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Development of a model of participation in community-based, discretionary activities
by people who use wheelchairs

Anita Perr

A dissertation submitted to the Graduate Faculty in Environmental Psychology
in partial fulfillment of the requirements for the degree of Doctor of Philosophy,
Graduate School and University Center of The City University of New York
2014
This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the Dissertation requirements for the degree of Doctor of Philosophy.

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Abstract

Development of a model of participation in community-based, discretionary activities by people who use wheelchairs

by

Anita Perr

Adviser: Professor Gary Winkel

This cross-sectional research analyzed an existing data set of 302 wheelchair users to identify the psychosocial predictors of participation in community-based, discretionary activities. Two defining elements of participation were studied: the extent of participation and satisfaction with participation. Descriptive analyses of the participants’ demographic information and portions of four assessments were completed first. Regression analyses were then used to systematically eliminate potential covariates until the significant psychosocial covariates of the extent of and satisfaction with participation were identified. Perceived control over one’s life and perceived reintegration to social function were found to predict the extent of participation. Perceived control also predicted satisfaction with participation as did the participant’s general mental health. Additionally, because the extent of participation predicted satisfaction, the perception of reintegration also predicted satisfaction through the extent of participation. Limitations of this study include those inherent in using an existing data set as well as not representing wheelchair users from sufficiently diverse racial, ethnic, socio-economic or geographic backgrounds.
These important findings indicate a need for future study to identify how psychosocial function is addressed during the physical rehabilitation process and may act as an impetus for modifications in the education of professionals who work with people with disabilities.
Acknowledgments

There are so many people who supported me through this process. I would like to thank a few of them here. I send thanks to my workmates, friends, and family for their support and encouragement through my frustration and learning. I send thanks to my committee David Chapin and Dr. John Seley and my external readers, Dr. David Gray and Dr. Mariette Bates for their input and expertise as I planned the research and completed the dissertation defense. I send thanks to Dr. David Gray and Dr. Holly Hollingsworth for sharing their data and their knowledge and experience so freely. I send thanks to Dr. Kitch Barnicle for her insight and advice in helping what was in my head come across in words. And I send thanks to my advisor, Dr. Gary Winkel, for his mentorship throughout this process and especially for guiding me to ask the right questions and to find the possible answers.
Table of Contents

Abstract ........................................................................................................................................ iv

Acknowledgments ...................................................................................................................... vi

List of Tables ................................................................................................................................ x

List of Figures ............................................................................................................................ xiii

List of Appendices ..................................................................................................................... xv

Introduction .................................................................................................................................... 1

  Background ................................................................................................................................ 1

  Theoretical Rationale ................................................................................................................ 3

  Need for the Study .................................................................................................................... 7

  Boundaries of this Research .................................................................................................... 11

  Key Terms .................................................................................................................................. 11

  Research Questions ................................................................................................................ 14

  Summary .................................................................................................................................... 14

Review of the Literature .............................................................................................................. 16

  Tools Used to Measure Participation ...................................................................................... 16

  Barriers to and Facilitators of Participation .......................................................................... 23

    Physical barriers to and facilitators of participation. ......................................................... 23
Psychosocial barriers to and facilitators of participation

Methods

Instruments

The Participation Survey/Mobility (PARTS/M).

The Personal Independence Profile (PIP).

The Reintegration to Normal Living Index (RNLI).

The Medical Outcomes Study 36-Item Short Form Health Survey (SF-36).

Data

Participants

Participants contained in the full data set.

Participants in this dissertation study.

Data Analysis

Variables derived from the PARTS/M.

Variable derived from the PIP.

Variable derived from the RNLI.

Variables derived from the SF-36.

Extent of Participation

Satisfaction with Participation

Results
List of Tables

Table 1. Structure of the PARTS/M ................................................................. 29
Table 2. Potential Covariates ........................................................................... 35
Table 3. Continuous Variables: Age, years at present living situation, years since onset of the disability......................................................................................................................... 42
Table 4. Characteristics of Participants (N=302) ........................................... 45
Table 5. Descriptive Statistics Regarding the Outcome and Explanatory Variables ......................................................................................................................... 54
Table 6. Scoring Scales of Extent of Participation by Domain ....................... 56
Table 7. Extent Factor Analysis Structure Matrix .............................................. 56
Table 8. Descriptive Statistics Regarding Extent of Participation in Selected Community-based Activities of the PARTS/M ......................................................................................... 57
Table 9. Descriptive Statistics Regarding Importance of Participation ........... 58
Table 10. Importance Factor Analysis Structure Matrix .................................... 58
Table 11. Descriptive Statistics Regarding Satisfaction with Participation ........ 59
Table 12. Satisfaction Factor Analysis Component Matrix ............................... 59
Table 13. Regression Analysis of Medical and Demographic Covariates of Extent of Participation ........................................................................................................ 61
Table 14. Regression Analysis of Covariates of Extent of Participation ............ 62
Table 15. Order of Removal and Significance of Non-significant Covariates of Extent of Participation ........................................................................................................ 63
Table 16. Extent: Significant Covariate Predictors ............................................ 63
Table 17. Extent: Regression Analysis of Covariates and Social Function ......... 65
Table 18. Extent: Regression Analysis of Covariates and General Mental Health ................................................................. 65
Table 19. Extent: Regression Analysis of Covariates and Emotional Role Functioning .......... 66
Table 20. Extent: Regression Analysis of Covariates and Vitality ............................................. 66
Table 21. Extent: Regression Analysis of Covariates and Perceived Control ......................... 67
Table 22. Extent: Regression Analysis of Covariates and Perception of Reintegration to Social Function ...................................................................................................................................... 67
Table 23. Extent: Regression Analysis of Covariates and All of the Psychosocial Factors .......... 69
Table 24. Order of Removal and Significance of Non-significant Covariates of Extent of Participation .................................................................................................................................................. 69
Table 25. Extent: Significant Predictors ................................................................................. 70
Table 26. Regression Analysis of Medical and Demographic Covariates of Satisfaction with Participation .................................................................................................................................................. 71
Table 27. Regression Analysis of Covariates of Satisfaction with Participation .................... 72
Table 28. Order of Removal and Significance of Non-significant Covariates of Satisfaction with Participation .................................................................................................................................................. 73
Table 29. Satisfaction: Significant Covariates ...................................................................... 73
Table 30. Satisfaction: Regression Analysis of Covariates and Social Function ..................... 74
Table 31. Satisfaction: Regression Analysis of Covariates and General Mental Health ............ 75
Table 32. Satisfaction: Regression Analysis of Covariates and Emotional Role Functioning ...... 75
Table 33. Satisfaction: Regression Analysis of Covariates and Vitality .................................... 76
Table 34. Satisfaction: Regression Analysis of Covariates and Perceived Control .................... 76
Table 35. Satisfaction: Regression Analysis of Covariates and Perception of Reintegration to Social Function .................................................................................................................................................. 77
Table 36. Satisfaction: Regression Analysis of Covariates and All of the Psychosocial Factors 78
Table 37 Order of Removal and Significance of Non-significant Covariates ........................................ 78

Table 38. Satisfaction: Significant Predictors...................................................................................... 79
List of Figures

Figure 1. Sample of SF-36 subscale and item score ................................................................. 38
Figure 2. Gender ....................................................................................................................... 42
Figure 3. Race .......................................................................................................................... 43
Figure 4. Education .................................................................................................................. 43
Figure 5. Marital Status ........................................................................................................... 44
Figure 6. Income ...................................................................................................................... 44
Figure 7. Primary Diagnosis Leading to Wheelchair Use ......................................................... 47
Figure 8. Incidence of Other Conditions ................................................................................ 49
Figure 9. Frequency of Pain (n=215) ..................................................................................... 49
Figure 10. Frequency of Spasticity (n=155) ........................................................................... 50
Figure 11. Frequency of Skin Problems (n=105) ................................................................... 51
Figure 12. Frequency of Depression (n=131) ....................................................................... 52
Figure 13. Amount of Assistance Received Per Week .............................................................. 53
Figure 14. A Model Predicting the Extent of Participation by Wheelchair Users in Community-based, Discretionary Activities. ................................................................. 64
Figure 15. A Model Predicting the Extent of Participation by Wheelchair Users in Community-based, Discretionary Activities. .............................................................................. 70
Figure 16. A Model Predicting Satisfaction with Participation in Community-based, Discretionary Activities by Wheelchair Users ................................................................. 73
Figure 17. A Model Predicting Satisfaction with Participation in Community-based, Discretionary Activities by Wheelchair Users ................................................................. 79
Figure 18. A Model of Participation in Community-based, Discretionary Activities. .................. 81
List of Appendices

Appendix A UN Convention on the Rights of Persons with Disabilities ..................... 95
Appendix B Letter of Agreement ................................................................................. 96
Appendix C Participation Survey/Mobility ................................................................. 97
Appendix D Personal Independence Profile .................................................................. 111
Appendix E Reintegration to Normal Living Index ...................................................... 112
Appendix F Medical Outcomes Study 36-Item Short Form Health Survey ............... 114
Introduction

Like all people, wheelchair users have a life outside of their homes and work. They have hobbies and avocational interests, familial and social relations, and needs for inclusion in activities outside their homes. Participating in these activities is just as important for wheelchair users as the rest of the population and as such, is considered a right (United Nations General Assembly, 2006). This dissertation investigated certain aspects of how disability affects social inclusion. This research used an existing data set to identify the social and psychological characteristics of wheelchair users that predict participation in community-based, discretionary activities. Discretionary activities are those that occur by choice, outside of work, chores, and self-care. My experience as an occupational therapist specializing in seating and wheeled mobility used by people with disabilities and the existing literature show that clinicians and researchers focus more on the physical attributes of wheelchair users and their environments than on the psychological and social attributes associated with being in the community and participating in discretionary activities. Taking into account physical, environmental, and demographic contributors, this research examined the social and psychological characteristics of wheelchair users as predictors of participation in discretionary activities outside home.

Background

According to the 2010 U.S. census data, about 12% of the US civilian, non-institutionalized population reported a disability, half of whom reported difficulty with their ability to walk (United States Census Bureau, n.d.). According to the 2005 US Census data, approximately 3.3 million individuals over 15 years of age, or 1.4% of that population, use a
wheelchair as their primary means of mobility (United States Census Bureau, 2008). It is expected that the number of people with disabilities and the prevalence of wheelchair use will increase as baby boomers age (Brault, Hootman, Helmick, Theis, & Armour, 2009; Christensen, Doblhammer, Rau, & Vaupel, 2009). The vast majority of wheelchair users (at least 93%) report a limitation in their ability to perform or participate in desired activities (Kaye, Kang, & LaPlante, 2002). The reasons for the limitations have not yet been thoroughly identified. Until the causes for the limitations are identified, it is impossible to act upon them and facilitate improved participation for those who wish to take part in activities in their communities. The mere numbers of wheelchair users and their perceived limitations due to their disabilities suggest that further research is needed to identify the psychosocial factors that impede or facilitate participation in such activities thereby increasing the knowledge base and perhaps suggesting foci for intervention (Kaye et al., 2002).

The United Nations Convention of the Rights of Persons with Disabilities (the Convention) recognizes that discrimination against a person on the basis of a disability is a “violation of the inherent dignity and worth of the person” (United Nations General Assembly, 2006). The Convention is based, in part, on the principle of full and effective participation and inclusion in society. The Convention was adopted in 2006 and entered into force in 2008 (United Nations Enable, 2008-2011a) and has 153 signatories (United Nations Enable, 2008-2011b). Articles 9, 19, 20, 29, and 30 of the Convention clearly act to support the intent of the research in this dissertation as they directly address accessibility, mobility, and participation in community-based activities (Appendix A).

It follows then, if access and participation is a right for people with disabilities, it is necessary to determine how people currently participate in order to determine where
interventions are necessary. It is further necessary to determine the facilitators of and barriers to participation so that they can be addressed to increase participation where there are limitations. The issue of participation by people with disabilities is too broad to study as a whole so this project extracts one specific area to investigate closely.

**Theoretical Rationale**

There is no single theory or framework of participation. The theoretical base for this dissertation draws on the work of a number of theorists who describe concepts associated with participation, specifically participation in community based discretionary activities. Maslow’s theory uses a hierarchical representation to describe the location of discretionary activities and social activities taking into account a person’s needs and priorities. According to Maslow’s hierarchy of needs, people have a need for belongingness and love and a desire for self-esteem and for recognition, dignity, or appreciation (Maslow, 1987) which can be achieved through participation in community-based, discretionary activities. At the base of his hierarchy is the need for food and shelter. These needs to maintain survival precede the need to improve satisfaction and happiness. It is through meeting needs at basic levels that a person can then move on to higher levels of existence. Needs at the level of belongingness, a higher level in Maslow’s hierarchy of needs, may be met in part through participation in social and leisure activities.

Most of the current research in rehabilitation regarding wheelchair users addresses function at basic levels, focusing, for example, on mobility and self-care skills which correlate with Maslow’s two lowest levels, those of physiological needs and the need for safety and security. There is a lack of research investigating function at higher levels of Maslow’s hierarchy
by people who use wheelchairs users. This dissertation investigates function that occurs at the levels of love and belonging and self-esteem, both of which are higher levels in Maslow’s hierarchy.

Oldenburg is another theorist whose work is relevant to this dissertation. He addresses the need for participation in community based activities when he described what he calls “third places” (Oldenburg, 1997). In his book, The Great Good Place, Oldenburg describes the roles of place in the lives of humans. He describes home being a first place and work being a second place. Related to the research in this dissertation, his description of the important role of informal public gathering places or “third places” is particularly interesting. Third places are the places where people go to be a part of their community and to feel comfortable and included (Oldenburg, 1997). Although not hierarchical, it is interesting to compare Oldenburg’s discussion of place with Maslow’s hierarchy of needs, relating Oldenburg’s third place with Maslow’s discussion of the need for belongingness. Although Oldenburg does not address the needs for people with disabilities to have access to and to feel a part of these third places, he does describe the need for all people to have these public places for regular, voluntary, and informal gathering. In my reading of Oldenburg’s work, I include people with disabilities as part of ‘all people’ although their specific needs and desires may be different than those of other people.

Oldenberg describes the sense of worth that people feel in these third places as a result of being recognized, accepted, and valued (Oldenburg, 1997). My research begins to investigate whether and how wheelchair users have places in their lives that act as their third places and may identify whether third places are important to and available to people who use wheelchairs by investigating the psychosocial factors that predict participation.
While the research in this dissertation focuses on adults, the following model of children’s’ participation includes many factors that are relevant to adults and help to support the work of this dissertation. King, et al. (2003) developed a model of factors affecting the participation of children with disabilities containing three categories of factors:

1. Factors that reside within the child such as self-perceptions of athletic and scholastic competence, physical and cognitive function, emotional and social function, and preferences,
2. Factors that come from the family including supports and preferences, and
3. Factors that reside in the environment, including the presence or absence of barriers and supportive relationships for the child and the family.

This socio-ecological model addresses the complexities of participation. Factors from three levels, each containing multiple, variable constructs interrelate in various ways leading to the complexity of participation. These theorists identify the directions of the relationships between the different aspects of the model although, by their own admission, the links are based on theory and logic. Empirical data supporting the direction of the relationships is limited (King et al., 2003). The model described by King, et al. informs many aspects of participation revealed in the research of this dissertation.

Nosek and Fuhrer describe a model of independence that defines the contributions to independence. The elements include perceived control over one’s life, physical function, psychological self-reliance, and environmental resources (Nosek & Fuhrer, 1992). These concepts serve as part of the framework of this research.

The International Classification of Functioning, Disability and Health (ICF) is the World Health Organization’s framework for describing health and health-related states. Participation is
central to the functioning described in the ICF. The ICF defines participation as the nature and extent of a person’s involvement in a life situation. In a footnote, they go on to state that central to participation is involvement, taking part, being included, and being accepted. The ICF’s model of functioning and disability describes the interactions between the person, including his or her health conditions as well as his or her mental, sensory and motor functions; the activities; and the environments (Jette, Haley, & Kooyoomjian, 2003; World Health Organization, 2001). The model defines all of the factors that influence participation and accepts the complex nature of participation. It accounts for products and technology as well as the natural environment and human made changes to the environment, as well as support, relationships, attitudes, services, and systems or policies (Rimmer, 2006). The ICF model is used to describe disability and function throughout the world and is being used as a foundation for many US and international programs and services. The ICF has been used as the theoretical base for research on participation by wheelchair users (Harris, 2007). Harris’ work takes into account issues related to time, to capacity and actual performance, and to the social and physical environment.

The ICF presents a unified approach to explaining participation by people with disabilities. In the past, disability theory focused on two separate perspectives: medical and social. Rather than separating a person into parts, the ICF acknowledges that biological and societal influences are so intertwined that neither explains participation without the other (Imrie, 2004). Disability is seen as a variation in function due to impairment, activity limitation, and/or societal participation restrictions. Disability occurs as a result of interactions between an individual and his or her environment-socio-cultural context. The ICF is flexible enough to account for differences among people as well as in different environments and societies (Imrie, 2004). This dissertation is based on the ICF model, focusing specifically on the role of a person’s
psychosocial function while accounting for his or her health conditions and while situating the activities within their environments.

**Need for the Study**

Many wheelchair users are limited in their participation in activities in their communities. Barriers to participation include physical factors such as environmental obstacles, weakness, and poor endurance. Barriers also include societal factors such as limited finances and inadequate enforcement of laws regarding accessibility, and psychosocial factors such as poor social functioning and self-efficacy (Cooper, Cooper, McGinley, Fan, & Rosenthal, 2012; R. Kennedy, 2002). Up to this point, little research has addressed the impact of psychosocial functioning on wheelchair users’ participation in community-based activities focusing instead on the physical aspects of performing skills and participating in activities. Additionally, little research regarding wheelchair users addresses activities that are done by choice, in one’s free time focusing instead on obligatory activities such as self-care and work. This research seeks to develop and evaluate a model of participation that identifies the psychosocial factors, such as perceived control, that predict participation in community-based, discretionary activities.

The need for this study was based on three main reasons: 1) limitations in physical rehabilitation programs and the education of physical rehabilitation professionals, 2) a focus in research on physical factors relating to wheelchairs and wheelchair use as a proxy for participation, and 3) the complicated nature of studying and explaining participation. When people experience a disabling illness or trauma, they frequently undergo physical rehabilitation in order to return to their desired home- and community-based activities. People born with such conditions and those who acquire the conditions early in life often undergo repeated courses of
rehabilitation to maximize their abilities to function in various settings including home, school, workplace, and community. Most rehabilitation programs address the physical factors required to perform activities like endurance, strength, and wheelchair propulsion techniques but they often neglect psychosocial factors relevant to community living (M. L. Lund & Lexell, 2008; K. A. Walker et al., 2010). This neglect of psychosocial functioning may become more acute given our recent economic crisis and the emphasis on cost containment in healthcare. The focus of physical rehabilitation is building independence but it is primarily limited to personal self-care issues while opportunities to address socialization and function within the community are limited. Wheelchair users participating in rehabilitation programs may be discharged once their basic needs are met, such as being able to feed or dress themselves, but before more advanced skills needed for effective social and community function are mastered.

Some researchers report that rehabilitation is shifting somewhat from a biomechanical approach to a more holistic, client-centered approach which expands the opportunities to address psychosocial functioning in physical rehabilitation settings (Cardol, De Jong, & Ward, 2002). In a client-centered approach, the patient identifies his or her needs and participates in developing his or her program of rehabilitation. While this may be the case, I contend that psychosocial functioning is not addressed sufficiently by rehabilitation practitioners. While the client has input, it is still within the confines of institutional and funding policies which focus on basic, home-based, self-care skills. Because psychosocial functioning is not a priority during physical rehabilitation, people undergoing rehabilitation may not achieve their desired levels of independence or community reintegration. In order to integrate psychosocial functioning into physical rehabilitation, it is imperative to describe the roles that psychosocial factors play in predicting participation. Once the predictors are identified and a comprehensive model of desired
community engagement is described, researchers will be able to focus their attention on strategies to incorporate an emphasis on psychosocial functioning during physical rehabilitation. It may be possible to increase the efficiency and effectiveness of rehabilitation programs and expedite the person’s return to community life. The content of educational programs for rehabilitation professionals such as occupational and physical therapists who work with wheelchair users in an ongoing manner may also need to be modified to emphasize psychological and social functioning.

