DISSERTATION

COMPARISON BETWEEN OLDER ADULTS WHO ARE HOMEBOUND AND NONHOMEBOUND

Submitted by

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In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

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ABSTRACT OF DISSERTATION

COMPARISON BETWEEN OLDER ADULTS

WHO ARE HOMEBOUND AND NONHOMEBOUND

The objective of this study was to investigate the differences in activities of daily living (ADL) ability, level of satisfaction with ADL performance, and home safety among older adults who were chronically homebound and two groups of older adults who were nonhomebound: those who were independent and those who needed assistance. The second objective was to examine the influence of three psychosocial variables (i.e., self-identification of ADL problems, perception of role incumbency, and the presence of depressive symptoms) on participants' ADL ability, level of satisfaction with ADL performance, and home safety.

The results of three analyses of variance (ANOVA) revealed that participants who were chronically homebound (n = 20) had significantly lower ADL motor ability, ADL process ability, and level of satisfaction with ADL performance compared to those who were nonhomebound and independent with performing ADL (n = 10). However, these variables did not differ significantly between participants who were nonhomebound and had assistance with ADL and participants who were homebound. The mean home safety ability measure for the nonhomebound with assistance group was significantly greater than the homebound group, and significantly less than the nonhomebound independent group.

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Low to moderate relationships (r = -.36 to -.50) were found between the number of self-identified ADL problems and the dependent variables of ADL motor ability, ADL process ability, level of satisfaction with ADL performance, and home safety. Low relationships (r = .25 to .35) were found between the number of perceived roles currently occupied and the same dependent variables. Low relationships (r = -.33 to -.41) were also found between the number of depressive symptoms and the dependent variables. A moderate canonical correlation was found (r = .58) between (a) the three psychosocial variables studied, and (b) the dependent variable set comprised of ADL motor ability, ADL process ability, and home safety ability.

The findings support the need for occupational therapists to provide services for older adults who have ADL limitations regardless of their homebound status. Further research is needed to evaluate the complex relationships between psychosocial variables and older adults' ADL and home safety ability.

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS v

LIST OF TABLES x

LIST OF FIGURES xii

CHAPTER 1: INTRODUCTION 1

Health Care Context 2
Older Adults Who Are Chronically Homebound 5
Occupational Therapy Perspective 8
Psychosocial Variables 12
Significance 17
Summary 20
Research Questions 22
Study Limitations 23
Definitions of Terms 23

CHAPTER TWO: REVIEW OF THE LITERATURE 26

The Ecological Theory of Aging 26
Ecological Theory and Its Link to Occupational Therapy 28
Demographics of the Older Adult Population 29
Active Life Expectancy 31
Older Adults Who are Homebound 32
Level of Satisfaction with ADL Performance 38
Home Safety 39
Perception of Role Incumbency 44
Depression and Older Adults Who Are Homebound 48
Medicaid and Community Long-term Care 53

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Medicare Policy 56
Summary and Implications for Further Research 57

CHAPTER THREE: METHODS 59

Design 59
Participants 59
Instrumentation 71
Procedures 85
Data Analysis 87

CHAPTER FOUR: RESULTS 93

ADL Ability 93
Level of Satisfaction with ADL Performance 93
Home Safety 94

CHAPTER 5: DISCUSSION 113

ADL Ability 114
Home Safety 115
Unique Characteristics of Participants in the Homebound Group 116
Relationship Between Self-Identified ADL Problems and Dependent Variables 117
Relationships Between Perceived Roles and Dependent Variables 120
Relationships Between Symptoms of Depression and Dependent Variables 121
Canonical Correlation 122
Limitations 123
Implications for Occupational Therapy Practice 124
Conclusion 128

REFERENCES 130

APPENDIX A 147

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LIST OF TABLES

Table 1 .... **61**
Frequencies of Demographic Variables for Participants in the Homebound and Nonhomebound Groups

Table 2 .... **62**
Level of ADL Assistance Used By Participants in the Homebound (HB) and Nonhomebound (NH) Groups

Table 3 .... **65**
Means, Standard Deviations, or Frequencies for Demographic Variables for Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups

Table 4 .... **66**
Frequencies for Demographic Variables for Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups (Continued)

Table 5 .... **67**
Types of Domiciles Occupied by Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups

Table 6 .... **68**
Types of ADL Assistance Used By Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups

Table 7 .... **70**
Number of Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups Who Identified Problems with Performing Specific PADL

Table 8 .... **71**
Number of Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups Who Identified Problems with Performing the Following IADL

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Table 9 .... **95**
Means and Standard Deviations for Dependent Variables Among Participants in the Homebound (HB), Total Nonhomebound (TNH) Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups

Table 10 .... **96**
Correlations Between Self-Identified ADL Problems and the Dependent Variables for Participants in the Total Sample (TS), Homebound (HB), and Total Nonhomebound (TNH) Groups

Table 11 .... **101**
Correlations Between Roles and the Dependent Variables for Participants in the Total Sample (TS), Homebound (HB), and Total Nonhomebound (TNH) Groups

Table 12 .... **106**
Correlations Between the Number of Depressive Symptoms and the Dependent Variables for Participants in the Total Sample (TS), Homebound (HB), and Total Nonhomebound (TNH) Groups

Table 13 .... **112**
Canonical Correlation Analyses of the Relationship Between the Canonical Variable (IV) and the Dependent Variable (DV) for the Total Sample

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LIST OF FIGURES

Figure 1 .... **64**
Comparison of ADL motor and ADL process ability measures for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 2 .... **97**
Relationship between the number of ADL problems and ADL motor ability measures for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 3 .... **98**
The relationship between the number of ADL problems and ADL process ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 4. .... **99**
The relationship between the number of ADL problems and level of satisfaction with ADL for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 5. .... **100**
The relationship between the number of ADL problems and home safety ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 6 .... **102**
The relationship between perceived roles currently occupied and ADL motor ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 7. .... **103**
The relationship between perceived roles currently occupied and ADL process ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 8 .... **104**
The relationship between perceived roles currently occupied and level of satisfaction with ADL for the homebound, nonhomebound with assistance, and nonhomebound independent groups

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Figure 9 .... **105**
The relationship between perceived roles currently occupied and home safety ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 10 .... **107**
The relationship between the number of depressive symptoms and ADL motor ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 11 .... **108**
The relationship between the number of depressive symptoms and ADL process ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 12 .... **109**
The relationship between the number of depressive symptoms and level of satisfaction with ADL for the homebound, nonhomebound with assistance, and nonhomebound independent groups

Figure 13 .... **110**
The relationship between the number of depressive symptoms and home safety ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups

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CHAPTER 1: INTRODUCTION

The Centers for Medicare and Medicaid (CMS) fund the majority of the health care services provided to older adults (Sultz & Young, 2001). As a result of this financial reality, eligibility regulations for health care services are set by CMS and followed by other third-party payers throughout the country. CMS has established a set of regulations related to the definition of homebound status that greatly affects the types of services for which older adults may be eligible, including occupational therapy. In spite of the far-reaching impact of the definition of homebound onerontic occupational therapy practice, occupational therapy researchers have not specifically studied the assumptions about activities of daily living (ADL) participation that underlie regulations related to homebound status. The purpose of this study was to investigate whether older adults who are chronically homebound demonstrate significant differences in their ability to participate in everyday activities compared to older adults who are nonhomebound. More specifically, this study had two primary objectives. The first objective was to investigate the differences in ADL ability, level of satisfaction with ADL performance, and home safety between older adults who are chronically homebound compared to older adults who are nonhomebound. The second objective of this study was to examine the influence of three psychosocial variables, self-identification of ADL problems, perception of role incumbency, and the presence of depressive symptoms on older adults'

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activities of daily living (ADL) ability, level of satisfaction with ADL performance, and home safety.

Health Care Context

In this study, *homebound* was defined as a state in which older adults report extraordinary difficulty leaving their homes because of weakness, frailty, or risk of further health complications (Health Care Financing Administration, 2001). Older adults who are homebound have physical and cognitive impairments and level of disability that limit their community involvement to medical appointments and religious activities (Stoker, 1999). Meeting the criteria for homebound status is important for older adults who wish to receive home health services from Medicaid or Medicare programs, the two largest payers for home health services. State Medicaid programs offer older adults who are chronically homebound community and home-based services through their long-term care waiver programs (Wolfgang, 2001a). Medicaid long-term care services pay for low-income older adults' nursing home care or for community-based services designed to keep these older adults out of nursing homes (Fried, Pollack, & Tinetti, 1998). Originally, Medicare home health services were designed to reduce the length of stay during acute hospitalizations. The Medicare program provides home health services after a hospitalization to older adults who are homebound and require short-term skilled nursing or therapy services (Wolfgang, 2001b).

At a minimum, Medicaid community-based long term care waiver programs provide older adults who are chronically homebound skilled nursing, personal care aide assistance, and homemaker services (Diwan, Berger, & Manns, 1997; Freedman, 1999).

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Community-based long term care programs operate under the assumption that only older adults who are homebound have a level of ADL limitations that puts them at risk for nursing home placement. Occupational therapy and other rehabilitation services are not uniformly available to older adults who are chronically homebound through community-based long term care programs funded by Medicaid or other federal sources (CMS, 2002, April 8; Leutz, 1999). This discrepancy in the availability of services can be attributed to variations in how state Medicaid programs are legislated and administered. The discrepancy can also be attributed to a lack of outcome data regarding the efficacy occupational therapy services for older adults who are chronically homebound. Thus, the persons of particular interest for this study were older adults who (a) were chronically homebound because of the presence of chronic medical conditions and ADL limitations and (b) met the criteria for federally-funded community-based services (e.g., Medicaid community-based long term care services administered through the local Area Agency on Aging).

Although older adults who are chronically homebound were the primary focus of this investigation, it is important to recognize that older adults who are nonhomebound have less eligibility for home-based occupational therapy services regardless of their level of ADL restriction. Unless they become hospitalized, there are no uniform mechanisms in the current health care structure that allow older adults who are nonhomebound with ADL limitations to receive home-based occupational therapy. Older adults who are nonhomebound and require therapy services after a hospitalization are automatically referred to outpatient rehabilitation settings to receive services. This regulation is

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contrary to past findings of occupational therapy studies showing that many older adults perform ADL better in the home versus the clinic environment (Nygård, Bernspång, Fisher, & Winblad, 1994; Park, Fisher, & Velozo, 1994). Results of this study can shed light on whether the current regulations are sufficiently meeting the needs of this secondary group of older adults who are nonhomebound.

Despite this study's focus on Medicaid-funded community-based long term care waiver programs, one needs to acknowledge that older adults who are chronically homebound also utilize home health care services funded by Medicare. In the Medicare program, being homebound brings skilled therapy or skilled nursing services to the home setting as an adjunct to acute care. In contrast, the classification of homebound in the Medicaid system opens the door to a wide variety of on-going community services (e.g., nursing services, personal care aides, homemaker services, case management, rehabilitation therapies). For example, an older adult may be hospitalized for hip replacement surgery after experiencing a fall. Medicare would pay 80% of the costs associated with the hospital stay and home health rehabilitation services. If the older adult is indigent, then his or her Medicaid benefit could cover the other 20% of these costs. After approximately 2 weeks, the home health physical and occupational therapy services would stop if the person has met therapy goals and is no longer homebound. In contrast, if the older adult also had, for example, a moderate level of dementia, once the home health rehabilitation services were discharged, he or she could be referred to the local Area Agency on Aging to receive community-based long term care services funded through the state waiver program. Receiving these services would be contingent on the

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agency determining that the older adult is at risk for nursing home placement and also meets their requirements for homebound status. It is at this point that an older adult could receive, at a minimum, skilled nursing, personal care aide assistance, and homemaker services. An older adult does not have to be hospitalized to be referred to the Area Agency on Aging for community-based long term care services. The referral could come from a health care provider or from the individual. If an older adult is nonhomebound, but still has unresolved ADL problems, he or she would have not access to these types of community-based long term care services.

Past studies of state Medicaid expenditures have shown significant state variations of per capita spending for community-based services for older adults (Kane, Kane, Ladd, & Veazie, 1998). Some states have relatively high Medicare-low Medicaid expenditures per capita and vice versa. Some states are using Medicare home health services for maintenance functions (Kenney, Rajan, & Soscia, 1998). Other states have reduced Medicare expenditures because older adults have strong Medicaid community-based waiver programs. Although the persons of primary interest in this study were those who are eligible to receive community-based long term care through Medicaid funding, one must also understand that their service utilization can be linked to future Medicare costs encumbered through acute hospital stays or through nursing home placement.

Older Adults Who Are Chronically Homebound

An estimated 3.9 million adults over the age of 65 are classified as chronically homebound by the Centers for Medicare and Medicaid (2002, June 20). The average older adult who is chronically homebound is likely to be a female, widowed, and over 70

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years old with an income below the federal poverty level (Ganguli et al., 1996; Kellogg & Brickner, 2000). Older adults who are chronically homebound are likely to display a combination of comorbidity, frailty, and activity limitations (Fried et al., 2001). Any one of these factors in itself would not necessarily cause a person to become homebound, but together, these factors can create a barrier to ready access outside the home. To understand why older adults might become chronically homebound, familiarity with each of these factors is useful.

Comorbidity. *Comorbidity* refers to the presentation of more than one chronic medical condition in a person (Fried & Guralnik, 1997). Older adults who are homebound are likely to present, on average, with approximately three medical conditions (Hobbs & Damon, 1996), with the most common being stroke, hypertension, chronic heart failure, fractures, degenerative joint disease, and dementia (Ganguli, Fox, Gilby, & Belle, 1996; Kellogg & Brickner, 2000). A medical condition may result in an impairment of body structure or functioning that constrains the ability of a person who is homebound to perform activities of daily living (ADL). ADL includes personal activities of daily living (PADL) (e.g., dressing, bathing, grooming) and instrumental activities of daily living (IADL) (e.g., cooking, budgeting, shopping). In addition, each medical condition requires a set of treatments or medications that can affect a person differently based upon the other conditions the person may have. Comorbidity is important to identify because it adds to the complexity of an older adult's health care needs and can make ADL performance problematic.

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Frailty. Clinicians recognize *frailty* as a syndrome manifested by a combination of factors such as decreased strength, endurance, mobility, and physical activity, as well as unintentional weight loss (Fried et al., 2001). Frailty involves compromise of multiple bodily systems that makes older adults more vulnerable to disease and acute health problems (e.g., urinary tract infection). Frailty also increases older adults' risk for falls, hospitalizations, and death (Speechley & Tinetti, 1991). Because frailty is defined by the presence of a combination of impairments in body structure or functioning, it can also negatively affect a person's capacity to perform ADL leading to higher levels of activity limitations and difficulty leaving the home environment.

Activity limitations. *Activity limitations* refer to "difficulties an individual may have in executing activities" (World Health Organization, 2001, p. 14). Investigators have consistently documented limitations in the ability of older adults who are chronically homebound to perform ADL (Ganguli et al., 1996; Gloth, Walston, Meyer, & Peterson, 1995; Lubaczewski & Pezzoli, 1998).

An older adult with comorbid medical conditions may be able to cope with some ADL limitations and retain his or her ability to readily go out into the community. For example, if a 65-year-old person with hypertension develops the early symptoms of macular degeneration, the person may not experience significant limitations in his or her ability to participate in ADL. If the person's vision worsens, he or she may initially curtail some activities (e.g., grocery shopping, playing cards with friends). If the person has the requisite adaptive strategies, he or she may learn ways to compensate for these

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visual deficits and return to performing previous activities, avoiding long-term activity restrictions.

If a person has both comorbid medical conditions and signs of frailty, the person may face a greater threat of ADL limitations that could lead them to becoming homebound. If we substitute the previous hypothetical person with a frail 75-year-old woman with sensory loss in the extremities from peripheral vascular disease, the additional condition of macular degeneration could be too much for her to compensate for independently. The sensory loss would make it challenging for her to identify items through touch and impair her walking balance. Without more professional assistance, she could experience difficulty engaging in ADL, which could lead to more residual disability.

The previous examples illustrate that comorbidity in combination with frailty may create a higher threshold of impairment in body functions that an older adult cannot overcome through his or her own compensatory approaches. The more ADL limitations an older person experiences, the more likely his or her activity involvement will be curtailed. The activity curtailment in itself can result in reduced strength and endurance leading to more frailty. This cycle of difficulty with ADL performance leading to doing less can spiral downward to a point at which an older person has little stamina for leaving the home.

Occupational Therapy Perspective

Reducing activity limitations and maintaining the ability to do ADL is a central concern of occupational therapists. Occupational therapists routinely work with older adults to achieve the goals of improved ADL performance, home safety, and increased

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levels of satisfaction with ADL performance (Law et al., 1998; Letts & Marshall, 1996; Park, 1996). Occupational therapists accomplish these goals by working with an older client to identify specific ADL difficulties, also known as occupational problems (Law et al.). Once occupational problems are identified, an occupational therapist and client collaborate to develop an individualized program that involves the introduction of compensatory strategies (e.g., assistive devices), remediation approaches, and preventative interventions (Allison, 1996).

Gerontic occupational therapy is a recognized specialization area within the profession. Occupational therapists work in acute hospitals, outpatient clinics, skilled nursing facilities, home health care, and other settings with older adults (Fonti, 1996). Carlson, Fanchiang, Zemke, and Clark (1996) concluded from a meta-analysis that occupational therapy interventions with older adults made a significant difference in these individuals' ability to participate in ADL. Other studies of occupational therapy interventions with older adults have demonstrated positive outcomes such as improved quality of life, reduction in falls, and increased independence in ADL (Clark et al., 1997; Close et al., 1999; Cumming et al., 1999; Kondo, Mann, Tomita, & Ottenbacher, 1997; Przybylski et al., 1996). In spite of an established presence in gerontology and evidence to support our efficacy with the grontic population, I could find no occupational therapy studies that have specifically examined differences in ADL ability, home safety, or the perceived level of satisfaction with ADL performance in older adults based on homebound status. It is important to note that although studies of the effectiveness of gerontic occupational therapy have not specifically targeted older adults who are

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homebound, it is likely these individuals have been involved with research studies; however, their particular needs have not been disaggregated from data that included peers who were nonhomebound.

ADL performance. Occupational performance consists of the actual doing of daily self-care, productivity, and leisure activities. Optimum occupational performance has been conceptualized as more than performing a task independently; it also includes performing daily tasks with the desired level of quality, including ease, efficiency, and safety (Fisher, 2001a). An objective measure of ADL ability can provide specific information about tasks that are difficult for a chronically homebound older person to perform, as well as generate a baseline measure of the capacity to participate in ADL. Limitations in ADL performance can be directly addressed by an occupational therapy intervention. Occupational therapists can instruct older adults who are homebound in the use compensatory approaches to doing what they need to accomplish, thus reducing their overall disability level. Frailty can be addressed by an occupational therapist facilitating the person's gradual increase in ADL participation, such that older adults build or maintain their endurance, strength, and ability to carry out functional activities.

Level of satisfaction with ADL performance. Understanding an older client's level of satisfaction with different ADL performance areas at the outset of therapy services is critical in order for occupational therapists to design relevant and useful services. Reevaluating a client's level of satisfaction with ADL performance at the conclusion of services provides invaluable outcome data. The relationship between perceived level of satisfaction with occupational performance and the general construct of overall life

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satisfaction has been studied with a group of community-dwelling adults across the age span (McColl, Paterson, Davies, Doubt, & Law, 2000). This investigation revealed a low to moderate positive correlation ($r = .46$; $p < .01$) between level of satisfaction with occupational performance and life satisfaction, as measured by the Life Satisfaction Scale (McColl et al.; Michalos, 1980). Interpreting the strength of this and the other correlation coefficients was based on a scale described by Hinkle, Wiersma, and Jurs (1998) in which .00 to .30 = little if any correlation, .30 to .50 = low level of correlation, .50 to .70 = moderate level of correlation, .70 to .90 = high level of correlation, and .90 to 1.0 = very high level of correlation. This low positive relationship demonstrates that satisfaction with occupational performance is related to overall life satisfaction but is not, however, the same construct. Level of satisfaction with occupational performance has not been studied with older adults who are chronically homebound or nonhomebound.

Home safety. In addition to ADL ability and level of satisfaction with ADL performance, home safety is another critical outcome of occupational therapy services with older adults that warrants attention in this study. Home safety has been linked to the ability to perform ADL (McNulty & Fisher, 2001) and an older adult's ability to stay in their own homes versus becoming institutionalized (Tinetti & Williams, 1997). Although home safety has typically been studied in terms of fall prevention in gerontology (Lord, Ward, Williams, & Strudwick, 1995; Tinetti et al., 1994) and in occupational therapy (Close et al., 1999; Cumming et al., 1999), older adults who are homebound can benefit from a broader view of home safety that goes beyond fall risk. Occupational therapists, Letts, Marshall, and Cawley (1995), presented home safety as a transaction of dynamic

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and interacting relationships among a person's body functions, activity performance skills, and the physical and social elements in his or her environment. They viewed home safety as including a person's ability to access needed services and supports in the community as well as a person' ability to avoid high-risk situations that can lead to adverse consequences. Allen (1992) expanded the notion of home safety further by also considering the underlying cognitive planning and organizational capacities needed to obtain meals, maintain shelter and personal health, cope with emergencies, and prevent personal injuries as part of home safety skill. Because older adults who are homebound have multiple medical conditions and more activity limitations than most older adults, they can benefit from a home safety assessment approach that is comprehensive and addresses more of their home safety risk factors.

The first objective of this study was an attempt to begin to remedy a gap in our literature about differences in the ADL participation of older adults who are homebound and nonhomebound. By providing comparative data about ADL ability, satisfaction with ADL performance, and home safety, I wanted to document differences between older adults who are chronically homebound and older adults who are nonhomebound in terms that are unique to occupational therapy. Understanding these populations' ADL ability, level of satisfaction with ADL performance, and home safety, could provide insights for use in developing future interventions.

Psychosocial Variables

Occupational therapists need to address psychosocial dimensions that influence ADL participation even if the primary barrier to participation is not a mental health disorder

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(Giroux-Bruce & Borg, 2002; Noh & Posthuma, 1990). This occupational therapy practice may be even more critical during assessment of older adults who are homebound because of the higher prevalence of psychiatric disorders in this population compared to their nonhomebound cohorts (Ganguli et al., 1996). Three psychosocial factors that could impact the need for and efficacy of occupational therapy services in older adults are the self-identification of problematic ADL, the perception of current role incumbancy, and the presence of depressive symptoms. These are not the only psychosocial variables that occupational therapists need to consider when performing ADL assessments with older adults; however, I argue in the following paragraphs that these three variables are especially relevant to a comparison of older adults who are chronically homebound and nonhomebound. An overview of each of these psychosocial variables and their potential relationship to ADL ability, level of satisfaction with ADL performance, and home safety follows.

