Functioning, Mobility	CF_A09A	.971	p ≤ .0001	.943	p ≤ .0001
	CF_A10A	.931	<b>p</b> ≤ .0001	.866	<b>p</b> ≤ .0001
	CF_A12A	.901	p ≤ .0001	.812	p ≤ .0001

(cont'd)	
Table 20	

Factor	Variable	Factor Loading	Significance (2-tailed)	Variance Explained (R <sup>2</sup> )	Significance (2-tailed)
Employment Functioning	CDF_49	.564	p ≤ .0001	.319	p ≤ .0001
	CDF_54	.458	<b>p</b> ≤ .0001	.210	<b>p</b> ≤ .0001
	Hourly Wages	.680	p ≤ .0001	.462	<b>p</b> ≤ .0001
Community & Recreational Activities	CF_C04A	.486	p ≤ .0001	.236	p ≤ .0001
	CF_C04B	.350	<b>p</b> ≤ .0001	.122	<b>p</b> ≤ .0001
	CF_C04C	.478	<b>p</b> ≤ .0001	.229	<b>p</b> ≤ .0001
	CF_C04D	.322	<b>p</b> ≤ .0001	.104	<b>p</b> ≤ .0001
	CF_C05	.385	p ≤ .0001	.148	<b>p</b> ≤ .0001
	CF_C07A	.379	<b>p</b> ≤ .0001	.144	<b>p</b> ≤ .0001
	CF_C07B	.324	<b>p</b> ≤ .0001	.105	<b>p</b> ≤ .0001
	CF_C07C	.378	p ≤ .0001	.143	<b>p</b> ≤ .0001
	CF_C07D	.341	p ≤ .0001	.116	<b>p</b> ≤ .0001
Living Environment Functioning	$CF_A03A$	.731	p ≤ .0001	.534	p ≤ .0001
	CF_A04A	890	<b>p</b> ≤ .0001	.793	<b>p</b> ≤ .0001
	CF_A05A	.879	<b>p</b> ≤ .0001	.772	<b>p</b> ≤ .0001
	CF_A06A	.955	<b>p</b> ≤ .0001	.912	p ≤ .0001
	CF_A07A	986.	<b>p</b> ≤ .0001	.978	<b>p</b> ≤ .0001
	CF_A13A	.879	p ≤ .0001	.773	<b>p</b> ≤ .0001
	CF_A14A	.512	p ≤ .0001	.262	p ≤ .0001
	CF_A15A	.466	p ≤ .0001	.217	<b>p</b> = .006

Endogenous Factors: Standardized Factor Loadings and Variance Explained

Table 21.

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Factor	Variable	Factor Loading	Significance (2-tailed)	Variance Explained (R <sup>2</sup> )	Significance (2-tailed)
	CF_A16A	.781	p ≤ .0001	.610	p ≤ .0001
	CF_A18A	919.	p ≤ .0001	.845	p ≤ .0001
	CF_A21A	.650	p ≤ .0001	.422	p ≤ .0001
	CF_A22A	.866	p ≤ .0001	.750	p ≤ .0001

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#### Structural Equation Modeling Results

In order to assess Livneh's (2001) model of psychosocial adaptation to CID using participants from the LSVRSP longitudinal study of state-federal VR consumers, structural equation modeling (SEM) was conducted using Mplus 5.1 (Muthén & Muthén, 2007). Specifically, confirmatory analysis of the model was performed on data obtained from consumers both during the normal course of their involvement with the state-federal VR system and following case closure. Given its "real life" setting, it was anticipated that this data would realistically assess the model's ability to accurately represent the interactive, multidimensional process of psychosocial adaptation and the resulting extrapersonal quality of life for individuals with chronic illness and/or disability. Structural equation modeling was chosen to analyze the data because it can account for errors within construct measures and because it allows for the necessary integrated analysis of relationships among constructs posited in Livneh's (2001) theory of psychosocial adaptation to chronic illness and disability.

#### Initial Analyses of Exogenous and Endogenous Constructs

Before evaluating the full model, separate confirmatory analyses of exogenous and endogenous constructs was conducted (Table 22). This approach allowed for initial assessment of the viability of the exogenous and endogenous constructs and provided insight during subsequent assessment of the full model.

During this initial analysis it became clear that the exogenous constructs (i.e., Locus of Control, Self-Esteem, Perceived Counselor Support, and CID-Related Functioning) formed a more coherent group than did the endogenous constructs (i.e., Employment Functioning, Community and Recreational Activities, and Living

Environment Functioning). A review of goodness-of-fit indices in Table 22 suggests that the exogenous variables formed a relatively reasonable unit, while the same cannot be said for the endogenous variables as a group. These results may help to explain several findings obtained when the full and modified models were implemented.

#### Full Theorized Model

Livneh's (2001) model of psychosocial adaptation to CID as represented in the present study (Figure 2) was partially supported by the data. The discussion of SEM results for the hypothesized model begins with consideration of the goodness-of-fit statistics (Table 22). Next, relationships among the factors and their associations with the Extrapersonal QOL outcome are explored (Tables 23 through 25).

In light of the large sample size of 2,170 participants, data that deviated appreciably from the normal distribution, and a highly complex hypothesized model, it is not surprising that the chi-square statistic for the proposed model was significant ( $\chi^2 =$ 3116.556, p  $\leq$  .0001, df = 512). However, normed chi-square (a measure that is relatively unaffected by these fundamentals) also suggests that the proposed model is a poor fit with the data (Normed- $\chi^2 = 6.09$ ). Results of the remaining goodness-of-fit statistics were mixed.

The Comparative Fit Index (CFI) assesses improvement in overall fit of a hypothesized model as compared to the baseline model. According to Schermelleh-Engel and Moosbrugger (2003), values  $\geq$  .97 are indicative of good data-model fit and values between .95 and .97 indicate acceptable fit. Using data from participants of the present investigation, the CFI statistic was calculated to be .847, considerably below both of these standards.

In addition to being relatively unaffected by sample size, TLI and RMSEA include corrections for model complexity such that more parsimonious models provide better data-model fit. An RMSEA statistic  $\leq .050$  is indicative of good data-model fit, while values  $\geq .90$  for TLI are generally considered to reflect good data-model fit. Considering the complexity of the proposed theory, it was not surprising that the TLI statistic obtained is suggestive of a poor fitting model. Conversely, the more reliable fit index, RMSEA, supports a conclusion that the proposed model is a good fit with the data.

In light of the divergence between goodness-of-fit indices observed in the present research, a side note may be useful. Discrepancies among goodness-of-fit statistics are a well known phenomenon and, considering the mixed data types used to measure latent constructs and the complexity of the hypothesized model, disagreement between goodness-of-fit indices was not entirely unexpected. Additionally, while opinions vary concerning the interpretation of the various goodness-of-fit statistics, RMSEA has repeatedly demonstrated its trustworthiness in a variety of studies (T. Raykov, personal communication, February 16, 2009).