Participation in community-based activities varies greatly among wheelchair users. In looking at popular media, there are wheelchair users who are quite active and visible in everyday life. Examples of this variation include the popularity of sporting events and television shows including participants who use wheelchairs. Conversely, isolation of and barriers to participation are also evident in today’s culture. For instance, the media often depict wheelchair users as being alone or in need of help. Participation in community-based activities varies greatly among wheelchair users and as yet is not predictable. A review of the extant literature does not clarify whether or why some wheelchair users participate to a greater extent than others and it does not emphasize the psychosocial factors that predict community-based participation. Participation is a complicated concept that is likely affected by a wide variety of personal and societal factors (Bode, Hahn, Bernspang, & Lexell, 2010). Most research on participation by wheelchair users has focused on physical factors like propulsion speed, pushrim style, and medical diagnosis (Chow & Levy, 2011; Dieruf, Ewer, & Boninger, 2008; Giesbrecht, Ripat, Quanbury, & Cooper, 2009; Harris & Sprigle, 2008; Howarth, Pronovost, Polgar, Dickerson, & Callaghan, 2010). To use concepts such as these as markers of participation is shortsighted because the physical act of propelling a wheelchair does not equate with participation. Further research must be done to
explore the relationships between the physical aspects of wheelchair mobility and the functional, social, and psychological aspects of participation in selected activities. A recent study in the Netherlands revealed that while there was a relationship between the wheelchair user’s satisfaction with the fit and dimensions of his or her wheelchair with a more active lifestyle, there was not a significant relationship between wheelchair-related characteristics and overall participation as measured using the Dutch version of the Quebec User Evaluation of Satisfaction with Assistive Technology (de Groot, Post, Bongers-Janssen, Bloemen-Vrencken, & van der Woude, 2011).

Research that involves the psychosocial factors predictive of participation has primarily focused on quality of life and satisfaction (Boschen, Tonack, & Gargaro, 2003; M. P. Dijkers, 1999; M. P. Dijkers, 1999; Tate, Kalpakjian, & Forchheimer, 2002). While quality of life and satisfaction may result from participation, there is insufficient evidence regarding the relationship between participation in discretionary community-based activities and quality of life or satisfaction or that quality of life and satisfaction predict participation. Most participation studies focus on a conglomeration of activities including 1) those that occur in the home, 2) those that occur in the community, 3) those that are mandatory (such as bathing, dressing, grooming, toileting, and work), and 4) those that are discretionary (performed by choice, after mandatory activities are completed) (Boschen et al., 2003; Sonenblum, Sprigle, Harris, & Maurer, 2008). Much of this research does not focus specifically on wheelchair users; instead it includes wide variation in means and ability of mobility. While this research may include too broad a population to be directly useful to any individual, it is important because it describes the complexities of participation and offers a basic theoretical framework that can be used as a starting point for describing participation among specific populations. Participants in these
studies were often grouped in ways that do not differentiate whether they use wheelchairs. For instance, some researchers looked at people with all types of mobility impairments including those who use walking aids like canes and walkers or otherwise have difficulty walking (M. L. Lund, Nordlund, Bernspang, & Lexell, 2007). Others have grouped participants by diagnostic category rather than by functional ability (P. Kennedy, Lude, & Taylor, 2006; M. L. Lund, Nordlund, Nygard, & Bernspang, 2005; Noreau & Fougeyrollas, 2000). By studying these mixed groups and by including a wide variety of activities in the research, it is impossible to describe wheelchair users’ desired community engagement. My research focuses specifically on wheelchair users and on community-based, discretionary activities in an effort to fill this gap in the literature.

**Boundaries of this Research**

This research focused on adults who use wheelchairs for the majority of those activities requiring mobility outside their home. This research addressed men and women, aged 18 and over, living in the community in rural, suburban, or urban settings. It addresses participation in community-based activities only. Participation in activities performed in the home were not considered as part of this research. This research addressed only discretionary activities and did not include those activities which the participants were compelled or required to perform like work or daily self-care tasks.

**Key Terms**

Some of the concepts that are central to this project have multiple meanings in common language that differ from their usage in disability literature. It is therefore necessary to explain
the specific use of some of the concepts in the context of this research. For the purpose of this research, the term **wheelchair** is any wheeled mobility device such as a manual or power wheelchair or a scooter. For the purpose of this research, a **wheelchair user** is a person who uses his or her wheelchair for community access. **Participation** has long been difficult to define and measure in the field of physical disabilities rehabilitation. For the purpose of this study, participation refers to the active or passive engagement in an activity. Participation may occur alone or with other people. It may involve physical and/or cognitive engagement. Participation involves personal choice and individual meaning (Hammel et al., 2008). **Community-based, discretionary activities** are those activities in which the person participates by choice, for their own sake or pleasure, rather than from mandate or obligation. My research focuses on activities that occur outside of the home, in public or private locations, indoors or outdoors and as such, are labeled as community-based. Such activities include active recreation like playing basketball or camping; leisure activities like attending movies or reading; taking vacations; socializing; religious activities like attending weekly services or singing in a choir; and community activities like attending community meetings or serving on a community board (Gray, Hollingsworth, Stark, & Morgan, 2006).

This research focuses specifically on the role of psychosocial functioning on desired community engagement. **Psychosocial factors** are the psychological and social characteristics that are thought to influence a person’s participation in activities or make some people more or less likely than other people to do what they want to do. In the literature in this field and in the instruments used to measure such concepts, the psychosocial factors include the following: vitality, social function, emotional role function, mental health, perceived control over one’s life, and perceived satisfaction with the performance of everyday activities.
Vitality refers to a person’s energy or fatigue level. Social function refers to the type and frequency of participation in social activities and considers the impact that physical health and emotional problems have on it. Emotional role functioning refers to a person’s ability to function in his or her usual roles, like worker or caregiver, and considers the influence of mental health on role performance. Emotional role functioning accounts for limitations that occur as a result of personal and emotional problems. Mental health is an umbrella term that includes anxiety, depression, loss of behavioral or emotional control, and psychological well-being (Ware & Sherbourne, 1992).

Perceived control over one’s life refers to the sense that what happens in one’s life is as a result of the person’s own actions. It relates to the feeling of power to direct one’s life and the ability to make choices (Nosek, Fuhrer, & Howland, 1992). Perceived satisfaction with the performance of everyday activities refers to an individual’s perception of his or her physical, psychological, and social characteristics that affect performance of routine living patterns (SL Wood-Dauphinee, Opzoomer, Williams, Marchand, & Spitzer, 1988). Perceived satisfaction with the performance of everyday activities is a predictor of quality of life.

In addition to psychosocial factors, sociodemographic and medical characteristics also play a role in a person’s participation. Factors considered as central to this study are wheelchair type, age, gender, race/ethnicity, marital status, education, income, living arrangement and location, primary condition causing mobility impairment, time since onset of condition, other medical conditions impacting participation, amount and type of help needed, and transportation methods used.
Research Questions

My research used an existing data set to describe a model of participation that identifies the predictors of a wheelchair user’s participation in community-based, discretionary activities. The data set includes information about the participants’ impressions of their physical and psychosocial functioning during various activities in various environments. My research investigated the roles of the following psychosocial factors as they predict participation in community-based, discretionary activities: vitality, social function, emotional role function, mental health, perceived control over one’s life, and perception of reintegration to social activities.

1. After controlling for demographic and medical covariates, to what extent do each of the psychosocial factors of interest predict the extent of participation in community-based, discretionary activities by wheelchair users?

2. After controlling for the level of perceived importance, to what extent do each of the psychosocial factors of interest predict participation in each of the domains of interest of community-based, discretionary activities by wheelchair users?

3. After controlling for the extent and level of perceived importance, to what extent do each of the psychosocial factors of interest predict satisfaction with participation in each of the domains of interest of community-based, discretionary activities by wheelchair users?

Summary

This study will use an existing data base to describe a model of participation by wheelchair users in community-based, discretionary activities. Participation research tends to
focus 1) on larger populations than wheelchair users, including people with all disabilities, with or without mobility limitations; 2) on self-care, leisure, and work activities as a whole; and 3) on activities inside and outside of the home. Results of those studies cannot be easily generalized to wheelchair users nor can they be generalized to specific types of activities or specific locations. Wheelchair users might have unique concerns or needs related to participation in community-based, discretionary activities. Additionally, prior research focused on physical and environmental factors that predict participation. Intrinsic, psychosocial characteristics are also likely to predict participation in community-based, discretionary activities. This research fills a gap in explaining community-based participation by wheelchair users’ by identifying and describing the psychosocial factors that predict participation.
Review of the Literature

This dissertation investigates certain aspects of participation by people who use wheelchairs in community-based activities. The literature search revealed little literature specifically on this topic. This literature review broadens the topic slightly to comprise two topics that are integral to the investigation: 1) measurement tools and 2) barriers to and facilitators of participation.

Tools Used to Measure Participation

My review of the tools designed to measure participation in community-based activities revealed that there is no single, comprehensive instrument that addresses all of the factors related to participation. Instead many researchers have begun to develop various tools to measure participation (Boschen et al., 2003; Brown et al., 2004b; Cardol, Beelen, et al., 2002; M.P. Dijkers, 1999; Fougeyrollas, 2010; Kannisto, Merikanto, Alaranta, Hokkanen, & Sintonen, 1998; Noreau & Fougeyrollas, 2000; van Brakel et al., 2006). While some of the tools have been embraced by researchers and clinicians none has been identified as the most effective in the field of rehabilitation. This section of the literature review mentions these tools and then focuses on the Participation Survey/Mobility (PARTS/M; Appendix C) from which the dependent variables in this study were derived. The complicated nature of describing and measuring participation is partly due to whether measures should be subjective, objective, or both, and from whose perspective the measures should be made (Brown et al., 2004a; Coster & Khetani, 2008). In an effort to build the knowledge base in participation and rehabilitation, there has been a push to
quantify constructs that are subjective in nature. Participation involves the interplay between the person and his or her environment involving choice, control, and opportunity and is interpreted within each individual’s personal and social values (Hammel et al., 2008). The instruments that are used most frequently in research on participation by people with physical disabilities are the Craig Handicap Assessment and Reporting Technique (CHART) (Whiteneck et al., 1992), the Canadian Occupational Performance Measure (COPM) (Law et al., 1994), the Functioning Everyday with a Wheelchair Instrument (FEW) (Holm, Mills, Schmeler, & Trefler, n.d.), and the Participation Survey/Mobility (PARTS/M) (Gray et al., 2006).

The CHART measures performance in six domains: physical and cognitive independence, mobility, occupation, social integration, and economic self-sufficiency (Hall, Dijkers, Whiteneck, Brooks, & Krause, 1998; Whiteneck et al., 1992). It does not however, include participation in religious or political activities. It was found to differentiate levels of function consistently with the Functional Independence Measure, a widely used measure of burden of care (N. Walker, Mellick, Brooks, & Whiteneck, 2003).

The COPM uses a semi-structured interview to identify areas of functioning with which a person has concerns or difficulties. After identifying the problems or concerns, the person is asked to rate their importance and their satisfaction with that activity (Law et al., 2000; Law et al., 1994). Two areas of the COPM, productivity that includes paid/unpaid work and school work and leisure including quiet leisure, recreation, and socialization, may be helpful in describing a person’s participation.

The FEW is a questionnaire that measures the wheelchair user’s perceived ability to function in ten areas (Holm et al., n.d.; Mills, Holm, & Schmeler, 2007). Although considered a
participation measure, the FEW measures the person’s capacity, or potential ability, to participate. It includes measures of indoor and outdoor mobility and transportation.

The current study uses The Participation Survey/Mobility (PARTS/M) which was developed by Dr. David Gray as part of the Research and Training Center on Measurement and Interdependence in Community Living in St. Louis, Missouri (https://enablemob.wustl.edu/CommunityParticipation.html). The PARTS/M contains 120 survey items in 20 life activities areas that are grouped into six life domains including self-care; mobility; domestic life; interpersonal interactions and relationships; major life areas; and community, social, and civic life. Each life domain addresses four components of participation: temporal (such as amount of time), evaluative (such as choice and satisfaction), relation to health (such as fatigue or pain), and supportive (such as assistance required).

The PARTS/M has been used to investigate the relationship between participation and physical activity levels, the need for support, wheelchairs, and speeds of travel. The studies reviewed below used specific aspects of the PARTS/M but did not look specifically at participation in activities in the community nor did they specifically identify the psychological factors that predict greater participation.

In one study, the PARTS/M was used along with wheelchair data loggers to investigate the correlation between mobility characteristics like distance traveled, speed, number of stops made, and the frequency of participation (Cooper, Ferretti, Oyster, Kelleher, & Cooper, 2011). The data loggers were electronic sensors that were attached to the participants’ wheelchairs by the research personnel in such a way that they did not interfere with regular use of the wheelchair during everyday activities. They were used to calculate and record the speed, distance travelled, number of stops, and the amount of time the wheelchair was used. The participants were asked to
conduct their daily activities as usual. Data were gathered over a three week period; the first week was during the 2007 annual National Veterans Wheelchair Games. The second and third weeks occurred when the participants were in their home environments. Data collected during the two weeks in the home environment were used for this study. In addition to the data logger, participants also completed the PARTS/M. Of the 31 participants recruited, 22 completed all portions of the study. Because data from eight of those 22 participants could not be used either because of instrumentation problems, participant’s inability to use their wheelchairs during the study timeframe, or incomplete PARTS/M data, data from 14 participants were used for analysis to compare their mobility characteristics with their PARTS/M community participation scores.

Data were analyzed for the group of 14 wheelchair users as a whole and for manual wheelchair users and power wheelchair users as separate groups. Twenty four correlations yielded two significant findings. The researchers found a significant positive correlation among manual wheelchair users between the average speed traveled and the frequency of using transportation \( (r_s = .837, p = .019) \) and socialization \( (r_s = .772, p = .042) \). Manual wheelchair users who wheeled their wheelchairs faster also used transportation more frequently and reported higher levels of socialization. The researchers also identified a trend towards a significant correlation between the average speed and the total community participation score among manual wheelchair users \( (r_s = .714, p = .071) \). Among power wheelchair users, they found a trend toward a significant negative correlation between average speed and leisure participation \( (r_s = -.635, p = .066) \).

I question the usefulness of these findings for a number of reasons. Firstly, the participant pool was very small and homogenous. There were only 14 participants included in the correlation analysis. Although 14 participants were included in the data analysis, the authors
report the demographics on the 16 participants who completed all aspects of the research including the two whose PARTS/M surveys were incomplete. Of those 16 people, 15 were men and 12 were white, representing an homogeneous group. Additionally, they were recruited during a veteran’s athletic event and this event might attract a certain type of person. The findings may not reflect performance of a larger sample of people with more varied experiences, histories, and interests. Secondly, by running so many correlations, the researchers increased the likelihood of finding significance simply by chance. Lastly, the conceptual link between the variables studied and participation is questionable, even if significance was found. Traveling further or faster, making more or less frequent stops, and spending more time driving may not necessarily relate at all to participation. Wheelchair propulsion speed, for example, could be a function of the person’s physical stamina or whether the environment is spacious, obstacle-free, and smooth-surfaced.

Another group studied the relationship between the wheelchair, the person’s impairment, and the environment in three settings: at home, in the community, and during transportation (Chaves et al., 2004). Seventy spinal cord injured wheelchair users in Pittsburgh and St. Louis were assessed using three sections of the PARTS/M: getting around inside the home, leaving the home, and transportation. The participants’ responses were divided into two categories: 1) participation limitations or health-related factors leading to limitations and 2) access limitations, or non-health related factors like the physical environment, wheelchair, social attitudes, self-concept, and lack of assistance. The frequencies of perceived reasons for limitations were used to calculate the percentage that each factor was perceived to be a limitation in each of the three settings. Chi-square tests were used to analyze differences between those with paraplegia and tetraplegia and between the group in Pittsburgh and the group in St. Louis. A significantly higher
percentage of participants in St. Louis indicated that wheelchair seating was a limiting factor for leaving the home than participants in Pittsburgh (St. Louis, 24%; Pittsburgh, 5%, p = .025). Participants in St. Louis also reported that social attitudes (St. Louis, 18%; Pittsburgh 0%, p = .007) and self-concept (St. Louis, 15%, Pittsburgh 0%, p = .015) were limiting factors for leaving the home at significantly higher rates than participants in Pittsburgh. Lastly, people in St. Louis reported that social attitudes were limiting factors for transportation at significantly higher rates than participants in Pittsburgh (St. Louis, 15%, Pittsburgh, 0%, p = .017) (Chaves et al., 2004).

While these researchers found significance in the frequency of the wheelchair being a limiting factor, the social and psychological findings are also very interesting and should be examined further. However, the researchers did not define the terms social attitudes or self-concept nor did they describe how these concepts were measured. This interests me because it is not overtly obvious how these data were extracted from the PARTS/M. In addition to these findings regarding social attitudes and self-concept, it would be interesting to investigate the participants in St. Louis and Pittsburgh further to determine their differences in perception. It would be important to determine whether there are differences in society’s perception and acceptance of disability among people living in these locations.

A third group of researchers used the PARTS/M, SF-36, and RNLI to study the relationship between physical activity and participation in major life activities of a group of 604 people with mobility impairments (Crawford, Hollingsworth, Morgan, & Gray, 2008). They used the US Department of Health and Human Services Centers for Disease Control and Prevention criteria for physical activity to identify three categories of activity level: high active- either 30 minutes of moderately intense activity five days weekly or 20 minutes of vigorous activity three days weekly; insufficient physical activity- more than 10 total minutes per week of moderate or
vigorous activity but less than the recommended amount; and inactivity- less than 10 minutes per week of moderate or vigorous activity (Crawford et al., 2008). Assignment to the groups was based on responses to questions on the PARTS/M regarding the frequency and duration of exercise inside and outside the home and participation in active recreation outside the home. Using an ANOVA to examine the relationship between activity level and participation, they found that the frequency of participation in the mobility, community, social, and civic life domains of the PARTS/M was significantly higher for the high active group than the two lower activity level groups. They also found that satisfaction and choice were significantly higher in the high active group for self-care (p<.05), mobility (p<.01), domestic life (p<.01), and community, social, and civic life (p<.01). Using an ANOVA to examine the relationship between activity level and health status from the SF-36 scores, the inactive group was found to be significantly lower on the social functioning subscale than the high active group (p<.01). Additionally, the inactive group rated themselves significantly lower than the low active and high active groups for the vitality subscale (p<.01) and for pain (low active group, p<.05, high active group, p<.01). Using the RNLI to compare activity with reintegration to normal living, they found that the high active group took more trips out of town and were more satisfied with their personal assistance for self-care than the inactive group (p<.01). They also found that the low active group reported higher frequency of enjoyable work than the inactive group (p<.05) and that the high active group scored significantly higher than the low active group on recreational activities (p<.05) and significantly higher in social activities than the inactive group (p<.01). They found that the low active group scored significantly higher in social activities than the inactive group (p<.01) (Crawford et al., 2008). The findings of this study are important and support the need for further investigation. My research complements Crawford’s work but differs
from it in some significant ways. While Crawford focused on engagement through physical activity, I am interested in looking at engagement in a broader sense by looking at participation in all discretionary activities. Crawford investigated physical activity whether it took place in the home or outside of the home. I am especially interested in focusing on activities that take place outside of the home. Lastly, Crawford’s research focused on a group of people with all types of mobility impairments including those who were able ambulate without a wheelchair. Using the same data set, my research focuses specifically on wheelchair users.

These studies exemplify the potential usefulness of the PARTS/M in measuring participation in activities in the community among wheelchair users. While these findings are interesting, they do not fully explain participation. For instance, they do not address the importance of considering how peoples’ experiences or how long they used their wheelchair (time since onset) might affect their participation. They do not elaborate on the differences or similarities between power and manual wheelchair users. My study will use multiple instruments to develop of model of participation in community-based activities among wheelchair users.

**Barriers to and Facilitators of Participation**

**Physical barriers to and facilitators of participation.**

Much of the literature on wheelchair users’ participation focuses on physical barriers and facilitators including environmental access, personal propulsion skills, and wheelchair features. Participation requires that a wheelchair user be able to maneuver a wheelchair successfully in a variety of environments. The American National Standard Index (ANSI) and International Standard Organization (ISO) identify testing and reporting procedures for the performance characteristics of wheelchairs such as tipping angles, turning abilities, obstacle climbing abilities,
and strength/durability of parts and whole systems. Based on these and other procedures, there has been some research that informs everyday wheelchair use. For instance, in a study of power and manual wheelchairs, Koontz and colleagues (2010) determined the styles and configurations of the most maneuverable wheelchair systems by testing maneuvers like 360° and U-turns (Koontz, Brindle, Kankipati, Feathers, & Cooper, 2010).

Driving characteristics like speed and distance traveled have been used as indicators for participation (Bussmann et al., 2010; Harris, Sprigle, Sonenblum, & Maurer, 2010; Sonenblum et al., 2008). Another group of researchers studied the participation of veterans in two locations: at the National Veteran’s Wheelchair Games and in their own communities (Tolerico et al., 2007). The researchers reported that the veterans traveled farther and faster during the athletic events than they did in their own communities. They concluded that speed and distance traveled correlated with participation but they did not say how or why speed and distance specifically related to levels of participation. With the limited research in this area, it is not possible to draw the conclusion they reported. They did not consider the contexts within which the participants were acting. In the context they studied, speed and distance traveled made sense. In other words, the size of the arena and distance between events may have dictated the distances traveled. In another context, speed and distance may not have been important indicators of participation.