Self-identification of ADL problems. Two older adults who are chronically homebound could present with the same number of medical conditions and measured impairments in body structures or functioning; however, one person may not identify any ADL as problematic because he or she has devised multiple strategies to compensate for ADL limitations. This person may have "resolved" past problematic ADL by obtaining more assistance from family members, changing how tasks are performed, or by supervising, rather than by doing, a previous household chore. Another person with a similar number of medical conditions and impairments may identify more problematic ADL that he or she has not been able to successfully problem-solve. These unresolved,

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problematic ADL will likely intensify the need for occupational therapy services. Self-identified ADL problems should be related to a person's ADL ability, level of satisfaction with ADL performance, and home safety for at least two reasons. Unresolved, problematic ADL could represent a lack of access to resources in the environment and/or a compromised ability to cope with changing body functions; thus, in this study, I investigated the relationship between (a) self-identified ADL problems, and (b) the variables of ADL ability, level of satisfaction with ADL performance, and home safety. The number of problematic ADL self-identified could reflect problems with performing ADL such that the more problematic ADL identified, the less ADL ability a person would demonstrate. An increase in the number of ADL problems could diminish the level of satisfaction a person experiences with ADL performance. If an older adult identifies a greater number of problematic ADL, the person may have less ability to take actions to maintain optimum safety in his or her home environment. I also investigated the type of self-identified ADL problems that participants in the homebound and nonhomebound groups reported. By identifying the type of ADL problems reported by participants in the homebound and nonhomebound samples, future occupational therapy assessments and interventions for these groups could be better planned.

Perceived role incumbency. The tasks in which a person engages during the day can be linked to the different roles a person occupies (Dunn, Brown, & McGuigan, 1994). Roles are internalized understandings of what is expected when one occupies a given status within a social organization. Roles influence the type of activities a person performs as well as the manner in which the person performs the activity (Kielhofner,

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2002). A person's constellation of roles will also drive how a person organizes his or her time on a cyclical basis (e.g., weekly). Participation in activities affords individuals opportunities to fulfill role expectations and to receive feedback from others in their lives. Role expectations can drive older adults to continue to participate in ADL in spite of impairments that pose challenges to performing ADL, resulting in an incentive to keep their overall activity levels high (Llorens, 1996).

Geriatric researchers have found that declining social involvement can be a risk factor for needing more assistance with PADL (Stuck et al., 1999) and IADL (Ishizaki, Watanabe, Suzuki, Shibata, & Haga, 2000). Although role incumbency and level of social activity are not the same construct, perceived incumbency of current roles could serve as one type of index of older adults' social involvement and potential sources of social support. Older adults who are chronically homebound may experience an exacerbation of the role loss common to older adults because of their limited mobility outside the home. Occupational therapists have hypothesized that the types of roles a person has in his or her life influences the level of skill developed in particular activities and the level of satisfaction experienced in daily living (Gregory, 1983). I could not find occupational therapy studies that specifically investigated the relationship between perceived role incumbency and ADL ability, levels of satisfaction with ADL performance, and home safety in older adults who are homebound or nonhomebound. However, because additional roles may represent more sources of support that can enable older adults to have better ADL ability, level of satisfaction with ADL performance, and home safety, the possibility exists that a higher number of currently perceived roles may

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be associated with greater ADL ability, level of satisfaction with ADL performance, and home safety. The number of perceived roles currently encumbered may have a stronger influence on the ADL ability, level of satisfaction with ADL performance, and home safety of older adults who homebound compared to older adults who are nonhomebound because the former group is considered to be at a higher risk for social isolation.

Depression and disability. Diminishing role occupancy and social isolation can be a significant component in the onset of depression in older adults, which, in turn, can also precipitate more ADL limitations (Badger, 1998). Due to their multiple health conditions and ADL limitations, older adults who are chronically homebound are more vulnerable to developing symptoms of depression compared with their nonhomebound cohorts (Thobaben, 1990). Unfortunately, the cognitive and physical changes associated with depression are typically more severe in older adults. Depressive symptoms can affect older adults' cognitive skills so significantly that they may appear to health care providers to have some type of dementia (Steffens, Hays, & Krishnan, 1999). Older adults with depression also demonstrate more signs of psychosis and psychomotor retardation in contrast to adults under 60 who have depression (Brodaty et al., 1997). Psychomotor retardation refers to a person's slowed speech, thinking, and body movements (American Psychiatric Association, 1994). The more depressive symptoms an older adult displays, the more likely he or she will experience more limitations in ADL ability (Girard, Fisher, Short, & Duran, 1999; Penninx, Leveille, Ferrucci, Van Eijk, & Guralnik, 1999). Because depressive symptoms can intensify and increase the severity of ADL limitations in older adults who are homebound, the effect of depressive symptoms

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on ADL ability, level of satisfaction with ADL, and home safety was investigated in this study.

The second objective of this study evaluates a basic tenet of occupational therapy practice about the influence of psychosocial factors on ADL-related variables. The increased risk for psychosocial concerns for older adults who are homebound make the study of psychosocial factors and ADL participation particularly relevant. Moreover, to further test the validity of assessing the proposed variables in older adults, I investigated whether the three proposed psychosocial variables in combination could estimate the dependent variables of primary interest in this study, ADL ability, level of satisfaction with ADL performance, and home safety ability, in older adults regardless of their homebound status.

Significance

As the demographics of western countries shift toward what Peterson (1999) called a "Gray Dawn," the health and quality of life of older adults will continue to have a significant effect on society. By 2050, adults aged 65 and over will number approximately 68 million and will constitute 23% of the US population (US Senate Special Committee on Aging, 1991). One positive trend is that older adults are living longer in the community with higher levels of disability, thus delaying or avoiding nursing home placement (Chase & Bishop, 1999). This decline in the percentage of older adults living in nursing homes can be attributed to the development of more housing options (e.g., assisted living centers), the integration of more home- and community-based long-term care services, and the recognition that community services are usually

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less expensive than institutionalization (Hawes, 1999). The direction away from institutionalization provides evidence that older adults' desire to live in their own homes is being honored. However, in spite of this progress, many older adults are living in the community with preventable or reducible levels of frailty, comorbidity, and disability.

The desire of older adults to live in the community will only grow if one considers that the next generation of older adults will be comprised of the baby-boomer generation. Health care planners and researchers have found baby boomers to be more assertive about their rights to health care and to alternative services compared with the current generation over 65 (Lumsdon, 1993; Mariotto et al., 1999). It seems likely that baby boomers will be strong self-advocates for programs that support their autonomy, independence, and active participation in the community. Occupational therapists need to be active in the planning and service provision of programs designed to support an aging population in the community.

Relevance to health care expenditures. Feder and Lambrew (1996) argued that Medicare managers must pay attention to the needs of older adults who are chronically homebound and who receive long-term care services through the Medicaid waiver program because older adults who are chronically homebound are responsible for a disproportionate expenditure of the Medicare budget. Older adults who are chronically homebound and who utilize Medicaid long-term care services also constitute 13% of Medicare beneficiaries and account for 32% of Medicare costs, which include post-acute benefits of home health and rehabilitation in skilled nursing facilities (Feder & Lambrew). Developing more knowledge about the ADL ability, level of satisfaction with

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ADL, and home safety of older adults who are chronically homebound can be a first step in determining more efficacious and cost-effective services that may reduce long-term costs to Medicare. By investigating the relationship between the psychosocial variables of self-identification ADL problems, perceived number of current roles, and the presence of depressive symptoms with the dependent variables of ADL ability, level of satisfaction with ADL, and home safety, we can develop a better understanding of how these psychosocial factors should be assessed with older adults who are homebound and nonhomebound.

Implications for occupational therapy. This study highlights the needs of older adults who are homebound and calls attention to the idiosyncracies of state-legislated Medicaid funding for occupational therapy. The results of this study can provide a starting point for developing unified intervention programs for older adults who are chronically homebound in the community. The results can also offer a basis to evaluate whether the variables studied should be used in future practice with older adults who are homebound and nonhomebound. The data generated will also reflect the particular instruments chosen in this study. The data analysis can provide an opportunity to determine the value of using these same tools in future occupational therapy assessments and in future research studies with older adults who are homebound and nonhomebound .

With more systemic studies of older adults who are chronically homebound, occupational therapists will have evidence to support the profession's involvement in community-based program serving older adults across the country. The study also tested the underlying assumption that there are significant differences in ADL ability, level of

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satisfaction with ADL performance, and home safety between older adults who are chronically homebound versus those who are nonhomebound. The Medicaid and Medicare system works under the principle that older adults who are nonhomebound have significantly fewer ADL limitations and do not warrant eligibility for home-based therapy services. With more specific data about the functional ability of older adults who are homebound and nonhomebound, occupational therapists can better contribute to policy discussions and decisions about the types of health care services for which older adults with ADL limitations should be eligible.

Occupational therapists recognize that occupational performance is influenced by psychosocial factors. It is not only important to recognize these psychosocial factors in practice, occupational therapists need to recognize them in the profession's research and test underlying assumptions about them. These psychosocial variables are worthy of study because they are theorized to influence ADL ability, home safety, and level of satisfaction with ADL. Older adults who are homebound may be more influenced by these psychosocial variables because they are considered to be at higher risk for social isolation and depressive disorders. By comparing the relationship of these psychosocial variables to the total sample and to the sub-groups of older adults who are homebound and nonhomebound, the study can show whether a continuum exists between these two sub-groups as well as gaining a perspective on older adults in general.

Summary

Despite the great significance of homebound status to the eligibility for community-based long term care programs, occupational therapists have conducted few, if any,

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research studies focusing on the ADL ability, ADL satisfaction, and home safety of older adults who are chronically homebound in comparison to older adults who are nonhomebound. Nor have studies examined the influence of (a) self-identified ADL problems, current role incumbency, and the presence of depressive symptoms, on this population's (b) ADL ability, level of satisfaction with ADL, and home safety. The purpose of this investigation was to study a small sample of older adults who were chronically homebound and compare this sample to an equal number of older adults who are nonhomebound in order to gather data about each group's ADL ability, satisfaction with ADL, and overall home safety. I anticipated that homebound older adults would demonstrate lower levels of ADL ability, satisfaction with ADL, and home safety than their nonhomebound cohort. In addition, I investigated how self-identified ADL problems, role participation, and the presence of depressive symptoms were related to ADL ability, satisfaction with ADL, and home safety for older adults in general and for those who are specifically homebound and nonhomebound. Because of their isolation in the home and restricted access to community resources, these psychosocial variables may more greatly influence the ADL ability, level of satisfaction with ADL performance, and home safety of older adults who are homebound compared to older adults who are nonhomebound. Evaluating whether a combination of the psychosocial variables could estimate a combination of the dependent variables was a method for determining the validity of choosing these particular variables in a study of older adults. This exploratory correlational study can be used to determine the need and direction for future studies with larger samples of older adults who are chronically homebound and nonhomebound.

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Research Questions

This study addressed the following research questions:

1. Do older adults who are chronically homebound demonstrate significantly lower ADL ability than older adults who are nonhomebound?

2. Do older adults who are chronically homebound demonstrate significantly lower levels of satisfaction with ADL performance than older adults who are nonhomebound?

3. Do older adults who are chronically homebound demonstrate significantly lower home safety ability than older adults who are nonhomebound?

4. Is there a significant negative relationship between the number of problematic ADL identified and (a) ADL ability, (b) level of satisfaction with ADL performance, and (c) home safety in the total sample? Can a stronger relationship be found for older adults who are homebound versus older adults who are nonhomebound?

5. Is there a significant positive relationship between the number of current roles encumbered and (a) ADL ability, (b) level of satisfaction with ADL performance, and (c) home safety in the total sample? Can a stronger relationship be found for older adults who are homebound versus older adults who are nonhomebound?

6. Is there a significant negative relationship between the number the number of depressive symptoms and (a) ADL ability, (b) level of satisfaction with ADL performance, and (c) home safety in the total sample? Can a stronger relationship be found for older adults who are homebound versus older adults who are nonhomebound?

7. Is there a linear combination of the psychosocial variables (i.e., self-identified ADL problems, number of perceived roles currently occupied, and symptoms of depression)

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that can predict a linear combination of the dependent variables (i.e., ADL ability, level of satisfaction with ADL performance, and home safety) for the total sample?

Study Limitations

The most significant limitation of the study was the use of a relatively small convenience sample from one geographic location. Costs prohibited the use of a representative sample of homebound and nonhomebound older adults. Sampling from one geographic location limited my ability to generalize the results to other regions of the country. The lack of previous occupational therapy research focused on the ADL ability, the level of satisfaction with ADL performance, home safety of older adults who are homebound and nonhomebound, however, helped to justify the exploratory nature of this study.

Another limitation of this study was the high level of involvement of the principal investigator in data collection. Ideally, data collectors would be blind to the details of the study; however, because of financial limitations, I collected the majority of data with the assistance of two other data collectors: a registered occupational therapist and a second-year graduate occupational therapy student. One planned limitation of this study was its focus on older adults who are chronically homebound rather than adults who are homebound receiving Medicare post-acute home health services.

Definitions of Terms

Activities. *Activities* refer to "the execution of a task or action by an individual" (World Health Organization, 2001, p. 14)

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Activities of daily living. Activities of daily living (ADL) are comprised of personal activities of daily living (PADL) and instrumental activities of daily living (IADL). PADL are related to basic self-care and are comprised of the following: bathing and showering, bowel and bladder management, dressing, eating, feeding, functional mobility, personal device care, personal hygiene and grooming, sexual activity, sleep and rest, and toilet hygiene (Rogers & Holm, 1994). IADL are more complex in nature, involve more interaction with the environment, and can be delegated more readily than PADL. IADL are comprised of the following activities: care of others, care of pets, child rearing, communication device use, community mobility, financial management, health management and maintenance, home management, meal preparation, and shopping (Rogers & Holm). Functional mobility refers to moving from one position to another during ADL, (e.g., transfers and functional ambulation including the transportation of task objects). Community mobility includes moving one's self in the community using private or public transportation.

Occupations. Occupations constitute meaningful and purposeful activities that people want to do, need to do, or are expected to do in the general areas of self-care, productivity, and leisure (Law et al., 1998).

Occupational performance. Occupational performance refers to "meaningful sequences of action in which a person completes an occupational form" (Fisher & Kielhofner, 1995, p. 113). An occupational form represents the typical way an occupation is performed in terms of its physical and sociocultural characteristics (Nelson, 1996).

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Home safety. Home safety relates to the ability of a person to perform activities free from (a) unsafe practices that can lead to personal injury or damage to the environment; and (b) the complications of task breakdown that suggests potential inability to meet basic needs related to food, clothing, shelter, and personal health (Allen, 1992; McNulty & Fisher, 2001).

Tasks. Task are comprised of objective behaviors that are required to accomplish a goal (Dunn et al., 1994)

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CHAPTER TWO: REVIEW OF THE LITERATURE

In this literature review, I will begin with a discussion of the theoretical framework for a comparison of the ADL ability, level of satisfaction with ADL performance, and home safety of older adults who are chronically homebound and older adults who are nonhomebound. Next, I will discuss basic demographic information related to older adults before describing one of the most significant outcomes for geriatric practitioners: active life expectancy. Subsequently, I will hone in on the characteristics and ADL functioning of homebound older adults described in past studies. The next sections will focus on the relevant topics of home safety, role incumbancy, and the presence of depressive symptoms in older adults. In the last section, I will offer more background information on Medicaid and Medicare home care services.

The Ecological Theory of Aging

Adults over the age of 60 often seek home environments that offer them an optimum balance between autonomy and security (Parmelee & Lawton, 1990). In 1973, gerontologists Lawton and Nahemow (1973) spearheaded a movement to improve nursing home environments by proposing a new theory in their field, the *ecological theory of aging* (ETA). The ETA addresses older adults' need for environments that provide a favorable range of stimulation known as an optimal adaptation level (Lawton & Nahemow). An older adult experiences maladaptation when too little or too much environmental stimulation or "press" is experienced. Environmental press is comprised

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of the objective and subjective demands the environment perceived by the older adult. With too little press, an older person may experience a lack of fulfillment or boredom; in contrast, feelings of frustration or failure could be the result of interacting with an environment that has too high a level of press. Older adults who are fully competent in their functional activities can adaptively respond to a wide variety of levels of environmental presses (Lawton & Nahemow). For frail elders (e.g., the chronically homebound), an optimal adaptation level can be attained only if the environmental press is simplified or reduced.

In addition to the adaptation level, environmental press, and functional competence of an elder, the ETA includes the fourth variable of time (Nahemow, 2000). For example, after an acute medical event, such as having a cerebral vascular accident, an older adult may likely find the low level of environmental press in a skilled nursing facility to fit his or her diminished functional abilities. However, once the person regains his or her strength, endurance, cognitive capacities, and ability to participate in ADL, the nursing home environment would provide too little press, thus making it an unsuitable environment for the individual.

The ETA views the functional competence of an older adult and the level of environmental press as dynamic and interacting elements that affect a person's adaptation level. Lawton and Nahemow (1973) challenged earlier notions of viewing older adults' behavior in a vacuum, free from environmental influences. They began an important discussion about how the home environment can interact with an older person's functional skills to mediate the person's overall level of adaptation, which is a crucial

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antecedent to the present study. Without an appreciation of the effect of the environment on older adults' ADL participation, we could study an older adult's ADL ability in isolation from the person's social and physical environments, losing important information about what elements of the environment support or impede participation. Instead, we need to view older adults who are chronically homebound at one point in time and analyze how sufficiently their environments are matched to their abilities and skills as well as analyze ways to improve their functional competence. If we add a temporal dimension to this analysis, we may answer the question: What is the 1-year trajectory for this person's adaptation level? Are there changes that need to be made to promote a more optimal level of adaptation? Will he or she continue to be homebound? If his or her adaptation level is not optimal, and he or she will likely be homebound in the future, how could the person-environment fit be improved over time?

The ETA's weakness is that relatively little research has been conducted to test its propositions. One explanation for the paucity of research related to the ETA is its lack of more specific information about each element of the theory, thus making it difficult to operationalize into testable variables. However, in spite of the theory's weaknesses, it is gerontology's most relevant theory for an investigation of homebound older adults' ADL ability, level of satisfaction with ADL performance, and home safety.

Ecological Theory and Its Link to Occupational Therapy

The central components of the ETA – competence, environmental press, and level of adaptation – are echoed in occupational therapy theories that view occupational performance as related to the person, task, and environmental factors (Dunn et al., 1994;

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Fisher, 1998, 2001a; Law et al.,1998; Kielhofner, 1995, 2002; Schkade & Schultz, 1992). An older person's competence in the ETA is analogous to concepts in occupational therapy such as occupational performance and body functions (e.g., cognitive capabilities, joint stability). Environmental press is comparable to Kielhofner's (2002) description of environmental elements serving as facilitators or barriers to a person's participation in self-care, productivity, and leisure activities. Unlike the ETA, occupational therapists have explicitly articulated the notion that people are more than passive responders to their environments; instead, they have the ability to shape and change environments to better meet their needs and abilities (Schkade & McClung, 2001). Rather than a one-way interaction with the environment acting upon a person, there is a transaction between the person and the environment with the potential that each will change the other (Law et al., 1996). Optimum adaptation level within occupational therapy could be interpreted as compatible fit between environmental demands, what activities the person wants to do, and the skill level and preferences of a person (Kielhofner). The result is that the person experiences a sense of mastery and accomplishment. What these occupational therapy theories offer that the ETA lacks are more specific definitions and also approaches to assessment and interventions that can be investigated and applied in the practice of gerontic occupational therapy.

Demographics of the Older Adult Population

In the 20th century, while the total United States population tripled, the population of adults over 65 increased 11-fold (Hobbs & Damon, 1996). According to the US Census Bureau, 35 million Americans were over 65 in 2000, a 12% increase from the year before

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(Hetzel & Smith, 2001; Hobbs & Damon). The 2000 census reported the following age distribution among older adults: 65 to 75 years (52.6%), 75 to 84 years (35.3%), 85 to 94 years (11.2%), and 95 years and older (1.0%). The fastest growing subset of these groups is older adults aged 85 and older. The census report also depicted older adults as feeling relatively positive about their health status. Three out of four 65- to 74-year-old persons described their health to be good, very good, or excellent, as did two out of three adults over 75 (Hetzel & Smith).

As older adults age, they are more likely to experience chronic health conditions that put them at risk for disability or limitations in the ability to perform ADL (Ostchega, Harris, Hirsch, Parsons, & Kinston, 2000). It has been observed that the percentage of older adults requiring ADL assistance increases with age: 65 to 69 years, 9.2 %; 70 to 74 years old, 11.0%; 75 to 79 years old, 19.5 %; 80 to 84-years old, 31.2%; and 85+ years , 49.5% (Hobbs & Damon, 1996). However, the need for ADL assistance does not have to threaten one's ability to live in the community. In fact, despite an almost universal concern of older adults about being "put away" in nursing homes, only a small minority of older adults (i.e., 4.5 % in 2000 compared with 5.1 % in 1990) reside in nursing homes (Hetzel & Smith, 2001; Hobbs & Damon). Another 3% of older adults live in supportive housing situations that provide 24-hour ADL assistance such as assisted living or board and care facilities (Hawes, 1999). The vast majority of older adults, 92%, reside in single-family domiciles (e.g., houses, apartments, mobile homes). Approximately 8% of older adults who live in single-family domiciles are homebound (Centers for Medicare and Medicaid, 2002, June 20).

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Active Life Expectancy

For the field of gerontology, increasing active life expectancy is as important as reducing the rate of mortality (Katz et al., 1983). The number of years older adults are active and able to independently participate in ADL constitutes the notion of active life expectancy (Hobbs, & Damon, 1996; Katz et al.). Katz defined inactive life years as the amount of time an older adult is institutionalized or is dependent in bathing, dressing, transferring to a bed or chair, or eating. More recently, researchers have broadened the definition of nonactive life years to also include the amount of time a person is dependent in at least one of the following specific IADL: preparing a meal, shopping for personal items, managing money, using the telephone, or doing light housework (Crimmins, Hayward, & Saito, 1996).

Investigators have examined the factors associated with active life expectancy in order to assist policy makers in planning health care policy. Americans now enjoy a much longer active life expectancy because of advances in the prevention and treatment of diseases as well as the development of life-saving technology. Currently, a female at age 70 can look forward to 11.9 years of active life expectancy and her male cohort, 9.7 years (Hayward, Crimmins, &Yasuhiko, 1998). White, non-Hispanic ethnicity and higher educational and socioeconomic levels are positive predictors of longer active life expectancy (Crimmins et al., 1996). Because of the significant discrepancies in active life expectancy among people of non-Anglo heritage and those of lower socioeconomic means, active life expectancy has been proposed as an important outcome for testing the

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efficacy and value of programs aimed at reducing disability in older adults (Laditka & Wolf, 1998).