In view of the foregoing, it appears that when viewed as a group, the indices seem to support the conclusion that while the proposed model of psychosocial adaptation is not an ideal fit with the data, it may be considered acceptable. A closer look at relationships between constructs (Tables 23 and 24) reveals specific strengths and weakness in the theorized model.

#### Exogenous Factors

*Relationships among exogenous factors.* Given the vast amount of literature concerning locus of control, it was anticipated that external locus of control would relate

negatively to internal locus of control. This is precisely what occurred. Both externality measures, chance/fate and powerful others, correlated negatively with the measure of internal locus of control (r = -.354 and -.405, respectively;  $p \le .0001$ ). It was also anticipated that the two external measures of locus of control would correlate with each other. Yet, considering Levenson's (1981) claim that these two beliefs in external controls are distinct measures, the magnitude of the association was a bit unexpected (r = .858,  $p \le .0001$ ).

Turning to the measurement of self-esteem, it is interesting that for the present group of participants, positive self-esteem evidenced a strong correspondence with internal locus of control (r = .729,  $p \le .0001$ ), a small but significant association with perceptions of counselor support (r = .193,  $p \le .0001$ ), and moderately negative relationships with both measures of external locus of control (r = .555 and -.573,  $p \le .0001$ ). Additionally, perceived counselor support displayed a slight but significant correlation with internal locus of control (r = .165,  $p \le .001$ ) and equally small but significant negative relationships with both external locus of control orientations (r = .165 and -.189,  $p \le .0001$ ).

These findings partially support Livneh's (2001) theory that the process variables interact as they affect adaptation and its QOL outcomes. Specifically, it appears that consumers of state-federal vocational rehabilitation who adopt external locus of control beliefs may experience lower self-esteem than those with an internal locus of control. Similarly, those with low self-esteem and/or an external locus of control orientation appear to be less satisfied with their state-federal vocational rehabilitation counselors. As regards CID-related functional limitations and abilities, cognitive and sensory functioning correlated with mobility functioning (r = .354, p  $\le$  .0001), indicating that participants with greater mobility tended to also perceive themselves to be less limited with respect to their cognitive and/or sensory functioning (and vice versa). The remainder of the findings pertaining to CID-related functioning are less obvious and, therefore, require further discussion.

For the current sample of individuals, CID-related cognitive and sensory functioning evidenced slight negative correlations with chance/fate and powerful others external locus of control beliefs (r = -.183 and -.173, p  $\leq$  .0001) and a small positive association with internal locus of control (r = .255, p  $\leq$  .0001). Cognitive and sensory functioning was also found to be positively associated with self-esteem (r = .229, p  $\leq$ .0001) and perceived counselor support (r = .172, p  $\leq$  .001). With respect to mobility, aside from a slight positive correlation with the belief that powerful others control the individual's life (r = .129, p = .033), the measure of CID-related mobility functioning did not relate significantly to the remaining exogenous constructs.

Based upon these results it appears that greater cognitive and/or sensory functioning is associated with internal locus of control beliefs, positive self-esteem, and the perception that the rehabilitation counselor is supportive. Conversely, reduced cognitive and/or sensory functioning seems to be associated with an external locus of control orientation (i.e., a belief that chance or fate controls the one's life and/or a belief that powerful others control the individual's life). As with CID-related cognitive and sensory functioning, it appears that impaired mobility is associated with a belief that powerful others control the individual's life. However, it should be noted that this relationship is relatively weak. It is unclear why cognitive and sensory functioning is related to perceptions of ourselves (e.g., self-esteem and locus of control) and those with whom we are interacting (e.g., perceived counselor support), while mobility does not share a similar relationship. Given that cognition is central to our self-concepts and our perceptions of the environment, it is possible that cognitive and sensory limitations impact us to a greater extent than do mobility restrictions. Regardless, these results have practice implications that will be discussed in Chapter 5.

#### Relationships between exogenous factors and extrapersonal quality of life.

Perhaps the most unexpected findings with respect to exogenous variables involve their relationships with extrapersonal QOL (Table 24). For participants of the present investigation, neither locus of control, self-esteem, perceptions of counselor support, nor race significantly predicted extrapersonal quality of life. It is remarkable that none of the psychological constructs were found to relate significantly to quality of life. Equally notable, locus of control did not relate significantly to extrapersonal QOL nor to any of its constituents and self-esteem corresponded significantly with only Community and Recreational Activities (see results of the modified model, pp. 113-117). Considering prior research that has repeatedly found connections between psychological constructs and perceptions of quality of life (including subjective well-being), it is likely that these results are an aberration associated with the design of the study and/or the sample of participants utilized in the current investigation. Therefore, it is essential that these results be investigated further before they can be relied upon with any confidence.

Importantly, CID-related functioning, education, gender, and marital status (never married) all related significantly to extrapersonal quality of life. Of these four, only CID-

related mobility functioning exhibited substantial correspondence with Extrapersonal QOL ( $\beta = .794$ , p  $\le .0001$ ). Controlling for all other predictors, for each standard deviation increase in CID-related mobility functioning, overall extrapersonal QOL increased by .794 standard deviations. Given the overwhelming importance of the endogenous Living Environment Functioning factor to the QOL construct, it is not surprising that the single strong relationship among the exogenous variables and QOL involved CID-related mobility functioning. Also, as the modified model demonstrates (pp. 113-117), while controlling for all other predictors, a similar one standard deviation increase in CID-related mobility functioning resulted in a .743 standard deviation increase in living environment functioning.

Based upon these findings, it appears that individuals who experienced fewer mobility restrictions due to their chronic illness and/or disability also experienced substantially better overall QOL in terms of employment, community and recreational activities and, especially, functioning within the living environment. This finding coincides with previous research by Livneh, Lott, and Antonak (2004) and Reinhardt, Boerner, and Horowitz (2006), each of whom found a relationship between the extent of functional limitations and adaptation to disability.

Although the relationships are considerably less compelling, it also appears that enhanced extrapersonal QOL was experienced by men ( $\beta = -.161$ ,  $p \le .0001$ ), those with greater cognitive functioning ( $\beta = .277$ ,  $p \le .0001$ ), and participants with more years of education ( $\beta = .119$ ,  $p \le .0001$ ). Conversely, as compared to individuals who were either married or widowed at the start of the LSVRSP study, participants who were single appear to experience slightly lower extrapersonal QOL ( $\beta = -.076$ , p = .048).

#### **Endogenous** Factors

*Relationships among endogenous factors.* Contrary to theory, none of the endogenous factors that reflected extrapersonal QOL were found to relate positively with each other, and one relation did not rise to significance (Table 23). The two significant associations each included community and recreational activities. The strongest relationship occurred between community and recreational activities and living environment functioning (r = -.411,  $p \le .0001$ ). Employment functioning and community and recreational activities formed the only other significant relationship among the endogenous factors (r = -.254,  $p \le .001$ ).

Based upon these findings it appears that community and recreational activities decreased as employment or environmental functioning increased. These findings seem atypical and open to honest debate. One rationale for the unexpected relationships may be the exceptionally poor internal consistencies exhibited by the Employment Functioning and Community and Recreational Activities instruments (pp. 81-82). Clearly, before conclusions can be reached with any confidence, additional research is needed using alternative instruments to evaluate relationships between these three endogenous QOL factors.