Wheelchair equipment itself can also be a barrier or facilitator to participation as participation may be greater when the person is able to use his or her wheelchair to its fullest advantage. Certain aspects of wheelchairs have been studied and have led to the design of new styles of wheelchairs and of components that may impact function. Two recent and most notable design changes are related to 1) the handrim shape and placement on manual wheelchairs and to 2) power assist systems that increase the effectiveness of manual propulsion (Dieruf et al., 2008;
Giesbrecht et al., 2009). The newly designed pushrims are shaped to match the user’s hands and to increase efficiency of pushing. The power assist systems increase efficiency in that each push of the pushrim is given a boost, making the wheelchair roll further than an unassisted push. The researchers concluded that equipment such as these make propulsion easier and therefore leads to increased participation. Their views are short-sighted, however, because their research focused only on those specific wheelchair parts and did not investigate the combined effect of the other many physical, societal, and psychosocial factors that influence a person’s participation.

**Psychosocial barriers to and facilitators of participation.**

Psychosocial barriers to community participation include issues such as the wheelchair user’s confidence and sense of self-efficacy and his or her impressions of the psychological and social attitudes of other people in the environment. It seems clear that the psychosocial context influences participation at least as powerfully as the physical environment. Psychological factors such as self-consciousness and the attitudes of non-disabled people, including professionals, were also identified as barriers (Rimmer, Riley, Wang, Rauworth, & Jurkowski, 2004). For example, in a study of how people with disabilities use gyms, Buffart (2009) found that the staff members’ limited knowledge of how people with disabilities could use the gym equipment was a barrier to participation. Another group of researchers found that attitudinal barriers such as negative staff attitudes were barriers to participation in leisure travel by people with disabilities (Card, Cole, & Humphrey, 2006). Conversely, attitudes and support from family, friends, and colleagues can facilitate participation (Noreau, Fougeyrollas, & Boschen, 2002).

While there is a body of research that relates to psychosocial aspects of physical disability, it does not specifically focus on wheelchair users nor does it specifically address participation in community-based, discretionary activities. The studies vary greatly. When
looked at as a group, they do seem to indicate the importance of investigating the role of psychosocial functioning on participation by people with physical disabilities. Persson and Ryden interviewed 26 people with physical disabilities regarding their coping strategies (Persson & Ryden, 2006). They found that most of the interviewees acknowledged the importance of developing confidence or trust in themselves. This relates to a person’s ability to make choices and the importance of having choice in their own lives. Ozanne, Strang, and Persson studied the health-related quality of life, anxiety, and depression of people diagnosed with amyotrophic lateral sclerosis (ALS) and their closest relatives (Ozanne, Strang, & Persson, 2011). They found higher incidences of anxiety and depression as well as a lower health-related quality of life indicators in these research subjects than in the general population. Their study did not however, investigate whether there was a relation between the levels of anxiety or depression and the subjects’ patterns of participation in discretionary activities in their communities. In a study of hopefulness, depression, and participation among people who had a stroke, researchers found that hopefulness and participation may predict depression among stroke survivors (P.D.A. Gum, CR Snyder, & P.W. Duncan, 2006).

A number of studies have been performed to determine whether there is a link between physical activity and participation (Bergland & Narum, 2007; R.W. Motl & E. McAuley, 2010). In an invited clinical commentary for the New Zealand Journal of Physiotherapy, Mulligan described numerous studies that indicate that the physiotherapist (rehabilitation professional) can positively influence the patterns of participation by people with long term disabilities which in turn, positively influences overall health and well-being (Mulligan, 2011). The studies that Mulligan describes also indicate the importance of social relationships and psychosocial functioning like self-efficacy in improving well-being. In a study of people with multiple
sclerosis, 292 participants were examined to explain the relationship between psychosocial functioning, physical activity, and quality of life. The researchers found that the relationship between physical activity and quality of life is likely indirect and that psychosocial factors like mood, pain, social support, and self-efficacy (among other factors) are intermediate variables (Motl, McAuley, Snook, & Gliottoni, 2009). Although this study investigates a different population, it clearly identifies the role of psychosocial functioning on activity and supports the need for further related research.

The literature described here points out the areas that have been emphasized thus far in explaining participation by people with disabilities. The research focusing specifically on participation by wheelchair users focuses primarily on the physical aspects of disability and on the equipment used by disabled people. While there is some literature that also includes the role of psychosocial functioning on participation, this pool of literature is limited. It was necessary to broaden the scope of the literature review to a wider population of people with disabilities to find more research explaining the role of psychosocial functioning on participation. This supports the need for further investigation of wheelchair users in order to develop a comprehensive model of participation among wheelchair users in discretionary, community-based activities and leads directly to the following research questions.
Methods

This research was conducted using an existing data set provided by Dr. David Gray, Ph. D., Associate Professor of Neurology and Occupational Therapy at Washington University School of Medicine in St. Louis, MO (Appendix B). Gray’s research interests encompass broadly ranging disability and socio-political topics including accessibility, care provision, and equality. The data were collected with support from the National Institute on Disability and Rehabilitation Research (NIDRR), award number H133B060018 as part of the Research and Training Center on Independent Living at The University of Kansas, Lawrence, KS. This NIDRR funded project studied how people with mobility impairments perform skills within and outside of their homes. Data were collected regarding environmental access and participants’ opinions regarding their own functional abilities. These data were also used to determine the parametric characteristics of the PARTS/M, a measure developed by Gray with funding from the Centers for Disease Control and Prevention (R04/CCR714134-03S).

Instruments

The data extracted and analyzed in this dissertation were collected using the following four instruments: The Participation Survey/Mobility (PARTS/M; Appendix C), The Personal Independence Profile (PIP; Appendix D), The Reintegration to Normal Living Index (RNLI; Appendix E), and the Medical Outcomes Study 36-Item Short Form Health Survey (SF-36; Appendix F).
The Participation Survey/Mobility (PARTS/M).

The PARTS/M is a self-report survey developed by Gray (2006), which focuses on 20 major life activities. The individual items that make up the PARTS/M instrument generate responses that are categorized into six domains (Table 1). In addition to the six domains, the instrument measures four components of participation. These components of participation cut across all six domains. The four components are 1) temporal -- frequency and time; 2) evaluative -- choice, satisfaction, and importance; 3) health-related -- limitations as a result of illness, pain, or fatigue; and 4) supportive -- is assistance needed from another person or from accommodations, adaptations, or special equipment.

Table 1. Structure of the PARTS/M

<table>
<thead>
<tr>
<th>Domain</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-care</strong></td>
<td>Dressing</td>
</tr>
<tr>
<td></td>
<td>Bathing</td>
</tr>
<tr>
<td></td>
<td>Bladder care</td>
</tr>
<tr>
<td></td>
<td>Bowel care</td>
</tr>
<tr>
<td></td>
<td>Meals</td>
</tr>
<tr>
<td><strong>Mobility</strong></td>
<td>Move inside home</td>
</tr>
<tr>
<td></td>
<td>Leave home</td>
</tr>
<tr>
<td></td>
<td>Vacations</td>
</tr>
<tr>
<td><strong>Domestic life</strong></td>
<td>Work inside home</td>
</tr>
<tr>
<td></td>
<td>Exterior maintenance</td>
</tr>
<tr>
<td><strong>Interpersonal interactions and relationships</strong></td>
<td>Parenting</td>
</tr>
<tr>
<td></td>
<td>Intimacy</td>
</tr>
<tr>
<td><strong>Major life areas</strong></td>
<td>Employment</td>
</tr>
<tr>
<td></td>
<td>Volunteering</td>
</tr>
<tr>
<td></td>
<td>Money management</td>
</tr>
<tr>
<td><strong>Community, social, and civic life</strong></td>
<td>Active recreation</td>
</tr>
<tr>
<td></td>
<td>Leisure activities</td>
</tr>
<tr>
<td></td>
<td>Socializing</td>
</tr>
<tr>
<td></td>
<td>Community activities</td>
</tr>
<tr>
<td></td>
<td>Religious activities</td>
</tr>
</tbody>
</table>
The PARTS/M uses a combination of nominal and ordinal scales. An individual’s overall PARTS/M score can be calculated, as can scores for each of the 6 domains, each of the 4 components, or each of the 20 life activities (Crawford et al., 2008). The internal consistency of the two domains of interest in this dissertation study, as calculated using Cronbach’s Alpha, were mobility = .72 and community, social, and civic life = .85. The internal consistency of the three variables derived from the evaluative component of the PARTS/M as calculated using Cronbach alphas were satisfactory: choice items = .93, satisfaction items = .94, and importance items = .78) (Gray et al., 2006).

This dissertation used data collected from those portions of the PARTS/M related to participation in discretionary, community-based activities. Of the 20 activities in the PARTS/M, this study focused on the following six areas: active recreation, leisure activities, vacationing, socializing, religious activities, and community activities. These areas are contained within two domains: mobility and community/social/civic life. The three variables derived from the PARTS/M were: 1) extent of participation in selected community-based activities (extent), 2) importance of participation in selected community-based activities (importance), and 3) satisfaction with participation in selected community-based activities (satisfaction).

The Personal Independence Profile (PIP).

The PIP is a self-report measure of psychological and environmental aspects of independence based on a model of independence emphasizing control of life, having options, making decisions, performing daily activities, and participating in community life (Bolton, 2001). The PIP is comprised of three subscales: perceived control over one’s self, psychological self-reliance, and physical functioning. Perceived control over one’s self is measured with 10 questions using a 5-
point Likert scale ranging from 1= no control to 5= complete control. It is scored by summing the responses for a total possible score of 50 with a higher score indicating a higher level of perceived control. Internal consistency using Cronbach’s α is .86, demonstrating high reliability.

The Psychological Self-reliance subscale measures the character traits of confidence, assertiveness, and ambition using a 34 item, 5-point Likert scale ranging from 1= completely agree to 5= completely disagree. Items in this Psychological Self-reliance subscale are from Fordyce’s Independence Scale (Fordyce, 1953). Cronbach’s α for the Psychological Self-reliance subscale is .79.

The Physical Functioning subscale contains 25 items that assess the degree of independence from other people in performing daily activities. Cronbach’s α is .93 for the physical functioning subscale (Nosek et al., 1992).

**The Reintegration to Normal Living Index (RNLI).**

The perception of reintegration to social activities was measured using the Reintegration to Normal Living (RNLI) scale, an 11-item self-assessment developed to determine an individual’s perception of and satisfaction with his or her level of reintegration into social activities. Reintegration to Normal Living is described as “reorganization of physical, psychological, and social characteristics of an individual into a harmonious whole so that one can resume well-adjusted living after an incapacitating illness or trauma” (SL Wood-Dauphinee et al., 1988). Scoring of each item ranges from 0 = no integration to 10 = complete reintegration on a visual analogue scale. The adjusted score ranges from 0 - 100 with a higher score indicating better perceived integration. Cronbach’s α was greater than .9 when tested with 109 patients with cancer, cardiac conditions, center nervous system disorders, and orthopedic conditions, and their families/significant others and health professionals (S. Wood-Dauphinee & Williams, 1987). In a
study on well-being in older community residents, Steiner, et al. report the Cronbach’s α as .83 in their primary sample of 414 participants and .76 in their reliability sample of 50 participants (Steiner et al., 1996).

The Medical Outcomes Study 36-Item Short Form Health Survey (SF-36).

The SF-36 is a 36-item self-report measure of health-related quality of life. Four variables are derived from data collected with this instrument: vitality, social function, general mental health, and emotional role function. The SF-36, one of the most widely used health scales, is organized into two major dimensions: physical and mental health. It contains eight scales: Physical Functioning, Role Physical, Bodily Pain, General Health Perceptions, Vitality, Social Functioning, Role Emotional, and Mental Health (McHorney, Ware Jr, Lu, & Sherbourne, 1994). The Physical Functioning scale measures the person’s involvement in various everyday activities including exercise, walking, and bending. The Role Physical scale measures accomplishments and limitations in the ability to work or perform other activities. The Bodily Pain scale measures both the intensity of pain and the extent to which it limits participation with usual activities. The General Health Perception scale measures the extent to which the person sees him or herself as healthy or ill as well as his or her expectation of health in the future. The Vitality scale measures the person’s perception of his or her energy level. The Social Functioning scale includes items related to health problems that interfere with social activities. The Role Emotional scale measures the extent to which the person sees him or herself as accomplishing less than desired. The Mental Health scale measures emotions like nervousness, sadness, calmness, and downheartedness (McHorney, War Jr, Lu, & Sherbourne, 1994). The SF-36 is widely used with various populations, has been translated into 140 languages, and is available in numerous formats including fixed form, oral interview, online, fax, eForm, smartphone, tablet/kiosk, and
interactive voice response via telephone (McHorney, Ware, et al., 1994) (McHorney, War Jr, et al., 1994; McHorney, Ware, et al., 1994; Quality Metric, 2012; StrokEngine, n.d.). Reliability of the SF-36 (Cronbach’s α) ranges from .78 to .93 as follows: physical functioning = .93, role physical = .84, bodily pain = .82, general health = .78, vitality = .87, social functioning = .85, role emotional = .83, mental health = .90 (McHorney, War Jr, et al., 1994; McHorney, Ware, et al., 1994).

Data

Permission for use of these data was obtained prior to analyses (Appendix B). The original data set provided for use in this dissertation study did not include personally identifiable information. A description of how the original data set was created appears below.

Participants

Participants contained in the full data set.

Participants represented in the original data set were recruited from across the United States. They were adults, over age 18, with mobility impairments who lived in the community for at least one year. Non-English speaking people, people with less than one year of disability experience, people with cognitive impairments or psychiatric conditions that prohibited participation, and people living in institutions were excluded from the original study. Participants were recruited via mailings from charitable organizations, service provider agencies, and advocacy organizations as well as through newspaper advertisements and newsletter notices.

Seven hundred and one research packets, including the surveys, project information, and informed consent requests were mailed to potential participants who responded to the call for
participation and met the inclusion criteria. Six hundred and four responses were received, a response rate of 86%.

Data from the surveys were coded, identifying information was removed, and data were entered into SPSS, a statistical software package. The data set was checked to insure accuracy. Data coding, input, and checking were performed by Dr. Gray’s research team. Dr. Gray provided the SPSS data file, minus any personally identifiable participant information, for use in this dissertation study.

**Participants in this dissertation study.**

The original dataset included people with mobility impairments who used various mobility aids including canes, crutches, walkers, and wheelchairs as well as those who reported difficulty walking up to three blocks without an assistive device. The dissertation study reported here only includes those individuals from the original dataset who used a wheelchair and the study only investigates those issues that specifically impact the participation of wheelchair users. The filtered data set, consisting of only those individuals who used a wheelchair, contained 302 participants (n=302.)

**Data Analysis**

Data were analyzed using SPSS-PC for Windows Release 20.0. Upon receipt, the data set was examined for missing data using procedures described by the instrument authors to address missing data, as appropriate.

Descriptive analysis was performed on the participants’ demographic information. This descriptive analysis focused on the characteristics that were identified as covariates of participation through in-depth discussion between this author and her advisors (Table 2).
Table 2. Potential Covariates

- Wheelchair type
- Age
- Gender
- Race/ethnicity
- Marital status
- Education
- Personal and household income
- Housemates
- Years in present living arrangement
- Primary condition causing mobility impairment
- Time since onset of condition
- Other conditions in past 30 days
- Amount and type of help needed
- Transportation used
- Primary location

Three variables were derived from the PARTS/M: Extent, Satisfaction, and Importance. Four variables were derived from the SF-36: Vitality, Social Function, General Mental Health, and Emotional Role Function. One variable, Perceived Control Over One’s Life, was derived from the PIP and one variable, Perception of Reintegration to Social Activities, was derived from the RNLI. The label for each of these variables came directly from the subscale name. Each variable was calculated using the appropriate instrument’s scoring system.

Variables derived from the PARTS/M.

The PARTS/M subscales were the source of the variables extent of participation, importance and satisfaction with participation. Standardized scores were calculated for extent, importance and satisfaction.

Extent of Participation.
Extent of participation was determined using the PARTS/M items regarding the frequency of participation in each of the six domains of interest: active recreation, leisure activities, vacationing, socializing, religious activities, and community activities. Some scales included multiple items (such as active recreation and leisure activities) and some included only one item (such as socializing and religious activities). For the active recreation scale, frequency scores for the individual activities (swimming, playing golf, skiing, racing, bowling, camping, hiking nature trails) were summed and used as the variable determining the standardized score. For the leisure recreation scale, frequency scores for the individual activities (dining out, attending movies, attending concerts, playing cards, playing board games, watching sports, reading) were summed. Each of the frequency scales contained a single item. Scores were standardized to address the differences in the number of items in each domain. Factor analysis determined that extent of participation comprised a single factor. The frequency score in each domain was used as the variable to determine the standardized score. The following equation was used to determine the standardized scores.

\[
\text{Importance} = \frac{\text{variable} - \text{The variable's mean score}}{\text{The variable's standard deviation}}
\]

Factor analysis was used to compute the coefficients of a principal component score. For each variable, missing values were replaced with the variable’s mean value. Each domain’s importance score was calculated using the following equation.

\[
(principal\ component\ score\ coefficient) \times \frac{\text{variable} - \text{mean}}{\text{standard\ deviation}}
\]
Factor analysis determined that *importance* was comprised of two categories which are named *cerebral importance* and *dynamic importance*.

Satisfaction with Participation.

Factor analysis was used to compute the coefficients of a principal component score. For each variable, missing values were replaced with the variable’s mean value. Each domain’s *satisfaction* score was calculated using the following equation.

\[(\text{principal component score coefficient}) \times \frac{\text{variable} - \text{mean}}{\text{standard deviation}}\]

Factor analysis determined that *satisfaction* was comprised of a single category.

**Variable derived from the PIP.**

*Perceived control over one’s life* was determined using the Part 1, Control subscale of the PIP. Scoring consisted of a simple summation of the 10 items in the subscale with a possible total score of 50.

**Variable derived from the RNLI.**

*Perception of integration to social activities* was calculated as the adjusted score on the RNLI. The adjusted score of this assessment was calculated using the following equation:

\[\text{Adjusted Score} = \frac{\text{sum of the scores of the 11 RNLI items}}{110} \times 100\]

**Variables derived from the SF-36.**

The scores for *vitality, social function, general mental health,* and *emotional role function* were calculated according to the SF-36 scoring guidelines. It was first determined whether
enough data were present to calculate the score. If at least half of the items in a subscale were present in the data set, that participant’s scores could be used and the missing values were replaced with the mean score for that variable. Some of the item scores were then transformed such that they all reflected an undesirable characteristic as a low score and a desirable characteristic as a high score. For instance, the subscale of vitality contained four items and the score of 2 items were reverse scored (Figure 1).

<table>
<thead>
<tr>
<th>How much time during the past 4 weeks:</th>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Did you feel full of pep?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Did you have a lot of energy?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Did you feel worn out?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Did you feel tired?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 1. For each item, the response “all of the time” is scored 1, “most of the time” is scored 2, “a good bit of the time” is scored 3, “some of the time” is scored 4, “a little of the time” is scored 5, and “none of the time” is scored 6. In this example, the scores for a. pep and e. energy were inverted to be on the same scale as the other items. Similar instructions were provided for each subscale of the SF-36.*

Raw scores were calculated as the sum of the scores of the items in the subscale. Each raw score was then transformed to a 0-100 scale using the following formula:

\[
\text{Transformed Score} = \frac{\text{actual score} - \text{lowest possible raw score}}{\text{possible raw score range}} \times 100
\]
Once the variables were determined, I discussed the strategies that would be used to analyze the data with my advisor. Extent and satisfaction were analyzed separately using similar strategies that are listed below.

**Extent of Participation**

Research questions 1 and 2 involve determining the significant predictors of the *extent* of participation in community-based discretionary activities by wheelchair users. In each of the following steps *extent* of participation was the dependent variable. Ordinary Least Squares regression was used in all analyses of the research questions.

1. Backward elimination regression analysis was used to determine the significant medical and demographic covariates of *extent* of participation.
2. *Dynamic importance* and *cerebral importance* were included in a subsequent regression that also included the significant medical and demographic covariates.
3. Non-significant variables were then removed one at a time, removing the least significant variable at each step, until only significant variables remained.
4. In order to determine the role of each psychosocial factor in predicting the extent of participation, each one was included in a regression analysis with the significant variables identified in step 3.
5. In order to investigate covariation among the psychosocial factors, a regression analysis was performed on all of the significant medical and demographic covariates, cerebral and dynamic importance, and all of the psychosocial factors.
6. The non-significant variables were then removed from the model one at a time, removing the least significant variable at each step, until only the significant predictors of *the extent* of participation remained.
Satisfaction with Participation

Research question 3 involves determining the significant predictors of satisfaction with participation in community-based discretionary activities by wheelchair users. In each of the following steps satisfaction with participation was the dependent variable.