An investigation of older adults who are chronically homebound and their nonhomebound cohorts can potentially provide a comparison of ADL ability, satisfaction with ADL, and overall home safety between older adults who are in their active and nonactive life years. Older adults who were chronically homebound would be considered examples of persons in their nonactive life years. Fifty percent of participants in the nonhomebound group could also be classified as being in their nonactive life years. To understand the full continuum of ADL ability in older adults, it may be worth considering the characteristics of older adults who are in their inactive life years, but are not homebound.

Older Adults Who are Homebound

Defining homebound. The clinical literature points to a controversy about which older adults meet the criteria for the homebound status used to determine eligibility for home health services provided by Medicaid and Medicare programs (Stoker, 1999; Weiss, 1999). Medicare and Medicaid are administered at the federal level by the same organization, so the programs share the same official definitions for homebound status. Defining what qualifies an older adult as chronically homebound also varied in the studies encountered in this literature review. Investigators have drawn their chronically homebound sample from local community long-term care programs whose homebound requirements were unclear (Golden et al., 1999; Ritchie et al., 1997). One set of investigators did not elaborate on their definition of homebound other than to say that

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their participants were being assessed in the home by a physician due to a recent decline in ADL participation (Currie, Moore, Friedman, & Warshaw, 1981). One criterion for homebound status was the inability to leave the home due to physical or cognitive impairments or if the older person reported difficulty shopping or preparing meals (Lubaczewski & Pezzoli, 1998). Other researchers considered homebound to be the inability to go out of the home without extraordinary effort (Kellogg & Brickner, 2000). Ganguli et al. (1996) based the distinction on how many times people left their homes per week (i.e., if older adults went out into the community ≤ 1 time per week). For the present study, the criteria for homebound status are modeled after the Health Care Financing Administration's (2001) homebound definition, which states that older adults must indicate that it takes extraordinary effort to leave their homes because of the presence of weakness, frailty, or risk for further health complications. Their cognitive and/or physical impairments and level of ADL participation restrict their community outings to religious or medical appointments (Stoker, 1999).

Health characteristics of older adults who are homebound. The presence of comorbid conditions is common to older adults who are homebound and complicates their health care (Kellogg & Brickner, 2000). For instance, an older adult with hypertension may experience dizziness, one potential side effect of the person's hypertension medication. The dizziness can lead to a fall and an ensuing hip fracture. This person may have a longer and more complicated recovery from the fall and resulting total hip arthroplasty because of the presence of another condition, osteoporosis. If the health care team wants to reduce the risk of falls and further injury, the team must

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evaluate the comorbid conditions and treatments in aggregate to develop an intervention plan with the fewest number of unacceptable side effects.

The majority of older adults who are chronically homebound are also frail. Geriatricians have separated frailty from disability in order to refine therapeutic approaches (Fried et al., 2001). Fried and colleagues proposed a definition of frailty that included a syndrome with at least three of the following characteristics present: (a) unintentional weight loss of more than 10 pounds or 5% of body weight from the previous year, (b) weakness as measured by grip strength in the lowest 20th percentile, (c) decreased endurance as measured by a self-report of exhaustion, (d) slowed walking ability as indicated by scoring in the lowest 20th percentile for a timed 15-foot walk, and (e) scoring in the 20th percentile for overall low physical activity as measured by the number of calories expended in a week. Older adults with none of these five characteristics are labeled as robust, and those with one or two are viewed as potentially prefrail.

As previously discussed, disability represents the level of restriction in a person's ability to participate in daily activities and often results from impairments in body functions, health conditions, or diseases. By clearly defining different health characteristics such as comorbidity, frailty, and disability, geriatric practitioners can target relevant interventions for each characteristic rather than lumping them all together as if they constituted an inevitable element of growing old. Levels of frailty can be improved by conditioning programs that build physical capacity and tolerance for performing ADL. Disability can be reduced by using compensatory approaches during

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ADL or, in some cases, by improving impairments in body functions that support independent performance.

ADL ability of older adults who are chronically homebound. Although there is a paucity of occupational therapy studies specifically focused on older adults who are chronically homebound, other disciplines have carried out investigations with this population. These studies have concentrated on dental care, nutrition, falls, and the management of chronic conditions such as incontinence and diabetes (Dolan & Atchison, 1993; Forbes, & Morris, 1999; Lester, Ashley, & Gibbons, 1998; Tinetti & Williams, 1997). Only a limited number of studies have focused on the ADL participation of older adults who are chronically homebound.

In an early study of homebound older adults, the ADL functioning of 50 participants was described only in terms of mobility (Currie et al., 1981). Ten participants used walking aids, 1 was mobile inside with a wheelchair, 9 were confined to bed or a chair, and 16 were able to ambulate outside their homes. Ganguli and colleagues (1996) studied the instrumental IADL functioning of homebound older adults in rural Pennsylvania ($n = 90$). IADL functioning was designed to be a dichotomous variable defined as (a) performing IADL independently or (b) needing help to perform IADL or unable to perform IADL. The following information describes each IADL and the percentage of the homebound sample who reported needing help or being unable to perform the respective activities: using the phone, 25%; getting to places out of walking distances, 63%; grocery shopping, 57%; meal preparation, 51%; taking medications, 44%; and handling money, 40%. No data were collected regarding PADLs.

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In a sample of 288 urban-living homebound older adults, Lubaczewski and Pezzoli (1998) found that the majority of the sample was independent with the majority of their ADL. ADL was assessed by self-report as a three-level variable: (a) independent, (b) receives assistance, and (c) needs more assistance. The study's results follow in the order of specific ADL, percentage receiving assistance, and percentage needing more assistance: eating (12.3%; 3.2%), transferring (22.2%; 8.1%), dressing (25.6%; 10.9%), bathing (30.6%; 16.9%), grooming (30.3%; 14.4%), toileting (24.9%; 7.1%), walking (34.7%; 6.5%), cooking (42.4%; 13.8%), light chores (44.5%; 27.0%), taking medications (28.8%; 3.6%), grocery shopping (64.3%; 12.7%), handling finances (50.4%; 5.4%), using telephones (18.5%; 2.5%), making decisions (38.0%; 2.9%), and doing errands (61.6%; 14.6%). Participants identified bathing, grooming, light chores, grocery shopping, and doing errands as the activities in which they had the most unmet needs for assistance.

One criticism leveled at ADL assessments utilized with frail older adults is that they do not have a low enough scale to capture the abilities of lower ADL-functioning homebound individuals such as older adults who are homebound (Gloth et al., 1995). One assessment designed for frail older adults is the Frail Elderly Functional Assessment Questionnaire (FEFAQ) (Gloth et al.), a structured interview that covers PADL and IADL. The FEFAQ was designed to assess frail, homebound adults with a wide range of ADL abilities. Although this assessment was designed for use with older, homebound adults, it has the one limitation that can be found in several assessments of activities of daily living utilized with older adults (e.g., the Katz Index of ADL, Functional

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Independence Measure, Barthel Index) (Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963; Keith, Granger, Hamilton, & Sherwin, 1987; Mahoney & Barthel, 1965): The FEFAQ and these other assessments were designed to provide a global rating of ADL independence, providing no specific data about which actions are directly hampering a person's ability to do a task competently. A global rating may be acceptable for large, epidemiological studies that principally aim to provide generic information about levels of ADL performance; however, these types of tests do not elucidate which task actions directly impede ADL performance. Nor do they describe whether an older adult views the need for assistance as problematic. Without this type of information, it is far more difficult to develop appropriate remediation or compensatory interventions to maintain or restore ADL ability for an individual older adult client.

Studies of ADL participation in older adults who are chronically homebound have taken the form of interviews and written surveys that focus on how much ADL assistance participants need (Currie et al., 1981; Ganguli et al., 1996; Gloth et al., 1995; Lubaczewski & Pezzoli, 1998). The data derived from these studies have not elucidated what individuals who are homebound can actually do in their daily routines or how well they can perform ADL.

Trends in assistance. Compared to men with ADL limitations over the age of 65, older women with ADL limitations receive less informal (unpaid) and formal (paid) assistance with ADL (Katz, Kabeto, & Langa, 2000). This is due in part to the fact that women on average live longer than men and therefore are more likely to be living alone without significant others available to provide assistance with ADL. Receiving less

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assistance may bring additional problems for the typical chronically homebound older adult who is less likely to belong to social groups or to have adult children living within a 30-minute drive (Branch et al., 1988).

The level of formal services available to the typical homebound older adult, who is likely a female, may not be adequate if one looks to the findings of study conducted by Bierman and Clancy (2001) with a sample of 91,314 community-dwelling older women. The older women who reported the highest numbers of medical conditions, diseases, and ADL limitations also reported the most difficulty negotiating the current health care system. The individuals with the highest levels of comorbidity and disability indicated problems with access to health care and the quality of services received. Bierman and Clancy implied that these women were "falling through the cracks" and could benefit from more assistance to navigate the system to obtain needed services. They called for the development of more community-based programs aimed at promoting the self-management strategies of women with chronic, comorbid conditions. The whole arena of promoting more self-management skills in community-dwelling women with disabilities is one to which occupational therapists could contribute. Because of our understanding of comorbid conditions, frailty, adapting to disability, and lifestyle modification, we could develop and investigate programs aimed at improving health outcomes for individuals like those described in the Bierman and Clancy study.

Level of Satisfaction with ADL Performance

Another factor that has been missing from these ADL investigations is the perspective of older adults who are chronically homebound and how satisfied they are

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with their ADL performances. Learning about the level of satisfaction with ADL of older adults who are chronically homebound enabled me to begin to understand if they were receiving the types of assistance or support they need to perform ADL. This information can be used to support occupational therapists to better prioritize intervention needs of this population.

Home Safety

Within gerontology and occupational therapy, home safety has been conceptualized principally as fall reduction. Unintentional falls constitute the number one cause of injuries for people 55 years of age and older (US National Center for Injury Prevention and Control, 1998). For those over 65 years, unintentional falls result in a high rate of fractures, intracranial injuries, contusions, and superficial injuries (e.g., lacerations, sprains, strains) (Hall & Owings, 1991). Older adults who experience a fall are at a higher risk for nursing home admission (Tinetti & Williams, 1997).

Intrinsic fall risk factors are those that originate within the person. Investigations of the etiology of falls in older adults have revealed several intrinsic factors that increase the risk of falls. These factors include acute and chronic conditions that affect an older person's musculoskeletal (e.g., decreased grip strength or lower extremity weakness [hip and knee]), reduced mobility, abnormality of gait or balance, difficulty performing sit-to-stand, difficulty bending, arthritis, cognitive issues (e.g., taking more than four medications, severe depression, dementia), and neurological systems (e.g., Parkinson's disease, past history of a cerebral vascular accident) (Tinetti & Speechley, 1989). Another category of intrinsic risk factors includes conditions that affect the visual,

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auditory, vestibular, and proprioceptive systems. Clemson (1997) proposed that these intrinsic factors increase fall risk for several reasons. These risk factors can impact an older person's perception of the environment, ability to negotiate the environment, movement speed and velocity, ability to recover from a trip or fall, and ability to pay attention and make judgments about movements and elements of the environment.

Extrinsic fall risk factors are those found outside the person. Clemson (1997) noted that the 10 extrinsic factors most frequently reported in the gerontology literature include slippery surfaces; obstacles in trafficways; poor illumination; floor mats; footwear; ladder, step ladder, and chair used to climb; bath; uneven broken, or loose pathways; cords on floor; and steps and stair railing. Speechley and Tinetti (1991) found that more active and vigorous older persons fell less frequently, but were more likely to fall in the presence of unfamiliar environmental hazards, resulting in serious injury. In contrast, frail older adults tended to fall during familiar ADL due to intrinsic factors such as those discussed earlier (Speechley & Tinetti).

Thirty to 50 percent of community-living older adults are afraid of falling (Howland et al., 1998). The fear of falls and associated injuries is prevalent because older adults understand that falls can jeopardize their ability to live autonomously in the community. Although superficially a fear of falling can appear to be a healthy inclination on the part of an older adult, gerontologists have discovered a harmful consequence of a fear of falling: an increased restriction in physical and social activity. Another problem with the fear of falling and related activity curtailment is that an older adult's level of fear is not always commensurate with the number of fall risks present (Howland et al.). Fear of

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falling can result in disproportionate activity curtailment that can lead to deconditioning and risk for ADL limitations. A 4 week intervention study that included education about falls and the topics of assertiveness, self-efficacy, activity level, exercise, and environmental hazards was effective in promoting a more realistic and proactive view of fall risk (Tennstedt et al., 1998).

Occupational therapists have demonstrated efficacy with fall reduction interventions in relatively large randomized studies. The first study included 163 participants in the control group and 184 in the intervention group (Close et al., 1999). The intervention group received an outpatient medical assessment and an occupational therapy assessment home visit. The home visit included an assessment of ADL, the Barthel Index, (Mahoney & Barthel, 1965), a nonstandardized environmental hazards evaluation, and Fall Handicap Inventory (i.e., questions related to health, function, and emotion) (Rai, Kinirons, & Wientjes, 1995). The occupational therapy intervention included education, home modifications, minor equipment, and referral for social services. After 1 year, the intervention group had statistically fewer falls than the control group.

In a subsequent study, researchers investigated an occupational therapy fall reduction intervention that began with 530 community-dwelling older adults who had recently been discharged from an acute hospital stay (Cumming et al., 1999). The intervention group ($n = 264$) received an occupational therapy home visit that consisted of an assessment and intervention focused on environmental hazards. The researchers did not find a statistically significant difference in the occurrence of falls between the intervention and control groups, but results showed that a subset of the intervention group, participants

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who had experienced one or more falls in the last year, did demonstrate a significant reduction in the number of falls reported over the course of 1 year.

Although falls account for the majority of injuries and mortality associated with home accidents, they are not the only type of accident that affects older adults' home safety. Older adults are also at risk for unintentional injury due to burns and fires, medical and medication complications, poisoning, suffocation, electrocution, and use of machinery (US National Center for Injury Prevention and Control, n.d.). The third largest cause of unintentional injuries for 65 to 84 years is a category title "unspecified." Another reason to broaden our view of home safety can be found in *The Comprehensive Accreditation Manual for Home Care* (Joint Commission on Accreditation of Healthcare, 1999). This manual instructs home care professionals, including occupational therapists, to address all hazards and risks in the home, as well as those related to "equipment, medications, nutrition, and supplies" (p. 297). In addition, Carter, Cambell, Sanson-Fisher, and Gillespie (2000) encouraged assessment of non-fall accidents with older adults after results of their study revealed that 50% of home accidents were non-fall related.

Occupational therapists have described a broader view of home safety that goes beyond a strict focus on fall prevention. Letts et al. (1995) proposed that overall home safety be viewed as a transaction of dynamic and interacting relationships between a person's body functions, ADL skills, and the physical and social elements in his or her environment. They conceptualized home safety as including a person's ability to access needed services and support in the community as well as a person's ability to avoid high-

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risk situations that can lead to adverse consequences. Allen (1992) specified that a person who has adequate home safety skills has the planning and organization abilities to obtain meals, maintain shelter and personal health, cope with emergencies, and prevent personal injuries. Implicit within this definition is the notion that someone with adequate home safety skills has the capacity to recognize and problem-solve strategies for reducing home safety risks in spite of existing sensorimotor, cognitive, and perceptual body function impairment. This conceptual background leads to the definition of home safety that will be used for this study. *Home safety* relates to (a) the ability of a person to perform tasks free from unsafe practices that can lead to personal injury or damage to the environment; and (b) the ability of a person to perform tasks free from the complications or task breakdown that suggests potential inability to meet basic needs related to food, clothing, shelter, and personal health (Allen, 1992; McNulty & Fisher, 2001).

If occupational therapists can successfully provide intervention programs that reduce fall accidents, it makes sense to address the other causes of unintentional home accidents that older adults experience. Older adults who are homebound can especially benefit from this broader assessment of home safety, considering their relatively high levels of disability. In spite of vulnerability of older who are homebound to accidents of all kinds and to the risk of not having access to needed resources, no studies have specifically investigated the home safety of older adults who are homebound in comparison to older adults who are nonhomebound.

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Perception of Role Incumbency

The perception of role incumbency is important for occupational therapists to investigate because a person's notion of his or her role responsibilities can have great bearing upon which occupations a person chooses to do and with whom he or she chooses to perform these occupations. Role theory has a long history in sociology and social psychology and has served as a way to understand the link between a person's identity, development, and success in social relationships. Merton (1957) characterized a role as including a role occupant and members of the role set (e.g., mother, child, child's teacher), each with separate identities and some shared notion about expected role behavior that includes types of communication and associated activities. Each member of the role set assigns some type of status (e.g., the social position of a mother) within a given social hierarchy that bring along rules about how one should act when occupying that role. The choice of role occupant is arbitrary; it serves as a way to study how one role status, for example, the role of mother, at one point in time, can interact with multiple role partners and experience varying degrees of intensity, power, and conflicting demands (Merton).

Heiss (1981) described five different problems that can emerge in the performance of role interactions. The first problem begins with inappropriate role selection in a situation arising from a person's lack of exposure to role behavior. The second involves not knowing which roles to select in a particular social situation. The third type of role problem develops when a conflict exists between the role occupant and a member of a role interaction; a consensus is not reached between the two about what is expected from

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each other. Role strain constitutes the fourth problem and occurs in either one or two scenarios: (a) when a person finds that expectations from one role are in conflict with his or her perceived expectations of another role, or (b) the person does not have the resources to adequately perform perceived role expectations (Goode, 1960).

Whereas sociologists and social psychologists study roles to gain knowledge about relationships and patterns of group behaviors, occupational therapists investigate the perception of role occupancy to understand its link to what occupations people perform their daily lives. Roles organize the patterns of occupational performance based upon the person's internalized understanding of what must be done to meet other's expectations as well as his or her own expectations (Kielhofner, 2002). Each role has accompanying activities that must be done in order to successfully meet role expectations (e.g., a worker must get to work, do a variety of work tasks, and communicate with other workers individually and in meetings). Roles are culturally dependent and learned in a socialization process (Merton, 1957).

Occupational therapists would add that a rich component of this socialization process is the "doing" of role-related occupations with others and receiving feedback from them regarding approximations of role-associated occupations. The performance of these occupations comprise a person's notion of maintaining a role (Dunn et al., 1994). When an elderly grandmother cannot crochet her newest granddaughter a swaddling blanket because of painful joint diseases, she has lost a part of what it means to occupy the role or position of grandmother. Depending on what else she does related to this role, how others in her grandmother role set respond to this change in behavior, and her ability to

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interpret other occupations as contributing to this role, she may or may not experience erosion of her identity as a grandmother. Likewise, if she has lost the role of spouse because of the death of a spouse and then the role of friend because she is homebound, again, she will be challenged to reintegrate her identity into a new configuration of roles.

Occupational therapy researchers have studied the relationship between perceived role incumbency and life satisfaction (Bränholm & Fugl-Meyer, 1992; Elliot & Barris, 1987; Watson & Ager, 1991) and with adults of different ages (Bränholm & Fugl-Meyer). Multiple studies have investigated the effect of different disabilities or disorders on perception of role involvement (Barris, Dickie, & Baron, 1988; Cheng, & Rogers, 1989; Dickerson & Oakley, 1995; Hachey, Boyer, & Mercier, 2001; Hallett, Zasler, Maurer, & Cash, 1994). Despite the theoretical underpinnings for investigating the perception of role incumbency on occupational or ADL performance (Barris, Kielhofner, & Watts, 1988; Jackoway, Rogers, & Snow, 1987; Kielhofner, 2002), no studies have specifically examined this relationship with older adults. In this study, the relationship between number of current perceived roles occupied and (a) ADL performance, (b) satisfaction with ADL performance, and (c) home safety was investigated with homebound and nonhomebound older adults.

Although no specific studies have investigated the relationship between perceived role incumbency and ADL ability, level of satisfaction with ADL performance, or home safety, the relationship between life satisfaction and perceived role incumbency has been studied previously. Because the construct of overall life satisfaction is related to level of satisfaction with ADL performance (McColl et al., 2000), review of this area of research

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is warranted. Occupational therapy investigations of perceived role occupancy and older adults point to a weak positive relationship between the number of roles occupied and life satisfaction and other tests of well-being. Elliot and Barris (1987) found a weak significant correlation ($r = .26, p < .01$) between the total number of current roles occupied and life satisfaction scores in a sample of 112 community-dwelling older adults. They also found that the correlation between current invovlement in valued roles and life satisfaction was marginally more significant ($r = .29, p < .01$).

In a study of 75 community-dwelling older adults aged 50 to 90 years, Watson and Ager (1991) detected a low to moderate relationship between how frequently participants performed activities associated with specific roles and how much they valued 9 out of 10 tested roles ($r = .32$ to $.74, p < .05$). In their study, Watson and Ager modifed the Role Checklist to include Likert scale questions related to how frequently participants performed activities associated with each role. Brånholm and Fugl-Meyer (1992) compared role participation to life satisfaction among four groups of participants across the life span (25-year-olds, 35-year-olds, 45-year-olds, and 55-year-olds). Before studying perceived role occupancy and life satisfaction, they performed a factor analysis of the 10 roles on the Role Checklist (Oakley, Kielhofner, Barris, & Reichler, 1986). Nine of the 10 roles fit into four metaroles that accounted for 59% of the variance among the roles; the role that did not fit into the analysis was home maintainer. The four metaroles and their constituent roles were: family metarole (caregiver, partner, and family member), leisure metarole (friend, outdoor hobbyist, and indoor hobbyist), vocational metarole (student and worker), and organizational participant metarole

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(hobbyist and organizational participant). A discriminant analysis revealed that three of the four metaroles – family, leisure, vocational – correctly classified higher levels of life satisfaction in the study participants. In a non-occupational therapy study of 1600 community-dwelling older adults, Adelmann (1994) found weak statistically significant correlations between the number of perceived roles occupied and individual tests of well-being (i.e., health problems, self-efficacy, and the presence of depressive symptoms) ($r = -.13$, $r = .13$, and $r = -.19$, respectively). The mean number of roles reported in this study was 3.28 roles.

Given the relatively weak relationship between life satisfaction and perceived current occupancy presented in these studies, a more limited hypothesis between the relationship between role participation and ADL ability, level of satisfaction with ADL, and home safety was appropriate. It was anticipated that low positive relationships would be found between number of current perceived roles occupied and (a) ADL ability, (b) level of satisfaction with ADL, and (c) home safety of homebound and nonhomebound older adults.