# Relationships between endogenous factors and extrapersonal quality of life.

According to modern theories, including that by Livneh (2001), extrapersonal quality of life is reflected in, among other things, one's employment functioning, community and recreational activities, and functioning within the environment. However, contrary to theory, for participants of the present research extrapersonal quality of life was overwhelmingly explained by a single factor: the ability to function effectively within

one's living environment ( $R^2 = .705$ ). Additionally, with a factor loading of .840, Living Environment Functioning was the only indicator to display a strong association with the extrapersonal QOL latent construct. As demonstrated by their factor loadings (Table 25), the remaining two indicators of extrapersonal QOL in this study (i.e., Employment Functioning and Community and Recreational Activities) each displayed considerably weaker correspondence with the construct they were intended to measure. In spite of their relatively low correspondence with extrapersonal QOL, both employment functioning and activities associated with community and recreational pursuits explained moderate amounts of variability in extrapersonal QOL (35.6% and 33.0%, respectively). Although not entirely, these findings appear to support Livneh's (2001) theory that extrapersonal QOL is multifaceted and includes aspects of employment functioning, community and recreational activities, and functional abilities within the living environment.

#### Modified Model

Considering the less than perfect fit of the theorized model and the disappointing correspondences between the second order extrapersonal QOL construct and its three indicators, it was decided that analysis should proceed further in order to clarify whether it is the relationships between the exogenous and endogenous factors and/or those with the second order QOL construct that are problematic to the model of psychosocial adaptation to chronic illness and disability. To accomplish this, a second model was developed (Figure 5) that excluded the second order quality of life factor and considered only direct relationships between the exogenous and endogenous factors. Although this model proved to be a slightly better fit with the data, as with the initial model, the fit was less than ideal (Table 22).

The RMSEA result of .047 for the modified model is indicative of good datamodel fit. However, the remaining fit indices do not concur. Based upon consideration of the results in their entirety, it can be concluded that the modified model while sufficient was not an ideal fit with data from participants of the present research. Yet, the modified model revealed important relationships between exogenous and endogenous factors that was not apparent in the original hypothesized model. These relationships are presented in Table 26, and important findings are highlighted below.

#### **Employment Functioning**

Given the nonsignificant association between endogenous employment functioning and living environment functioning (r = -.168, p = .087), it is unremarkable that exogenous CID-related mobility functioning did not significantly predict employment functioning ( $\beta$  = .117, p = .087). Among the functional factors in the model, CID-related cognitive and sensory functioning alone corresponded significantly with employment functioning ( $\beta$  = .260, p ≤ .0001) such that, controlling for all other predictors, each standard deviation increase in cognitive and sensory functioning resulted in a .260 standard deviation increase in employment functioning. Other significant predictors of employment functioning included years of education ( $\beta$  = .285, p ≤ .0001); marital status, never married ( $\beta$  = -.261, p ≤ .0001); and gender ( $\beta$  = -.221, p ≤ .0001). Interestingly, neither locus of control, self-esteem, CID-related mobility, race, nor marital status of separated or divorced related significantly to employment functioning.

Based upon these findings, it appears that in the current study, males with better sensory and/or cognitive functioning, who had been or were married at the start of the LSVRSP study and who had more years of education, experienced better employment functioning as reflected in a greater number of hours worked; higher hourly salary; and more integrated, paid employment.

#### Community and Recreational Activities

As with employment functioning, community and recreational activities exhibited only slight correspondence with other variables. For example, self-esteem ( $\beta$  = .221, p = .006), perceived counselor support ( $\beta$  = .116, p = .009), and years of education ( $\beta$  = .176, p ≤ .0001) displayed small but significant predictive relationships with community and recreational activities. Marital statuses of separated or divorced ( $\beta$  = -.086, p = .020) and never married ( $\beta$  = .092, p = .010) also evidenced significant, albeit negligible, predictive relations with the community and recreational activities.

Based upon these results it appears that, for participants of the study, those with higher self-esteem, who viewed their rehabilitation counselors as supportive, and who had more years of education at the start of the LSVRSP study were more frequently engaged in community and recreational activities. Although self-esteem and perceived counselor support did not exhibit significant relationships with extrapersonal QOL generally, they displayed significant correspondences with one aspect of extrapersonal QOL, i.e., community and recreational activities. It appears that, for participants of the current study, these two process influences, though not affecting extrapersonal QOL as hypothesized, may relate to extrapersonal QOL through their relationships with community and recreational activities.

Unexpectedly, for participants of the current research, CID-related functioning did not correspond significantly with community and recreational functioning. In conjunction with this finding, the reader is reminded that endogenous living environment functioning was negatively related to community and recreational activities (r = -.411, p  $\leq .0001$ ) such that as environmental functioning increased, community and recreational pursuits decreased. These latter findings would benefit from further investigation. Having said this, the reader is also reminded that both the environmental functioning and the community and recreational activities measures were found to lack internal consistency and, as a result, were unreliable measures for participants of the present study.

#### Living Environment Functioning

As with the remaining endogenous factors, living environment functioning displayed few significant relationships with exogenous factors. Only three exogenous variables corresponded significantly with environmental functioning: CID-related cognitive and sensory functioning ( $\beta = .285$ ,  $p \le .0001$ ), CID-related mobility ( $\beta = .743$ ,  $p \le .0001$ ), and gender ( $\beta = -.109$ ,  $p \le .0001$ ). None of the psychological constructs were found to relate to the ability to function within the environment. Furthermore, mobility functioning alone was the most substantial predictor of environmental functioning. Controlling for all other factors, each standard deviation increase in mobility resulted in a .743 standard deviation increase in environmental functioning.

Importantly, CID-related mobility corresponded significantly with living environment functioning, but not with the remaining two indicators of extrapersonal quality of life. This lack of correspondence with two of the indicators of extrapersonal QOL along with the disconnects between several exogenous and endogenous indicators calls into question the theory that exogenous factors affect overall extrapersonal quality of life.

Based upon these findings, it seems that males with better cognitive and sensory functioning, and fewer mobility limitations were better able to function within their living environments. This correspondence between environmental functioning and CID-related functioning was not unexpected. However, the especially strong relation between CIDrelated mobility and living environment functioning, combined with the noticeably weaker relationship between CID-related cognitive and sensory functioning and living environment functioning was not anticipated. It appears that for the participants of the present research, the ability to physically navigate their environment was considerably more important than were cognitive and sensory capabilities.

When viewed in their entirety, results from SEM analysis of the data appear to partially support the subset of Livneh's (2001) theory of psychosocial adaptation to CID that was the focus of the current study. While several relationships were as predicted, others were weaker than expected, and several others were unexpectedly absent. A more detailed discussion of the ramifications of these results, including practice implications, is presented in Chapter 5.