1. Backward elimination regression analysis was used to determine the significant medical and demographic covariates of satisfaction with participation.

2. Dynamic importance and cerebral importance were included in a subsequent regression that also included the significant medical and demographic covariates.

3. Non-significant variables were then removed one at a time, removing the least significant variable at each step, until only significant variables remained.

4. In order to determine the role of each psychosocial factor in predicting satisfaction with participation, each one was included in a regression analysis with the significant variables identified in step 3.

5. In order to investigate covariation among the psychosocial factors, a regression analysis was performed on all of the significant medical and demographic covariates, cerebral and dynamic importance, and all of the psychosocial factors.

6. The non-significant variables were then removed from the model one at a time, removing the least significant variable at each step, until only the significant predictors of satisfaction with participation remained.

The final step was to integrate these two sets of regression analyses into one model of participation in discretionary, community-based activities by people who use wheelchairs.
Results

Participants

Data from 302 participants were analyzed. The mean age of participants was 49.42 years (SD 15.66; range 17-83 years, skewness 0.033, kurtosis -.65) (Table 3). Of these participants, 44.7% were male and 55.3% were female; 88.1% were white, 9.9% were black or African American, and the remaining 2% reported being from another race or ethnicity or selected the response “other”. Ninety one percent of the sample had at least a high school education or GED (Figures 2, 3, and 4). Regarding marital status, 42.7% of the participants were married or part of an unmarried couple and 18.8% were separated, divorced, or widowed (Figure 5) and 17.9% reported having children living at home (Table 4). Participants’ reported a wide range of incomes with 44.4% reporting their annual income to be less than $25,000 (Figure 6).

The participants reported living in a variety of housing situations; 52.6% lived in a house they owned, 13.9% reported living in a house owned by someone else, 2.3% reported renting a house, 2.6% reported living in a multiple family dwelling, 18.5% in an apartment, 0.7% in a dormitory, 0.7% in a transitional living facility, 1% in a hospital or nursing home, and 7.3% responded “other” to the question (Table 4). One person selected the option “refused” on the survey. The mean amount of time the participants reported living at their current location was 16.07 years (SD, 14.22; range <1 - >61 years, skewness 1.088, kurtosis .393) (Table 3). Participants reported using both private and public transportation within their communities; 47% owned a car or van or had independent means of transportation, 36.4% used public transportation or friends for transportation, 13.6% depended on rides from family or friends when they were
available, 1% reported seldom traveling and having no reliable source of transportation, and 2% reported that they did not know or they did not respond (Table 4).

Table 3. Continuous Variables: Age, years at present living situation, years since onset of the disability.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years</td>
<td>302</td>
<td>49.42 (15.66)</td>
<td>17 - 83</td>
<td>0.033</td>
<td>-0.650</td>
</tr>
<tr>
<td>Years of present living situation</td>
<td>289</td>
<td>16.07 (14.28)</td>
<td>&lt; 1 to &gt; 61</td>
<td>1.0888</td>
<td>0.393</td>
</tr>
<tr>
<td>Spinal Cord Injury</td>
<td>89</td>
<td>11.27 (9.92)</td>
<td>0.71 - 41.16</td>
<td>1.335</td>
<td>1.068</td>
</tr>
<tr>
<td>Multiple Sclerosis</td>
<td>56</td>
<td>19 (12.69)</td>
<td>3.47 - 69.93</td>
<td>1.55</td>
<td>3.52</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>63</td>
<td>40.08 (13.06)</td>
<td>16.9 - 71.68</td>
<td>.259</td>
<td>-0.083</td>
</tr>
<tr>
<td>Polio</td>
<td>65</td>
<td>47.06 (18.68)</td>
<td>2.72 - 79.94</td>
<td>-0.922</td>
<td>0.453</td>
</tr>
<tr>
<td>Stroke</td>
<td>16</td>
<td>6.65 (3.85)</td>
<td>2.3 - 14.48</td>
<td>0.956</td>
<td>0.067</td>
</tr>
</tbody>
</table>

Figure 2. Gender

![Gender Chart]

Percent

- Male: 44.7%
- Female: 55.3%
Figure 3. Race

Figure 4. Education
Table 4. Characteristics of Participants (N=302)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Children Living at Home?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>54 (17.9)</td>
</tr>
<tr>
<td>No</td>
<td>248 (82.1)</td>
</tr>
<tr>
<td><strong>Wheelchair Type Used</strong></td>
<td></td>
</tr>
<tr>
<td>Manual wheelchair only</td>
<td>148 (49)</td>
</tr>
<tr>
<td>Power wheelchair only</td>
<td>52 (17.2)</td>
</tr>
<tr>
<td>Scooter only</td>
<td>26 (8.6)</td>
</tr>
<tr>
<td>Manual and power wheelchair</td>
<td>63 (20.9)</td>
</tr>
<tr>
<td>Manual wheelchair and scooter</td>
<td>12 (4)</td>
</tr>
<tr>
<td>Power wheelchair and scooter</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td><strong>Primary Mobility Device Used in the Community</strong></td>
<td></td>
</tr>
<tr>
<td>Manual wheelchair</td>
<td>77 (25.5)</td>
</tr>
<tr>
<td>Power wheelchair</td>
<td>72 (23.8)</td>
</tr>
<tr>
<td>Scooter</td>
<td>22 (7.3)</td>
</tr>
<tr>
<td>Ambulation aid (cane, crutches, walker)</td>
<td>39 (12.9)</td>
</tr>
<tr>
<td>Multiple devices</td>
<td>92 (30.5)</td>
</tr>
<tr>
<td><strong>Assistance Providers (includes reports of multiple providers)</strong></td>
<td></td>
</tr>
<tr>
<td>Relatives</td>
<td>122 (40.4)</td>
</tr>
<tr>
<td>Friends</td>
<td>46 (15.2)</td>
</tr>
<tr>
<td>Persons hired by participant</td>
<td>68 (22.5)</td>
</tr>
<tr>
<td>Persons sent by an agency</td>
<td>66 (21.9)</td>
</tr>
<tr>
<td>Other</td>
<td>31 (10.3)</td>
</tr>
<tr>
<td>No assistance providers reported</td>
<td>65 (21.5)</td>
</tr>
<tr>
<td><strong>Type of Residence</strong></td>
<td></td>
</tr>
<tr>
<td>Owns Home</td>
<td>159 (52.6)</td>
</tr>
<tr>
<td>Lives in a home somebody else owns</td>
<td>42 (13.9)</td>
</tr>
<tr>
<td>House, rented</td>
<td>7 (2.3)</td>
</tr>
<tr>
<td>Multiple Family Dwelling</td>
<td>8 (2.6)</td>
</tr>
<tr>
<td>Apartment</td>
<td>56 (18.5)</td>
</tr>
<tr>
<td>Dorm</td>
<td>2 (0.7)</td>
</tr>
<tr>
<td>Transitional Facility</td>
<td>2 (0.7)</td>
</tr>
<tr>
<td>Hospital or Nursing Home</td>
<td>3 (1)</td>
</tr>
<tr>
<td>Other</td>
<td>22 (7.3)</td>
</tr>
<tr>
<td>No response</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td></td>
</tr>
<tr>
<td>Owns car or van or has independent means of transportation</td>
<td>142 (47)</td>
</tr>
<tr>
<td>Uses public transportation or friends for transportation</td>
<td>110 (36.4)</td>
</tr>
<tr>
<td>Depends on rides from friends/family when available</td>
<td>41 (13.6)</td>
</tr>
<tr>
<td>Seldom/never travel, no reliable source of transportation</td>
<td>3 (1)</td>
</tr>
<tr>
<td>No response</td>
<td>5 (1.7)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>1 (0.3)</td>
</tr>
</tbody>
</table>
All participants were wheelchair users; 49% reported using a manual wheelchair only, 17.2% reported using a power wheelchair only, and 8.6% reported using a scooter only (Table 4). While most wheelchair users use only one type of wheelchair, some use multiple devices for a variety of reasons including differences in their ability to maneuver in different environments. For example, sometimes people use power wheelchairs or scooters in the community where spaces are larger and travel distances are longer especially if their endurance for pushing their manual wheelchair is limited. They may use a manual wheelchair in their home because they either are able to manage it sufficiently in that environment or the environment is too confined to use a power wheelchair or scooter. Some people use multiple devices because their conditions vary from day to day and even throughout the day. These individuals may use manual wheelchairs when their coordination and strength are sufficient for propulsion and use powered wheelchairs or scooters at other times. Of the 302 participants in this sample, 20.9% reported using both a manual and power wheelchair, 4% reported using both a manual wheelchair and a scooter, and 0.3% reported using both a power wheelchair and a scooter (Table 4). However, participants’ reasons for using multiple devices were not included in the data set. Participants were also asked to identify their primary means of mobility in the community with 25% reporting that they primarily used a manual wheelchair in the community. Of the remaining participants, 23.8% reported they primarily used a power wheelchair, 7.3% reported using a scooter, 12.9% reported using primarily ambulation aids like canes, crutches, and walkers, and 30.5% reported using more than one device in the community (Table 4).

The participants presented with various diagnoses requiring the use of a wheelchair for community mobility; 29.8% with spinal cord injury (SCI), 19.9% with multiple sclerosis (MS), 22.5% with cerebral palsy (CP), 21.9% with polio, and 6% with stroke (CVA) (Figure 7).
Participants reported the onset of their diagnosis as ranging from < 1 year to > 79 years (Table 3). These data demonstrate normality with the exception of years since onset of the diagnosis of MS which is kurtotic (kurtosis is 3.52) due to the presence of one outlier. When this participant is removed from the data set, the distribution is normal (skewness = 0.823, kurtosis = -0.075).

![Figure 7. Primary Diagnosis Leading to Wheelchair Use](image)

Note. SCI= Spinal Cord Injury. MS= Multiple Sclerosis. CP= Cerebral Palsy

The data set does not differentiate between the time of onset of the disability and the time when the participant began using a wheelchair. The time of onset of the disability is the reference point for this study and ranges from < 1 year to > 79 years. Information regarding the time since onset by disabling condition can be found in Table 3. These data are normally distributed.

In addition to their medical diagnoses, people with disabilities often have other conditions that impact their ability to function. In this study, pain, spasticity, skin problems, and depression were considered as factors that might influence participation in community-based, discretionary activities. The incidence and frequency of these conditions are reported in Figures 8 through 12.
The conditions that may limit community participation are not diagnosis-specific. For instance, pain may result directly from nerve damage associated with a certain diagnosis but, for wheelchair users, it may also result from other factors such as remaining in a given seated position for an extended period of time. People with any of the diagnoses identified in this participant pool (SCI, MS, CP, polio, or stroke) may be unable to reposition themselves in their wheelchairs without help so pain from poor positioning can be associated with any of these diagnoses. As noted in Figure 8, 71.2% of the participants reported having pain. Of those who reported the presence of pain, 41.9% reported that their pain was constant (Figure 9).

Spasticity is the presence of involuntary muscle contractions. Spasticity can be painful or it can restrict movement leading to difficulty in movement and/or avoidance of participation. Spasticity may also make positioning difficult. If a person is unable to sit appropriately in his or her wheelchair or is unable to propel his or her wheelchair when spasticity is present, he or she may avoid participation. Of the participants in this study, 51.3% reported experiencing spasticity (Figure 8). Of those who reported the presence of spasticity, 31% reported that their spasticity was constant (Figure 10).
Figure 8. Incidence of Other Conditions

- Pain: 71.2%
- Spasticity: 51.3%
- Skin Problems: 34.8%
- Depression: 43.4%

Figure 9. Frequency of Pain (n=215)

- Constant: 41.9%
- Off and On: 47.9%
- Rarely: 8.4%
- Refused or NA: 1.9%
Figure 10. Frequency of Spasticity (n=155)

Skin problems, such as ulcers, can develop when a person remains in a single position for a long period of time. Impaired sensory perception may also prevent the wheelchair user from knowing he or she is developing skin problems. Low muscle tone may cause excessive pressure on the seating surface and lead to skin ulcers. Other causes of skin problems include sitting in sub-optimal positions and sitting without appropriate cushions. People with active skin ulcers in areas associated with sitting are instructed to stay out of the seated position to allow the ulcers to heal so they may defer participation in activities that require sitting. Additionally, people with a history of skin ulcers may be more prone to development of ulcers in the future due to changes in the condition of their skin and other soft tissue at the ulcer site. These individuals may therefore avoid discretionary participation reserving their limited sitting time for critical or mandatory activities. As is reported in Figure 8, 34.8% of the participants in this study reported skin problems. Of those who reported skin problems, 20% reported that this problem was constant (Figure 11).
People with depression often participate in discretionary activities with less frequency and less vigor than those without symptoms of depression. It follows then that wheelchair users with depression may also limit their participation in community-based discretionary activities. Of the participants in this study, 43.4% reported that they had depression (Figure 8). Of those who reported the presence of depression, 18.3% reported that the depression was constant (Figure 12).

Only 13 individuals reported no pain, spasticity, skin problems, or depression. Eighty-four people (27.81%) reported one of these four conditions. It is important to note that these conditions are not mutually exclusive. An additional 205 participants reported experiencing two or more of these four conditions.
Most of the participants reported that they required assistance during their daily routines with 23.2% using more than 30 hours of assistance per week, 4.6% using 21-30 hours of assistance, 11.3% using 11-20 hours, 14.6% using 5-10 hours, 21.5% using less than 5 hours, and 21.5% using no assistance (Figure 13). Additionally, 2.6% of the participants did not report the amount of assistance used, 0.3% responded “don’t know”, and 0.3% responded “NA”. Those who did report using assistance identified their sources of help as follows: 40.4% used assistance from relatives, 15.2% from friends, 22.5% from persons they hired, 21.9% from persons provided by an agency, and 10.3% from other sources (Table 2). Additionally, 2% selected “refused” and 0.7% responded “NA”.

Figure 12. Frequency of Depression (n=131)
Access to appropriate transportation may also be associated with participation in community-based activities. Many wheelchair users cannot easily move from their wheelchair to a car seat so they use an accessible vehicle that allows them to remain in their wheelchairs when being transported. For many, accessible vans are prohibitively expensive and, without a van or access to accessible public transportation, community participation may be limited. As is reported in Table 2, 47% of the study participants either own a vehicle or have independent means of transportation while 36.4% use public transportation and 13.6% rely on rides from family and friends when they are available.

**Outcome and Explanatory Variables**

The study variables were derived from subscales of four instruments: The Reintegration to Normal Living Index (RNLI), The Personal Independence Profile (PIP), The Medical Outcomes Study Short Form (SF-36), and The Participation Survey/Mobility (PARTS/M). The variables included *perception of reintegration to social activities, perceived control over one’s life, vitality, general mental health, social function, emotional role function, extent of participation, dynamic importance, cerebral importance, and satisfaction with participation.*
Descriptive statistics for these variables can be found in Table 5. The variable identified as *perception of reintegration to social activities* was calculated as the adjusted score on the RNLI. With 292 cases, the mean score on the RNLI was 76.01 (SD 19.19; range 10 - 100, skewness -1.134, kurtosis 1.41). *Perceived control over one’s life* was determined using the control subscale of the PIP. With 258 cases, the mean score of this subscale was 36.83 (SD 8.09; range 13 - 50, skewness -0.421, kurtosis -0.275.

*Table 5. Descriptive Statistics Regarding the Outcome and Explanatory Variables*

<table>
<thead>
<tr>
<th>Variable (source)</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Reintegration to Social Activities (RNLI)</td>
<td>292</td>
<td>76.01 (19.19)</td>
<td>10 - 100</td>
<td>-1.134</td>
<td>1.41</td>
</tr>
<tr>
<td>Perceived Control Over One’s Life (PIP)</td>
<td>258</td>
<td>36.83 (8.09)</td>
<td>13 - 50</td>
<td>-0.421</td>
<td>-0.275</td>
</tr>
<tr>
<td>Vitality (SF-36)</td>
<td>295</td>
<td>51.66 (20.15)</td>
<td>0 - 93.33</td>
<td>-0.993</td>
<td>0.266</td>
</tr>
<tr>
<td>General Mental Health (SF-36)</td>
<td>298</td>
<td>72.47 (18.63)</td>
<td>4 - 100</td>
<td>-0.929</td>
<td>0.667</td>
</tr>
<tr>
<td>Social Function (SF-36)</td>
<td>292</td>
<td>65.92 (21.84)</td>
<td>10 - 90</td>
<td>-0.559</td>
<td>-0.635</td>
</tr>
<tr>
<td>Role Emotional Function (SF-36)</td>
<td>260</td>
<td>78.21 (36.4)</td>
<td>0 - 100</td>
<td>-1.331</td>
<td>0.13</td>
</tr>
<tr>
<td>Extent (PARTS/M)</td>
<td>207</td>
<td>-1.1148 (3.31065)</td>
<td>-7.36 – 7.94</td>
<td>.258</td>
<td>-.684</td>
</tr>
<tr>
<td>Dynamic Importance (PARTS/M)</td>
<td>302</td>
<td>6.98 (2.4709)</td>
<td>4 - 16</td>
<td>.911</td>
<td>.570</td>
</tr>
<tr>
<td>Cerebral Importance (PARTS/M)</td>
<td>302</td>
<td>3.9625 (1.44889)</td>
<td>2 - 8</td>
<td>.831</td>
<td>.588</td>
</tr>
<tr>
<td>Satisfaction (PARTS/M)</td>
<td>302</td>
<td>0.1166 (3.33671)</td>
<td>-6.79 - 7.34</td>
<td>-0.096</td>
<td>-0.463</td>
</tr>
</tbody>
</table>

Four variables were calculated as scores of subscales on the SF-36: *vitality, social function, general mental health*, and *emotional role function*. Each of these subscales contains the transformed score with a possible range of 0-100. A higher score on each of the scales indicates a higher perception of this quality. In order to be scored, a participant must have completed more than half of the items in that subscale. With 295 cases meeting criteria for
inclusion, the mean vitality score was 51.66 (SD 20.15; range 0 - 93.33, skewness -0.993, kurtosis 0.266). With 298 cases meeting inclusion criteria, the mean general mental health score was 72.47 (SD 18.63; range 4 -100, skewness -0.929, kurtosis 0.667). With 292 cases meeting inclusion criteria, the mean social function score was 65.92 (SD 21.84; range 10 - 90, skewness -0.559, kurtosis -0.635). With 260 cases meeting inclusion criteria, the mean emotional role function score was 78.21 (SD 36.4; range 0 - 100, skewness -1.33, kurtosis 0.13). All of these variables are normally distributed.