Depression and Older Adults Who Are Homebound

The relationship between depression and disability is complex in older adults. One can find evidence that the presence of a impairments in body functions is a significant risk factor for developing depression (Geerlings, Beekman, Deeg, & Van Tilburg, 2000). In contrast, two more recent studies with large sample sizes have shown that well older adults with depression are more likely to experience disability in the future than their non-depressed cohorts (Cronin-Stubbs et al., 2000; Penninx et al., 1999). Depression

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also worsens ADL participation for adults who already have impairments in body functions (Ormel et al., 1998). Although there is no clear cause and effect relationship between these two constructs, one can find strong evidence supporting a positive relationship between the presence of depression and disability (Oslin, Streim, Katz, Edell, & TenHave, 2000). These studies indicate that the presence of depressive symptoms increases the probability of ADL limitation in older adults.

If an older adult already has some type of medical condition that limits his or her ability to participate in regular daily activities, the onset of depressive symptoms can intensify the level of disability he or she experiences (Ormel et al., 1998). To illustrate this phenomenon, we can consider a hypothetical, 78-year-old woman whose name is Margaret. Margaret has thought of herself as fairly lucky with her health, as her mind is still "clear as a bell," and she is still able to walk regularly with her husband at the mall. Her rheumatoid arthritis has been the only chronic health condition that she has had to contend with in recent years, and it has only limited her ability to do heavy housework such as vacuuming and cleaning the bathtub. Margaret and her husband moved away from a small coastal community to which they had retired 16 years earlier for two major reasons. They decided they wanted to be closer to their adult children in a nearby city, so they moved into an assisted living setting and made friends with several other couples in the complex. They also liked the idea of receiving assistance with heavy cleaning and not having a yard to worry about. Nine months after moving to the assisted- living setting, Margaret experienced several stressful life events. Her husband died suddenly of a heart attack, her sister passed away, and her oldest son with three children divorced his

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wife after 20 years of marriage. Margaret was lost without her husband, felt discouraged about losing her youngest sister, and despaired about her son's marital troubles. After 1 year, Margaret still did not feel like visiting with her old friends as much, and she had significantly reduced her walking activities and overall level of physical activity in her daily routine. Her husband had been 2 years younger than she, and she could not get over "him going first."

Margaret developed the symptoms of depression after she passed through a typical grieving period of 1 year (American Psychiatric Association, 1994). Margaret's social and physical activities had significantly reduced over time, which are common manifestations of depression (Lebowitz et al., 1997). For example, she decided she did not have the energy to change the sheets on her bed or to sweep and mop her kitchen, so she elected to receive household services set up by the assisted-living complex manager to take care of these tasks. Margaret's physician was especially concerned about Margaret's health after she reported more frequent arthritis exacerbations and significantly more joint pain. Her pain level was now high enough that she requested prescription medications to treat it.

Because of her age and her joint disease, Margaret's reduction in daily activities, brought on by depressive symptoms, significantly affected her endurance, strength, and overall physical conditioning. These physical changes had the effect of shrinking the number of activities in which she could comfortably participate, thus increasing the severity of her disability.

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Depression is the most prevalent psychiatric diagnosis in adults over the age of 65 (Dalton & Busch, 1995). To meet the criteria for the diagnosis of major depression, a person must report or display a low mood or a loss of interest in previously-enjoyed activities that lasts at least 2 weeks and is accompanied by three other signs or symptoms of depression (American Psychiatric Association, 1994). These signs and symptoms include sleep disturbances, weight loss or gain, thoughts of harming one's self, problems with concentration or memory, low energy, fatigue, and psychomotor agitation or retardation.

The etiology of depressive symptoms differs for older persons compared to younger adults. The onset of depression in younger people is typically attributed to psychological vulnerability and stress; in contrast, the risk factors for depression in older adults are more likely to be comorbid medical or neurological conditions (Karel, 1997). Because homebound older adults typically have more health impairments and limitations in their ability to perform ADL than nonhomebound older adults, they are more vulnerable to developing symptoms of depression (Katz et al., 2000). Bruce and McNamara (1992) investigated the psychiatric status of older adults who were homebound and nonhomebound and found a statistically significant difference between the two groups. Older adults who were homebound displayed a higher prevalence of major depression (2.3% vs. 0.7%) and minor depression (3.9% vs. 1.7%). Minor depression, also known as subclinical depression, is a recognized diagnosis that is based on the presence of a significant number of depressive symptoms that falls short of meeting the criteria of major depression, but still negatively impacts older adults' quality of life and daily

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functioning (Badger, 1998). In a study of the health status and ADL assistance levels of urban homebound older adults, 40% of the participants reported symptoms of depression (Lubaczewski & Pezzoli, 1998); however, the relationship between feeling depressed and receiving or needing assistance with ADL was not examined.

Major and minor depression continues to be under-diagnosed in older adults who are homebound and nonhomebound despite of the availability of effective treatment for both diagnoses (Currie et al., 1981; Schulberg et. al., 1998, Williams et al., 2000). The trend for under-diagnosis of depression is a concern because of the previously discussed cognitive and physical changes that can lead to a loss of independence and well-being in older adults, in addition to the significantly increased risks for acute hospitalizations, suicide, and death (Badger, 1998; Livingston, Watkin, Milne, Manela, & Katona, 2000). A panel of specialists in geriatrics concluded that out of 78 health conditions, depression was the second most critical (following pharmacological management) for the medical community to target and treat to prevent further disability and high health care costs for frail older adults (Sloss et al., 2000).

Although they may be in a high-risk group for depression, many older adults who have multiple chronic medical conditions are able to cope with their changing health and abilities. This is due in part to the strategies they employ to cope with their health changes, including how they perceive the effects of their impairments (Dugan, 2000). For example, one study studied homebound older adults who had urinary incontinence. Participants who had depression were more likely to perceive their incontinence as a barrier to doing what they wanted to do in their daily routine, while those without

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depressive symptoms did not. It appeared that those who had incontinence without depression had found better ways to cope and adapt to their impairment in body functioning.

Within the field of occupational therapy, a study comparing the ADL ability of psychiatric groups revealed that adults with depression demonstrated significantly less ADL ability than persons without a psychiatric disorder; however, persons with depression demonstrated significantly better than ADL ability than persons with schizophrenia (Girard et al., 1999). Noh and Posthuma (1990) encouraged occupational therapists working with older adults whose primary diagnosis is related to impairments in physical body functioning to be aware of the symptoms of depression and to appreciate its effect on ADL performance. Glogoski-Williams (2000) argued that occupational therapists had a unique contribution to make with this population. An ADL evaluation administered by an occupational therapist can provide important information for discharge planning in addition to serving as a guide for a holistic intervention.

Medicaid and Community Long-term Care

Medicaid waiver programs are funded by a combination of state dollars matched by federal funds. Whereas Medicare pays for health care services of all adults over the age of 65, Medicaid pays the health care costs for low-income children, adults with disabilities, and low-income adults over the age of 65 (Wolfgang, 2001a). Congress authorized the Medicaid Home and Community-Based Services Waiver Program in 1981 in Section XIX of the Social Security Act. Prior to 1981, Medicaid long-term care monies were mainly used for paying the costs of nursing home care; however, state

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Medicaid waiver programs were approved to provide community-based services that could prevent nursing home admission for older adult Medicaid recipients and younger adults with disabilities.

In 1994, the federal budget allocated $45.6 billion to long-term care Medicaid spending. In spite of the continued support for using community-based long-term care services to prevent institutionalization, the majority of federal long-term care monies for Medicaid (61%) were used for nursing home care in 1994 (Leutz, 1999). Twenty percent of the funds were spent on intermediate care, 8% on home and community-based care, 7% on personal care, and 4 % on home health care. In many states, Medicaid home health services do not include skilled rehabilitation services such as occupational, physical, and speech therapies.

Investigators have found mixed results when trying to answer the question of whether these Medicaid long-term community-based programs are more cost-effective than nursing home care (Gaumer et al., 1986; Mims, Thomas, & Conroy, 1977; Skellie, Mobley, & Coan, 1982). Probably, the most plausible answer can be found in the findings of Harrow, Tennstedt, & McKinlay (1995). Their investigation of the cost of caring for older adults in nursing homes versus in the community showed that for the majority of older adults (75%), community care would be cheaper. The minority of older adults' community care would approach or surpass the average yearly cost of nursing home care (i.e., approximately $35,522 in 1991 dollars). This last proposition was based on a formula that assumed all the care provided to an older adult needed to be calculated in dollars, whether provided by family, friends, or paid staff.

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Traditionally, older adults with ADL restrictions have more passively accepted long-term care programs offered to them compared with younger adults with disabilities (Kane & Kane, 2001). If long-term care programs are going to improve significantly, older adults must become more informed about long-term care options and actively explore how they might individualize services rather than blindly accept whatever an agency offers (Kane & Kane). This education and advocacy process would likely include lobbying state legislators to change individual Medicaid waiver program rules to promote a fundamental shift in the way managers evaluate the value of long-term care programs serving older adults. Instead of documenting long-term care's outcomes only in terms of the medical model (e.g., an absence of disease or bed sores), these same programs could shift to a social model that emphasizes choice and quality of life. However, despite the obvious merits of this argument, older adults with ADL restrictions may serve as the greatest barriers to these proposed changes (Kane & Kane.). Older adults who have acquired disabilities in their senior years often do not view themselves as "disabled." Instead, they attribute their ADL limitations to old age or sickness. Because they do not consider themselves disabled, they are less likely to seek remedies under the Americans with Disabilities Act or to demand alternatives to the relatively limited number of current choices in long-term care services (Kane & Kane). This lack of self-advocacy and awareness of disability rights could be a barrier to developing more unified availability of rehabilitation services in community-based long-term care programs across the country.

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Medicare Policy

The results of this study can also address what some specialists in geriatrics consider an unexamined policy in the Medicare home health coverage system (Callahan, 2001). The policy in question is the requirement that older adults be classified as homebound by the health care professional initiating their home health services. The rationale behind the homebound requirement is that home health care services are too costly to provide to those clients who can get themselves to an outpatient clinic. The assumption implicit in this policy is that nonhomebound seniors in need of rehabilitation services can be equally well-served in the clinic setting as in the home setting.

Challenges to this policy can be made. Studies comparing persons' PADL and IADL performances in the clinic and home setting have shown that many participants perform better in their home setting (Darragh, Sample, & Fisher, 1998; Nygård et al., 1994; Park et al., 1994). By doing a functional assessment in the outpatient clinic, a client's assessment may be less accurate than if done at home.

With additional data about the differences in ADL ability, levels of satisfaction with ADL performance, and home safety of homebound and nonhomebound older adults, rehabilitation specialists may begin to discern the functional problems of nonhomebound persons revealed in their home settings. If trends are found in the types of functional difficulties older nonhomebound adults report, practitioners could justify pilot studies of services that address these unresolved functional issues in both the home and outpatient setting. It is possible that some types of occupational therapy interventions can be

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effectively provided in a clinic setting, while other assessments and interventions may be more efficacious in the home setting, whether a person is labeled homebound or not.

Summary and Implications for Further Research

The adaptation and health of older adults is often related to dynamic relationships they maintain with their environments. If their ADL abilities change, then environmental demands, or press, will also need to change. The results of the US Census demonstrate that the majority of older adults report their health to be good or very good in spite of many needing assistance with ADL. This can be taken as some indication that the majority of older adults are able to maintain an adaptive equilibrium between their environments and their functional abilities. Unfortunately, nonAnglo older adults with lower socio-economic means experience more years of dependency in ADL or lessened active life expectancy (Crimmins et al., 1996).

One subset of older adults, older adults who are chronically homebound, demonstrate significant restrictions in their ADL participation and have limited access to environments outside their homes. These individuals are at significant risk for experiencing maladaptation and worsened health outcomes because of the potential lack of fit between their environmental supports and demands and their ADL performance capacities. The field of occupational therapy has theories and interventions designed to assist older adults maintain adaptive relationships with their environments through modifications and changes to their environments, task skills, or body functions. Occupational therapists have not studied the ADL abilities of older adults who are chronically homebound even though this population has significant ADL limitations,

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health concerns, and financial implications for current and future health care expenditures. With more information about the ADL ability, levels of satisfaction with ADL performance, and home safety of homebound older adults, occupational therapists will be better able to provide relevant services to this population.

Because perceived role occupancy can reflect the interaction of older adults with their social environments and can impact what ADL older adults perform regularly, it was considered worthy of inclusion in this study. Older adults who are homebound may perceive their current role occupancy limited because of difficulty leaving their homes. Because perceived role involvement can potentially threaten ADL performance, level of satisfaction with ADL performance, and the older person's ability to keep his or her home safe, it was another variable in this study. Because the risk of depression is greater in homebound older adults and can compromise their already marginal ADL ability, it was also considered in this study.

Homebound status has significant implications for Medicare and Medicaid home health services programs. Changing the types of services available (e.g., standardizing the availability of occupational therapy in the state Medicaid community-based long-term care) may require older adults to change their role from passive recipients of services to active advocates for services such as occupational therapy. This will likely require changes in older adults' attitudes about disability and self-empowerment and require more data that supports the efficacy and cost-effectiveness of services such as occupational therapy.

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CHAPTER THREE: METHODS

Design

The design of this pilot study was comparative and utilized convenience sampling. As previously discussed, random selection was not feasible. The first objective of this study was to focus on the differences in ADL ability, level of satisfaction with ADL performance, and home safety in older adults who are homebound in comparison to older adults who are nonhomebound. The second objective was to examine the relationship between (a) specific psychosocial variables, i.e., self-identified ADL problems, role incumbency, and the presence of depressive symptoms and (b) the outcome variables of ADL ability, level of satisfaction with ADL performance, and home safety.

Participants

Pre-existing data were utilized for this investigation. Participants included 20 persons who were homebound and 20 who were not homebound. Because one of the dependent variables was ADL ability, a sample size calculation was based on a power analysis utilizing results from the Assessment of Motor and Process Skills (AMPS) (Fisher, 2001a). Two groups were compared in the power analysis. The first group was comprised of older persons who were judged by their occupational therapists to be able to live independently. The second group included older persons who were judged by their occupational therapists to need moderate to maximum assistance to live in the community. Based on an expected large effect size of 1.2 and power set at .80, at least 10

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participants were needed in each group (i.e., homebound and nonhomebound). Additional participants were added to the design to reduce the probability of a type I error in the study with variables other than the AMPS. Type II error refers to a failure to reject a false null hypothesis (Hinkle et al., 1998).

Inclusion factors for this study were (a) homebound or nonhomebound status and (b) being at least 60 years old. A person met the criteria for chronic homebound status if (a) he or she reported being homebound for at least 6 months, and (b) he or she left the home only for medical appointments and religious activities due to the presence of physical or cognitive impairments or medical conditions that made getting out of the house for community activities a burden. Participants were excluded if they were (a) under 60 years of age, (b) unable to speak or read English, or (c) incompetent to give informed consent as demonstrated by scoring 19 or less on the Mini-Mental Status Exam (Folstein, Folstein, & McHugh, 1975).

The mean ages of participants in the homebound and nonhomebound groups were, respectively, 78.7 (SD = 9.9) and 75.0 (SD = 8.05) years. An independent samples t test did not reveal a statistically significantly difference in the mean ages of the two groups, $t\,(38) = 1.29$, $p = .21$. Participants in the homebound sample consisted of 17 women and 3 men which was similar to the gender distribution found in the nonhomebound group (16 women and 4 men). Because the data related to gender violated assumptions required for using a chi-square test, a Fisher's exact test was used to compare the proportion of female and male participants in the homebound and nonhomebound groups. The Fisher's

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exact test revealed that the observed frequencies of gender in the homebound and nonhomebound groups did not differ significantly from those expected from chance, $p > .99$. The likelihood ratio test was used to compare the ethnic/racial and marital status composition of participants in the homebound and nonhomebound groups. The observed frequencies of ethnicity/race, χ^2 (2, N = 40) = 3.22, p = .20, or types of marital status, χ^2 (3, N = 40) = 0.13, p = .96, did not differ significantly from those expected by chance (see Table 1).

Table 1

Frequencies of Demographic Variables for Participants in the Homebound and Nonhomebound Groups

	Homebound (*n*)	Nonhomebound (*n*)
Ethnicy/Race		
Black	0	1
Hispanic	2	5
White, non-Hispanic	18	16
Marital status		
Single	2	3
Married	5	5
Divorced	5	4
Widowed	8	8

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As anticipated, all participants who were homebound received assistance with performing PADL or IADL. I anticipated that most older adults in the nonhomebound group might require at least some assistance with performing ADL. Fifty percent of the participants in the nonhomebound group ($n = 10$) did not receive any assistance with PADL or IADL (see Table 2); thus, the data in this study were disaggregated into the following three groups for analyses: (a) participants who were homebound (HB), (b) participants who were nonhomebound and received assistance with ADL (NHA), and (c) participants who were nonhomebound and performed ADL independently (NHI).

Table 2

Level of ADL Assistance Used By Participants in the Homebound (HB) and Nonhomebound (NH) Groups

Assistance levels	HB (*n*)	NH (*n*)
No assistance	0	10
Assistance	20	10

An analysis of each participant's AMPS ADL motor ability measure and ADL process ability measure provided further support for dividing the data into three versus two groups. Both the ADL motor and ADL process scales have established cutoff measures that are associated with limitations in performing ADL (Fisher, 2001a). The ADL process ability cutoff measure of 1.0 logit discriminates more precisely between persons who live independently versus those who need assistance to perform ADL

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compared to the ADL motor ability cutoff measure of 2.0 logits. The ADL motor ability cutoff discriminates more precisely between persons who do not experience increased effort performing ADL versus those who do, whether or not they need assistance. Figure 1 shows that the majority of participants in the homebound and nonhomebound with assistance groups had ADL process ability measures at or below the 1.0 cutoff. All of the participants in the nonhomebound independent group demonstrated ADL process ability measures above the 1.0 cutoff. All participants in the homebound and nonhomebound with assistance groups demonstrated ADL motor ability measures below the ADL motor ability scale cutoff of 2.0. Seven of the ten participants in the nonhomebound independent group had ADL motor ability measures above the ADL motor ability cutoff. These differences in ADL ability, in addition to ADL assistance levels, further justified changing the data analysis from two to three groups to better understand the continuum of ADL ability found in the sample of older adults who were nonhomebound.

The age of participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups did not differ significantly, $F(2, 37) = 1.26, p = .30$. Results of chi-square analyses revealed that these three groups also did not have significantly different composition based on gender, $\chi^2 (1, N = 40) = 1.47, p = .48$, ethnicity $\chi^2 (2, N = 40) = 5.09, p = .28$, marital status, $\chi^2 (3, N = 40) = 5.72, p = .46$, living situation, $\chi^2 (1, N = 40) = .32, p = .85$, or type of housing, $\chi^2 (3, N = 40) = 7.72, p = .26$ (see Tables 3, 4, and 5).

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	AMPS ADL Motor Scale			AMPS ADL Process Scale	
	More able			More able	
	4.00			4.00	
	3.80			3.80	
	3.60	3		3.60	
	3.40	3		3.40	
	3.20			3.20	
	3.00	33	33	3.00	
	2.80			2.80	
	2.60	33		2.60	
	2.40	3		2.40	
	2.20		3	2.20	
CUTOFF	2.00		3	2.00	
	1.80		3	1.80	
	1.60	233	333	1.60	
	1.40	123	123	1.40	
	1.20		13	1.20	
	1.00	11	112	1.00	CUTOFF
	0.80	1122	11111222	0.80	
	0.60	1122	1112222	0.60	
	0.40	122	11112	0.40	
	0.20	112	1	0.20	
	0.00	1111	11	0.00	
	-0.20	112	1	-0.20	
	-0.40	111		-0.40	
	-0.60	1		-0.60	
	Less able			Less able	

Figure 1. Comparison of ADL motor and ADL process ability measures.

(1 = participants in the homebound group, 2 = participants in the nonhomebound with assistance group, 3 = participants from the nonhomebound independent group)

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Table 3

Means, Standard Deviations, or Frequencies for Demographic Variables for Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups

	Group		
Variable	HB (*n* = 20)	NHA (*n* = 10)	NHI (*n* = 10)
Mean age (*SD*)	78.7 (9.9)	76.9 (9.1)	73.1 (6.7)
Gender			
F	17	9	7
M	3	1	3
Ethnicity			
Black	0	1	0
Hispanic	2	3	2
White, non-Hispanic	18	6	8

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Table 4

Frequencies for Demographic Variables for Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups (Continued)

	Group		
Variable	HB (n = 20)	NHA (n = 10)	NHI (n = 10)
Marital status			
Single	15	1	3
Married	5	2	3
Single	2	3	0
Widowed	8	4	4
Living situation			
Lives alone	12	6	7
Lives with	8	4	3
Falls in last year (*SD*)	1.3 (1.7)	3.0 (6.3)	0.2 (0.6)

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Table 5

Types of Domiciles Occupied by Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups

	Group		
Variable	HB ($n = 20$)	NHA ($n = 10$)	NHI ($n = 10$)
House owned	11	7	6
House rented	3	1	1
Apartment rented	1	1	3
Apartment rented, subsidized	5	1	0

An ANOVA revealed significant differences in the number of medical conditions among participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups $F(2, 37) = 8.40, p < .01$. Post-hoc Tukey-HSD testing revealed that participants in the nonhomebound with assistance ($M = 2.4$, $SD = 1.4$) and nonhomebound independent ($M = 1.5$, $SD = 1.3$) groups had significantly fewer medical conditions than participants in the homebound group ($p < .05$). Participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups did not report a significantly different number of falls in the last year $F(2, 37) = 1.83, p = .18$. Means and standard deviations for this demographic variable can be found in Table 4.

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A chi-square analysis showed that the sources of assistance utilized by participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups varied significantly, χ^2 (2, N = 40) = 49.90, $p < .01$ (see Table 6).

Table 6

Types of ADL Assistance Used By Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups

Assistance types	HB (*n*)	NHA (*n*)	NHI (*n*)
No assistance	0	0	10
Family	4	5	0
Paid personnel	7	4	0
Family/paid personnel	9	1	0

An ANOVA revealed that the number of self-identified ADL problems also differed significantly among participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups, $F(2, 37) = 7.66, p < .01$. A Dunnett C post-hoc analyses was conducted because the groups failed Levene's Test of Equality of Group Variance (Morgan & Griego, 1998). The Dunnett C post-hoc analyses indicated that

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participants in the homebound and nonhomebound with assistance groups did not differ significantly in the number of ADL problems identified; however, both groups had significantly more identified ADL problems than participants in the nonhomebound independent group ($p < .05$).