	χ <sup>2</sup>	Normed $\chi^2$ $(\chi^2 / df)$	RMSEA	CFI	TLI
<ul> <li>Exogenous Variables Only</li> <li>Locus of Control</li> <li>Self-Esteem</li> <li>Perceived Counselor Support</li> <li>CID-Related Functioning</li> </ul>	1919.383 (p ≤ 0.0001) df = 342	5.61	.046	£06.	.937
Endogenous Variables Only <ul> <li>Employment Functioning</li> <li>Community &amp; Recreational Activities</li> <li>Living Environment Functioning</li> </ul>	1460.353 (p ≤ 0.0001) df = 93	15.7	.082	.850	.876
<ul> <li><u>Full 2<sup>nd</sup> Order Model</u> <sup>(1)</sup></li> <li>Exogenous Variables (including Sociodemographic Variables)</li> <li>Quality of Life by endogenous variables</li> </ul>	3116.556 (p ≤ 0.0001) df = 512	6.09	.050	.847	.878
<u>Modified Model</u> <ul> <li>1<sup>st</sup> order factors only</li> </ul>	2887.352 (p ≤ 0.0001) • df = 521	5.54	.047	.861	168.

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(1) Variables CDF\_A09A and CDF\_A12A were constrained to be equivalent in the Full Model in order to enable the covariance matrix (theta) to remain positive definite.

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# Table 22.

Goodness-of-Fit Indices

# Table 23.

# Standardized Relationships Among the Factors

Factor	Correlation	Significance (2-tailed)		
EXOGENOUS FACTORS				
Locus of Control, Internal WITH				
External Locus Of Control				
Locus of Control, Chance/Fate	354	p ≤ .0001		
Locus of Control, Powerful Others	405	<b>p</b> ≤ .0001		
Self-Esteem	.729	p ≤ .0001		
Perceived Counselor Support	.165	p ≤ .001		
CID-Related Functioning:				
Cognitive and Sensory	.255	p ≤ .0001		
Mobility	084	p = .247		
Locus of Control, Chance/Fate WITH				
Locus of Control, Powerful Others	.858	p ≤ .0001		
Self-Esteem	555	p ≤ .0001		
Perceived Counselor Support	164	p ≤ .0001		
CID-Related Functioning:				
Cognitive and Sensory	183	p ≤ .0001		
Mobility	.089	p = .132		
Locus of Control, Powerful Others WITH				
Self-Esteem	573	p ≤ .0001		
Perceived Counselor Support	189	p ≤ .0001		
CID-Related Functioning:				
Cognitive and Sensory	173	<b>p</b> ≤ .0001		
Mobility	.129	p = .033		
Self-Esteem WITH				
Perceived Counselor Support	.193	p ≤ .0001		
CID-Related Functioning:				
Cognitive and Sensory	.229	p ≤ .0001		
Mobility	015	p = .778		
Perceived Counselor Support WITH				
CID-Related Functioning:				
Cognitive and Sensory	.172	p ≤ .001		
Mobility	.014	p = .827		
CID-Related Functioning, Cognitive and Sensory WITH				
CID-Related Functioning, Mobility	.354	p ≤ .0001		

# Table 23 (cont'd)

Factor	Correlation	Significance (2-tailed)
ENDOGENOUS	<b>S</b> FACTORS	
Employment Functioning WITH		
Community & Recreational Activities	254	p ≤ .001
Living Environment Functioning	168	p = .087
Community & Recreational Activities WITH		
Living Environment Functioning	411	p ≤ .0001

# Table 24.

# Standardized Relationships Between Exogenous Factors and Extrapersonal QOL

Factor	Standardized Coefficient (Beta)	Significance (2-tailed)
Quality of Life ON		
Locus of Control		
Internal	.038	p = .740
External, Chance/Fate	062	p = .636
External, Powerful Others	071	p = .594
Self-Esteem	.081	p = .413
Perceived Counselor Support	.062	p = .261
CID-Related Functioning, Cognitive and Sensory	.277	p ≤ .0001
CID-Related Functioning, Mobility	.794	p ≤ .0001
Sociodemographic Variables		
Gender	161	p≤.0001
Race	.000	p = .995
Separated or Divorced	004	p = .909
Never Married	076	p = .048
Years of Education	.119	p ≤ .0001

Table 25.

Factor	Factor Loading	Significance (2-tailed)	Variance Explained (R <sup>2</sup> )
Quality of Life BY			
Employment Functioning	.597	p ≤ .0001	.356
Community & Recreational Activities	.574	p ≤ .0001	.330
Living Environment Functioning	.840	p ≤ .0001	.705

9.4

Extrapersonal Quality of Life: Standardized Relationships with Endogenous Factors and Variance Explained



Figure 4. Initial model: Path diagram with significant standardized correlations, betas ( $\beta$ ), and factor loadings ( $\lambda$ )



Figure 5. Modified measurement model without second order QOL factor

# Table 26.

Factor	Standardized Coefficient (Beta)	Significance (2-tailed)
mployment Functioning ON		
Locus Of Control		
Internal	.036	p = .636
External, Chance/Fate	112	p = .242
External, Powerful Others	.074	p = .453
Self-Esteem	.075	p = .315
Perceived Counselor Support	.058	p = .152
CID-Related Functioning		
Cognitive and Sensory	.260	p ≤ .0001
Mobility	.117	p = .087
Sociodemographic Characteristics		
Gender	221	p ≤ .0001
Race	031	p = .187
Marital Status, Separated or Divorced	056	p = .054
Marital Status, Never Married	261	p ≤ .0001
Years of Education	.285	p ≤ .0001

# Standardized Relationships Between Exogenous and Endogenous Factors

Locus of Control		
Internal	.096	p = .257
External, Chance/Fate	136	p = .212
External, Powerful Others	.040	p = .720
Self-Esteem	.221	p = .006
Perceived Counselor Support	.116	p = .009
CID-Related Functioning		
Cognitive and Sensory	024	p = .696
Mobility	.128	p = .073
Sociodemographic Characteristics		
Gender	008	p = .801
Race	013	p = .547
Marital Status, Separated or Divorced	086	p = .020
Marital Status, Never Married	.092	p = .010
Years of Education	.176	p ≤ .0001

Table 26 (cont'd)

Factor	Standardized Coefficient (Beta)	Significance (2-tailed)
Living Environment Functioning ON		
Locus of Control		
Internal	.002	p = .984
External, Chance/Fate	002	p = .989
External, Powerful Others	100	p = .422
Self-Esteem	.012	p = .895
Perceived Counselor Support	.028	p = .575
CID-Related Functioning		
Cognitive and Sensory	.285	p ≤ .0001
Mobility	.743	p ≤ .0001
Sociodemographic Characteristics		
Gender	109	p ≤ .0001
Race	.012	p = .697
Marital Status, Separated or Divorced	.026	p = .438
Marital Status, Never Married	041	p = .228
Years of Education	.020	p = .501



Figure 6. Modified model: Path diagram with significant standardized beta (B) paths

#### CHAPTER 5

#### CONCLUSIONS

The current investigation addressed the following four research questions by applying Livneh's (2001) theory of psychosocial adaptation to data from participants of the LSVRSP study:

(1) To what extent is extrapersonal quality of life represented by employment variables, community and recreational activities, and functional limitations and abilities associated with the living environment?