Three variables were derived from the PARTS/M: extent of participation in select community-based activities, satisfaction with performance in select community-based activities, and importance of participation in select community-based activities which was analyzed as two factors: dynamic importance and cerebral importance. The selected community-based activities used for determining these scores were Active Recreation, Leisure Activities, Vacationing, Socializing, Religious Activity, and Community Activity. These domains were measured using four scales (Table 6). On each scale, a higher score indicated a greater degree of participation. A principal components factor analysis indicated that there was a single factor comprising the extent of participation (Table 7). Because extent comprised subscales with an unequal number of items, domain-based frequency scores were standardized. Table 8 contains the descriptive statistics of the unstandardized and standardized extent scores for each domain of interest. Extent scores were calculated by summing the standardized scores of each domain of interest.
Table 6. Scoring Scales of *Extent* of Participation by Domain

<table>
<thead>
<tr>
<th>Domain (s)</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Active Recreation and Leisure Activities</td>
<td>Never</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Taking Vacations</td>
<td>Never</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Socializing</td>
<td>Less than once/week</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Religious and Community Activities</td>
<td>None</td>
</tr>
</tbody>
</table>

|                                    | 1 - 2 times/month       |
|                                    | 1 - 2 times/week        |
|                                    | More than twice/week    |
|                                    | Less than once/year     |
|                                    | Once or twice/year      |
|                                    | More than twice/year    |
|                                    | Daily or almost daily   |
|                                    | 1 - 2 times/week        |
|                                    | 3 – 4 times/week        |
|                                    | More than 5 hours/week  |
|                                    | (not used in scale)     |

Table 7. *Extent* Factor Analysis Structure Matrix

<table>
<thead>
<tr>
<th></th>
<th>Component 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>standardized leisure activities frequency</td>
<td>.610</td>
</tr>
<tr>
<td>standardized vacation frequency</td>
<td>.521</td>
</tr>
<tr>
<td>standardized active recreation</td>
<td>.615</td>
</tr>
<tr>
<td>standardized socializing frequency</td>
<td>.573</td>
</tr>
<tr>
<td>standardized community activity frequency</td>
<td>.616</td>
</tr>
<tr>
<td>standardized religious activity frequency</td>
<td>.433</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis. One component extracted
Table 8. Descriptive Statistics Regarding *Extent* of Participation in Selected Community-based Activities of the PARTS/M

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Scores</th>
<th>Standardized Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Active recreation</td>
<td>270</td>
<td>8.97 (1.48)</td>
</tr>
<tr>
<td>Leisure activities</td>
<td>260</td>
<td>14.00 (2.9)</td>
</tr>
<tr>
<td>Vacationing</td>
<td>293</td>
<td>2.36 (.982)</td>
</tr>
<tr>
<td>Socializing</td>
<td>295</td>
<td>2.84 (1.123)</td>
</tr>
<tr>
<td>Religious activities</td>
<td>269</td>
<td>1.64 (.585)</td>
</tr>
<tr>
<td>Community activities</td>
<td>268</td>
<td>1.51 (.590)</td>
</tr>
</tbody>
</table>

The importance of participation was measured in each domain of interest using the following scale: 1 = very important, 2 = somewhat important, 3 = somewhat unimportant, and 4 = not important. Unlike the *extent* score, a lower score on this scale reflected greater importance. Descriptive data regarding the importance of participation in the domains of interest can be found in Table 9. Principal components factor analysis indicated that there were two factors in importance (Table 10). The two domain groupings are based on qualities related to movement required versus their community-mindedness. For this reason, two importance variables *dynamic importance* and *cerebral importance* were named. *Dynamic importance* was calculated as the sum of the importance scores of the following domains: active recreation, leisure activities, vacations, and socialization. *Cerebral importance* was calculated as the sum of the importance scores in the domains of religious activities and community activities. Descriptive statistics regarding *dynamic importance* and *cerebral importance* scores can be found in Table 5.
Table 9. Descriptive Statistics Regarding *Importance* of Participation

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active recreation</td>
<td>302</td>
<td>2.22 (1.036)</td>
<td>1 - 4</td>
<td>.504</td>
<td>-.857</td>
</tr>
<tr>
<td>Leisure activities</td>
<td>302</td>
<td>1.58 (.787)</td>
<td>1 - 4</td>
<td>1.486</td>
<td>1.955</td>
</tr>
<tr>
<td>Vacationing</td>
<td>302</td>
<td>1.67 (.853)</td>
<td>1 - 4</td>
<td>1.335</td>
<td>1.172</td>
</tr>
<tr>
<td>Socializing</td>
<td>302</td>
<td>1.51 (.657)</td>
<td>1 - 4</td>
<td>1.186</td>
<td>1.136</td>
</tr>
<tr>
<td>Religious activities</td>
<td>302</td>
<td>1.78 (.948)</td>
<td>1 - 4</td>
<td>1.263</td>
<td>.632</td>
</tr>
<tr>
<td>Community activities</td>
<td>302</td>
<td>2.9 (.910)</td>
<td>1 - 4</td>
<td>.508</td>
<td>-.366</td>
</tr>
</tbody>
</table>

Table 10. *Importance* Factor Analysis Structure Matrix

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance - Leisure activities</td>
<td>.788</td>
<td></td>
</tr>
<tr>
<td>Importance - Take a vacation</td>
<td></td>
<td>.708</td>
</tr>
<tr>
<td>Importance – Socializing</td>
<td>.690</td>
<td>.337</td>
</tr>
<tr>
<td>Importance - Active recreational activities</td>
<td>.682</td>
<td></td>
</tr>
<tr>
<td>Importance - Religious activities</td>
<td></td>
<td>.825</td>
</tr>
<tr>
<td>Importance - Community activities</td>
<td>.323</td>
<td>.714</td>
</tr>
</tbody>
</table>


*Importance* Factor Analysis Component Correlation Matrix

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.000</td>
<td>.253</td>
</tr>
<tr>
<td>2</td>
<td>.253</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Satisfaction with participation was scored using the following scale: 1 = very satisfied, 2 = satisfied, 3 = somewhat satisfied, 4 = dissatisfied. Therefore, a lower score reflected greater satisfaction. Descriptive statistics regarding satisfaction with participation in the domains of interest can be found in Table 9. Factor analysis determined that there was one factor in satisfaction (Table 10).

Table 11. Descriptive Statistics Regarding Satisfaction with Participation

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active recreation</td>
<td>302</td>
<td>2.99</td>
<td>1 - 4</td>
<td>-.664</td>
<td>-.625</td>
</tr>
<tr>
<td>Leisure activities</td>
<td>302</td>
<td>2.40</td>
<td>1 - 4</td>
<td>.036</td>
<td>-.904</td>
</tr>
<tr>
<td>Vacationing</td>
<td>302</td>
<td>2.61</td>
<td>1 - 4</td>
<td>.140</td>
<td>-1.033</td>
</tr>
<tr>
<td>Socializing</td>
<td>302</td>
<td>2.30</td>
<td>1 - 4</td>
<td>.225</td>
<td>-1.042</td>
</tr>
<tr>
<td>Religious activities</td>
<td>302</td>
<td>2.19</td>
<td>1 - 4</td>
<td>.413</td>
<td>-.551</td>
</tr>
<tr>
<td>Community activities</td>
<td>302</td>
<td>2.41</td>
<td>1 - 4</td>
<td>.146</td>
<td>-.527</td>
</tr>
</tbody>
</table>

Table 12. Satisfaction Factor Analysis Component Matrix

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction - Socializing</td>
<td>.822</td>
</tr>
<tr>
<td>Satisfaction - Leisure activities</td>
<td>.809</td>
</tr>
<tr>
<td>Satisfaction - Active recreational activities</td>
<td>.740</td>
</tr>
<tr>
<td>Satisfaction – Vacationing</td>
<td>.726</td>
</tr>
<tr>
<td>Satisfaction - Community activities</td>
<td>.701</td>
</tr>
<tr>
<td>Satisfaction - Religious activities</td>
<td>.545</td>
</tr>
</tbody>
</table>

Note. Extraction Method: Principal Component Analysis. One component extracted. The solution cannot be rotated.

The mean extent score was -.1148 (n = 207, SD 3.31065, range -7.36 – 7.94, skewness .258, kurtosis -.684). The mean dynamic importance score was 6.98 (n = 302, SD 2.4709, range 4 - 16, skewness .911, kurtosis .570). The mean cerebral importance score was 3.9625 (n = 302, SD 1.44889, range 2 - 8, skewness .831, kurtosis .588). The mean satisfaction score was 0.1166
(n = 302, SD 3.33671, range -6.79 - 7.34, skewness -0.096, kurtosis -0.463) (Table 5). These variables were normally distributed.

**Findings Regarding the Extent of Participation in Community-based, Discretionary Activities by People who Use Wheelchairs**

Research questions 1 and 2 concern the *extent* of participation. The first step in determining the role of psychosocial function in predicting participation in community-based, discretionary activities was to determine the significant medical and demographic covariates. Backward elimination regression analysis was used to determine the significant medical and demographic covariates of the *extent* of participation. Years in the present living situation and a diagnosis of cerebral palsy as the condition leading to the need for a wheelchair were positively related to the *extent* of participation. In addition, education to grades 1 through 8 or grade 12 or GED were identified as predictors of non-participation at a significant level. A diagnosis of stroke as the condition leading to the need for a wheelchair predicted non-participation at a significant level (Table 13).
Table 13. Regression Analysis of Medical and Demographic Covariates of Extent of Participation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Years in Present Living Arrangement</td>
<td>.058</td>
<td>.021</td>
</tr>
<tr>
<td>Grade 1 – 8</td>
<td>-4.390</td>
<td>2.162</td>
</tr>
<tr>
<td>Grade 12 or GED</td>
<td>-1.899</td>
<td>.630</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>3.584</td>
<td>.848</td>
</tr>
<tr>
<td>Primary Condition- Stroke</td>
<td>-2.268</td>
<td>1.090</td>
</tr>
</tbody>
</table>

Note. $R^2 = .259$.

In addition to these medical and demographic covariates, it is likely that importance plays a role in the extent to which a person participates in the activities of interest in this dissertation. Therefore, a regression analysis was performed with the significant medical and demographic covariates and the two importance variables. When *dynamic importance* and *cerebral importance* were added to the regression model, they were found to be predictors of extent of participation (Table 14). The only previously identified medical or demographic covariate that remained significant was a diagnosis of cerebral palsy leading to wheelchair use.
The next step in determining the psychosocial predictors of participation was to remove the variables that were not significant and to analyze the results. Each non-significant variable was removed from the analysis one at a time until only significant variables remained. Non-significant variables were removed such that the least significant was removed at each level of the model. Table 15 shows the order by which the variables were removed as well as their significance when they were removed. In the final model, the following variables remained: a diagnosis of cerebral palsy, dynamic importance, and cerebral importance (Table 16). This indicates that they are significant predictors of the extent of participation. A diagram representing the model at this point can be found in Figure 14.
Table 15. Order of Removal and Significance of Non-significant Covariates of Extent of Participation

<table>
<thead>
<tr>
<th>Variable (in order of removal)</th>
<th>Significance (at time of removal from model)</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 1 - 8</td>
<td>.101</td>
<td>.286</td>
</tr>
<tr>
<td>Grade 12 or GEC</td>
<td>.111</td>
<td>.279</td>
</tr>
<tr>
<td>Years of living situation</td>
<td>.133</td>
<td>.273</td>
</tr>
<tr>
<td>Stroke</td>
<td>.110</td>
<td>.271</td>
</tr>
</tbody>
</table>

Table 16. Extent: Significant Covariate Predictors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>1.699</td>
<td>.485</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.395</td>
<td>.089</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.564</td>
<td>.136</td>
</tr>
</tbody>
</table>

Note. R² = .265. *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.
The next step in determining the role of psychosocial factors in predicting the extent of participation was to include each of the six psychosocial factors (social function, general mental health, emotional role function, vitality, perceived control, and reintegration to social function) in the model one at a time. Each psychosocial factor was entered individually to isolate the effects of each factor. In each regression, each psychosocial factor also was shown to be a significant predictor of extent. All of the medical and demographic covariates remained significant predictors of extent (Tables 17 – 22).
Table 17. *Extent*: Regression Analysis of Covariates and Social Function

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>1.002</td>
<td>.499</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.362</td>
<td>.087</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.579</td>
<td>.132</td>
</tr>
<tr>
<td>Social Function</td>
<td>.036</td>
<td>.009</td>
</tr>
</tbody>
</table>

Note. $R^2 = .286$. *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.

Table 18. *Extent*: Regression Analysis of Covariates and General Mental Health

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>1.489</td>
<td>.478</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.403</td>
<td>.087</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.526</td>
<td>.134</td>
</tr>
<tr>
<td>General Mental Health</td>
<td>.035</td>
<td>.010</td>
</tr>
</tbody>
</table>

Note. $R^2 = .301$. *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.
Table 19. *Extent*: Regression Analysis of Covariates and Emotional Role Functioning

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>1.674</td>
<td>.505</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.372</td>
<td>.092</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.672</td>
<td>.147</td>
</tr>
<tr>
<td>Emotional Role Functioning</td>
<td>.014</td>
<td>.006</td>
</tr>
</tbody>
</table>

Note. $R^2 = .326$. *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.

Table 20. *Extent*: Regression Analysis of Covariates and Vitality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>1.413</td>
<td>.499</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.356</td>
<td>.091</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.564</td>
<td>.136</td>
</tr>
<tr>
<td>Vitality</td>
<td>.021</td>
<td>.010</td>
</tr>
</tbody>
</table>

Note. $R^2 = .277$. *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.
Table 21. *Extent: Regression Analysis of Covariates and Perceived Control*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
<td>Beta</td>
<td>t</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>2.070</td>
<td>.514</td>
<td>.244</td>
<td>4.028</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.286</td>
<td>.090</td>
<td>-.200</td>
<td>-3.196</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.413</td>
<td>.141</td>
<td>-.183</td>
<td>-2.928</td>
</tr>
<tr>
<td>Perceived Control</td>
<td>.134</td>
<td>.024</td>
<td>.341</td>
<td>5.593</td>
</tr>
</tbody>
</table>

Note. $R^2 = .361$.  *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.

Table 22. *Extent: Regression Analysis of Covariates and Perception of Reintegration to Social Function*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
<td>Beta</td>
<td>t</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>1.636</td>
<td>.464</td>
<td>.204</td>
<td>3.527</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.327</td>
<td>.085</td>
<td>-.232</td>
<td>-3.849</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.483</td>
<td>.130</td>
<td>-.222</td>
<td>-3.705</td>
</tr>
<tr>
<td>Perception of Reintegration to</td>
<td>5.712</td>
<td>1.032</td>
<td>.321</td>
<td>5.536</td>
</tr>
<tr>
<td>Social Function</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $R^2 = .377$.  *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.
The next step in the analysis was to include all of the psychosocial factors and all of the significant medical and demographic variables in a single regression model. This step was necessary in order to account for any covariation among the psychosocial explanatory factors. In this model, a diagnosis of cerebral palsy leading to wheelchair use, dynamic importance, and cerebral importance remained significant. The only psychosocial factors that were found to be significant predictors were perceived control and perception of reintegration to social function (Table 23). The non-significant variables were then removed from the model one at a time; removing the least significant variable at each step until only significant predictors remained in the model. Table 24 identifies the order by which the variables were removed along with their significance at the time of removal. The final model of the extent of participation by wheelchair users in community-based discretionary activities includes the following significant predictors: a diagnosis of cerebral palsy leading to wheelchair use, dynamic importance, cerebral importance, perceived control, and perception of reintegration (Table 25, Figure 15).
Table 23. *Extent*: Regression Analysis of Covariates and All of the Psychosocial Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>----------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>2.145</td>
<td>.568</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.287</td>
<td>.097</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.504</td>
<td>.155</td>
</tr>
<tr>
<td>General Mental Health</td>
<td>-.002</td>
<td>.015</td>
</tr>
<tr>
<td>Social Function</td>
<td>.016</td>
<td>.014</td>
</tr>
<tr>
<td>Emotional Role Function</td>
<td>.006</td>
<td>.007</td>
</tr>
<tr>
<td>Vitality</td>
<td>-.023</td>
<td>.014</td>
</tr>
<tr>
<td>Perceived Control</td>
<td>.085</td>
<td>.037</td>
</tr>
<tr>
<td>Perception of Reintegration to Social Function</td>
<td>3.322</td>
<td>1.663</td>
</tr>
</tbody>
</table>

Note. $R^2 = .390$. *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.

Table 24. Order of Removal and Significance of Non-significant Covariates of *Extent* of Participation

<table>
<thead>
<tr>
<th>Variable (in order of removal)</th>
<th>Significance (at time of removal from model)</th>
<th>Adjusted $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Mental Health</td>
<td>.913</td>
<td>.390</td>
</tr>
<tr>
<td>Emotional Role Functioning</td>
<td>.425</td>
<td>.394</td>
</tr>
<tr>
<td>Vitality</td>
<td>.180</td>
<td>.398</td>
</tr>
<tr>
<td>Social Function</td>
<td>.105</td>
<td>.394</td>
</tr>
</tbody>
</table>
Table 25. *Extent*: Significant Predictors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>2.013</td>
<td>.506</td>
</tr>
<tr>
<td>Dynamic Importance*</td>
<td>-.276</td>
<td>.089</td>
</tr>
<tr>
<td>Cerebral Importance*</td>
<td>-.425</td>
<td>.136</td>
</tr>
<tr>
<td>Perceived Control</td>
<td>.086</td>
<td>.032</td>
</tr>
<tr>
<td>Perception of Reintegration to Social Function</td>
<td>3.634</td>
<td>1.436</td>
</tr>
</tbody>
</table>

Note. $R^2 = .388$. *The scales for Dynamic and Cerebral Importance are written such that a high score indicates low importance therefore a negative value indicates positive covariation with extent.

Figure 15. A Model Predicting the *Extent* of Participation by Wheelchair Users in Community-based, Discretionary Activities.
Findings Regarding Satisfaction with Participation in Community-based, Discretionary Activities by People who Use Wheelchairs

Research question 3 concerns satisfaction with participation. The first step in determining the role of the psychosocial factors in predicting satisfaction was to determine the significant medical and demographic covariates. Backward elimination regression analysis was used to determine the significant medical and demographic covariates of satisfaction with participation. Participants diagnosed with cerebral palsy as the condition leading to wheelchair use and those who reported greater participation were satisfied with their participation at a significant level. Those with spasticity and those with depression were not satisfied with their participation at a significant level (Table 26).

Table 26. Regression Analysis of Medical and Demographic Covariates of Satisfaction with Participation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>-1.847</td>
<td>.786</td>
</tr>
<tr>
<td>Spasticity</td>
<td>-1.004</td>
<td>.502</td>
</tr>
<tr>
<td>Depression</td>
<td>-1.641</td>
<td>.500</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.372</td>
<td>.077</td>
</tr>
</tbody>
</table>

Note. $R^2 = .259$. The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.

In addition to these medical and demographic covariates, it was necessary to determine whether importance played a role in the satisfaction with participation in the activities of interest in this dissertation. Therefore, a regression analysis was performed with the significant medical and demographic covariates and the two importance variables. When dynamic importance and
cerebral importance were added to the model, they were found not to be predictors of satisfaction (Table 27). The only previously identified medical or demographic covariate that remained significant was a diagnosis of cerebral palsy leading to wheelchair use.

Table 27. Regression Analysis of Covariates of Satisfaction with Participation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>CP</td>
<td>-1.153</td>
<td>.560</td>
</tr>
<tr>
<td>Spasticity</td>
<td>.831</td>
<td>.405</td>
</tr>
<tr>
<td>Depression</td>
<td>1.167</td>
<td>.420</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.463</td>
<td>.072</td>
</tr>
<tr>
<td>Uses public transportation or relies on friends</td>
<td>-.831</td>
<td>.462</td>
</tr>
<tr>
<td>Dynamic Importance</td>
<td>-.147</td>
<td>.094</td>
</tr>
<tr>
<td>Cerebral Importance</td>
<td>-.116</td>
<td>.143</td>
</tr>
</tbody>
</table>

Note. $R^2 = .302$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.

The next step in determining the roles of the variables was to remove the variables that were not significant and to analyze the resulting significance. Each non-significant variable was removed from the analysis one at a time until only significant predictors remained. Non-significant variables were removed such that the least significant was removed at each level of the model. Table 28 shows the order in which the variables were removed as well as their significance when they were removed. In the final model, the following variables remained: cerebral palsy, depression, and extent of participation (Table 29). This indicates that they are significant predictors of satisfaction with participation. A diagram representing the model at this point can be found in Figure 16.
Table 28. Order of Removal and Significance of Non-significant Covariates of Satisfaction with Participation

<table>
<thead>
<tr>
<th>Variable (in order of removal)</th>
<th>Significance (at time of removal from model)</th>
<th>Adjusted $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebral Importance</td>
<td>.418</td>
<td>.302</td>
</tr>
<tr>
<td>Dynamic Importance</td>
<td>.085</td>
<td>.303</td>
</tr>
<tr>
<td>Public Transportation or Friends</td>
<td>.098</td>
<td>.296</td>
</tr>
<tr>
<td>Spasticity</td>
<td>.053</td>
<td>.291</td>
</tr>
</tbody>
</table>

Table 29. Satisfaction: Significant Covariates

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>CP</td>
<td>-1.481</td>
<td>.520</td>
</tr>
<tr>
<td>Depression</td>
<td>1.313</td>
<td>.421</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.378</td>
<td>.064</td>
</tr>
</tbody>
</table>

Note. $R^2 = .265$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.

Figure 16. A Model Predicting Satisfaction with Participation in Community-based, Discretionary Activities by Wheelchair Users.
The next step in determining the role of psychosocial factors in predicting *satisfaction* with participation was to include each of the six psychosocial factors in the model one at a time. Each psychosocial factor was entered individually to isolate the effects of each factor. General mental health, social function, vitality, control, and perception of reintegration to social function were significant in each of their respective models. In the models for vitality and the perception of reintegration to social functioning, all of the covariates previously identified as significant remained significant. In the models for general mental health, social function, and control, depression was no longer found to be a significant predictor; only a diagnosis of cerebral palsy leading wheelchair use and extent of participation remained significant. In the model that included emotional role functioning, that psychosocial factor was not found to be a significant predictor but all three of the previously identified covariates remained significant (Tables 30 – 35).

Table 30. *Satisfaction*: Regression Analysis of Covariates and Social Function

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Beta</td>
</tr>
<tr>
<td>CP</td>
<td>-1.038</td>
<td>-.127</td>
</tr>
<tr>
<td>Depression</td>
<td>.817</td>
<td>.120</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.322</td>
<td>-.312</td>
</tr>
<tr>
<td>Social Function</td>
<td>-.037</td>
<td>-.246</td>
</tr>
</tbody>
</table>

Note. $R^2 = .322$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.
Table 31. *Satisfaction*: Regression Analysis of Covariates and General Mental Health

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>-1.594</td>
<td>.494</td>
</tr>
<tr>
<td>Depression</td>
<td>.268</td>
<td>.453</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.320</td>
<td>.062</td>
</tr>
<tr>
<td>General Mental Health</td>
<td>-.059</td>
<td>.012</td>
</tr>
</tbody>
</table>

Note. $R^2 = .356$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.