A Kruskall-Wallis analyses among the homebound, nonhomebound with assistance, and nonhomebound independent groups revealed significant differences for PADL problems, $H = 11.96, p < .01$ and IADL problems, $H = 15.47, p < .01$. Post-hoc testing utilizing multiple Mann-Whitney U tests revealed that participants in the homebound group reported significantly more PADL problems than participants in the nonhomebound independent group, $U = 22.00, p < .01$), but not more than the participants in the nonhomebound with assistance group $U = 74.00, p = .27$. Mann-Whitney U post-hoc tests also showed that participants in the homebound group reported significantly more IADL problems than participants in the nonhomebound independent group, $U = 23.50, p < .01$). Participants in the nonhomebound with assistance groups reported significantly more IADL problems than participants in the nonhomebound independent group, $U = 6.50, p < .01$. Tables 7 and 8 show the number of participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups who reported specific PADL and IADL problems. Appendix A shows the types of ADL for which participants received assistance.

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Table 7

Number of Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups Who Identified Problems with Performing Specific PADL

	Group		
PADL	HB	NHA	NHI
	n	*n*	*n*
Bathing or showering	6	1	0
Dressing	4	1	2
Functional mobility	14	6	0
Toilet hygiene	2	0	0
Eating or feeding	1	0	0
Personal hygiene	2	0	1
Grooming	0	2	0

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Table 8

Number of Participants in the Homebound (HB), Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups Who Identified Problems with Performing the Following IADL

	Group		
IADL	HB (*n*)	NHA (*n*)	NHI (*n*)
Communication device use	3	4	0
Community mobility	11	4	1
Home management	8	7	2
Financial management	3	3	0
Health management	1	1	0
Meal preparation	5	2	0
Grocery shopping	5	5	0
Shopping, other	1	0	0
Care of others	1	0	0

Instrumentation

Mini-Mental Status Exam. The Mini-Mental Status Exam (MMSE) (Folstein et al., 1975) was used in this study as a screening tool to determine whether potential

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participants were competent to give consent. The MMSE is the most common cognitive screening test used with older adults (Molloy, Alemayehu, & Roberts, 1991). Items on MMSE evaluate skills such as orientation to time and place, immediate recall, short-term memory, calculation, language, and constructive ability (Molloy et al.; Ford, Haley, Thrower, West, & Harrell, 1996). Investigators have found that education, age, and African-American ethnicity may affect the validity of the MMSE (Crum, Anthony, Bassett, & Folstein, 1993; Ford, et al.). Tombaugh and McIntyre (1993) found the reliability and construct validity of the MMSE to be satisfactory for a screening tool. In a more recent study, Jones and Gallo (2000) evaluated the MMSE with a sample of 8556 community dwelling older adults and found that the MMSE had adequate construct validity with this population. Given that the purpose of using the MMSE in this study was to ensure that participants were competent to give informed consent, its psychometric properties were deemed adequate.

The cutoff for participation in this study was a score of 19 or below on a Mini-Mental Status Exam because such a score could suggest an inability to give informed consent due to cognitive impairment. This cut offpoint was chosen because of the findings of two studies. Folstein and colleagues (1975) found the mean score for older adults with dementia to be 9.7; intact older adults, 27.6; and older adults with depression and mild cognitive deficit, 19.0. Further support for the use of this cut score was also found in the investigation done by Weissman and colleagues (1985), which established that scores below 18 indicate severe cognitive impairment.

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Assessment of Motor and Process Skills. The Assessment of Motor and Process Skills (AMPS) was used in this study to evaluate the ADL ability of participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups. The AMPS is a standardized, observational evaluation of both overall ADL ability and the quality (i.e., ease, efficiency, safety, and independence) of goal-directed motor and process actions that comprise ADL performance (Fisher, 2001a). ADL motor skills are the individual actions of performance used by people to move objects or themselves. ADL process skills are defined as observable actions that are used to sensibly organize and adapt the actions of task performance as it unfolds over time.

During administration of the AMPS, the participant was given a choice of up to five or six tasks from the 83 task options in the AMPS manual based on the participant's abilities, daily routine, and the relative difficulty of each the tasks (Fisher, 2001b). The participant selected two tasks he or she liked to do. After the participant performed the tasks, the therapist rated the participant's actions from 1 (intervention or task breakdown occurs) to 4 (competent performance) based upon how skilled or effectively each of the 16 goal-directed ADL motor and 20 ADL goal-directed actions (skill items) were performed.

The occupational therapist data collector used her personal copy of the AMPS computer-scoring software to convert the raw data from these ratings into an equal-interval additive ADL motor and ADL process ability measures that was analyzed using traditional statistics. This software is a specialized application of the many-faceted Rasch analysis model for the AMPS (Linacre, 1987-1994). The software adjusted the final

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ADL ability measures to simultaneously account for four factors (facets): skill item difficulty, severity of the rater, challenge of the task, and the ability of the person. The FACETS software generates an ADL motor ability measure and a ADL process ability measure for each participant that can be placed on linear continua of ADL motor ability and ADL process ability. The high end of each continuum represents more ADL ability, and the low end indicates less ADL ability.

Several studies support the validity of the AMPS ability measures across age groups (Dickerson & Fisher, 1993, 1997; Fisher, 2001a), across cultures (Bernspång & Fisher, 1995a; Dickerson, & Fisher, 1995; Fisher, Liu, Velozo, & Pan, 1992; Goldman & Fisher, 1997; Goto, Fisher, & Mayberry, 1996; Magalhães, Fisher, Bernspång, & Linacre, 1996), across gender (Duran & Fisher, 1996), with different diagnostic subgroups (Bernspång & Fisher, 1995b; Doble, Fisk, Fisher, Ritvo, & Murray, 1994; Doble, Fisk, MacPherson, Fisher, & Rockwood, 1997; Pan & Fisher, 1994), across environments (Darragh et al., 1998; Nygård et al., 1994; Park, et al., 1994), and as a measure of change (Kinnman, Andersson, Wetterquist, Kinnman, & Andersson, 2000; Oakley & Sunderland, 1997; Tham, Ginsburg, Fisher, & Tegnér, 2001). Fisher (2001a) reported that 95% of all AMPS calibrated raters demonstrate acceptable goodness of fit to the many-faceted Rasch model for the AMPS, indicating high rater reliability.

For every variable in this study, the skewdness and kurtosis of all the different groups analyzed was evaluted. These different groups included the: (a) total homebound group ($n = 20$), (b) total nonhomebound group ($n = 20$), (c) nonhomebound with assistance group ($n = 10$), (d) nonhomebound independent group ($n = 10$), and (e) total

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sample ($N = 40$). The evaluation of the distribution included dividing the skewness and kurtosis statistic for each group's data by its respective standard error. When the answer was less than 2.5, the distribution was considered approximately normal (Morgan & Griego, 1998). The only distribution abnormality found for the ADL motor ability and ADL process ability variables was the distribution of ADL process ability for the total sample, which was positively skewed.

Level of Satisfaction with ADL Performance. Data regarding levels of satisfaction with ADL performance was obtained through the modified use of the Canadian Occupational Performance Measure (COPM) (Law et al., 1998). The COPM is a semi-structured interview assessment that was designed to gather information about occupational performance problems from a client's perspective. In the COPM theoretical framework, occupational performance is comprised of person's perception of (a) his or her ability to perform self-care, productivity, and leisure tasks; and (b) level of satisfaction with this performance ability. The COPM provides an opportunity for a client to communicate his or her priorities for occupational therapy and can be used as a pre- and post-evaluation to track changes in a client's self-perception of occupational performance ability and level of satisfaction with occupational performance over time (Law et al.).

The first recommended step of the COPM includes the therapist encouraging the client to describe his or her daily routine of activities, from waking up until going to bed. Although this step is optional, it can serve to remind participants about their daily routines and help them to focus what they have to do on a regular basis, which is the

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major domain of the COPM. The first formal step of the COPM, "Perceived Needs," involves the participant describing any activity (a) that he or she needs to do, wants to do, or is expected to do; and (b) that he or she experiences difficulty performing or feels is problematic to perform (Law et. al., 1998). The interviewer using the COPM can ask probing questions to determine what elements of the activity are most difficult or problematic for the person. For example, upon questioning by the interviewer, an older person may describe bathing as problematic because she cannot wash her feet in the bathtub or because she cannot find enough time to take a bath because of high caregiving demands. The problematic activities that participants identify are written down on the COPM form under the following categories: self-care, productivity, and leisure. For the examples given, the problematic ADL could be written down under the category of self-care as washing feet while bathing or finding time to take a bath at least every other day.

After a client has identified problematic tasks, he or she is asked to rate each task on a scale of importance from 1 (not important at all) to 10 (extremely important). The five most important tasks are then rated on similar scales of performance (e.g., 1 = not able to do it, 10 = able to do it extremely well) and satisfaction with performance (e.g., 1 = not satisfied at all, 10 = extremely satisfied. Administration of the COPM takes approximately 20 to 40 minutes. Performance and satisfaction scores for the COPM are obtained by dividing the total scores by the number of problematic tasks rated (Law et al.).

Standard administration of the COPM was utilized in this study with one exception. Participants rated all problematic tasks on all three scales of the COPM (i.e., importance,

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performance, and satisfaction), rather than narrowing the list down to the top five tasks for rating the performance and satisfaction scales. The level of satisfaction with ADL performance for each participant in this study was derived by totaling each participant's satisfaction ratings for problematic PADL and IADL and dividing by the total number of tasks identified.

McColl and colleagues (2000) studied the construct validity of the COPM and found low positive relationships between the satisfaction scale and the Life-Satisfaction Scale (Michalos, 1980), $r = .38, p < .01$, and the Reintegration to Normal Living Index (Wood-Dauphinee, Opzoomer, Williams, Marchand, & Spitzer, 1988), $r = .46, p < .01$. The COPM's test-retest reliability for the satisfaction scale have ranged from moderate to moderately high levels (ICC = .75 to .84) (Law & Stewart, 1996; Sanford, Law, Swanson, & Guyatt, 1994). Mean pre- and post-scores for satisfaction with occupational performance have demonstrated clinically significant changes in a neurorehabilitation program, a pain management program, palliative occupational therapy, and a psychosocial intervention (Bodium, 1999; Carpenter, Baker, & Tyldesley, 2001; Norris, 1999; Waters, 1995). A change of two or more points on the satisfaction scale constitutes clinically significant change (Law et al., 1998).

Although the psychometric properties of the COPM are rudimentary, the tool quickly communicates the unique domain of occupational therapy: the ability to perform self-care, productivity, and leisure occupations and level of satisfaction with how these activities are performed. Another assessment in occupational therapy, the Satisfaction with Performance Questionnaire (Yerxa, Burnett-Beaulieu, Stocking, & Azen, 1988) is

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used to assess satisfaction with the performance of 66 different home management and social/community problem-solving. The Satisfaction with Performance Questionnaire was not used in this study because it was not designed to assess the level of satisfaction with client-generated occupational performance problems.

Data generated from the COPM rating scale of satisfaction have been treated as both nonparametric data (Carpenter et al., 2001; Norris, 1999) and equal-interval data (Bodiam, 1999; McColl et al., 2000). In this study, ADL satisfaction was treated as approximately equal-interval because analyses of the skewness and kurtosis of the ADL satisfaction data for the homebound, two nonhomebound groups and the total sample revealed approximately normal distributions.

Safety Assessment of Function and Environment for Rehabilitation. The Safety Assessment of Function and Environment for Rehabilitation (SAFER) (Community Occupational Therapists and Associates, 1991) was used because it is a standardized test of home safety that defines home safety in broader terms than fall prevention. The SAFER is used by occupational therapists to assess the environment in terms of social supports and built objects and the transactive relationship with a person's functional abilities (Letts et al., 1994). The SAFER was designed with the notion that people's environments have different types and levels of physical and social supports. A significant role for the occupational therapist is to identify and facilitate the adaptations in the environment necessary to "match" a client's ADL capabilities to enable his or her safe optimal participation in home and community environments (Letts & Marshall, 1996).

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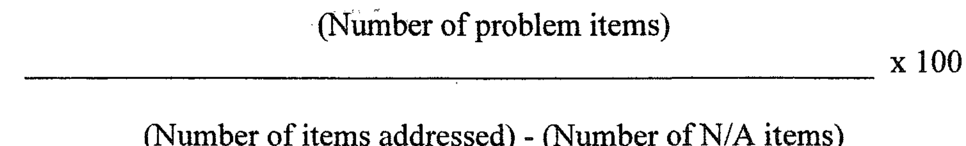
The SAFER is a standardized assessment comprised of 97 safety items within 14 categories. Each item is ranked as a problem item (score = 1), an item addressed (i.e., no problem, score = zero), or not applicable (N/A). The final score is a percentage score and is calculated based on the following formula:



$$\frac{\text{(Number of problem items)}}{\text{(Number of items addressed) - (Number of N/A items)}} \times 100$$

The SAFER was designed to allow an occupational therapist to delete items that the therapist judges not useful for a particular client's situation. For this study, 30 of the 97 SAFER items were selected by two occupational therapists experienced in gerontic occupational therapy, which included another data collector and myself. The items were selected based on their relevance to older adults with physical and cognitive impairments and the need to capture a wide range of home safety hazard risks.

Standard scoring of the SAFER was used with the following modification. If assistance was needed and provided by a caregiver or another person, the client was scored as having a problem with that particular item. The SAFER data was coded so that higher SAFER ability measures indicate more home safety ability.

Previous psychometric testing of the SAFER has been rudimentary (Letts & Marshall, 1996; Letts, Scott, Burtney, Marshall, & McKean, 1998). In order to perform traditional inferential statistics with the SAFER data, a mechanism to transform the SAFER's ordinal data into equal-interval data was needed. McNulty and Fisher (2001)

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hypothesized that the 29 items used in the SAFER research version in their study of persons with psychiatric disorders represented a unidimensional scale of home safety ability. To test this hypothesis, they applied many-faceted Rasch (MFR) analyses to their study's SAFER data along with a larger data set for 102 clients. These clients had participated in SAFER evaluations with trained and experienced SAFER evaluators. The participants in the larger data set were community-dwelling adults and older persons with memory, neurological, and psychiatric disorders. An equal-interval measure of overall home safety ability was generated for each person in the analysis. The results of this analysis supported the following: (a) scale validity (unidimensionality) as indicated by fit of the 29 items to the MFR model, (b) rater reliability as indicated by 37 of 38 raters demonstrating acceptable goodness-of-fit to the model, and (c) person response validity as indicated by fit of all 102 participants. The criteria for acceptable goodness-of-fit were $MnSq \leq 1.4$ and $z < 2$.

A similar type of analysis was utilized for the rank data collected in this study. This data was combined with data from 19 participants from the McNulty and Fisher study (2001) to determine whether the data gathered in this study continued to support scale validity (unidimensionality) and person response validity. Results of this latter analysis showed that 97% of participants met the criteria for acceptable goodness-of-fit set at $MnSq \leq 1.4$ and $z < 2$ which supported person response validity for home safety data collected in this study. The fit of the safety items chosen for this study also met this criteria which supported the scale validity of the SAFER items chosen. Finally, the

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analysis generated an equal-interval overall home safety measure for each participant in this study that could be used with parametric statistics.

Self-identification of ADL problems. Participants' self-identified ADL problems were obtained through the administration of the COPM. This component of the COPM was modified to include only activities related to PADL or IADL. PADL activities included bathing and showering, bowel and bladder management, dressing, eating, feeding, functional mobility, personal device care, personal hygiene and grooming, sexual activity, sleep and rest, and toilet hygiene (Rogers & Holm, 1994). IADL included care of others, care of pets, child rearing, communication device use, community mobility, financial management, health management and maintenance, home management, meal preparation, and shopping (Rogers & Holm). This modification was required because difficulties with performing ADL are most associated with community living and avoidance of nursing home placement in older adults (Tinetti & Williams, 1997).

McColl and colleagues (2000) tested the criterion validity of the COPM by comparing the results of the COPM with spontaneous responses to a question regardeding the five most important problems experienced in daily life? The comparison showed that 53% of respondents named at least one identical response to the question and the COPM, which is a relatively low level of agreement. Nevertheless, the COPM was chosen for this study based on its face validity and its value as a structured method to enable the participants to identify their ADL problems

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Based on analyses of the skewness and kurtosis and their respective standard errors, data collected for total identified ADL problems in the homebound and the two nonhomebound groups were approximately normally distributed. This finding allowed the data to be analyzed with parametric statistics. However, the total sample was positively skewed for number of ADL problems, so the use of nonparametric statistics for this group was required. In addition, violations in the distribution of PADL and IADL variables for all groups were found, so nonparametric statistics were also utilized with these variables.

The Role Checklist. To obtain data regarding participants' perceptions of the number of roles they were currently occupying, The Role Checklist (Oakley et al., 1986) was utilized. The Role Checklist is a brief inventory designed to gather data about a person's perceptions of (a) role incumbency in the past, present, and future, and (b) how much he or she values these roles. The inventory lists 11 different roles (i.e., student, worker, volunteer, caregiver, home maintainer, friend, family member, religious participant, hobbyist, participant within an organization, other). The Role Checklist took approximately 15 minutes to complete. Data for this variable was obtained by totaling the number of roles the participant verbally identified as being fulfilled in the present time.

Standard administration of the Role Checklist was followed with one exception. In the original Role Checklist, the role "religious participant" was defined as "involvement, at least once a week, in groups or activities affiliated with one's religion *excluding worship*" (Oakley et al., 1986, p.162). Worship was excluded based on the authors' notion that it reflected a person's spirituality rather than an outlet for occupational

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behavior (Oakley et al.). Apparently, spirituality was conceived of as primarily an intrapsychic process that did not manifest in observable occupational behavior. However, given our field's advanced understanding of occupational forms since the time the tool was originally developed, excluding worship was not considered appropriate. An occupational form represents the typical way an occupation is performed in terms of its physical and sociocultural characteristics (Nelson, 1996). The physical characteristics of an occupational form are comprised of the tools typically used in a task, the environmental elements usually present, and when the occupation is generally performed. An occupational form's sociocultural characteristics can be identified as the beliefs and meanings that society and cultural groups ascribe to a given form. These physical and sociocultural characteristics together shape the expectations of when, where, and how to perform any given occupation (Nelson). One can make the argument, then, that praying with the rosary or attending a Sunday service at a church easily meet the requirement of an occupational form that could serve as occupational behavior related to a role.

Oakley et al. (1986) found Kappa statistics for the inter-rater reliability to be between .77 to .93 on items in of the Role Checklist. They also reported that the item stability of the test was better for older participants (i.e., 31 to 79 years old). The majority of studies in occupational therapy utilizing the Role Checklist have treated the data as nonparametric (Bränholm, & Fugl-Meyer, 1992; Dickerson & Oakley, 1995; Hachey et al., 2001). For this reason the data from the Role Checklist in this study was analyzed to determine whether it met the criteria for nonparametric or parametric statistics. Results of the analyses of the skewness and kurtosis of perceived current roles for the

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homebound, three nonhomebound groups, and total sample revealed the data to be approximately normally distributed; therefore, parametric statistics were utilized with the data obtained from the Role Checklist.

The Geriatric Depression Scale. The Geriatric Depression Scale (GDS) (Yesage et al., 1983) was used in this study as an index of depressive symptoms. The GDS is an interview tool designed to screen for the presence of depressive disorders in older adults. GDS is frequently utilized in gerontology because of its ease of use, sensitivity to the presence of depression in older adults, and adequate psychometric properties (Montori & Izal, 1996). The GDS has strong content validity, and a study of its internal consistency resulted in a Cronbach's alpha of 0.94 (Yesavage et al., 1983). Researchers have established the validity of using the GDS with Chinese, French, and Turkish elders (Chan, 1996; Clement, Nassif, Leger, & Marchan, 1997; Ertan, & Eker, 2000).

Investigators have found the scores from the GDS to not be valid for persons with moderate to severe dementia (Feher, Larrabee, & Crook, 1992; Ott & Fogel, 1992). To address this limitation, Stiles and McGarrahan (1998) recommended that geriatric practitioners utilize the GDS in conjunction with the MMSE. They proposed that GDS findings should be considered not reliable if the MMSE score is less than 15. Because one exclusion factor for this study was the presence of significant cognitive impairment (i.e., scoring 19 or below on the MMSE), this limitation of the GDS did not jeopardize its use in this study.

The GDS is comprised of 30 questions that require *yes* or *no* answers and takes approximately 15 minutes to administer (Yesavage et al., 1983). Potential scores range

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from zero to 30. Scores between zero and 10 indicate normal mood; scores between 11 and 19 are associated with symptoms of mild depression; scores between 20 and 30 reflect symptoms of severe depression (Stiles & McGarrahan, 1998). Investigators have treated the data from the GDS as approximately equal-interval (Mossey, Knott, Higgins, & Talerico, 1996; Oslin et al., 2000). Based on analyses of the skewness and kurtosis and their respective standard errors, data collected from the GDS for the homebound, three nonhomebound groups, and total sample were approximately normally distributed. This finding provided a basis for using parametric statistics with this data.

Procedures

The data for this study originated in an earlier study approved by The University of New Mexico Human Research Review Board. Analysis of this pre-existing data for the current study was approved the Colorado State University Human Research Committee.

A convenience sample of 40 participants was recruited through a local senior center and a Meals on Wheels® Program. Out of approximately 50 older adults who were contacted and informed about the study at one senior, 17 consented to participate. These individuals comprised the majority of the nonhomebound group. The 20 participants who were homebound were recruited via a flyer disseminated to 300 people through the Meals on Wheels® Program. The three other participants who were nonhomebound were recruited through this Meals on Wheels flyer; however, they did not qualify for the homebound group because they went out into the community for activities that were not medical or religious in nature (e.g., two of these persons drove at least every other day, and one regularly went shopping with a personal care aid).

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Initial contact with participants varied based on how they were recruited. I approached nonhomebound participants at a local senior center, and described the protocol if the person expressed interest in the study. If the person wanted to participate, an appointment was made for the first home visit in the person's home. Homebound participants received recruitment flyers in the mail. Those who wanted to participate in the study had to first call to discuss the study further. If the homebound person gave verbal consent to participate, a member of the research team visited the person's house. The research team was comprised of myself, an occupational therapist specializing in gerontic occupational therapy, and a second year occupational therapy graduate student.

On the first visit to the nonhomebound or homebound person's house, a member of the research team described the study in more depth and sought the signature of the candidate on the consent form. If the participant changed his or her mind about participating, then the research team member left. However, no participant changed his or her mind about participating during the first or second home visit. If the person wanted to participate and signed the consent form, the research team member administered the Mini-Mental Status Exam. If the participant scored 19 or lower, the data collector ended the visit. If the participant scored 20 or above on the Mini-Mental Status Exam, the rest of the research protocol was administered. The research protocol for the first visit included the administration of the Canadian Occupational Performance Measure (COPM), Role Checklist, and Geriatric Depression Scale (GDS). Demographic data was collected regarding the participants' age, gender, ethnicity, number and type of medical conditions, number of falls experienced in the last year, living arrangement (i.e.,

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living alone or with others), type of housing and level of ADL assistance provided by outside agencies, friends, or families. Also, data regarding the number and types of PADL and IADL problems were collected. The first home visit lasted approximately 1 to 2 hours.