(2) To what extent is extrapersonal quality of life effected by contextual process influences including client self-esteem, locus of control, perceived vocational rehabilitation counselor support, sociodemographic characteristics, and/or condition-related functioning?

(3) To what extent do contextual process influences (i.e., locus of control, perceived rehabilitation counselor support, condition-related functioning, and/or sociodemographic characteristics) interrelate with each other?

(4) To what extent do extrapersonal quality of life indicators (i.e., employment functioning, community and recreational activities, and living environment functioning) interrelate with each other?

The first research question was answered by a review of the factor loadings and variances explained by each of the three factors that represented extrapersonal QOL in the present investigation. As discussed in Chapter 4, for participants of the study, the ability to function effectively within the living environment was of paramount importance to extrapersonal QOL. Employment functioning appears to be the second important influence, with community and recreational activities contributing least. In spite of their lesser

standing, both employment and community and recreational activities corresponded sufficiently with extrapersonal QOL to enable the conclusion that, as hypothesized by Livneh (2001), each of the three aspects of extrapersonal QOL examined in the present study explained a portion of extrapersonal QOL.

Given their mutual correspondences with extrapersonal QOL, it is interesting that employment functioning, community and recreational activities, and living environment functioning did not relate to each other as anticipated (Research Question 4). In the current study, employment functioning related negatively to community and recreational activities, and did not relate significantly to living environment functioning. Moreover, community and recreational activities exhibited a negative correspondence with each of the remaining components of extrapersonal QOL. These results were unforeseen and may indicate problems with the measures of these components, difficulties with the data, and/or other flaws in the design of the current study. It is also possible that, contrary to the theory, aspects of extrapersonal QOL do not interact to affect extrapersonal QOL outcomes. Rather, they may exert their influences independently. It appears that further research is needed to clarify the specific mechanisms involved in QOL outcomes.

As Figure 4 (p. 122) shows, for participants in the study, several contextual process influences theorized to affect quality of life did not significantly relate to the extrapersonal QOL construct (Research Question 2). Most unexpected were the lack of correspondences between extrapersonal QOL and both locus of control and self-esteem. Considering the expanse of studies that have found locus of control and self-esteem to be significantly associated with adaptation, as well as Li and Moore's (1998) research demonstrating that psychosocial factors may be more important to adjustment to disability than

sociodemographic variables, the lack of correspondence between extrapersonal QOL and the psychosocial process influences was not anticipated. In contrast to the measure of internal locus of control (a modified version of Levenson's 1981 instrument) that exhibited weak internal consistency, measures of external locus of control (modified versions of Levenson's 1981 instrument) and self-esteem (a modified version of Rosenberg's 1965 self-esteem instrument) exhibited good to excellent internal consistency. Therefore, aside from difficulties with the internality measure of locus of control, it appears that the instruments themselves did not interfere with the potential relationships between locus of control, self-esteem, and extrapersonal quality of life. It is unclear why locus of control and self-esteem did not significantly correspond, at least minimally, with extrapersonal quality of life.

In contrast to locus of control and self-esteem, particularly strong correspondences were exhibited between extrapersonal QOL and CID-related mobility functioning, and between extrapersonal QOL and living environment functioning. Considering that extrapersonal QOL is by definition comprised of environmental variables that involve interactions with one's community and personal living environment (Livneh, 2001), and given the demonstrated strong relationship between CID-related mobility functioning and living environment functioning, these connections are not surprising and identify functional ability as the key element in extrapersonal quality of life outcomes for participants in the present research. Additionally, these results conform to Livneh's (2001) theory of psychosocial adaptation and coincide with findings from studies by Beveridge (2003), Livneh, Lott, and Antonak (2004), Reinhardt, Boerner, and Horowitz (2006) and others. On the other hand, they diverge from research that has not found a relationship between

functional ability and QOL outcomes (e.g., Broers, Kaptein, LeCessie, Fibbe, & Hengeveld, 2000; Chase, Cornille, & English, 2000; and Whiteneck, Meade, Dijkers, Tate, Bushnik, & Forchheimer, 2004). The lack of standardized outcomes across investigations serves as one possible rationale for the disparate findings between the current investigation and these previous studies.

As with the other contextual process influences, sociodemographic variables exhibited mixed relations with extrapersonal QOL. While not all sociodemographic variables were significantly related to extrapersonal QOL, and those that reached significance displayed negligible to low correspondences, the effects of sociodemographic attributes are more evident when considered in relation to the separate components of extrapersonal OOL (Figure 6, p. 126). For example, marital status displayed minimal correspondence with extrapersonal OOL, but evidenced significant association with employment functioning (a component of extrapersonal QOL). Therefore, it appears that marital status may exercise its influence on quality of life through its relationship with employment. Likewise, gender and education seem to influence overall extrapersonal QOL through their relationships with employment functioning. Race, on the other hand, did not correspond significantly with extrapersonal QOL nor its individual components. This finding coincides with results from Beveridge (2003), Livneh, Lott, and Antonak (2004), Putzke, Hicken, and Richards (2002), and Dijkers (1999) neither of whom found race to significantly influence outcomes for participants with disabilities. Based upon results from the current study, it appears that among the sociodemographic variables, gender and education may exert the strongest influences on extrapersonal quality of life generally and
employment functioning specifically. Conversely, the effects of race on extrapersonal quality of life appear to be questionable.

Lastly, none of the psychosocial factors in the current study (i.e., locus of control, self-esteem, and perceived counselor support), but several sociodemographic variables (i.e., gender, education, and marital status) were found to be significantly related to extrapersonal QOL. These results appear to conflict with Li and Moore's (1998) conclusion that psychosocial factors may be more important to adjustment to disability than sociodemographic variables. They also partially conflict with the model of psychosocial adaptation to CID proposed by Livneh (2001). Overall, however, the data provide partial support for Livneh's (2001) theory that process contextual influences affect extrapersonal QOL outcomes.

The final research question addressed by the current investigation (Research Question 3) can be answered by reviewing Figure 4 (p. 122). Unfortunately, the manner in which sociodemographic variables were entered into the model does not allow for their inclusion in an analysis of this final question. However, as Figure 4 shows, excluding sociodemographic variables, contextual process influences interrelated as Livneh (2001) postulated. The strongest associations were found between self-esteem and the three domains of locus of control. As discussed in Chapter 4, participants who were oriented toward an internal locus of control also evidenced high self-esteem. Furthermore, participants with either or both of these characteristics (i.e., internal locus of control and/or high self-esteem) were more satisfied with their state-federal rehabilitation counselors. Also of note, self-esteem was positively and significantly associated with CID-related cognitive and sensory functioning, but was not related to either CID-related mobility or

living environment functioning. It seems that the self-esteem of participants was connected solely to their cognitive and sensory functioning. Physical functioning, including CID-related mobility and the ability to interact effectively with the living environment did not relate significantly to self-esteem. Each of the preceding findings have practice implications that will be discussed.