Table 32. *Satisfaction*: Regression Analysis of Covariates and Emotional Role Functioning

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>CP</td>
<td>-1.685</td>
<td>.533</td>
</tr>
<tr>
<td>Depression</td>
<td>1.046</td>
<td>.464</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.367</td>
<td>.067</td>
</tr>
<tr>
<td>Emotional Role Functioning</td>
<td>-.006</td>
<td>.006</td>
</tr>
</tbody>
</table>

Note. $R^2 = .302$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.
Table 33. *Satisfaction*: Regression Analysis of Covariates and Vitality

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>-1.177</td>
<td>.519</td>
</tr>
<tr>
<td>Depression</td>
<td>1.010</td>
<td>.425</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.341</td>
<td>.064</td>
</tr>
<tr>
<td>Vitality</td>
<td>-.032</td>
<td>.010</td>
</tr>
<tr>
<td></td>
<td>Beta</td>
<td>t</td>
</tr>
<tr>
<td></td>
<td>-.144</td>
<td>-2.262</td>
</tr>
<tr>
<td></td>
<td>1.48</td>
<td>2.376</td>
</tr>
<tr>
<td></td>
<td>-.331</td>
<td>-5.303</td>
</tr>
<tr>
<td></td>
<td>-.202</td>
<td>-3.183</td>
</tr>
<tr>
<td></td>
<td>t</td>
<td>Sig</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.024</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.018</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.002</td>
</tr>
</tbody>
</table>

Note. $R^2 = .312$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.

Table 34. *Satisfaction*: Regression Analysis of Covariates and Perceived Control

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>-1.699</td>
<td>.517</td>
</tr>
<tr>
<td>Depression</td>
<td>.666</td>
<td>.399</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.153</td>
<td>.066</td>
</tr>
<tr>
<td>Perceived Control</td>
<td>-.190</td>
<td>.025</td>
</tr>
<tr>
<td></td>
<td>Beta</td>
<td>t</td>
</tr>
<tr>
<td></td>
<td>-.198</td>
<td>-3.286</td>
</tr>
<tr>
<td></td>
<td>.099</td>
<td>1.668</td>
</tr>
<tr>
<td></td>
<td>-.151</td>
<td>-2.305</td>
</tr>
<tr>
<td></td>
<td>-.477</td>
<td>-7.486</td>
</tr>
<tr>
<td></td>
<td>Sig</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.097</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.000</td>
</tr>
</tbody>
</table>

Note. $R^2 = .439$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.
Table 35. *Satisfaction: Regression Analysis of Covariates and Perception of Reintegration to Social Function*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition- CP</td>
<td>-1.718</td>
<td>.484</td>
</tr>
<tr>
<td>Depression</td>
<td>.852</td>
<td>.396</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.220</td>
<td>.065</td>
</tr>
<tr>
<td>Perception of Reintegration to Social Function</td>
<td>-6.572</td>
<td>1.122</td>
</tr>
</tbody>
</table>

Note. $R^2 = .390$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.

The next step in the analysis was to include all of the psychosocial factors and all of the significant medical and demographic variables in a single regression model. This step was necessary to account for covariation among the explanatory predictors. In this model, a diagnosis of cerebral palsy leading to wheelchair use and the extent of participation remained significant. Depression was no longer a significant predictor in this model. The only psychosocial factor that was found to be a significant predictor was perceived control (Table 36). The non-significant variables were then removed from the model one at a time; removing the least significant variable at each step until only significant predictors remained in the model. Table 37 identifies the order by which the variables were removed along with their significance at the time of removal. The final model of *satisfaction* with participation in community-based discretionary activities by wheelchair users includes the following significant predictors: a diagnosis of
cerebral palsy leading to wheelchair use, extent of participation, general mental health, and perceived control (Table 38, Figure 17).

Table 36. *Satisfaction*: Regression Analysis of Covariates and All of the Psychosocial Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition - CP</td>
<td>-1.868</td>
<td>.562</td>
</tr>
<tr>
<td>Depression</td>
<td>.052</td>
<td>.477</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.154</td>
<td>.071</td>
</tr>
<tr>
<td>General Mental Health</td>
<td>-.029</td>
<td>.015</td>
</tr>
<tr>
<td>Emotional Role Function</td>
<td>.009</td>
<td>.006</td>
</tr>
<tr>
<td>Vitality</td>
<td>-.017</td>
<td>.013</td>
</tr>
<tr>
<td>Perceived Control</td>
<td>-.151</td>
<td>.035</td>
</tr>
<tr>
<td>Perception of Reintegration to Social Function</td>
<td>-1.276</td>
<td>1.573</td>
</tr>
</tbody>
</table>

Note. $R^2 = .452$. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.

Table 37. Order of Removal and Significance of Non-significant Covariates

<table>
<thead>
<tr>
<th>Variable (in order of removal)</th>
<th>Significance (at time of removal from model)</th>
<th>Adjusted $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>.913</td>
<td>.452</td>
</tr>
<tr>
<td>Social Functioning</td>
<td>.655</td>
<td>.456</td>
</tr>
<tr>
<td>Perception of Integration to</td>
<td>.427</td>
<td>.459</td>
</tr>
<tr>
<td>Social Function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Role Function</td>
<td>.227</td>
<td>.460</td>
</tr>
<tr>
<td>Vitality</td>
<td>.738</td>
<td>.457</td>
</tr>
</tbody>
</table>
Table 38. *Satisfaction*: Significant Predictors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B*</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Primary Condition - CP</td>
<td>-1.808</td>
<td>.500</td>
</tr>
<tr>
<td>Extent of Participation</td>
<td>-.139</td>
<td>.066</td>
</tr>
<tr>
<td>Perceived Control</td>
<td>-.170</td>
<td>.026</td>
</tr>
<tr>
<td>General Mental Health</td>
<td>-.034</td>
<td>.011</td>
</tr>
</tbody>
</table>

Note. R² = .388. * The scale for satisfaction is written such that a high score indicates low satisfaction. Therefore a negative value indicates positive covariation and a positive value indicates negative covariation.

Figure 17. A Model Predicting *Satisfaction* with Participation in Community-based, Discretionary Activities by Wheelchair Users.

When studying the role of psychosocial function in predicting participation in community-based, discretionary activities, it was necessary to investigate the extent to which people participated in community-based activities and their satisfaction with that participation. It was also necessary to analyze the roles of medical and demographic covariates. The only
covariate in the final model is a diagnosis of cerebral palsy leading to wheelchair use. In addition to the diagnosis of cerebral palsy, dynamic and cerebral importance, perceived control over one’s time, and perception of reintegration to social function predicted the extent to which wheelchair users participated in community-based, discretionary activities.

In addition to the diagnosis of cerebral palsy leading to wheelchair use, perceived control over one’s time and an individual’s general mental health (nervousness, sadness, calmness, and downheartedness) also predicted satisfaction. Perceived control over one’s time played a doubly important role as it predicted both the extent of participation and satisfaction with participation. Figure 18 illustrates the model of participation.
Figure 18. A Model of Participation in Community-based, Discretionary Activities.
Discussion

The purpose of this research was to determine the role of psychosocial functioning in influencing participation in community-based, discretionary activities by people who use wheelchairs. Two participation variables were studied: extent of participation and satisfaction with participation. This research demonstrates that psychosocial functioning does predict participation in community-based, discretionary activities. In the past, researchers used variables related to the extent of participation without also studying satisfaction. For example, Harris et al. (2010) used the amount of time the wheelchair user spent in his or her wheelchair as a proxy for participation. They did not, however, study the activities that occurred while the participants were in their wheelchairs in terms of the participant’s engagement. As a consequence, Harris and colleagues’ study limited the ability of the researchers to fully describe participation. By investigating both the extent of participation and satisfaction with participation this dissertation studied participation more thoroughly.

Other researchers who have studied wheelchair users have focused primarily on physical factors such as how far or fast a person propelled his or her wheelchair (Chow & Levy, 2011; Dieruf et al., 2008). Still others focused on self-care, work, and other mandatory activities such as a getting to a doctor’s appointment; on a mix of mandatory and discretionary activities; or on broader groups of people including individuals who do not use a wheelchair (M. L. Lund et al., 2007; Sonenblum et al., 2008). These research studies provide only a partial picture of participation and neglect to show the role of psychosocial functioning in participation.

Two previous studies identified the need to study the role of psychosocial functioning in predicting participation and were influential in designing the present dissertation. Chaves et al.
(2004) studied the relationship between the mobility device, the person’s impairments, and three environments. Among other results, they reported that social attitudes and self-concept limited the frequency with which participants left their homes. The results of Chaves et al.’s study did not describe psychosocial functioning sufficiently and did not enable the authors to develop a comprehensive model of participation.

Crawford et al. (2008) used the PARTS/M, RNLI, and SF-36 to study the relationship between physical activity and participation in both mandatory and discretionary activities inside and outside the home. Crawford et al.’s findings, while useful, are incomplete as they identified the physical activity levels that predicted participation without also including the psychosocial factors related to participation. Unlike Crawford et al., this dissertation investigated psychosocial characteristics rather than physical activity levels that predicted participation. By identifying the psychosocial factors that predict participation in discretionary, community-based activities by adult wheelchair users, the knowledge base is expanded and suggests that future researchers include these variables in their studies of this population. To date, comprehensive research such as this does not exist for adult wheelchair users. King et al. (2003) developed a comprehensive model of participation that includes physical and environmental factors as well as psychosocial factors. However, King et al.’s model addresses children with disabilities. This dissertation research reflects King et al.’s work but includes necessary adjustments to reflect the needs of adults who use wheelchairs. Knowledge is expanded by focusing on discretionary rather than mandatory activities and by focusing on community-based rather than home-based activities.

Previous research regarding the role of psychosocial functioning in disabled people’s participation in various activities has found that self-consciousness and the attitudes of non-disabled people were factors that influenced participation by disabled people (Card et al., 2006;
Fougeyrollas, Noreau, & Boschen, 2002; Rimmer et al., 2004). These studies and other psychosocial research projects concerning people with disabilities differ from this dissertation’s work because they do not differentiate wheelchair users from people with other mobility impairments or disabilities that do not affect mobility (P. D. A. Gum, C. Snyder, & P. W. Duncan, 2006; R. W. Motl & E. McAuley, 2010).

As previously noted, two participation variables were studied: extent of participation and satisfaction with participation. Data analysis on the extent of participation and satisfaction with participation were performed separately following the same series of steps. First, the significant medical and demographic covariates were identified through discussions with this researcher’s mentor and with experts in the field of physical rehabilitation. The list of factors was compared with the items in the data base and it was determined that the data base contained sufficient demographic and medical information to perform these analyses. Approximately 20 demographic and medical factors were investigated using regression analysis to determine which of these factors were significant predictors of extent and satisfaction.

Because the importance of each activity studied was thought to be a determinant of participation, the activity’s importance was then included in the regression analysis along with the significant demographic and medical covariates. This was necessary to determine the role that the importance of the activities played in predicting the extent of participation after controlling for the covariates. It is interesting that certain demographic and medical covariates were no longer significant predictors of participation when importance was included in the model. The following variables were eliminated as predictors of the extent of participation when importance was added to the model: years in the present living arrangement, education to grades 6-8 and 12 (or GED), and having a primary diagnosis of stroke. A diagnosis of cerebral palsy
was the only medical or demographic covariate that remained a positive predictor of the extent of participation.

These preliminary analyses were helpful in examining the complicated relationships among the various medical and demographic covariates. In addition, the results of these analyses indicated that my assumptions were not supported. For example, through previous clinical work and discussions with other rehabilitation professions, I assigned much greater importance to the type of wheelchair a person used and the person’s living situation than was the case. Although not specifically the purpose of this study, these findings are extremely important to share with rehabilitation professionals who specialize in seating and mobility and may be indicative of changes that might be made in prescribing therapies and equipment to wheelchair users. It may be that, rather than the type of mobility device the wheelchair user has, it is actually whether the device is the optimal or most appropriate device for the individual that impacts participation. That variable however, was not included in the data base and as such could not be studied in this dissertation.

It was surprising that the length of time a person was diagnosed with the condition leading to their wheelchair use did not predict participation. This researcher expected that people who recently began using their wheelchairs would participate to a lesser extent than those who had used their wheelchairs for longer lengths of time because they needed time to acclimate to their condition and new status as wheelchair users. Apparently, this was not the case. In this study, length of time since the diagnosis resulting in wheelchair user did not predict either extent of or satisfaction with participation.

The study data set included information about how much help participants required in hours per week. It also identified the caregivers. Neither the amount of help nor the identity of
the caregiver predicted participation. Future studies should also account for the types of tasks for which assistance is needed such as personal versus household care. It is plausible to think that people who need assistance of a more personal nature, such as, for example, for dressing or feeding, would have more difficulty participating in discretionary activities than those who need help with less personal tasks like writing checks to pay bills or shopping for groceries. Conversely, however, it is also plausible that people who use more assistance might conserve energy for desired activities and therefore be more able to participate in discretionary activities. Similarly broad arguments can be made regarding the people who provide assistance. It is equally plausible that a person may be more active if his or her assistant is a relative or a stranger dependent on the relationship they develop, the ease with which the wheelchair user can ask for help, and the strength with which (s)he makes his/her needs known. In this dissertation, the amount of assistance used and the source of the assistance were not found to be significant predictors of participation. It may be however, if different questions were asked, the findings might show that assistance actually does predict participation.

Interestingly, as noted above, the only medical or demographic covariate that predicted either the extent of participation or satisfaction with participation was a diagnosis of cerebral palsy leading to wheelchair use. Cerebral palsy predicted both a high frequency (extent) of participation as well as high satisfaction with participation. It is not obvious why this diagnosis would predict participation while other diagnoses leading to wheelchair use do not. However, in a study in Sweden on dependence in daily activities and life satisfaction of people with cerebral palsy, researchers found their participants reported high satisfaction with life in general even when the participants needed progressively more assistance with daily living talks and mobility (Andren & Grimby, 2004). Because they did not investigate participation in discretionary
activities, these findings cannot be generalized to this dissertation. Of the diagnoses leading to wheelchair use included in this study, cerebral palsy is the only disability present at birth. It may be that growing up with a disability or as a wheelchair user impacts participation but this is not clear, especially since the length of time since the onset of the disabling condition was not found to predict either extent or satisfaction.

In this study, the concept of importance was represented by two variables: cerebral importance and dynamic importance because factor analysis of this variable revealed that importance was comprised of two components. Cerebral importance is the label given to the component comprised of importance related to socializing, religious activities, and community activities. Dynamic importance is the label given to the component comprised of importance related to leisure activities, taking a vacation, and active recreational activities. This study demonstrated that both cerebral importance and dynamic importance are significant positive predictors of the extent of participation. In order to understand the role of importance, it is necessary to study the concept in greater detail. Future research needs to address the characteristics that make an activity important to an individual, such as whether it is the activity itself or the other people who also participate. It would also be necessary to determine the reasons that people do not participate in activities they identify as important. There may be other factors that influence a person’s participation in certain discretionary activities. This dissertation study was not sensitive enough to determine, for example, whether a person who thought a given activity was important or not is based on other factors like access to the activity’s location or finances needed to participate.

This dissertation focused on a broad spectrum of psychosocial factors all of which impact participation in discretionary activities: social functioning, general mental health, emotional role
functioning, vitality, perceived control over one’s time, and perception of reintegration to social function. Once the significant demographic and medical covariates (including importance) were identified, a separate series of regression analyses were performed on the extent of participation and on satisfaction with participation for each of the psychosocial factors considered individually. These analyses revealed that every psychosocial factor was a significant positive predictor of both the extent of and satisfaction with participation with one exception. However, emotional role functioning was not found to predict satisfaction with participation. It did, however, positively predict extent of participation.

When all of the psychosocial factors were included in a regression model along with the significant medical and demographic covariates, only perceived control and perception of reintegration were found to predict the extent of and satisfaction with participation. As the participants’ perceived control increased and as their perception of reintegration increased, there was a corresponding increase in the extent of participation and in the participant’s satisfaction with their participation. Since the majority of the community-based, discretionary activities investigated in this study are social, it follows that people in this study who report they have reintegrated to social function also participate more in such activities and are more satisfied with their participation.

Although the remaining psychosocial factors did not predict participation when they were included in the model as a group, they were shown to predict participation when they were examined in the model individually. This indicates they could have an indirect effect on the extent of participation and on satisfaction with participation. However, in order to determine this, it would be necessary to study participation at an earlier time to see the effect of these potential predictors over time.
Study Limitations

There are limitations to this study that need to be considered when assessing the value of the results. The sample of this research was diverse with the exception of race/ethnicity in that 88.1% of the participants identified themselves as white whereas, according to US Census data of 2000, 57.4% of the disabled population was white (US Census Bureau, 2009). There are a few possible explanations for this. The US Census data include people with all disabilities not just people who use wheelchairs so this may not be a comparable population. It is also possible that people of color and of diverse ethnicities participate less in the organizations where recruitment took place which included Independent Living Centers and national disability, diagnosis, and condition support groups. In a study comparing participation of children with and without disabilities in community-based activities, Bedell, et al. also report that 81% of their participants were white, non-hispanic (Bedell et al., 2013). Bedell identified this as a limitation of their study as well. It seems evident that better methods are needed to recruit participants characterized by greater diversity in race and ethnicity. As such, the research findings have limited generalizability. Cultural norms may influence not only the types of discretionary activities in which people participate, they also may influence their views of disability and wheelchair use. Cultural norms may also influence the extent to which people participate in various activities. Although ethnicity did not predict participation in this study, it may be because of the limited diversity in the study sample.

The five medical conditions that led participants in this study to use wheelchairs were spinal cord injury, stroke, cerebral palsy, polio, and multiple sclerosis. I initially assigned greater importance to the medical condition leading to wheelchair use as a predictor of participation and thought that people with different diagnoses would participate to different extents but this turned
out not to be the case. Four of the five diagnoses were fairly evenly represented in the participant pool (19.9%-29.8%) but only 6% of the participants were diagnosed with stroke as the condition leading to wheelchair use. It is not clear from the recruitment strategies why so few people who had strokes were recruited or agreed to participate. While having had a stroke did not predict participation in this study, so small a sample may not be representative of the population of people who had strokes in the areas from which participants were recruited. Additional research including more stroke survivors may reveal other important findings.

Using a Secondary Source for Data

There are many benefits to using a secondary data set, the first of which is that the data already exist. In research, this translates into time and money saved. Data collection is time consuming and costly. Using an existing data set shrinks the amount of time necessary to complete a study. The data set used in this dissertation included the information needed to answer the research questions and, as such, was an asset. This data set contains a wealth of information and should be used to answer additional questions in the future.

Using an existing data set also has the potential to lead to problems because the researcher may not have access to details of data collection and input that are necessary for full analysis. Such was the case for this data set. The problems and resulting limitations are discussed here. One example concerns how the participants reported their living situations. Participants were asked “how many people do you live with?” Whether participants included themselves or not in the reported number is not clear. One hundred and seventeen people indicated that they lived with one person. Of those 117 people, 80 also reported that they were married. While being married does not necessarily mean that every person lives with his or her spouse, it is likely that most of the married participants do live with their spouse suggesting that when they responded
that they lived with one person, it was the spouse. The problem is that there was not an option for participants to indicate that they lived with zero people which would be the appropriate answer for people living alone. Instead the divorced, widowed, and never been married people also likely responded that they lived with at least one person. This is important because people living with a spouse or other housemates may be more likely to participate in discretionary activities outside the home than those living alone. Without access to reliable data, it is not possible to infer participation based on whether the participants live with at least one other person or not. Future studies should take this into account.

**Recommendations for Future Research and Practice**

Investigating participation by people with disabilities is a complicated endeavor. Previous research has investigated participation in various activities by various people including mandatory and discretionary activities, activities that occur inside the home and in the community, and by mixed groups of disabled people (Card et al., 2006; Chaves et al., 2004; Crawford, Hollingsworth, Morgan, & Gray, 2008; Gum et al., 2006; Harris, Sprigle, Sonenblum, & Maurer, 2010; Noreau et al., 2002; Rimmer et al., 2004). This dissertation is among the first to describe a model of participation that focuses primarily on the effects of psychosocial functioning of physically disabled people who use wheelchairs and the path diagram of this model can be found on page 81. Developing this model was, in fact, the intent of this dissertation. Much greater research will be needed in the future to fill this model out so that it accounts for the plethora of psychosocial, physical, and environmental factors that influence participation. Additionally, further research is needed to determine differences and similarities in patterns of participation by various groups of people with disabilities as well as to determine their satisfaction with their participation and the facilitators and barriers to participation. It is also
important to compare the findings in this dissertation to research broader populations including people without disabilities and disabled people who do not use wheelchairs. However, this dissertation research is cross-sectional in nature. As such, this research yields a limited view of the role of psychosocial functioning in predicting in community-based, discretionary activities by wheelchair users. As noted above, each one of the psychosocial factors studied positively predicted participation when the factors were included in the regression model individually but most were no longer predictive when analyzed together. In order to understand the relationships between the psychosocial factors of interest longitudinal studies are needed. Longitudinal studies are also needed to investigate the predictive value of the medical and demographic covariates over time.