Within 1 week, a member of the research team conducted a second home visit to administer the AMPS and the SAFER. The second home visit lasted approximately 1 to 2 hours. The participants were compensated $25.00 for each home visit for a total of $50.00. All the participants who signed the consent form scored 20 or higher on the Mini-Mental Status Exam and participated in both the home visits.

Data Analysis

As noted earlier, the data for all the variables in this study were analyzed to determine whether they met the criteria for using parametric statistics. The variables evaluated closely for parametric or nonparametric statistics included self-identified ADL problems, number of current perceived roles, depressive symptoms, and level of satisfaction with ADL performance. Rasch analysis was used to convert the variables of ADL motor ability, ADL process ability, and home safety into continuous measures.

This study addressed the following research questions:

1a. Are there significant differences in ADL motor ability among participants in the homebound, nonhomebound independent, and nonhomebound with assistance groups?

1b. Are there significant differences in ADL process ability among participants in the homebound, nonhomebound independent, and nonhomebound with assistance groups

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Because data related to ADL motor and ADL process ability met the assumptions of parametric statistics for these groups, two one-way ANOVAs were utilized to compare the mean ADL motor ability and mean ADL process ability of participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups.

I anticipated that continua of ADL motor and ADL process ability would be found among the three groups. I expected to find that participants in the homebound group would demonstrate significantly lower ADL motor and ADL process ability than participants in the nonhomebound with assistance group. I also anticipated that participants in the nonhomebound with assistance group would demonstrate significantly lower ADL motor and ADL process ability than participants in the nonhomebound independent group.

2. Are there significant differences in levels of satisfaction with ADL performance among participants in the homebound, nonhomebound independent, and nonhomebound with assistance groups? Because data related to the level of satisfaction with ADL performance met the assumptions of parametric statistics, an ANOVA was again utilized to compare the mean level of satisfaction of participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups.

I anticipated that I would find a continuum of level of satisfaction with ADL performance among the three groups. I expected to find that participants in the homebound group would report significantly lower levels of satisfaction with ADL performance than participants in the nonhomebound with assistance group. I also anticipated that participants in the nonhomebound with assistance group would report

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significantly lower levels of satisfaction with ADL performance than participants in the nonhomebound independent group.

3. Are there significant differences in home safety ability among participants in the homebound, nonhomebound independent, and nonhomebound with assistance groups? ? An ANOVA was utilized to compare the mean level of home safety of participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups.

Once again, I anticipated that I would find a continuum of home safety ability among the three groups. I estimated that participants in the homebound group would demonstrate significantly lower home safety ability than participants in the nonhomebound with assistance group. I also anticipated that participants in the nonhomebound with assistance group would demonstrate significantly lower home safety ability than participants in the nonhomebound independent group.

Because four ANOVAs were performed with a single set of data, a familywise (α_{FW}) error rate was utilized to ensure that the cumulative type I error rate was below .05 (Portney & Watkins, 1993). The formula described by Portney and Watkins was

$$\alpha_{FW} = 1 - (1 - \alpha)^{c}$$

where *c* equaled the number of planned comparisons. An alpha level of .01 was chosen based on the results of this formula, i.e.,

$$\alpha_{FW} = 1 - (1 - .01)^{4} = 1 - (.99)^{4} = .04.$$

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Therefore, the alpha level for each ANOVA completed (i.e., ADL motor ability, ADL process ability, level of satisfaction with ADL performance, and home safety) was set at .01.

4. What is the relationship between the number of problematic ADL identified and (a) ADL ability, (b) level of satisfaction with ADL performance, and (c) home safety in the total sample? To investigate the relationship between the number of self-identified ADL problems and ADL motor ability for the total sample, a Pearson product moment correlation coefficient was utilized. This same plan for data analysis was utilized for investigating the relationship between the number self-identified ADL problems and (a) home safety ability and (b) level of satisfaction with ADL performance. To investigate the relationship between the number of self-identified ADL problems and ADL process ability in the total sample, a Spearman rank correlation coefficient was utilized. To visually examine the strength of the relationship between these variables in the homebound, nonhomebound with assistance, and nonhomebound independent groups, a scatterplot was created. I anticipated moderately strong negative relationships between the number of problematic ADL identified and the dependent variables for the total sample. I estimated that the relationships would be stronger for the homebound versus nonhomebound group.

5. What is the relationship between the number of current roles encumbered and (a) ADL ability, (b) level of satisfaction with ADL performance, and (c) home safety in the total sample? To investigate the relationship between perceived roles and ADL motor

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the number of depressive symptoms and the dependent variables for the total sample. I estimated that the relationships would be stronger for the homebound versus nonhomebound group.

7. Is there a linear combination of the psychosocial variables (i.e., self-identified ADL problems, number of perceived roles currently occupied, and symptoms of depression) that can predict a linear combination of the dependent variables (i.e., ADL ability, level of satisfaction with ADL performance, and home safety) for the total sample? To answer this question, a canonical correlation was performed. A canonical correlation is typically used to analyze the strength of a relationship between one group of variables and another group of variables (Stevens, 1986). This multivariate approach was used in this study to investigate the relationship between a linear combination of independent or explanatory variables (i.e., number of self-identified ADL problems, number of perceived roles, and number of depressive symptoms reported) and a linear combination of dependent variables (i.e., ADL motor ability, ADL process ability, home safety ability, and level of satisfaction with ADL performance). This analysis was undertaken as strictly exploratory. The recommended number of participants or cases required in a canonical correlation varies between 10 (Statistical Analysis Software, 2000) to 20 cases (Stevens, 1986) for each variable added to the independent and dependent variable sets. The least conservative estimate of cases needed would be 70 for this study as there were three variables entered into the independent variable combination and four variables entered into the dependent variable combination.

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CHAPTER FOUR: RESULTS

ADL Ability

Results of two one-way ANOVAs comparing ADL motor ability and ADL process ability revealed, respectively, significant differences among participants in the homebound, nonhomebound with assistance, and nonhomebound-independent groups, $F(2, 37) = 47.57, p < .01$; $F(2, 37) = 30.35,\ p < .01$. Post-hoc Tukey-HSD analyses revealed that participants in the homebound group had significantly lower ADL motor ability and ADL process ability than participants in the nonhomebound independent group, but not participants in the nonhomebound with assistance group ($p \leq .05$), and that the nonhomebound with assistance and homebound groups did not differ significantly. Means and standard deviations for these groups can also be found in Table 9.

Level of Satisfaction with ADL Performance

Results of a one-way ANOVA comparing levels of satisfaction with ADL among participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups revealed, significant differences, $F(2, 30) = 8.34,\ p < .01$. Post-hoc Tukey-HSD analyses revealed that participants in the homebound group had a significantly lower mean level of satisfaction with ADL than participants in the nonhomebound independent group, but not participants in the nonhomebound with assistance group ($p \leq .05$). The nonhomebound with assistance and homebound groups,

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again, did not different significantly. Means and standard deviations for level of satisfaction with ADL performance for these groups can be found in Table 9.

It is important to note that one participant in the nonhomebound with assistance group and six participants in the nonhomebound independent group did not rate their level of satisfaction with ADL performance because they did not identify any problematic ADL. As a result the data for level of satisfaction with ADL performance could not be collected for these seven participants.

Home Safety

Results of a one-way ANOVA comparing home safety ability among participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups also revealed significant differences, $F(2, 37) = 31.58, p < .01$. Tukey HSD post-hoc analyses showed significant differences in home safety ability among all three groups ($p \leq .05$). The mean home safety ability measure for the nonhomebound with assistance group was significantly greater than the homebound group and significantly less than nonhomebound independent group. Home safety ability means and standard deviations for participants in the homebound, nonhomebound with assistance, and nonhomebound independent groups can also be found in Table 9.

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Table 9

Means and Standard Deviations for Dependent Variables Among Participants in the Homebound (HB), Total Nonhomebound (TNH) Nonhomebound with Assistance (NHA), and Nonhomebound Independent (NHI) Groups

	Group							
Variable	HB		TNH		NHA		NHI	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
ADL motor ability	0.26	0.56	1.63	1.14	0.71	0.54	2.56	0.76
ADL process ability	0.63	0.44	1.38	0.76	0.79	0.26	1.97	0.62
Home safety ability	0.77	1.24	3.35	1.84	2.03	1.12	4.66	1.45
Satisfaction with ADL	4.36	2.00	5.95	2.34	4.80	1.80	8.50	0.58

Relationships Between Self-identified ADL Problems and the Dependent Variables.

When data from the total sample were analyzed, moderate negative correlations were found between the number of self-identified ADL problems and ADL motor ability, ADL process ability, level of satisfaction with ADL performance, and home safety. Pearson product-moment correlations revealed that the number of self-identified ADL problems had no to high relationships with ADL motor ability, ADL process ability, level of satisfaction with ADL performance or home safety ability for the participants in the total nonhomebound group (see Table 10). Scatterplots showing the relationships among variables for three groups are shown in Figures 2, 3, 4, and 5.

Table 10

Correlations Between Self-Identified ADL Problems and the Dependent Variables for Participants in the Total Sample (TS), Homebound (HB), and Total Nonhomebound (TNH) Groups

	Group		
Dependent variable	TS *r*	HB *r*	TNH *r*
ADL motor ability	-.50 *	.07	-.74 *
ADL process ability	-.48 *	-.24	-.52 *
Home safety ability	-.38 *	.01	-.45 *
Satisfaction with ADL	-.43 *	-.29	.32

Note. * $p \leq .05$ (1-tailed)

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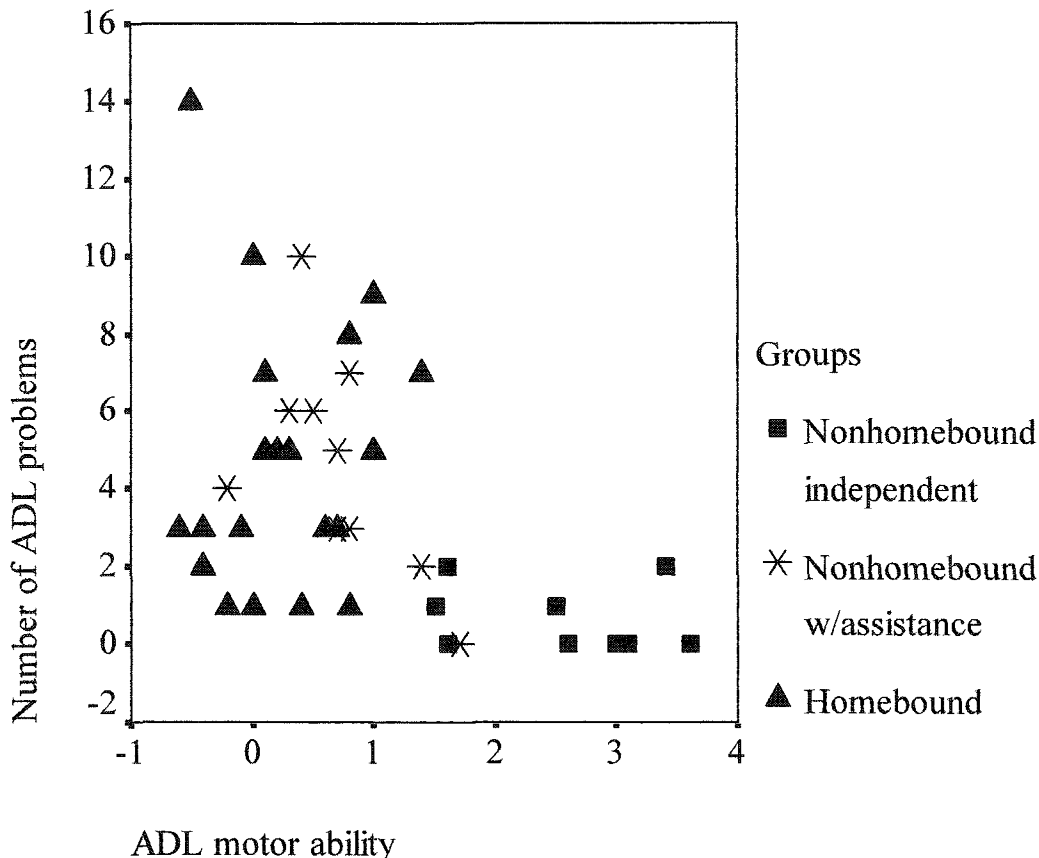

Figure 2. The relationship between the number of ADL problems and ADL motor ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = -.50, p \leq .05$.

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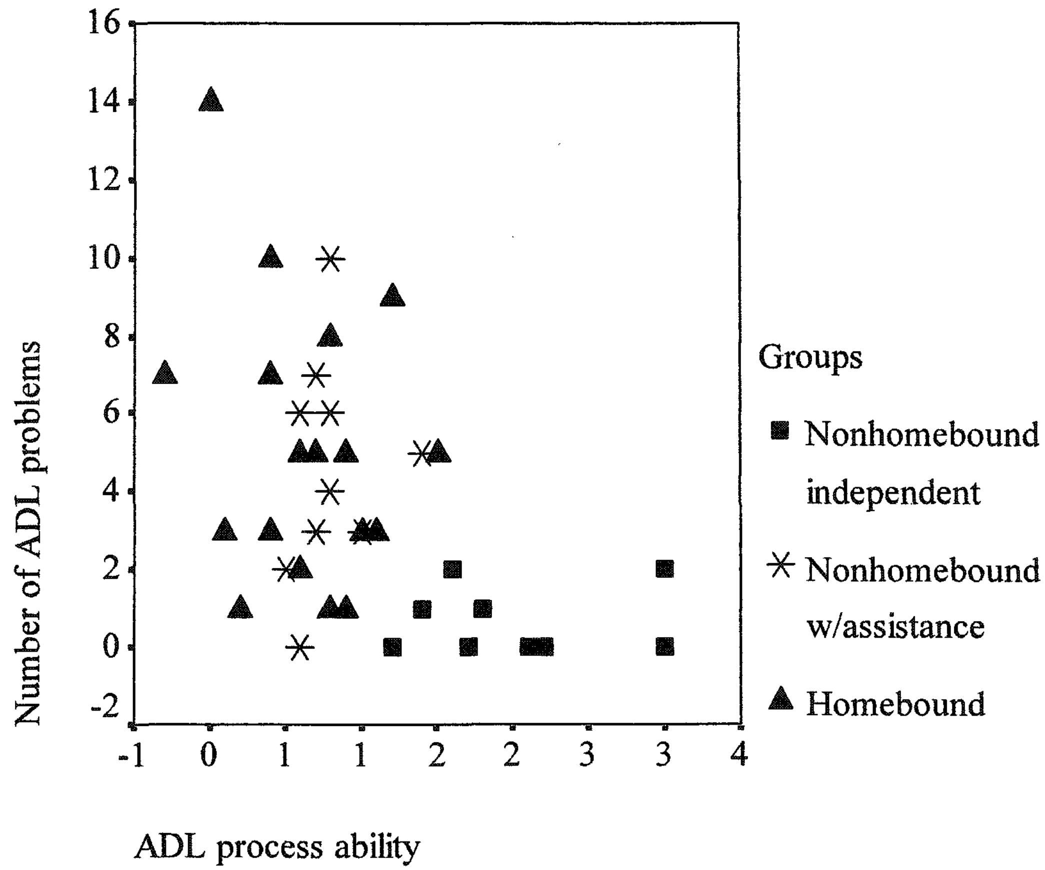

Figure 3. The relationship between the number of ADL problems and ADL process ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = -.50, p \leq .05$.

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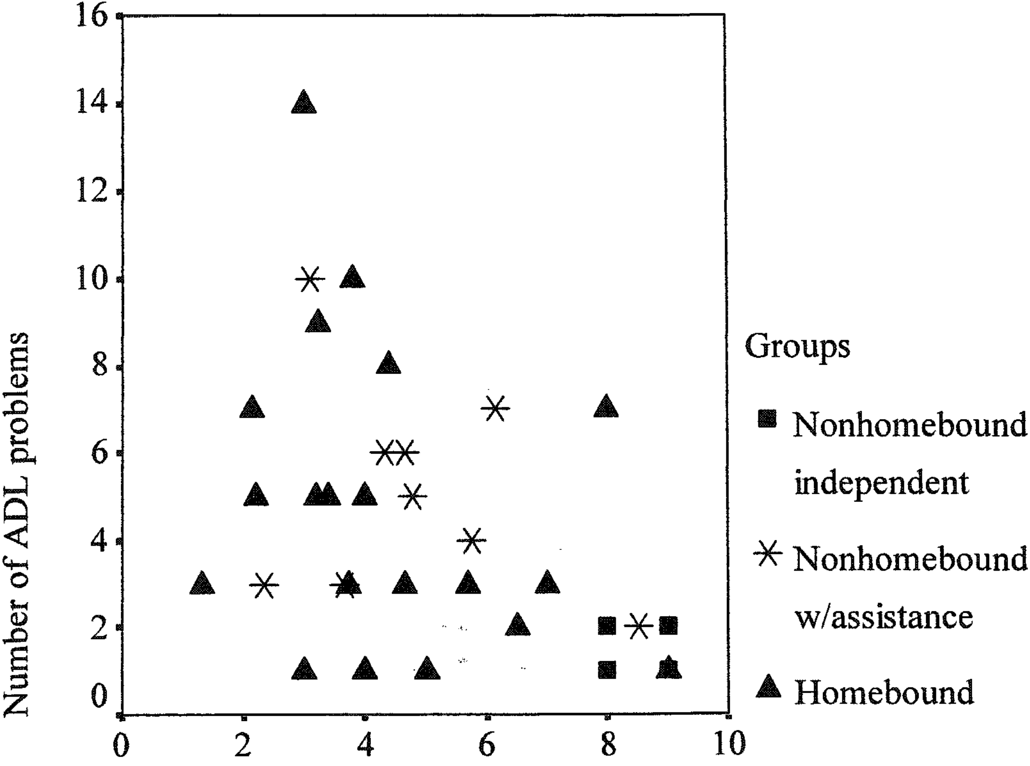

Figure 4. The relationship between the number of ADL problems and level of satisfaction with ADL for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = -.44, p \leq .05$.

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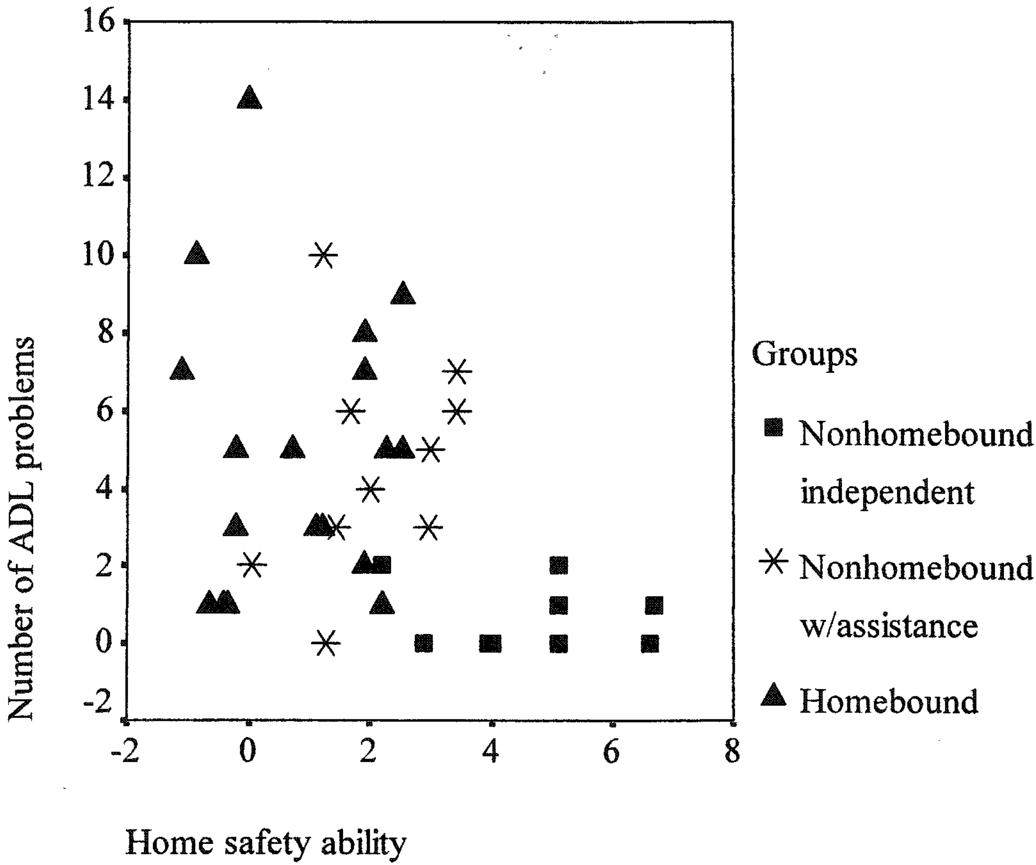

Figure 5. The relationship between the number of ADL problems and home safety ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = -.36, p \leq .05$.

Relationships Between Current Role Incumbency and the Dependent Variables.

Low positive relationships were found between the number of perceived roles currently occupied and ADL motor ability, ADL process ability, and home safety ability in the total sample (see Table 11). Pearson product-moment correlations revealed no

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significant relationships between the number of perceived current roles and ADL motor ability, ADL process ability, and home safety ability for either the homebound or nonhomebound groups. Figures 6, 7, 8, and 9 show the relationships between roles and these variables visually.