An adjustment to the hypothesized model was implemented after initial SEM results were examined. This post-hoc modification was undertaken in response to the less than ideal data-model fit exhibited by the theorized model, and was an attempt to clarify the strengths and weakness of the hypothesized model's components. Moreover, the modification allowed for an assessment of the interrelationships between exogenous and endogenous variables. As Figure 6 (p. 126) shows, notable connections include those between:

- CID-related functioning (especially mobility) and living environment functioning;
- CID-related cognitive and sensory functioning and employment functioning;
- Gender and employment functioning;
- Marital status and employment functioning; and
- Self-esteem and community and recreational activities.

Noteworthy exceptions include the disconnect between the three orientations of locus of control (i.e., internality, chance/fate, and powerful others) and each of the other elements in the model. A similar lack of correspondence was exhibited between race and the remaining variables. As with relationships in the theorized model, several findings from the modified model have practice implications.

### Limitations of the Study

Advanced techniques that allow for multidimensional analyses of theories were used to evaluate several key constructs within Livneh's (2001) theory of psychosocial adaptation to chronic illness and disability. Yet, several limitations should be taken into consideration when interpreting the findings of the current study.

First, the study did not employ an experimental design with strict controls. Rather, it relied upon ex post facto and archival data to assess the proposed model. As a result, questions regarding the internal validity of the study cannot be fully addressed. Similarly, instruments used to measure locus of control and self-esteem in the LSVRSP are variations of previously validated instruments from Levenson (1981) and Rosenberg (1965). Established psychometric properties of these earlier instruments cannot be expected to transfer to the customized measures used in the present investigation. These two aspects of the current design (i.e., the use of ex post facto and archival data and the use of modified instruments) highlight the need for carefully designed experimental studies that can evaluate the proposed model.

Second, participants of the current study consisted of a convenience sample of state-federal vocational rehabilitation consumers who previously participated in the LSVRSP study. Although the use of diverse individuals residing within their communities is a strength of the LSVRSP data, participants of the study represent a relatively narrow population (i.e., state-federal VR consumers). The resulting inability to confidently generalize findings beyond the public vocational rehabilitation population compromises the external validity of the present investigation. Therefore, research

inclusive of other populations with disabilities (e.g., workers' compensation or long-term disability insurance recipients) is needed so that results can be further generalized.

Third, during the LSVRSP study sociodemographic data was collected once. Consequently, changes in two sociodemographic variables used in the current study, marital status and education, could not be incorporated into SEM analyses. However, depending on their frequency, changes in the marital and/or educational status of participants might have affected correspondences between these two variables and the remaining elements of the model. Therefore, results that included marital status and education should be viewed with this in mind.

Fourth, the LSVRSP study was based solely on self-report data. Use of self-report data is susceptible to several confounds resulting from participant distortions, social desirability motivations, attributional errors, and/or the participant's relative selfawareness (Groth-Marnat, 1997; Katz, Rodin, & Devins, 1995; Schwarz, 1999). Criterion validity is also an issue when self-report data is used. Some participants may deliberately present a fake-good or fake-bad image, or may unintentionally provide incorrect information. For example, some individuals may have forgotten certain relevant life events such as the date of disability onset. Individuals may also provide inaccurate information if they view questionnaires as an invasion of their privacy. Consequently, uncorroborated self-report data can result in erroneous or inconclusive findings.

Fifth, in an attempt to evaluate demonstrable indicators of psychosocial adaptation to CID, the present investigation focused on extrapersonal aspects of quality of life at the expense of intrapersonal and interpersonal indicators. As a result, Livneh's

(2001) QOL outcome construct was not fully assessed by the study, nor has the multidimensional nature of QOL been fully appreciated.

Finally, given the analytical procedures used to evaluate the data, conclusions about direction of causality cannot be made with confidence. Structural equation modeling, although a well-established and powerful method for examining associations between and among latent constructs and their manifest indicators, does not allow for causal interpretations of the data. Structural equation modeling examines relationships among variables; causal inferences cannot be made based upon knowledge about associative relationships. For this reason, many researchers view SEM models as approximations of reality that cannot be proven (Raykov & Marcoulides, 2000).

### **Practice Implications**

Based upon results of the current research, it appears that the practice of rehabilitation counseling may be enhanced by inclusion of several considerations. For example, in addition to their strong shared relationship, clients with an internal locus of control orientation and high self-esteem perceived their state-federal vocational rehabilitation counselors as more supportive of them. In light of their apparent importance to perceived counselor support (and the resulting bond and mutual cooperation that are likely to result between the counselor and client), practices aimed at fostering both an internal locus of control and improved self-esteem of consumers is encouraged.

Similar significant relationships between cognitive and sensory functioning and both locus of control and self-esteem also were demonstrated in the current research. Clients with better cognitive and/or sensory functioning exhibited an internal locus of control and higher self-esteem than did clients with more limited cognitive and/or sensory

functioning. This link indicates that, especially for clients with cognitive and/or sensory limitations, rehabilitation counselors may need to work to improve the self-esteem of these individuals and attempt to foster an internal locus of control orientation.

For participants in the study, extrapersonal QOL was chiefly determined by environmental functional ability. Therefore, when appropriate, it is recommended that added effort be given to the improvement of environmental functioning for clients who have difficulty physically navigating their living environment. Whereas overall QOL displayed greatest correspondence with the ability to physically navigate the environment, employment (as represented by hours worked, wages, and type of job) seemed to be most influenced by education and cognitive and sensory functioning. Based upon this result, it is suggested that rehabilitation counselors pay particular attention to cognitive and sensory functioning as well as education when making decisions regarding the employment potential of clients.

Lastly, in view of the lack of correspondence between race and the remaining elements of the model in the current study, it seems that less emphasis can be placed on race by rehabilitation counselors when evaluating a client's psychosocial factors or their potential extrapersonal quality of life outcomes.

## Directions for Future Research

The present investigation extended prior research by utilizing participants with a wide variety of disabilities who resided within their communities and by applying complex statistical methods to assess components of a prominent theory of psychosocial adaptation to chronic illness and disability. In this manner, relationships between several contextual process influences and extrapersonal quality of life were examined, within-

group variability was assessed, and interrelationships among adaptation constructs were evaluated. The current research also revealed several potential strengths and weaknesses of the theory of psychosocial adaptation to CID offered by Livneh (2001). Yet, considering the study design and data limitations, these results should be viewed as less than definitive. The results can, however, be employed to suggest avenues for future research. Several such recommendations are presented below.

First, although generalizability was enhanced in the study through the use of diverse participants who resided within their communities, it was inhibited by the restricted use of consumers of the state-federal vocational rehabilitation program. In order for conclusions to be generalized with confidence, it is recommended that future research be extended beyond state-federal rehabilitation consumer population (e.g., private rehabilitation settings).