This research reveals that further investigation regarding wheelchair prescription is needed. Whether the person used a power wheelchair, manual wheelchair, or scooter was found not to predict participation in community-based, discretionary activities. The question that arises from this finding is whether the study participants had the appropriate seating and mobility devices. Future studies should investigate whether the appropriateness of the mobility device correlates with participation.

In accordance with the UN Convention on the Rights of People with Disabilities, it may be beneficial to change the focus of rehabilitation putting greater emphasis on participation in community-based activities. Because this dissertation research demonstrates that psychosocial functioning predicts such participation, it may be beneficial to develop inpatient programs that focus on improving psychosocial functioning, especially general mental health and perceived control. Such programs could include peer and/or group counseling and assertiveness training. By addressing general mental health and perceived control, wheelchair users may be more apt to
participate in community-based, discretionary activities after they are discharged from their rehabilitation hospitals. This research may also indicate that training programs for wheelchair users should include peer learning. Working with role models who have similar physical conditions may help people realize how they can increase their control over their own lives leading to more participation and better satisfaction with their participation in discretionary activities. Future research in program develop should study whether having novice wheelchair users work with experienced wheelchair users is an efficient and effective program model.

It would also be beneficial to design follow-up, community-based treatment that allows individuals to work on skills needed to access the community, to continue to address general mental health, and to allow individuals to explore various activities that might be of interest. This represents a major change in traditional practice and would require research to identify the psychosocial factors and then to determine the best strategies to improve them. If it was determined that an increased focus on psychosocial functioning in rehabilitation leads to increased participation in community-based, discretionary activities, it follows that the curricula of educational programs would need to be adjusted to address these altered focii.

Although this research did not investigate federal, state, or local policy related to participation by people who use wheelchairs, there are potential implications for policy. The need for this research was based in part on the principle of full and effective participation and inclusion of people with disabilities in society by the United Nations Convention of the Rights of Persons with Disabilities (United Nations General Assembly, 2006). The findings of this dissertation dovetail with the principles of the Convention in two ways. Firstly, the findings of this dissertation indicated that perceived control and the perception of reintegration predict participation in community-based activities. More participation and leadership in the activities of
interest by people who use wheelchairs may increase their own perceived control and reintegration and may also have a broader effect in that other people who use wheelchairs would then have more role models of these behaviors.

These findings may have policy implications in that society needs to both be open to participation and leadership by wheelchair users and make such opportunities available in an effort to further increase such participation. The second way these findings can have an impact on policy is to make people think about where they see or do not see people who use wheelchairs. It may also cause readers to think about why people who use wheelchairs and others with disabilities are not present more frequently and at various levels in all community-based activities.

Although this dissertation does not investigate participation in work activities, this is another area that may be related to this study. In our society, work activities are very important in defining the individual. According to the Bureau of Labor Statistics, people with disabilities are employed in the civilian labor force at a rate of 21.8% while the rate for people with no disabilities is 70.1% (United States Department of Labor, 2012). There may be correlations or causal relationships between employment and perceived control and reintegration. There may also be correlations or causal relationships between employment, financial means, and participation in discretionary activities.
Appendix A: UN Convention of the Rights of Persons with Disabilities: Articles Relevant to this Research

Article 9- Accessibility. This article addresses accessibility of the physical environment as well as transportation, information, and communications. It requires that obstacles and barriers to access be identified and eliminated.

Article 19- Living independently and being included in the community. This article recognizes the need to live in the community and for people with disabilities to have choices equal to others for full inclusion and participation in the community.

Article 20- Personal mobility. This article requires that effective measures be taken to provide the greatest possible independence including affordable mobility aids and training in their use. This article also instructs equipment producers to address all aspects of mobility.

Article 29- Participation in political and public life. This article recognizes that people with disabilities have the right to effective and full participation in political and public life be available to people with disabilities at local, regional, national, and international levels.

Article 30- Participation in cultural life, recreation, leisure, and sport. This article recognizes that all appropriate measures should be taken to ensure equal access to cultural, recreational, and leisure activities.
Appendix B: Letter of Agreement

Gray, David graydb@wusm.wustl.edu via nyu.edu 1/16/12

to anita.perr, Gary

Greetings Anita and Hello Dr. Winkel,

I’m pleased that you are interested in the PARTS/M data. The PARTS/M had two versions – a published version and one with several other activities. The additional activities were eliminated because of reliability issues. We need to make certain that the data set I sent you is the published version. Could you attach the version I sent you in a return email. Then I’ll know which data dictionary to send to you.

The PARTS/M was administered at the same time as the FABS/M. Each survey respondent filled out a third survey section that has demographics and several other surveys – SF 36, RN, Duke Social Support Scale, PIP and many of the CDC BRFSS questions. We included these addition ‘standard’ tests to examine the PARTS/M and FABS/M for similarities and differences. I mention these details to let you know the extent of the data set so that your selection of a topic for your dissertation considers a variety of possibilities. Please see the attached article for some details on how we developed the PARTS/M and FABS/M.

I have no problem with your use of the data set for your dissertation. The work you do on the data set will be yours and yours alone. I would like to be included as an author on papers coming from your work. But if I have no important intellectual contribution, then you do not need to include me as an author.

I would like to be a reader on your committee and participate in your committee meeting(s) but I will need to check the Washington University administration regarding any policy they have that might prohibit my participation. I seriously doubt they have any such policy. I’ll check tomorrow.

Cheers,
Dave
Appendix C: The Participation Survey/Mobility (PARTS/M)
PARTICIPATION SURVEY / MOBILITY

Password: ________  Participant ID Number: ________

Which size or format of text would you like to use for viewing these questions?

- 1) Smallest black text on white background
- 2) Small black text on white background
- 3) Medium black text on white background
- 4) Large black text on white background
- 5) Smallest white text on black background
- 6) Small white text on black background
- 7) Medium white text on black background
- 8) Large white text on black background
- 9) I use a screen reader

This interview is completely voluntary on your part. Thank you for agreeing to participate. The questions in this survey will take about 20-30 minutes of your time to answer.

This survey asks about participation in major life activities. It consists of 20 different areas of major life activities, and the questions are similar in each area. Please answer the questions using the framework of a typical day in the past 4 weeks. A typical day is neither your worst day nor your best day but represents most of your days during the past 4 weeks.

The definitions on the following page may help you answer these survey questions.

Thank you for agreeing to continue with the questionnaire.

Washington University in St. Louis School of Medicine  David B Gray, PhD
Program in Occupational Therapy
Choice means having the opportunity to select freely from a number of available options concerning when, where, how, how often, and with whom you participate for each of the activities listed in this survey.

Satisfaction refers to how you feel about your participation in each of the activities listed in this survey.

Importance represents how much you value participating in the activities listed in this survey.

Participation limitations are health-related problems that interfere with your ability to do activities.

Accommodations are ways of changing your environment to make activities easier to do. Some examples are placing items within reach, arranging furniture so that you can move around more easily, scheduling preparation time for activities, or calling ahead to check on accessibility.

Adaptations are changes made to rooms or buildings, such as lowered shelves or widened doors, or the use of special devices, such as a raised toilet, hand-held shower, grab bars, a ramp, or a modified cutting board to secure food. Adaptations could also include choosing to purchase such things as a portable phone instead of a stationary phone, a long-handled shoehorn instead of a short one, or a refrigerator with a freezer on the side or bottom instead of on the top.

Special equipment is equipment made especially for people with mobility limitations, including, but not limited to, a wheelchair, scooter, walker, cane, crutches, orthotic or prosthetic device, reacher, communication board, sliding board, adapted vehicle, lift, or an accessible parking permit.

Interdependence is the connection between a person and the special equipment and/or personal assistance that person uses which allows for participation in activities. A person may use one or both, allowing for a greater level of participation than would be possible without either. The more effective the fit, the higher level of interdependence is achieved.
DRESSING: The next questions are about dressing. Dressing includes selecting, putting on and taking off clothing, and changing clothing during the day.

1. How much time do you require for dressing on a typical day?
   - More than 20 minutes
   - 10 to 20 minutes
   - Less than 10 minutes

2. Is your participation in dressing limited by ... (Check all that apply.)
   - Illness
   - A physical impairment
   - Pain
   - Fatigue
   - Not limited

3. When dressing, how much choice do you have compared to others without mobility limitations? (Choice includes how often, when, where and how you dress.)
   - A lot of choice
   - Some choice
   - Little choice
   - No choice

4. How satisfied are you with your participation in dressing?
   - Very satisfied
   - Satisfied
   - Somewhat satisfied
   - Dissatisfied

5. How much help from another person do you require for dressing?
   - A great deal
   - A moderate amount
   - Just a little
   - None

6. How often do you use accommodations, adaptations, or special equipment to dress?
   - All of the time
   - Most of the time
   - Some of the time
   - A little of the time
   - Never

BATHING: The following questions are about bathing. Bathing includes taking a shower, a bath, or a sponge bath.

1. How much time do you require to bathe on a typical day? (This includes preparing to bathe.)
   - More than 20 minutes
   - 10 to 20 minutes
   - Less than 10 minutes

2. Is your participation in bathing limited by ... (Check all that apply.)
   - Illness
   - A physical impairment
   - Pain
   - Fatigue
   - Not limited

3. When bathing, how much choice do you have compared to others without mobility limitations? (Choice includes how often, when, where and how you bathe.)
   - A lot of choice
   - Some choice
   - Little choice
   - No choice

4. How satisfied are you with your participation in bathing?
   - Very satisfied
   - Satisfied
   - Somewhat satisfied
   - Dissatisfied

5. How much help from another person do you require for bathing?
   - A great deal
   - A moderate amount
   - Just a little
   - None

6. How often do you use accommodations, adaptations, or special equipment to bathe?
   - All of the time
   - Most of the time
   - Some of the time
   - A little of the time
   - Never
BLADDER CARE: The next questions involve emptying your bladder, which includes getting to a bathroom, adjusting clothing, using accommodations, or using special equipment.

1. How much time do you require for bladder care on a typical day?
   □ More than 60 minutes  □ 30 to 60 minutes  □ Less than 30 minutes

2. Is your participation in performing and managing bladder care limited by ...
   (Check all that apply.)
   □ Illness  □ A physical impairment  □ Pain  □ Fatigue  □ Not limited

3. For management of bladder care, how much choice do you have compared to others without mobility limitations? (Choice includes when, where and how care takes place.)
   □ A lot of choice  □ Some choice  □ Little choice  □ No choice

4. How satisfied are you with your participation in bladder care?
   □ Very satisfied  □ Satisfied  □ Somewhat satisfied  □ Dissatisfied

5. How much help from another person do you require for bladder care?
   □ A great deal  □ A moderate amount  □ Just a little  □ None

6. How often do you use accommodations, adaptations, or special equipment for bladder care?
   □ All of the time  □ Most of the time  □ Some of the time  □ A little of the time  □ Never

******************************************************************************

BOWEL CARE: The next questions involve bowel care, which includes a bowel management routine and the use of any special equipment.

1. How much time do you require for bowel care in a typical week?
   □ More than 3 hours  □ 1 to 3 hours  □ Less than 1 hour

2. Is your participation in performing and managing bowel care limited by ...
   (Check all that apply.)
   □ Illness  □ A physical impairment  □ Pain  □ Fatigue  □ Not limited

3. For management of bowel care, how much choice do you have compared to others without mobility limitations? (Choice includes when, where and how care takes place.)
   □ A lot of choice  □ Some choice  □ Little choice  □ No choice

4. How satisfied are you with your participation in bowel care?
   □ Very satisfied  □ Satisfied  □ Somewhat satisfied  □ Dissatisfied

5. How much help from another person do you require for bowel care?
   □ A great deal  □ A moderate amount  □ Just a little  □ None

6. How often do you use accommodations, adaptations, or special equipment for bowel care?
   □ All of the time  □ Most of the time  □ Some of the time  □ A little of the time  □ Never
MEALS: These questions about typical meals include preparation as well as eating.

1. In a typical day, how much time do you spend eating meals?
   - [ ] Over 3 hours
   - [ ] 1 to 3 hours
   - [ ] Under 1 hour

2. Is your participation in meal preparation limited by … (Check all that apply.)
   - [ ] Illness
   - [ ] A physical impairment
   - [ ] Pain
   - [ ] Fatigue
   - [ ] Not limited

3. For meals, how much choice do you have compared to others without mobility limitations? (Choice includes when, what, where and with whom you eat.)
   - [ ] A lot of choice
   - [ ] Some choice
   - [ ] Little choice
   - [ ] No choice

4. How satisfied are you with your participation in meals?
   - [ ] Very satisfied
   - [ ] Satisfied
   - [ ] Somewhat satisfied
   - [ ] Dissatisfied

5. How much help from another person do you need to eat a meal?
   - [ ] A great deal
   - [ ] A moderate amount
   - [ ] Just a little
   - [ ] None

6. How often do you use accommodations, adaptations, or special equipment to eat meals?
   - [ ] All of the time
   - [ ] Most of the time
   - [ ] Some of the time
   - [ ] A little of the time
   - [ ] Never

MOVING AROUND INSIDE YOUR HOME: The following questions are about moving around inside your home. This includes getting out of bed, getting out of a chair, going from room to room or getting to another floor, such as the basement.

1. How many waking hours each day do you spend in the following rooms of your home?

<table>
<thead>
<tr>
<th>Room</th>
<th>More than 4</th>
<th>1 to 4</th>
<th>Less than 1</th>
<th>Not applicable to my home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living room</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Dining room</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Kitchen</td>
<td>[ ]</td>
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</tr>
<tr>
<td>Bathroom</td>
<td>[ ]</td>
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</tr>
<tr>
<td>Bedroom</td>
<td>[ ]</td>
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<td>[ ]</td>
</tr>
<tr>
<td>Study</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Basement</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

2. Is your participation in moving around your home limited by … (Check all that apply.)
   - [ ] Illness
   - [ ] A physical impairment
   - [ ] Pain
   - [ ] Fatigue
   - [ ] Not limited

3. When moving around your home, how much choice do you have compared to others without mobility limitations? (Choice includes when, where and how you move around.)
   - [ ] A lot of choice
   - [ ] Some choice
   - [ ] Little choice
   - [ ] No choice

4. How satisfied are you with your participation in moving around your home?
   - [ ] Very satisfied
   - [ ] Satisfied
   - [ ] Somewhat satisfied
   - [ ] Dissatisfied

5. How much help from another person do you need to move around your home?
   - [ ] A great deal
   - [ ] A moderate amount
   - [ ] Just a little
   - [ ] None

6. How often do you use accommodations, adaptations, or special equipment to move around your home?
   - [ ] All of the time
   - [ ] Most of the time
   - [ ] Some of the time
   - [ ] A little of the time
   - [ ] Never
FOR THE REMAINDER OF THIS SURVEY, please continue to complete questions for each activity. However, if you NEVER participate in a specific activity, follow the instructions regarding which questions you may skip.

WORKING INSIDE YOUR HOME: The following questions refer to working inside your home. This topic includes washing dishes, doing laundry, cleaning house, or making repairs.

1. How frequently do you participate in housework or home maintenance activities?
   - □ 5 or more times a week  □ 3 to 4 times a week  □ 1 to 2 times a week  □ Never*

2. Is your participation in housework or home maintenance limited by ... (Check all that apply.)
   - □ Illness  □ A physical impairment  □ Pain  □ Fatigue  □ Not limited

3. How important is it for you to participate in housework or home maintenance?
   - □ Very important  □ Somewhat important  □ Somewhat unimportant  □ Not important

4. To participate in housework or home maintenance activities, how much choice do you have compared to others without mobility limitations? (Choice includes how often, when, how and by whom the activities are completed.)
   - □ A lot of choice  □ Some choice  □ Little choice  □ No choice
   ~ If you answered *NEVER to question 1 - Go to EXTERIOR MAINTENANCE ~

5. How satisfied are you with your participation in housework or home maintenance?
   - □ Very satisfied  □ Satisfied  □ Somewhat satisfied  □ Dissatisfied

6. How much help from another person do you require?
   - □ A great deal  □ A moderate amount  □ Just a little  □ None

7. How often do you use accommodations, adaptations, or special equipment for housework or home maintenance activities?
   - □ All of the time  □ Most of the time  □ Some of the time  □ A little of the time  □ Never

EXTERIOR MAINTENANCE: The following questions refer to outdoor home maintenance activities (for example, gardening or making exterior repairs).

1. How frequently do you participate in outdoor home maintenance activities?
   - □ 5 or more times a week  □ 3 to 4 times a week  □ 1 to 2 times a week  □ Never*

2. Is your participation in outdoor home maintenance limited by ... (Check all that apply.)
   - □ Illness  □ A physical impairment  □ Pain  □ Fatigue  □ Not limited

3. How important is it for you to participate in outdoor home maintenance?
   - □ Very important  □ Somewhat important  □ Somewhat unimportant  □ Not important

4. To participate in outdoor home maintenance activities, how much choice do you have compared to others without mobility limitations? (Choice includes how often, when, how and by whom these activities are completed.)
   - □ A lot of choice  □ Some choice  □ Little choice  □ No choice
   ~ If you answered *NEVER to question 1 - Go to LEAVING YOUR HOME ~

5. How satisfied are you with your participation in outdoor home maintenance?
   - □ Very satisfied  □ Satisfied  □ Somewhat satisfied  □ Dissatisfied

6. How much help from another person do you require?
   - □ A great deal  □ A moderate amount  □ Just a little  □ None

7. How often do you use accommodations, adaptations, or special equipment for outdoor home maintenance activities?
   - □ All of the time  □ Most of the time  □ Some of the time  □ A little of the time  □ Never

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LEAVING YOUR HOME: The following questions are about leaving your home to go into the community (such as to go shopping or to the doctor). This includes getting into a vehicle.

1. How frequently do you leave your home?
   - 0 3 or more times a day
   - 0 Once or twice a week
   - 0 Never
   - 0 Once or twice a month

2. Is your participation in leaving your home limited by ... (Check all that apply.)
   - 0 Illness
   - 0 A physical impairment
   - 0 Pain
   - 0 Fatigue
   - 0 Not limited

3. How important is it for you to leave your home?
   - 0 Very important
   - 0 Somewhat important
   - 0 Somewhat unimportant
   - 0 Not important

4. To leave your home, how much choice do you have compared to others without mobility limitations? (Choice includes how often, when, and how you leave and where you go.)
   - 0 A lot of choice
   - 0 Some choice
   - 0 Little choice
   - 0 No choice

~ If you answered NEVER* to question 1 - Go to ACTIVE RECREATION ~

5. How satisfied are you with your participation in leaving your home?
   - 0 Very satisfied
   - 0 Satisfied
   - 0 Somewhat satisfied
   - 0 Dissatisfied

6. How much help from another person do you need to leave your home?
   - 0 A great deal
   - 0 A moderate amount
   - 0 Just a little
   - 0 None

7. How often do you use accommodations, adaptations, or special equipment to leave your home?
   - 0 All of the time
   - 0 Most of the time
   - 0 Some of the time
   - 0 A little of the time
   - 0 Never

ACTIVE RECREATION: The following questions are about active recreational activities, such as a team sport or camping.

1. For the following active recreational activities, please indicate how often you do them.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swimming</td>
<td>0 Never*</td>
</tr>
<tr>
<td>Playing golf</td>
<td>0 2 times/month</td>
</tr>
<tr>
<td>Playing basketball</td>
<td>0 Never*</td>
</tr>
<tr>
<td>Skiing</td>
<td>0 2 times/month</td>
</tr>
<tr>
<td>Racing</td>
<td>0 Never*</td>
</tr>
<tr>
<td>Bowling</td>
<td>0 Never*</td>
</tr>
<tr>
<td>Camping</td>
<td>0 Never*</td>
</tr>
<tr>
<td>Going on nature trails</td>
<td>0 Never*</td>
</tr>
</tbody>
</table>

2. Is your participation in active recreational activities limited by ... (Check all that apply.)
   - 0 Illness
   - 0 A physical impairment
   - 0 Pain
   - 0 Fatigue
   - 0 Not limited

3. How important is it for you to participate in active recreational activities?
   - 0 Very important
   - 0 Somewhat important
   - 0 Somewhat unimportant
   - 0 Not important

4. To participate in active recreational activities, how much choice do you have compared to others without mobility limitations? (Choice includes how, where, when, how often, and with whom you participate in activities.)
   - 0 A lot of choice
   - 0 Some choice
   - 0 Little choice
   - 0 No choice

~ If you answered NEVER* to ALL activities in question 1 - Go to LEISURE ACTIVITIES ~

5. How satisfied are you with your participation in active recreational activities?
   - 0 Very satisfied
   - 0 Satisfied
   - 0 Somewhat satisfied
   - 0 Dissatisfied

6. How much help from another person do you require?
   - 0 A great deal
   - 0 A moderate amount
   - 0 Just a little
   - 0 None

7. How often do you use accommodations, adaptations, or special equipment for active recreational activities?
   - 0 All of the time
   - 0 Most of the time
   - 0 Some of the time
   - 0 A little of the time
   - 0 Never
LEISURE ACTIVITIES: The following questions are about leisure activities, such as spectator sports, playing cards and going to movies.