Table 11

Correlations Between Roles and the Dependent Variables for Participants in the Total Sample (TS), Homebound (HB), and Total Nonhomebound (TNH) Groups

	Group		
Dependent variable	TS *r*	HB *r*	TNH *r*
ADL motor ability	.29 *	.08	.19
ADL process ability	.25 *	.04	.18
Home safety ability	.30 *	.19	.13
Satisfaction with ADL	.25	.12	.04

Note. * $p \leq .05$ (1-tailed)

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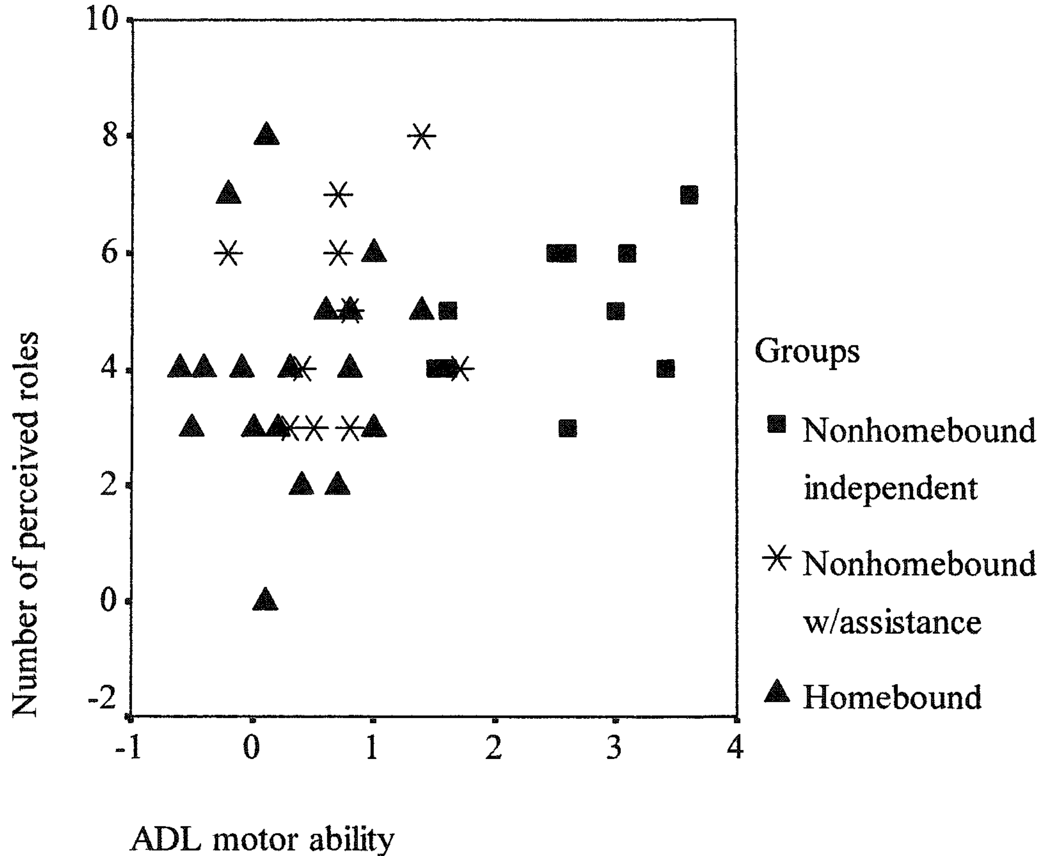

Figure 6. The relationship between perceived roles currently occupied and ADL motor ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = .29, p \leq .05$.

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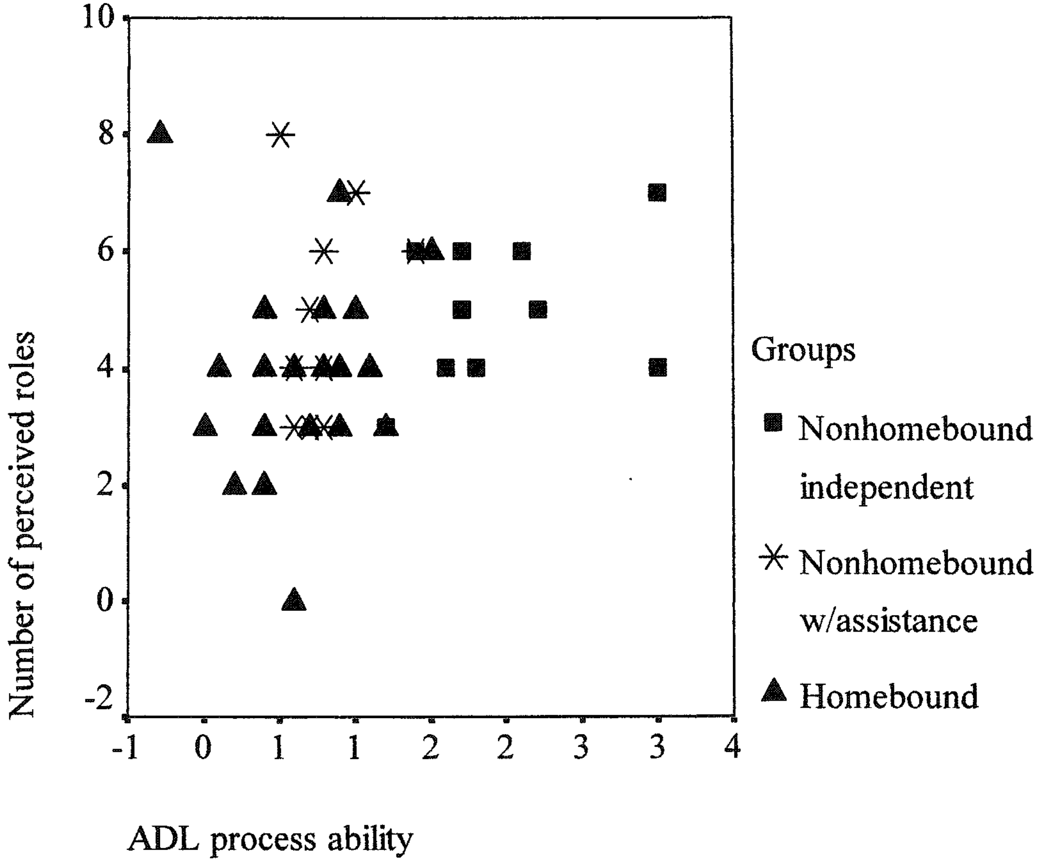

Figure 7. The relationship between perceived roles currently occupied and ADL process ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = .25, p \leq .05$.

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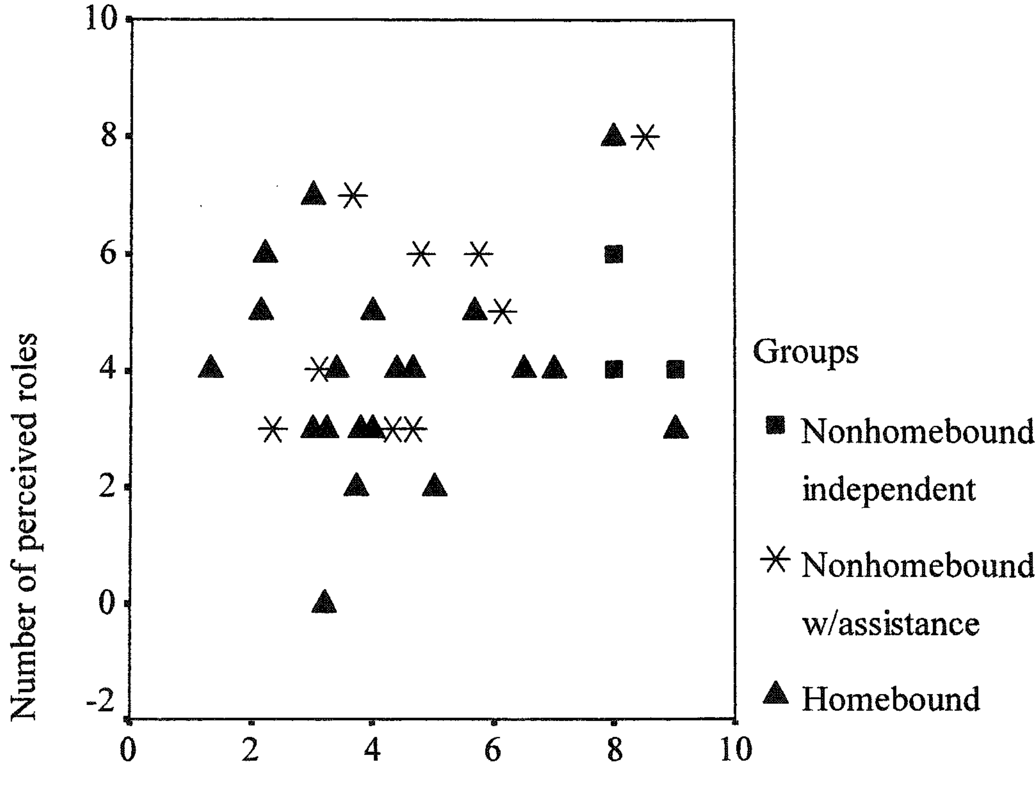

Figure 8. The relationship between perceived roles currently occupied and level of satisfaction with ADL for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = .25, p > .05$.

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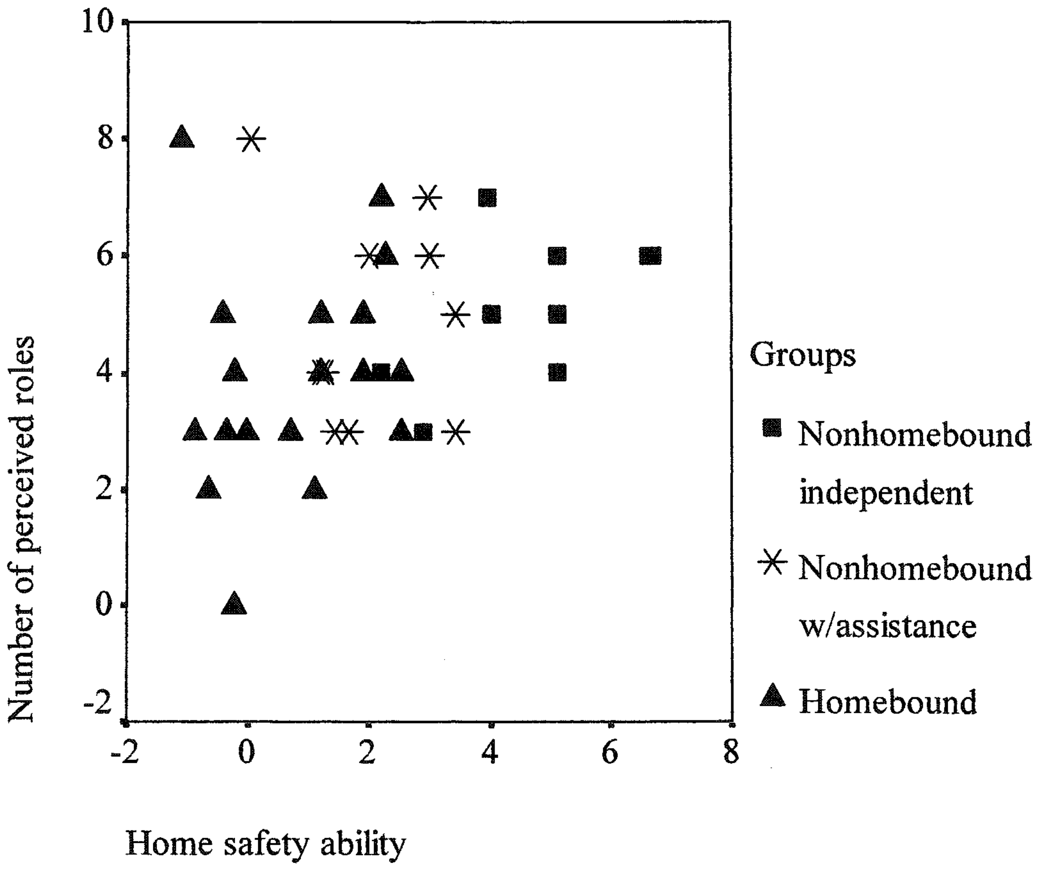

Figure 9. The relationship between perceived roles currently occupied and home safety ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = .30, p \leq .05$.

Relationships Between Depressive Symptoms and the Dependent Variables.

Pearson product-moment correlations and the Spearman Rank Correlation Coefficient analyses revealed low inverse relationships between the number of depressive

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symptoms reported and ADL motor ability, ADL process ability, level of satisfaction with ADL performance, and home safety in the total sample (see Table 10; see Figures 10, 11, 12 and 13).

Pearson product-moment correlations revealed low inverse relationtionships between the number of depressive symptoms reported and ADL motor ability, ADL process ability, level of satisfaction with ADL performance, and home safety in the total sample. Low to moderate negative relationships were found between number of depressive symptoms and ADL motor, ADL process ability, and home safety ability for participants in the total nonhomebound groups.

Table 12

Correlations Between the Number of Depressive Symptoms and the Dependent Variables for Participants in the Total Sample (TS), Homebound (HB), and Total Nonhomebound (TNH) Groups

	Group		
Dependent Variable	TS *r*	HB *r*	TNH *r*
ADL motor ability	-.33 *	.14	-.61 *
ADL process ability	-.37 *	-.16	-.50 *
Home safety ability	-.41 *	-.13	-.63 *
Satisfaction with ADL	-.38 *	-.34	.20

Note. * $p \leq .05$ (1-tailed)

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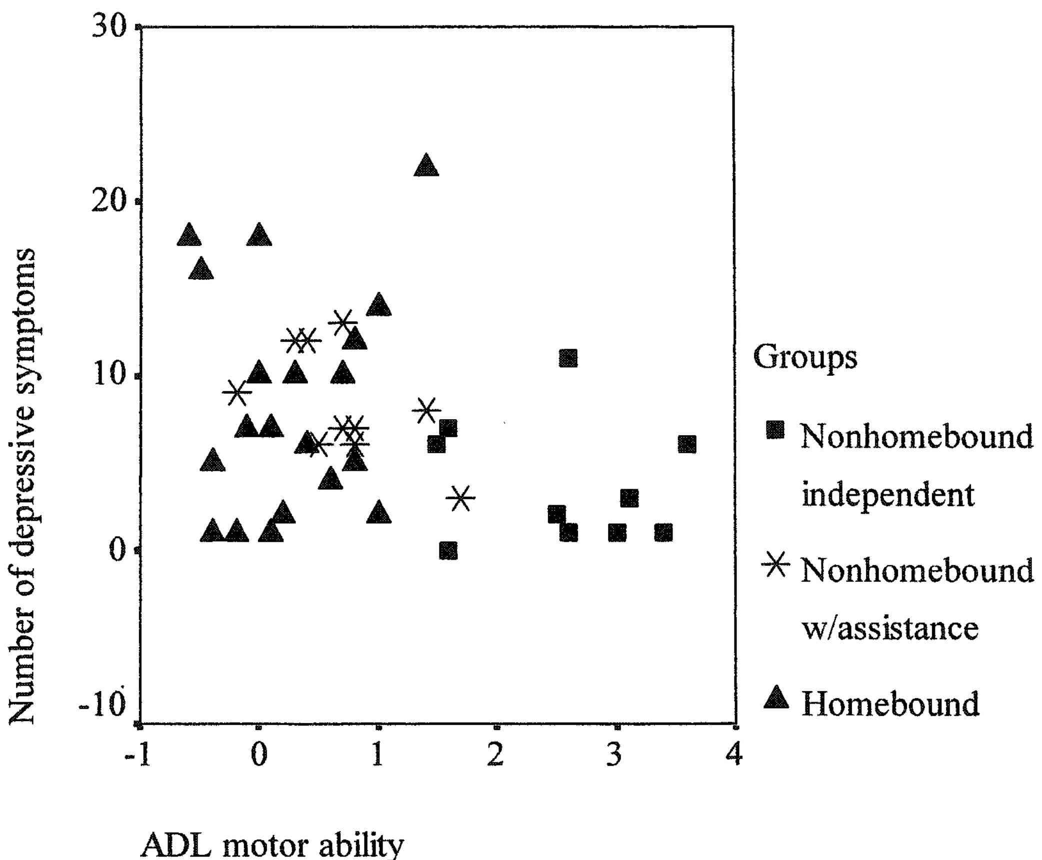

Figure 10. The relationship between the number of depressive symptoms and ADL motor ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = -.33, p \leq .05$.

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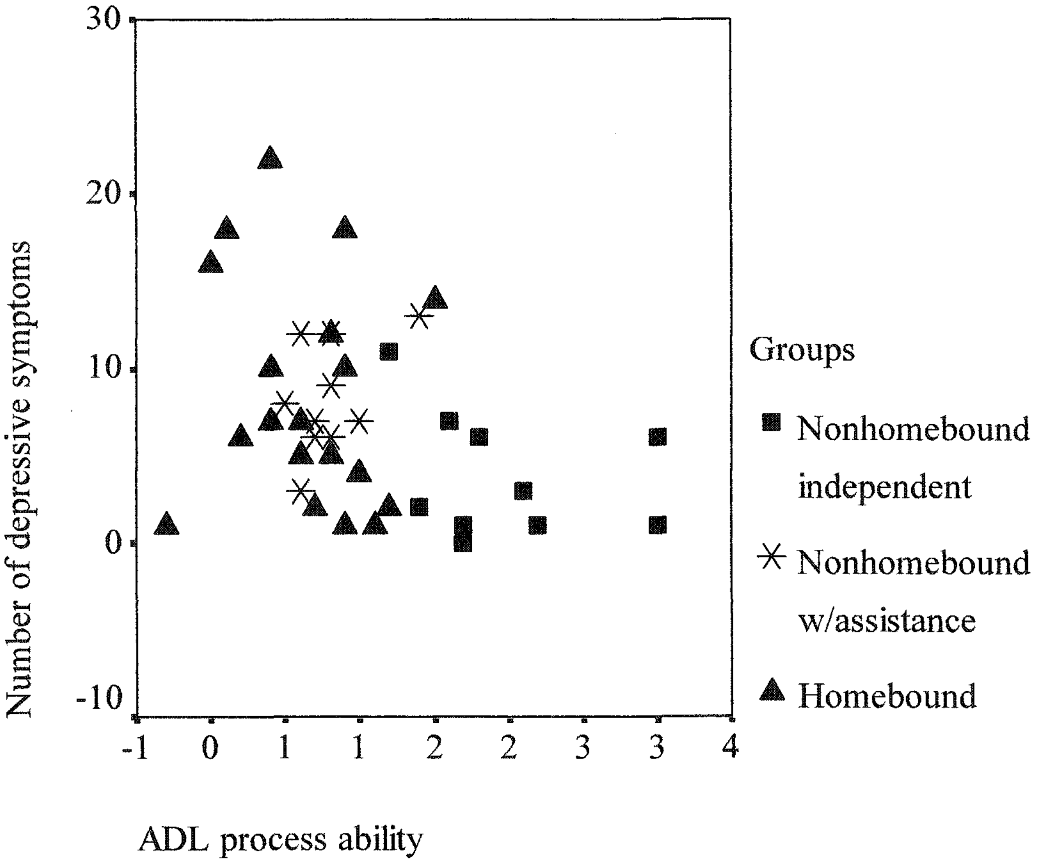

Figure 11. The relationship between the number of depressive symptoms and ADL process ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = -.38, p \leq .05$.

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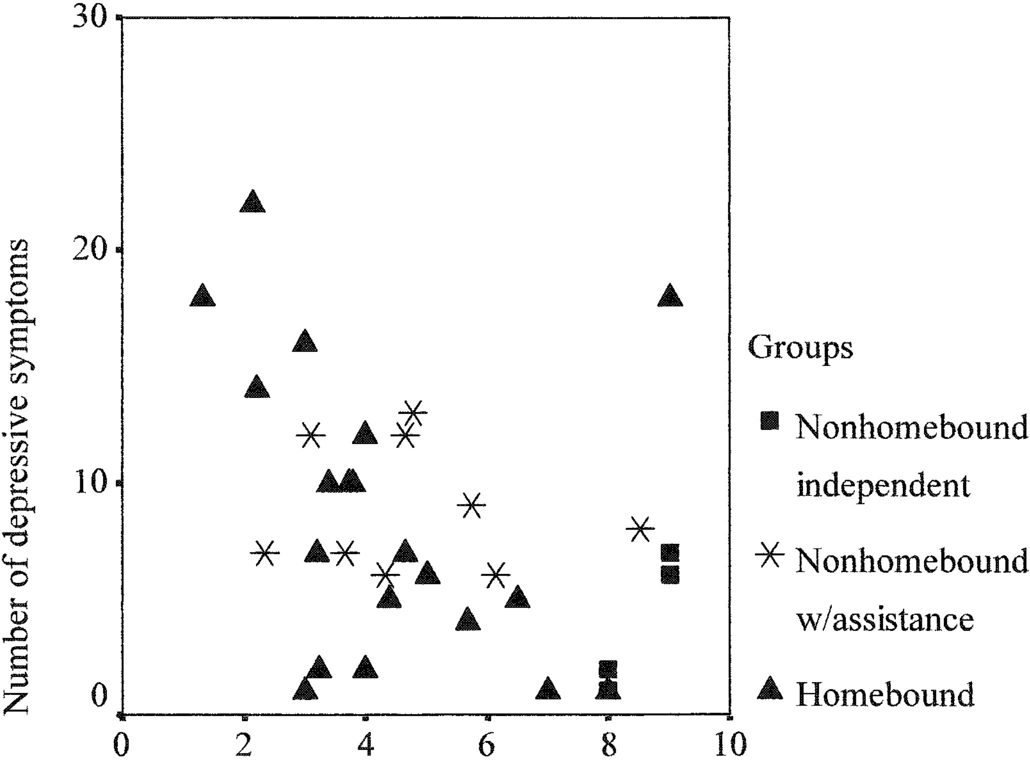

Figure 12. The relationship between the number of depressive symptoms and level of satisfaction with ADL for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = -.38, p \leq .05$.

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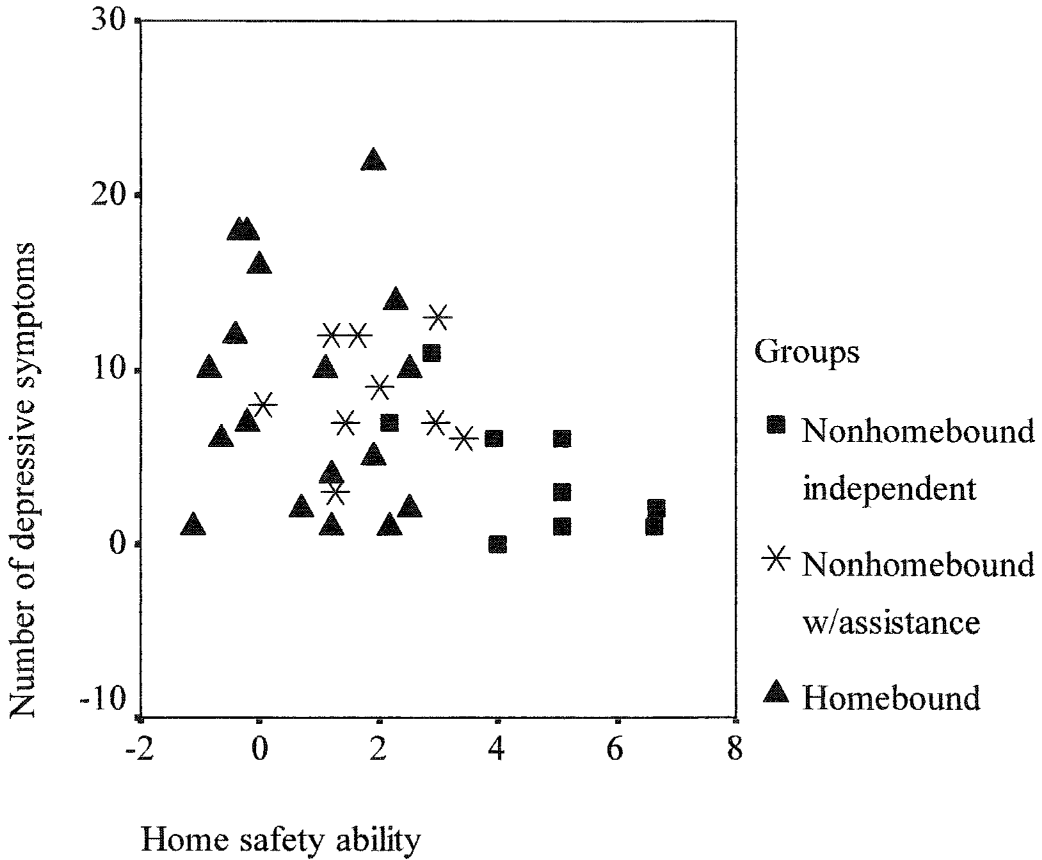

Figure 13. The relationship between the number of depressive symptoms and home safety ability for the homebound, nonhomebound with assistance, and nonhomebound independent groups, $r = -.41, p \leq .05$.