Secondly, the three endogenous factors used in the current research did not correspond as expected with extrapersonal QOL; one factor, living environment functioning, dominated. Given this uneven distribution, it is suggested that further clarification of the primary components of extrapersonal QOL and their interrelationships is needed.

Third, the present research assessed extrapersonal QOL in isolation. To be fully appreciated, examination of Livneh's (2001) model needs to be extended to intrapersonal and interpersonal QOL domains. Initially, it would be useful to consider these two domains separately so that their individual components can be confirmed and/or clarified. Ultimately, however, all three QOL domains need to be included in a single model so that

the efficacy of Livneh's (2001) model of psychosocial adaptation to CID can be appropriately studied.

Lastly, it is strongly recommended that future research control for the limitations encountered in the current study by adhering to rules of experimental design rather than relying on archived data that was administered without adequate controls. Having said this, it should also be noted that the number of participants included in the study allowed for considerable power to detect significant relations despite the flawed research design.

In spite of limitations of the data and study design, results of SEM analyses revealed several key relationships and provided important support for the model of psychosocial adaptation to CID proposed by Livneh (2001). As such, it is hoped that the present investigation both contributed substantively to the body of adaptation research and has encouraged further exploration of multidimensional theories of adaptation to CID such as that offered by Livneh (2001).

# APPENDIX

# VARIABLES AND MEASURES USED IN THE CURRENT STUDY

# Table 27.

Exogenous Variables and Measures

LSVRSP			<b>Reverse Scored or</b>
File/Variable	Question/Statement	Answer Range	Recoded

# **Process Contextual Influences: Personality or Psychological Attributes** (Data Obtained from First Administration of CFI)

Locus of Control, Internality: (1)

CFI; CF_F01	Whether or not I get to be a leader depends mostly on my ability.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F05	Whether or not I get into a car accident depends mostly on how good a driver I am.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F07	When I make plans, I am almost certain to make them work.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F11	How many friends I have depends on how nice a person I am.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F22	I can pretty much determine what will happen in my life.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F24	I am usually able to protect my personal interests.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F26	When I get what I want, it's usually because I worked hard for it.	1=Agree 2=- opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F29	My life is determined by my own actions.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
Locus of Cont	rol, Chance: <sup>(1)</sup>		
CFI; CF_F03	To a great extent, my life is controlled by accidental happenings.	1=Agree 2=No opinion 3=Disagree	l=Disagree 2=No opinion 3=Agree
CFI; CF_F08	Often there is no chance of protecting myself from bad luck.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree

Table 27 (cont'd)

LSVRSP File/Variable	Question/Statement	Answer Range	Reverse Scored or Recoded
CFI; CF_F09	When I get what I want, it's usually because I'm lucky.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F17	It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F19	Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F30	It's chiefly a matter of fate whether or not I have a few friends or many friends.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F31	Whether or not I get into a car accident is mostly a matter of luck.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
Locus of Con	trol, Powerful Others: (1)		
CFI; CF_F04	I feel like what happens in my life is mostly determined by powerful people.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F10	Although I might have good ability, getting ahead depends on who you know, not what you know.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F13	My life is controlled mostly by people who are in power.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F16	People like me have very little chance when what we want goes against what some strong pressure groups want.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F20	If important people were to decide they didn't like me, I probably wouldn't make many friends.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F25	Whether or not I get into a car accident depends mostly on the other driver.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree

Table 27 (cont'd)

LSVRSP File/Variable	Question/Statement	Answer Range	Reverse Scored or Recoded
CFI; CF_F28	In order to have my plans work, I make sure that they fit in with the desires of people who have power over me.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F33	Getting what I want requires pleasing the people above me.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
Self-Esteem:	(1)		
CFI; CF_F02	I feel that I am a person of worth, at least equal with others.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F06	I certainly, feel useless at times.	1=Agree 2=No opinion 3=Disagree	
CFI; CF_F12	I feel I do not have much to be proud of.	1=Agree 2=No opinion 3=Disagree	
CFI; CF_F14	I am able to do things as well as most people.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F15	I feel that I have a number of good qualities.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F18	At times I think I am no good at all.	1=Agree 2=No opinion 3=Disagree	
CFI; CF_F21	All in all, I am inclined to feel that I am a failure.	1=Agree 2=No opinion 3=Disagree	
CFI; CF_F23	I wish I could have more respect for myself.	1=Agree 2=No opinion 3=Disagree	
CFI; CF_F27	On the whole, I am satisfied with myself.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree
CFI; CF_F32	I take a positive attitude toward myself.	1=Agree 2=No opinion 3=Disagree	1=Disagree 2=No opinion 3=Agree

LSVRSP			<b>Reverse Scored or</b>
File/Variable	Question/Statement	Answer Range	Recoded

## Process Contextual Influences: External Environment, Available Social Support Systems (Data Obtained from Administration at Closure)

Perceived VR Counselor Support: (	(1)
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CDF3; CDF_42	Overall, how would you rate the quality of your counselor-client relationship in this case? <sup>(1)</sup>	1=Low Quality 2=Average Quality 3=High Quality	
SI; SI_A02	Did these meetings with your VR counselor happen as often as you would have liked?	1=Yes 2=No	1=No 2=Yes
SI; SI_A05	Did you speak with your VR counselor as often as you would have liked?	1=Yes 2=No	1=No 2=Yes
SI; SI_A08	Did your VR counselor show enough interest, attention, and concern for your needs during the rehabilitation process?	1=Always 2=Sometimes 3=Rarely 4=Never	1=Never 2=Rarely 3=Sometimes 4=Always
SI; SI_A09	Was your counselor willing to listen to your ideas and suggestions?	1=Always willing 2=Sometimes willing 3=Rarely willing 4=Never willing	1=Never 2=Rarely 3=Sometimes 4=Always

## **Process Contextual Influences: Functional Limitations Associated with the CID** (Data Obtained from First Administration of CFI)

CID-Related	Functioning – Cognitive/Sensor	y: <sup>(1)</sup>	
CFI; CF_A01A	Because of a health or physical problem, do you have difficulty: Seeing words and letters in ordinary newspaper print, when wearing glasses or contact lenses if you usually wear them? <i>Are you able to do this by your self?</i>	1=Yes 2=No	1=No 2=Yes
CFI; CF_A17A	Because of a health or physical problem, do you have difficulty: Reading and understanding the newspaper? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes

Table 27 (cont'd)

LSVRSP File/Variable	Question/Statement	Answer Range	Reverse Scored or Recoded
CFI; CF_A19A	Because of a health or physical problem, do you have difficulty: Writing? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A20A	Because of a health or physical problem, do you have difficulty: Having your speech understood? Are you able to do this by yourself?	l=Yes 2=No	1=No 2=Yes
CFI; CF_A23A	Because of a health or physical problem, do you have difficulty: Remembering things? Are you able to do this by yourself?	l=Yes 2=No	1=No 2=Yes
CID-Related 1	Functioning – Mobility:		
CFI; CF_A09A	Because of a health or physical problem, do you have difficulty: Bathing or showering? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A10A	Because of a health or physical problem, do you have difficulty: Dressing? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A12A	Because of a health or physical problem, do you have difficulty: Using the toilet, including getting to the toilet? Are you able to do this by yourself?	l=Yes 2=No	1=No 2=Yes