1. For the following leisure activities, please indicate how often you do them.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never</th>
<th>1-2 times/month</th>
<th>1-2 times/week</th>
<th>More than twice/week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dining out</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attending movies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attending concerts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Playing cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Playing board games</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watching sports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hobbies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Is your participation in leisure activities limited by ... (Check all that apply.)
   - Illness
   - A physical impairment
   - Pain
   - Fatigue
   - Not limited

3. How important is it for you to participate in leisure activities?
   - Very important
   - Somewhat important
   - Somewhat unimportant
   - Not important

4. To participate in leisure activities, how much choice do you have compared to others without mobility limitations? (Choice includes how, where, when, how often, and with whom you participate in leisure activities.)
   - A lot of choice
   - Some choice
   - Little choice
   - No choice

   ~ If you answered NEVER* to ALL activities in question 1 - Go to TAKING VACATIONS ~

5. How satisfied are you with your participation in leisure activities?
   - Very satisfied
   - Satisfied
   - Somewhat satisfied
   - Dissatisfied

6. How much help from another person do you need to participate?
   - A great deal
   - A moderate amount
   - Just a little
   - None

7. How often do you use accommodations, adaptations, or special equipment for leisure activities?
   - All of the time
   - Most of the time
   - Some of the time
   - A little of the time
   - Never

TAKING VACATIONS: The next questions are about taking vacations away from home.

1. How often do you take a vacation?
   - More than twice a year
   - Once or twice a year
   - Less than once a year
   - Never*

2. Is your participation in taking a vacation limited by ... (Check all that apply.)
   - Illness
   - A physical impairment
   - Pain
   - Fatigue
   - Not limited

3. How important is it for you to take a vacation?
   - Very important
   - Somewhat important
   - Somewhat unimportant
   - Not important

4. When taking a vacation, how much choice do you have compared to others without mobility limitations? (Choice includes how, where, when and how often you take a vacation.)
   - A lot of choice
   - Some choice
   - Little choice
   - No choice

   ~ If you answered NEVER* to question 1 - Go to SOCIALIZING ~

5. How satisfied are you with your participation in taking a vacation?
   - Very satisfied
   - Satisfied
   - Somewhat satisfied
   - Dissatisfied

6. How much help from another person do you require to take a vacation?
   - A great deal
   - A moderate amount
   - Just a little
   - None

7. How often do you use accommodations, adaptations, or special equipment for a vacation?
   - All of the time
   - Most of the time
   - Some of the time
   - A little of the time
   - Never
SOCIALIZING: The next questions are about socializing with people. This includes visiting with friends or family at home, at the homes of others, or at social events.

1. How frequently do you socialize with others?
   - Daily / Almost daily
   - 3 - 4 times a week
   - 1 - 2 times a week
   - Less than once a week

2. Is your participation in social activities limited by ... (Check all that apply.)
   - Illness
   - A physical impairment
   - Pain
   - Fatigue
   - Not limited

3. How important is it for you to participate in social activities?
   - Very important
   - Somewhat important
   - Somewhat unimportant
   - Not important

4. When socializing, how much choice do you have compared to others without mobility limitations? (Choice includes how often, when, how and with whom you socialize.)
   - A lot of choice
   - Some choice
   - Little choice
   - No choice

5. How satisfied are you with your participation in socializing?
   - Very satisfied
   - Satisfied
   - Somewhat satisfied
   - Dissatisfied

6. How much help from another person do you require to socialize?
   - A great deal
   - A moderate amount
   - Just a little
   - None

7. How often do you use accommodations, adaptations, or special equipment to socialize?
   - All of the time
   - Most of the time
   - Some of the time
   - A little of the time
   - Never

PARENTING: The following questions involve parenting, which includes spending time with children, grandchildren or others with whom you have a parenting relationship.

1. Do you participate in parenting or grandparenting activities?
   - Yes (Continue.)
   - No (Go to NEXT ACTIVITY - INTIMACY.)
   - NA - no children/grandchildren (Go to NEXT ACTIVITY - INTIMACY.)

2. How frequently do you participate in a parenting/grandparenting activity?
   - Daily / Almost daily
   - 3 - 4 times a week
   - 1 - 2 times a week
   - Less than once a week

3. Is your participation in parenting/grandparenting activities limited by ... (Check all that apply.)
   - Illness
   - A physical impairment
   - Pain
   - Fatigue
   - Not limited

4. How important is it for you to participate in parenting/grandparenting activities?
   - Very important
   - Somewhat important
   - Somewhat unimportant
   - Not important

5. To participate in parenting/grandparenting activities, how much choice do you have compared to others without mobility limitations? (Choice includes when, where, how and with whom.)
   - A lot of choice
   - Some choice
   - Little choice
   - No choice

6. How satisfied are you with your participation in parenting/grandparenting activities?
   - Very satisfied
   - Satisfied
   - Somewhat satisfied
   - Dissatisfied

7. How much help from another person do you require to participate in parenting/grandparenting activities?
   - A great deal
   - A moderate amount
   - Just a little
   - None

8. How often do you use accommodations, adaptations, or special equipment to participate in parenting/grandparenting activities?
   - All of the time
   - Most of the time
   - Some of the time
   - A little of the time
   - Never

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INTIMACY: This topic includes initiating or maintaining a romantic relationship, responding to physical intimacy, performing consensual sexual acts, or maintaining an intimate sexual relationship. Intimacy involves not only sexual intercourse but also any physical closeness with another person. Your responses will be kept confidential, and you may refuse to answer any or all of these questions.

Do you wish to continue with this section?  
☐ Yes (Continue below.)  
☐ No (Go to RELIGIOUS ACTIVITIES.)

1. In a week, how frequently do you have intimate relations with another person?  
☐ More than four times  
☐ 1 - 4 times  
☐ Less than once  
☐ Never*  

2. Is your participation in intimacy limited by ... (Check all that apply.)  
☐ Illness  
☐ A physical impairment  
☐ Pain  
☐ Fatigue  
☐ Not limited

3. How important is it for you to participate in intimacy?  
☐ Very important  
☐ Somewhat important  
☐ Somewhat unimportant  
☐ Not important  

4. To participate in intimacy, how much choice do you have compared to others without mobility limitations? (Choice includes how often, when, how and with whom.)  
☐ A lot of choice  
☐ Some choice  
☐ Little choice  
☐ No choice

~ If you answered NEVER* to question 1 - Go to RELIGIOUS ACTIVITIES ~

5. How satisfied are you with your participation in intimacy?  
☐ Very satisfied  
☐ Satisfied  
☐ Somewhat satisfied  
☐ Dissatisfied

6. How much help from another person do you need to participate in intimacy?  
☐ A great deal  
☐ A moderate amount  
☐ Just a little  
☐ None

7. How often do you use accommodations, adaptations or special equipment to participate in intimacy?  
☐ All of the time  
☐ Most of the time  
☐ Some of the time  
☐ A little of the time  
☐ Never

REASSURANCE: The following questions are about participation in religious activities. This topic includes attending weekly religious services or classes, as well as singing in a choir.

1. How much time do you spend on participation in religious activities?  
☐ More than 5 hours a week  
☐ 1-5 hours a week  
☐ None*

2. Is your participation in religious activities limited by ... (Check all that apply.)  
☐ Illness  
☐ A physical impairment  
☐ Pain  
☐ Fatigue  
☐ Not limited

3. How important is it for you to participate in religious activities?  
☐ Very important  
☐ Somewhat important  
☐ Somewhat unimportant  
☐ Not important

4. How much choice do you have about participating in religious activities compared to others without mobility limitations? (Choice includes when, where, how and with whom.)  
☐ A lot of choice  
☐ Some choice  
☐ Little choice  
☐ No choice

~ If you answered NONE* to question 1 - Go to COMMUNITY ACTIVITIES ~

5. How satisfied are you with your participation in religious activities?  
☐ Very satisfied  
☐ Satisfied  
☐ Somewhat satisfied  
☐ Dissatisfied

6. How much help from another person do you require?  
☐ A great deal  
☐ A moderate amount  
☐ Just a little  
☐ None

7. How often do you use accommodations, adaptations, or special equipment to participate in religious activities?  
☐ All of the time  
☐ Most of the time  
☐ Some of the time  
☐ A little of the time  
☐ Never
**COMMUNITY ACTIVITIES:** These questions involve participation in community activities, such as voting, attending community meetings, serving on a community board, or communicating with government officials.

1. How much time do you spend participating in community activities?
   - [ ] More than 5 hours a week
   - [ ] 1-5 hours a week
   - [ ] None*

2. Is your participation in community activities limited by ... (Check all that apply.)
   - [ ] Illness
   - [ ] A physical impairment
   - [ ] Pain
   - [ ] Fatigue
   - [ ] Not limited

3. How important is it for you to participate in community activities?
   - [ ] Very important
   - [ ] Somewhat important
   - [ ] Somewhat unimportant
   - [ ] Not important

4. How much choice do you have about participating in community activities compared to others without mobility limitations? (Choice includes when, where, how, and with whom you participate.)
   - [ ] A lot of choice
   - [ ] Some choice
   - [ ] Little choice
   - [ ] No choice

~ If you answered NONE* to question 1 - Go to EMPLOYMENT ~

5. How satisfied are you with your participation in community activities?
   - [ ] Very satisfied
   - [ ] Satisfied
   - [ ] Somewhat satisfied
   - [ ] Dissatisfied

6. How much help from another person do you require?
   - [ ] A great deal
   - [ ] A moderate amount
   - [ ] Just a little
   - [ ] None

7. How often do you use accommodations, adaptations, or special equipment to participate in community activities?
   - [ ] All of the time
   - [ ] Most of the time
   - [ ] Some of the time
   - [ ] A little of the time
   - [ ] Never

---

**EMPLOYMENT:** The next questions are about part-time or full-time work.

1. Are you currently employed?  
   - [ ] Yes (Continue.)
   - [ ] No* (Go to question 2.)

   1a. What type of work do you do?
   1b. In a typical week, how many hours do you work?
      - [ ] More than 40
      - [ ] 31 to 40
      - [ ] 11 to 30
      - [ ] Less than 10

2. Is your participation in employment limited by ... (Check all that apply.)
   - [ ] Illness
   - [ ] A physical impairment
   - [ ] Pain
   - [ ] Fatigue
   - [ ] Not limited

3. How important is it for you to work?
   - [ ] Very important
   - [ ] Somewhat important
   - [ ] Somewhat unimportant
   - [ ] Not important

4. How much choice do you have about employment compared to others without mobility limitations? (Choice includes when, where, how much and how you work.)
   - [ ] A lot of choice
   - [ ] Some choice
   - [ ] Little choice
   - [ ] No choice

~ If you answered NO* to question 1 - Go to VOLUNTEERING ~

5. How satisfied are you with your participation in work?
   - [ ] Very satisfied
   - [ ] Satisfied
   - [ ] Somewhat satisfied
   - [ ] Dissatisfied

6. How much help from another person do you require to participate in work?
   - [ ] A great deal
   - [ ] A moderate amount
   - [ ] Just a little
   - [ ] None

7. How often do you use accommodations, adaptations or special equipment to participate in work?
   - [ ] All of the time
   - [ ] Most of the time
   - [ ] Some of the time
   - [ ] A little of the time
   - [ ] Never
VOLUNTEERING: The next questions are about part-time or full-time volunteering.
1. Do you currently serve as a volunteer? □ Yes (Continue.) □ No* (Go to question 2.)
   1a. What kinds of volunteer activities do you do? ________________________________
1b. How often do you volunteer?
   □ Daily □ Weekly □ Monthly □ Yearly
2. Is your participation in volunteering limited by ... (Check all that apply.)
   □ Illness □ A physical impairment □ Pain □ Fatigue □ Not limited
3. How important is it for you to volunteer?
   □ Very important □ Somewhat important □ Somewhat unimportant □ Not important
4. To volunteer, how much choice do you have compared to others without mobility limitations? (Choice includes when, where and how you volunteer.)
   □ A lot of choice □ Some choice □ Little choice □ No choice
   ~ If you answered NO* to question 1 - Go to MANAGING MONEY ~
5. How satisfied are you with your participation in volunteering?
   □ Very satisfied □ Satisfied □ Somewhat satisfied □ Dissatisfied
6. How much help from another person do you require to participate in volunteering?
   □ A great deal □ A moderate amount □ Just a little □ None
7. How often do you use accommodations, adaptations or special equipment to participate in volunteering?
   □ All of the time □ Most of the time □ Some of the time □ A little of the time □ Never
   ~ If you answered NO* to question 1 - Go to NEXT PAGE ~

MANAGING MONEY: These questions involve managing money, which includes making a budget, paying bills, balancing a checkbook, going to the bank, filing insurance forms, or obtaining a loan.
1. How much time do you spend on money management activities?
   □ More than 5 hours a week □ 1 to 5 hours a week □ None*
2. Is your participation in money management activities limited by ... (Check all that apply.)
   □ Illness □ A physical impairment □ Pain □ Fatigue □ Not limited
3. How important is it for you to participate in money management?
   □ Very important □ Somewhat important □ Somewhat unimportant □ Not important
4. To participate in money management, how much choice do you have compared to others without mobility limitations? (Choice includes when, where, how and with whom you participate.)
   □ A lot of choice □ Some choice □ Little choice □ No choice
   ~ If you answered NONE* to question 1 - Go to NEXT PAGE ~
5. How satisfied are you with your participation in money management activities?
   □ Very satisfied □ Satisfied □ Somewhat satisfied □ Dissatisfied
6. How much help from another person do you require?
   □ A great deal □ A moderate amount □ Just a little □ None
7. How often do you use accommodations, adaptations, or special equipment to participate in managing money?
   □ All of the time □ Most of the time □ Some of the time □ A little of the time □ Never
You have completed the Participation Survey/Mobility (PARTS/M).

Thank you very much for your time and effort.

If you had physical assistance from another person in completing this survey, what is that person’s relationship?
- No one helped me
- Family member
- Friend
- Paid personal attendant
- Other

If you would like to make a comment about this section, please do so in the space provided below:

[Blank space]

IMPORTANT: PLEASE CLICK THE ‘Next’ ARROW BUTTON TO SUBMIT YOUR SURVEY.

---

Participation Survey / Mobility

This completes the survey.

Thank you for your time and effort.

Please visit the Community Participation and Receptivity website, which will give you information on other research projects, as well as accessibility resources.

Close browser window to exit survey.
Appendix D: The Personal Independence Profile (PIP)

Perceived Control Subscale of PIP using a 5-point Likert scale ranging from 1= no control to 5= complete control.

1. Material comforts
2. Recreation
3. Close friends
4. Health and personal safety
5. Close relationship with significant other
6. Reading, listening to music, etc.
7. Socializing
8. Work in job or at home
9. Relationships with relatives
10. Learning, attending school, etc.
Appendix E: The Reintegration to Normal Living Index (RNLI)

The following list includes the statements contained in Return to Normal Living Index. The index uses a visual analog scale with 1 indicating the lowest and 10 indicating the highest agreement.

1. I move around my living quarters as I feel is necessary. (Wheelchairs, other equipment or resources may be used.)

2. I move around my community as I feel is necessary. (Wheelchairs, other equipment or resources may be used.)

3. I am able to take trips out of town as I feel are necessary. (Wheelchairs, other equipment or resources may be used.)

4. I am comfortable with how my self-care needs (dressing, feeding, toileting, bathing) are met. (Adaptive equipment, supervision and/or assistance may be used.)

5. I spend most of my days occupied in a work activity that is necessary or important to me. (Work activity could be paid employment, housework, volunteer work, school, etc. Adaptive equipment, supervision and/or assistance may be used.)

6. I am able to participate in recreational activities (hobbies, crafts, sports, reading, television, games, computers, etc.) as I want to. (Adaptive equipment, supervision and/or assistance may be used.)

7. I participate in social activities with family, friends, and/or business acquaintances as is necessary or desirable to me. (Adaptive equipment, supervision and/or assistance may be used.)
8. I assume a role in my family which meets my needs and those of other family members.
   (Family means people with whom you live and/or relatives with whom you don’t live but see on a regular basis. Adaptive equipment, supervision and/or assistance may be used.)

9. In general, I am comfortable with my personal relationships.

10. In general, I am comfortable with myself when I am in the company of others.

11. I feel that I can deal with life events as they happen.
Appendix F: The Medical Outcomes Study 36-Item Short Form Health Survey (SF-36)

Your Health Status

Instructions: The first set of questions asks about your general health status. Answer every question by marking the appropriate circle. If you are not sure about how to answer a question, please give the best answer you can.

1. In general, would you say your health is:
   ○ Excellent ○ Very good ○ Good ○ Fair ○ Poor

2. Compared to one year ago, how would you rate your health in general now?
   ○ 1. Much better now than 1 year ago
   ○ 2. Somewhat better now than 1 year ago
   ○ 3. About the same as 1 year ago
   ○ 4. Somewhat worse now than 1 year ago
   ○ 5. Much worse now than 1 year ago

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

<table>
<thead>
<tr>
<th>Activities</th>
<th>Yes, limited a lot</th>
<th>Yes, limited a little</th>
<th>No, not limited at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>c. Lifting or carrying groceries</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>d. Climbing several flights of stairs</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>e. Climbing one flight of stairs</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>f. Bending, kneeling, or stooping</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>g. Walking more than a mile</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>h. Walking several blocks</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>i. Walking one block</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>j. Bathing or dressing yourself</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
4. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities as a result of your **PHYSICAL HEALTH**?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Cut down the <strong>amount of time</strong> you spent on work or other activities?</td>
<td>○ Yes</td>
</tr>
<tr>
<td>b. Accomplished <strong>less</strong> than you would like?</td>
<td>○ Yes</td>
</tr>
<tr>
<td>c. Been limited in the <strong>kind</strong> of work or other activities you do?</td>
<td>○ Yes</td>
</tr>
<tr>
<td>d. Had <strong>difficulty</strong> performing work or other activities (for example, it took extra effort)</td>
<td>○ Yes</td>
</tr>
</tbody>
</table>

5. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities as a result of any **EMOTIONAL PROBLEMS** (such as feeling depressed or anxious)?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Cut down the <strong>amount of time</strong> you spent on work or other activities?</td>
<td>○ Yes</td>
</tr>
<tr>
<td>b. Accomplished <strong>less</strong> than you would like?</td>
<td>○ Yes</td>
</tr>
<tr>
<td>c. Found you didn’t do work or other activities as <strong>carefully as usual</strong>?</td>
<td>○ Yes</td>
</tr>
</tbody>
</table>

6. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ Not at all</td>
<td>○ Slightly</td>
<td>○ Moderately</td>
<td>○ Quite a bit</td>
<td>○ Extremely</td>
</tr>
</tbody>
</table>

7. How much **bodily pain** have you had during the **past 4 weeks**?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ None</td>
<td>○ Very mild</td>
<td>○ Mild</td>
<td>○ Moderate</td>
</tr>
<tr>
<td></td>
<td>○ Severe</td>
<td>○ Very severe</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ Not at all</td>
<td>○ A little bit</td>
<td>○ Moderately</td>
<td>○ Quite a bit</td>
</tr>
<tr>
<td></td>
<td>○ Extremely</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. These questions are about how you feel and how things have been for you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.

<table>
<thead>
<tr>
<th>How much of the time during the past 4 weeks:</th>
<th>All of the time</th>
<th>Most of the time</th>
<th>A good bit of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Did you feel full of pep?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>b. Have you been a very nervous person?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>c. Have you felt so down in the dumps that nothing could cheer you up?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>d. Have you felt calm and peaceful?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>e. Did you have a lot of energy?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>f. Have you felt downhearted and blue?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>g. Did you feel worn out?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>h. Have you been a happy person?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>i. Did you feel tired?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

- All of the time
- Most of the time
- Some of the time
- A little of the time
- None of the time

11. How TRUE or FALSE is each of the following statements for you?

<table>
<thead>
<tr>
<th>a. I seem to get sick a little easier than other people</th>
<th>Definitely true</th>
<th>Mostly true</th>
<th>Don't know</th>
<th>Mostly false</th>
<th>Definitely false</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. I am as healthy as anybody I know</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>c. I expect my health to get worse</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>d. My health is excellent</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
References


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