## **Process Contextual Influences: Sociodemographic Characteristics** (Data Obtained From Sole CDF1 Observation per Client)

#### Gender CDF1; CDF\_02 Client Gender. 0=Male 1=Male 2=Female 1=Female Race<sup>(2)</sup> CDF1; CDF\_03 Client Race. 1=White 0=White AND 2=Black 1=All Others CDF1; CDF\_04 Hispanic Origin 3=American Indian or Alaskan Native 4=Asian or Pacific Islander 5=Hispanic

Table 27 (cont'd)

LSVRSP File/Variable	Question/Statement	Answer Range	Reverse Scored or Recoded
Marital Status	s at Program Entry		
CDF1; CDF_11	Marital status at entry.	l=Married 2=Widowed 3=Divorced 4=Separated 5=Never Married	0=Married or Widowed 1=Separated or Divorced 2=Never Married
Years of Educ	cation at Program Entry		
CDF1; CDF_13	Number of years of education completed at entry.	0-23	

(1) Recoded as needed so that higher numbers reflect greater amount of the measured variable. This was required in order to ensure that the exogenous variables correspond directionally with the QOL endogenous variables during statistical analysis.

(2) Race variable: In order to be useful, both CDF\_03 and CDF\_04 had to be combined then groups were recoded into 'Whites' and 'All Others'.

# Table 28.

# Endogenous Variables and Measures

LSVRSP File/Variable	Question/Statement	Answer Range	Reverse Scored or Recoded
	Quality of Life Outcomes:	Extrapersonal Funct	tioning
Employment (Data	Functioning: Obtained from Administration	of CDF3 at Closure)	
CDF3; CDF_49	Type of job. <sup>(1)</sup>	1=Competitive Labor Market 2=Sheltered Workshop 3=Self-Employment 4=Supported Employment 5=Homemaker 6=Unpaid Family Worker 7=Other	1= Unpaid Employment 2= Sheltered Employment 3= Integrated Employment
CDF3; CDF_53 and CDF_53U	Calculated hourly wages. New Variable = Hr_Wage	Hourly currency; \$0 - \$35.03	New Variable = Hr_Wage
CDF3; CDF_54	Hours worked per week.	Integer; 0 - 99	
<u>Community a</u> (Data	nd Recreational Activities: <sup>(2)</sup> Obtained from Final Administr	ation of CFI)	
CFI; CF_C04A	How often do you socialize with close friends, relatives, or neighbors?	1=At least twice a week 2=About once a week 3=About once a month 4=Less than once a month 5=Never	1=Never 2=Less than once a month 3=About once a month 4=About once a week 5=At least twice a week
CFI; CF_C04B	How often do you visit a supermarket or food store?	1=At least twice a week 2=About once a week 3=About once a month 4=Less than once a month 5=Never	1=Never 2=Less than once a month 3=About once a month 4=About once a week 5=At least twice a week

Table 28 (cont'd)

LSVRSP File/Variable	Question/Statement	Answer Range	Reverse Scored or Recoded
CFI; CF_C04C	How often do you go to a restaurant?	1=At least twice a week 2=About once a week 3=About once a month 4=Less than once a month 5=Never	1=Never 2=Less than once a month 3=About once a month 4=About once a week 5=At least twice a week
CFI; CF_C04D	How often do you go to a place of worship such as a church or synagogue?	1=At least twice a week 2=About once a week 3=About once a month 4=Less than once a month 5=Never	1=Never 2=Less than once a month 3=About once a month 4=About once a week 5=At least twice a week
CFI; CF_C05	Are you very active, somewhat active, or not active in any community group such as a religious group, volunteer group, or recreation group?	1=Very Active 2=Somewhat Active 3=Not Active	1=Not Active 2=Somewhat Active 3=Very Active
CFI; CF_C07A	Approximately how many times did you go to the movies in the past 12 months?	0-100	
CFI; CF_C07B	Approximately how many times did you go to live music performances in the past 12 months?	0-100	
CFI; CF_C07C	Approximately how many times did you go to live theater performances in the past 12 months?	0-100	
CFI; CF_C07D	Approximately how many times did you go to a sports event in the past 12 months?	0-100	
Living Enviro (Data)	onment Functioning: <sup>(2)</sup> Obtained from Administration a	tt Closure)	
CFI; CF_A03A	Lifting and carrying something as heavy as 10 pounds (such as a full bag of groceries): Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A04A	Because of a health or physical problem, do you have difficulty: Walking for a quarter of a mile - about three city blocks? <i>Are you able to do this by yourself</i> ?	1=Yes 2=No	1=No 2=Yes

Table 28 (cont'd)

LSVRSP File/Variable	Question/Statement	Answer Range	Reverse Scored or Recoded
CFI; CF_A05A	Because of a health or physical problem, do you have difficulty: Walking up a flight of stairs without resting? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A06A	Because of a health or physical problem, do you have difficulty: Getting around outside of the house? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A07A	Because of a health or physical problem, do you have difficulty: Getting around inside of the house? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A13A	Because of a health or physical problem, do you have difficulty: Shopping for personal items (such as toilet items or medicines)? <i>Are you able to do this by yourself</i> ?	l=Yes 2=No	1=No 2=Yes
CFI; CF_A14A	Because of a health or physical problem, do you have difficulty: Managing your money (such as keeping track of expenses or paying bills)? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A15A	Because of a health or physical problem, do you have difficulty: Using the telephone? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A16A	Because of a health or physical problem, do you have difficulty: Doing heavy housework (such as scrubbing floors, or washing windows)? Are you able to do this by yourself?	l=Yes 2=No	1=No 2=Yes
CFI; CF_A18A	Because of a health or physical problem, do you have difficulty: Doing light housework (such as doing dishes, straightening up, or doing light cleaning)? Are you able to do this by yourself?	l=Yes 2=No	l=No 2=Yes

Table 28 (cont'd)

LSVRSP File/Variable	Question/Statement	Answer Range	Reverse Scored or Recoded
CFI; CF_A21A	Because of a health or physical problem, do you have difficulty: Driving? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes
CFI; CF_A22A	Because of a health or physical problem, do you have difficulty: Using public transportation? Are you able to do this by yourself?	1=Yes 2=No	1=No 2=Yes

<sup>(1)</sup> Recoded CDF\_49: Unpaid Employment is composed of consumers who responded by selecting unpaid family worker, homemaker, or other; Sheltered Employment is composed of consumers who responded by selecting sheltered workshop; and Integrated Employment is composed of consumers who responded by selecting competitive labor market, self-employment, or supported employment as representing the type of job they held.

<sup>(2)</sup> Recoded as needed so that higher numbers reflect greater functioning. This was required in order to ensure that all variables that comprise QOL Extrapersonal Functioning are coded in the same direction (i.e., greater functioning is represented by higher numbers).

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