Canonical Correlation

Canonical correlation analyses were performed with (a) an independent variable set including the number of ADL problems, the number of roles, and the number of symptoms of depression, and (b) a dependent variable set comprised of ADL motor

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ability, ADL process ability, home safety ability, and level of satisfaction with ADL. Table 13 shows that there were no significant canonical correlations for this original combination of variables. Because 7 participants could not rate their satisfaction with ADL, I then removed level of satisfaction from the dependent variable set. A significant canonical correlation was then found for the total sample, but the strength of relationship did not change.

The level of correlation between the original variables and the new canonical variable can be interpreted as how much each of the original variables loads or contributes to the new canonical variables. The canonical correlation analyses revealed the following correlations between each of the original variables and the final canonical independent variable: number of ADL problems, r = -0.67; number of depressive symptoms, r = -.39; and number of roles, r =.29. The analyses also revealed the following correlations between each of the original variables and the final canonical dependent variable: ADL motor ability, r = .47; ADL process ability, r = .37; and home safety ability, r = .25.

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Table 13

Canonical Correlation Analyses of the Relationship Between the Canonical Variable (IV) and the Dependent Variable (DV) for the Total Sample

First canonical correlation	Squared canonical correlation	Eigen value	*F* (3,37)	*p*
IV (ADL problems + Roles + Symptoms of depression) and DV (ADL motor, ADL process, home safety, and level of satisfaction)				
0.58	0.34	0.51	0.60	.27
I. V. (ADL problems + Roles + Symptoms of depression) and D. V. (ADL motor, ADL process, and home safety)				
0.58	0.33	0.50	0.62	$\leq$.05

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CHAPTER 5: DISCUSSION

The results of this study supported my overall hypotheses that older adults who are homebound have less ADL motor ability, ADL process ability, level of satisfaction with ADL performance, and home safety than persons who are nonhomebound. However, by further dividing the nonhomebound sample into two groups, participants who were (a) nonhomebound with assistance and (b) nonhomebound and independent, the data revealed a continuum of ability in the nonhomebound group that the current Medicare and Medicaid systems do not recognize fully.

I hypothesized that a relationship would exist between the number of self-identified ADL problems, the number of perceived roles currently occupied, and the number of depressive symptoms reported and each of the dependent variables, ADL motor ability, ADL process ability, level of satisfaction with ADL performance, and home safety ability. The data from this study supported these relationships for the sample as a whole. I also anticipated that stronger correlations for older adults who were homebound due to the potential social isolation in their homes and because of their considerable level of ADL limitations. The data from older adults who were homebound in this study did not support this hypothesis.

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ADL Ability

The emergence of the group of older adults who were nonhomebound with assistance provided evidence that there is a wide continuum of ADL ability in nonhomebound older adults. The mean ADL motor and ADL process measures for participants in this group were well below the ADL motor and ADL process scale cutoffs. This finding is consistent with another recent study documenting the low levels of ADL independence of older adults who are, nonetheless, living in the community (Lysack, MacNeill, Neufeld, & Lichtenberg, 2002). Health care providers may need to reconsider their use of the term, living independently in the community. This study and the one conducted by Lysack et al. reveal that many adults are living autonomously in the community, but not independently.

Two participants in the homebound group demonstrated ADL process ability above the ADL process scale cutoff that appeared inconsistent with being homebound. It is worth noting that both of these participants had undergone several orthopaedic surgeries over the last year on their back, hips, and knees. They had relatively intact upper extremity range of motion and coordination and could skillfully use their hands in activities. They also did not have the medical conditions (e.g., chronic obstructive pulmonary disorder, congestive heart failure) affecting their endurance that were commonly found in other participants who were homebound. However, they had to expend considerable effort to move around in their homes, and even more effort to be mobile in the community. They may represent persons who are more likely to reintegrate into the community sooner than others in the homebound group because they did not

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have conditions that affect their vital capacity to breath, or neurological functioning (e.g., Parkinson's disease, cerebral vascular accident). Their ADL process ability measures may have represented rater error, although the two individuals were rated by two different raters.

Home Safety

The SAFER was designed to assess home safety as it relates to persons and the social and physical supports in their environments. The higher home safety measures for participants in the nonhomebound with assistance group could represent additional environmental supports they had compared to participants in the homebound group. These additional supports could be helping these older adults to remain nonhomebound even though their ADL motor and ADL process ability measures were more similar to participants in the homebound group rather than participants in the nohomebound independent group. An alternative explanation for this group's higher home safety ability could be that these participants had the underlying cognitive judgement and personal preferences that are consistent with sustaining positive home safety practices (e.g., keeping pathways free from obstacles, avoiding clutter on kitchen counter surfaces). These practices could have enabled them to be safer and to maintain their abilities to interact more readily with the community. Five persons in the homebound groups lived in smaller apartments in subsidized housing compared to only one person in nonhomebound with assistance group. Having a smaller home environment could also have contributed to the difficulty with keeping living areas organized and clutter-free for these persons in the homebound group.

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Unique Characteristics of Participants in the Homebound Group

Similar to other studies of older adults who are homebound (Ganguli et al., 1996; Kellogg & Brickner, 2000), the majority of participants in this study were female and identified their ethnicity as white, nonhispanic. Also consistent with these investigations, participants who were homebound had higher levels of comorbidity than their nonhomebound cohorts did. This trend confirms that persons who are homebound will likely have more complex health care needs and multiple changes in the structure and functioning of their bodily systems that can challenge their ADL ability. This finding also reinforces the notion that preventing or reducing additional comorbid conditions can affect homebound status and ADL ability, level of satisfaction with ADL performance, and home safety.

One unique difference in this sample was the relatively high percentage of persons (40%, $n = 8$) who were homebound and lived with spouses or family members. Four participants in the homebound group were married couples which is unique from other studies; nonetheless, each of these four married persons met the criteria of homebound and received assistance with ADL. Every person in the homebound sample utilized assistance provided by family members or paid personnel. Despite receiving some type of assistance with ADL, the majority of participants in the homebound group identified several problematic ADL. It is possible that the participants in the homebound group were not satisfied with the types of assistance they received, or they were frustrated by their limitations in ADL performance. Moreover, their use of assistance represents the strong supports available in their community, however, imperfect. No evidence was

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found to support the idea that participants's ADL limitations were due to the persons who provided them with ADL assistance.

The three most common problematic ADL identified by participants in the homebound group were functional mobility, community mobility, and home management. The participants in the homebound group identified similar levels of PADL problems to participants in the nonhomebound with assistance group; however they reported significantly more IADL problems than the nonhomebound with assistance group. The higher rate of IADL problems for participants in the homebound group makes sense given that two of the most frequently identified problems were community mobility and shopping which are both tasks that require going outside the home. The types of ADL problems identified by participants in this study could be addressed by occupational therapy interventions aimed at environmental and task modifications.

The most frequent problems identified in this study were similar to what Ganguli and colleagues (1996) found in study of urban older adults who were homebound. In that study, the most common ADL their participants wanted more assistance with were bathing, grooming light chores, grocery shopping, and doing errands.

Relationship Between Self-Identified ADL Problems and Dependent Variables

Contrary to my projected results, no relationships were found between self-identified ADL problems and the dependent variables, ADL motor ability, ADL process ability, home safety ability, and level of satisfaction with ADL performance in participants in the homebound group. These nonsignificant findings could be traced to two patterns in the homebound group. The first pattern involved two persons in the homebound group who

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had ADL motor and ADL process ability measures below the respective scale cutoffs and identified 10 and 14 problematic ADL, respectively. For these individuals, there was a close inverse relationship between less ADL ability and the presence of many self-identified ADL problems. However, another pattern found with nine participants in the homebound group did not support this type of relationship between ADL ability and the number of identified ADL problems.

Each of these nine participants reported only one to three problematic ADL despite demonstrating ADL motor and ADL process ability measures below the respective scale cutoffs. Because these persons had low ADL ability and relatively few unresolved, problematic ADL, no significant correlations were identified between the number of problematic ADL and the dependent variables. One could interpret these nine persons' lower numbers of perceived ADL problems as an indication that they had learned to cope with and adapt to their significant ADL restrictions, or they had more facilitators rather than inhibitors of ADL performance in their environments. It is possible these participants had the assistance they needed to satisfactorily perform ADL and did not view their ADL limitations as creating a problem in their lives. This finding supports the importance of occupational therapy assessments and interventions that fully examine how environmental supports affect an older adult's occupational performance. Another possible explanation for the pattern of low ADL ability and few ADL problems identified could be related to a lack of insight or awareness their ADL problems in the homebound sample. Regardless of the explanation, these findings showed that older adults who were

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homebound may or may not report many problematic ADL depending on their unique situations.

The low to moderate negative correlations between self-identified ADL problems and ADL motor ability, ADL process ability, level of satisfaction, and home safety ability for participants in the total sample may reflect an overlap that exists between an older adult's perceived ADL problems and their observable ADL ability. This finding also points to the heterogeneity of the population of older adults as a whole. They may have observable ADL or home safety ability limitations, but they may not view these limitations as problematic. Only through individualized assessments can occupational therapists determine what each individual older adult perceives as problematic in his or her daily routine, and from this information can build an intervention plan that is responsive to the person's needs.

Another important explanation for the lack of correlation between self-identified ADL problems and the dependent variables could rest in older adults' and their health care providers' lack of awareness that some ADL limitations can be successfully addressed by occupational therapy. As discussed in the literature review, younger adults with disabilities tend to be stronger advocates for getting the services they need to live autonomously in the community; whereas, older adults are more likely to attribute their ADL limitations to "getting old" (Kane & Kane, 2001). Further investigation of the reasons why older adults with lower ADL and home safety ability do not view ADL and safety limitations as problematic could further clarify whether this pattern is due to their

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higher levels of coping and adaptation or to insufficient knowledge about compensatory or therapeutic approaches available in health care services.

The low inverse relationship between the number of self-identified ADL problems and level of satisfaction with ADL performance for the total sample shows that how much an older adult is satisfied or dissatisfied with problematic ADL is only weakly related to how many problematic ADL they identify. Level of satisfaction is an important construct that may be best understood in the context of a client's unique situation.

Relationships Between Perceived Roles and Dependent Variables

Low positive relationships were found in the total sample between perceived current role occupancy and the dependent variables except for level of satisfaction with ADL performance. Potentially, higher ADL motor and ADL process ability would enable older adults to participate more easily in activities associated with different roles. Additional roles may have reflected more support from family and friends that helped to increase participants' levels of home safety ability. However, these correlations were weak and can only be considered as having a very limited relationship to the dependent variables. Overall, the number of roles that participants perceived themselves to be fulfilling had little relationship to their ADL motor ability, ADL process ability, level of satisfaction with ADL performance, and home safety ability. It is possible that further investigation of role loss over time and role value may be more related to ADL ability, satisfaction with ADL performance, and home safety than the perceived roles currently

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occupied. Also, it may be worthwhile to investigate other assessments that evaluate older adults' perceived social supports.

Relationships Between Symptoms of Depression and Dependent Variables

Similar to the variable of self-identified ADL problems, several participants in the homebound group had lower ADL motor, ADL process, and home safety ability measures and reported few depressive symptoms. Thus, a relationship between depressive symptoms and ADL ability and home safety ability were not found for participants in the homebound sample. The moderately strong negative relationships between the number of depressive symptoms and ADL motor ability, ADL process ability, and home safety ability for participants in the total nonhomebound group may have been due to some of this group's participants feeling more distressed about their decreased ADL and home safety ability. Older persons in the nonhomebound group who needed ADL assistance had similar levels of ADL motor and ADL process ability to their cohorts in the homebound group. They may have perceived more environmental press to continue interacting with the community even though they had significant limitations in ADL ability. These higher expectations for ADL performance and community interactions in the face of the lower ADL motor and ADL process ability could be related to symptoms of depression. These individuals in the nonhomebound group would likely be able to benefit from an occupational therapy intervention as much as participants in the homebound group.

The relationship found between the number of depressive symptoms and ADL motor and ADL process ability in the whole sample is consistent with other studies of mental

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health disorders and ADL ability. Decreased ADL motor ability, like ADL process ability, can be associated with the presence of mental health disorders such as depression, dementia, and schizophrenia (Girard et al., 1999; Pan & Fisher,1994). However, many persons with ADL and home safety limitations do not exhibit symptoms of depression, as this study illustrated.

Canonical Correlation

The ultimate goal of performing a canonical correlation is to determine if a group of independent variables will better predict a group of dependent variables compared to doing a series of simpler analyses (e.g., Pearson product moment correlation, multiple regression). The advantage of the canonical correlation is that it tests whether one set of variables in combination have a relationship to another set of variable in combination. The combination of self-identified ADL problems, the presence of depressive symptoms, and the number of current roles was able to predict 33% of the variance of the canonical dependent variable comprised of ADL motor ability, ADL process ability, and home safety ability for participants in the total sample. This was a moderately strong correlation, but nevertheless, should be viewed with caution. Typically, for an analysis with six variables, a canonical correlation requires at least 60 participants or cases. Only by completing a similar analyses with a larger number of participants could we understand the true strength of the relationship between these two combinations of variables.

Nevertheless, my results support the notion that the three independent variables selected for inclusion in this study reflected some type of psychosocial gestalt relevant to

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assessing older adults' ADL ability and home safety ability. The canonical correlation analyses showed that the number of self-identified ADL problems was a powerful contributor (r = -.67) to the formation of the new canonical independent variable; whereas, the other variables added smaller, but still significant contributions. The three dependent or outcome variables, ADL motor ability, ADL process ability, and home safety ability, that formed the canonical dependent variable, contributed more evenly to their respective canonical variable. It may be that these variables could be combined together in the canonical correlation because ADL motor ability and ADL process ability are based on objective, observational assessment, and home safety ability is based on observational and self-report assessment procedures. In contrast, the level of satisfaction with ADL performance was a self-report test.

Limitations

The use of convenience sampling in this study limited my ability to generalize the results. Future investigations could be strengthened by the inclusion of older adults with a broader representation of different ethnic groups and geographic regions of the country along with a much larger sample size. Prospective studies with older adults who are homebound and nonhomebound could utilize more objective medical information that uniformly describes comorbidity of the sample. In addition, employing multiple data collectors who were blind to the purpose of the study would also reduce the threat of bias posed by one person collecting the majority of data for the study.

Another limitation of this study was the collection of data at one point in time. Understanding how the variables of ADL ability, level of satisfaction, and home safety

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change over the course of a year for persons who are homebound could help therapists to understand the trajectory of these factors over time. Future research could focus on investigating these variables over time in older adults who are chronically homebound. In addition, comparisons could be made between those who received occupational therapy services versus a matched group who do not receive occupational therapy services. Documenting the outcomes of this type of study could justify future services for this population. Finally, future investigations utilizing a qualitative method could yield data about the experience of being homebound from the unique viewpoint of older adults experiencing this phenomenon.

Implications for Occupational Therapy Practice

One implication for practice is that therapists who provide home health services to older adults after acute hospitalizations must ensure that their interventions are targeted at the identified ADL concerns of their clients. It is important that they recognize the unique needs of this subset of their home health client population: older adults who are at risk for staying chronically homebound long after the home health visits have ceased.

Weinrich and Stuart (2001) called rehabilitation and the management of chronic conditions in a progressively older population the new frontier in health care. They pointed to the need for well-designed studies that inform policy makers about which services provide the best outcomes for people with chronic conditions. Occupational therapists need to take the lead in designing studies that investigate how our services can improve outcomes for older adults who are homebound or outcomes for older adults who are at risk for becoming homebound.

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It is troubling that currently many older adults who are chronically homebound do not have access to occupational therapy services unless they receive services in the hospital or through home health services after a hospital stay. The results of this study show that many older adults who are homebound have multiple ADL problems that could be addressed by occupational therapy services. The involvement of occupational therapy in community-based Medicaid waiver programs for older adults who are homebound should be addressed in the states that currently do not have occupational therapists written into their waiver laws. Occupational therapists need to be advocates for getting their services recognized more uniformly across the country. In some states, this type of advocacy and educational process is happening with therapists developing new, innovative roles with their local Area Agencies on Aging (Ratnoff, Becker-Omvig, Elliot, O'Sullivan, & Talley, 2002).

Another implication of this study for occupational therapists is the need for our health care system to develop avenues to access to our services for older adults who are nonhomebound, but who, nonetheless, have ADL limitations that are viewed as problematic. Some of the participants in this study who were nonhomebound had successfully avoided being hospitalized for years, but they had ADL limitations that they described as problematic. They did not appear aware of what occupational therapy could offer them in terms of reducing their ADL limitations or improving their quality of life. With the current structure of our health care system, it is not likely that they would be referred to an occupational therapist. If they were referred to an occupational therapist, it would have to be at an outpatient clinic setting, where many occupational therapists are

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in the habit of providing hand therapy or other techniques oriented toward remediating underlying body structures or functioning rather than offering environmental and task compensatory strategies designed for a person's unique home situation.

One inevitable concern about expanding occupational therapy or other services in the community-based Medicaid waiver programs is cost (Miller, Ramsland, Goldstein, & Harrington, 2001). However, at least one other country has successfully implemented community-based long term care for older adults and not faced runaway costs. In Denmark, the per-capita cost of community-based long-term care has leveled off; whereas, long term care costs continue to increase in the United States (Stuart & Weinrich, 2001). This discrepancy in relative costs exists despite Denmark's development of a comprehensive long-term care system for older adults that emphasizes community services versus nursing home care. Concerns about the cost of community-based long-term care must also be balanced with the fact that older adults who are homebound utilize a disproportionate share of Medicare resources for acute hospitalizations and other medical care. Alternative community programming needs to be evaluated to determine if these costs can be reduced while at the same time improving older adults' ADL participation, home safety, and overall quality of life. To make these types of programming a reality, occupational therapists will not only need to educate consumers, government agencies, and managed care organizations, they will also need to adopt a different attitude toward their assessment and intervention processes. In this study, the AMPS was demonstrated to have the capacity to measure ADL motor and ADL process ability in a sample that ranged from well older adults in peak health to frail

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older adults who perform ADL only with significant effort or with assistance from others. Because the AMPS ADL motor and ADL process scales can detect decrements in ADL ability that other ADL tests do not, it can serve as a useful tool for measuring change before and after an intervention for older adults who demonstrate significant ADL limitations. The SAFER tool provided a method to evaluate home safety in a way that is consistent with a broader view of home safety that is consistent with occupational therapy philosophy.

A more contemporary way of thinking about providing services to older adults in the community is articulated well by a therapist who created a new role for occupational therapy at the Howard County Office on Aging in Columbia, Maryland:

> *Occupational therapists are not in the business of home health, rehab, or the medical model. Rather, our business is truly about human potential and the ability to achieve health and wellness through facilitating meaningful occupations. Home health and traditional medical model are merely service delivery systems, and with the growing senior populations, many other service systems are attempting to facilitate independence and quality of life for seniors. Occupational therapists must respond now to the opportunities outside of traditional medical model to establish our professional expertise within the increasing number of senior services interested in facilitating occupational performance. Area agencies on aging represent just one of the many delivery delivery systems with increased funding perfectly suited for occupational therapists.* (Ratnoff et al., 2002, p. 1).

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Conclusion

This exploratory study provided evidence that those older adults who were chronically homebound had significantly lower ADL motor ability, ADL process ability, home safety ability, and level of satisfaction with ADL performance than their peers who were nonhomebound. Moreover, older adults in the nonhomebound with assistance group demonstrated ADL motor and ADL process ability, levels of satisfaction, and numbers of perceived problematic ADL similar to older adults who were homebound. This finding exposes a serious gap in the health care environment because older adults who are nonhomebound with assistance have even less access to occupational therapy services than older adults who are homebound.

The results of this study suggested that the psychosocial factors of self-identified ADL problems, the presence of depressive symptoms, and to a lesser degree, perceived current role occupancy, should be considered in a comprehensive occupational therapy assessment of ADL and home safety ability. This investigation included participants who were recruited from community agencies rather than from clinics or hospitals. Unfortunately, the vast majority of them had not had the opportunity to receive an occupational therapy assessment despite the presence of ADL limitations that were perceived as problematic. The results of this study serve as a challenge to occupational therapists to become more involved in community-based service delivery systems. This is likely the only way to ensure that if older adults have ADL limitations they view as

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dissatisfying or problematic, they will access to relevant, meaningful, and cost-effective occupational therapy services whether or not they meet the criteria for homebound services from Medicaid and Medicare.

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APPENDIX A

Specific ADL that Participants Received Assistance with and the Frequency with Which They Obtained Assistance from Family or Paid Personnel

Partici-pant	Group*	PADL or IADL for which participants received assistance	Daily	2-3x/ wk	1x/ wk	1-2x/ mo
01	NHA	IADL: financial management (check writing, budgeting), home management (cleaning the walls, gardening)				x
03	NHA	IADL: shopping, home management (gardening)			x	
06	NHA	IADL: shopping, home management (gardening, heavy housecleaning windows) community mobility			x	
07	NHA	IADL: home management (heavy housecleaning)				x
11	NHA	IADL: shopping, meal preparation, financial management (paying bills)	x			
13	NHA	IADL: home management (Making the bed), shopping			x	
17	NHA	IADL: financial management (balancing checkbook), home management (heavy cleaning)				x

Note. * HB = homebound group, NHA = nonhomebound with assistance group, and NHI = nonhomebound independent group

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Specific ADL that Participants Received Assistance with and the Frequency with Which They Obtained Assistance from Family or Paid Personnel (Continued)

Partici-pant	Group*	PADL or IADL for which participants received assistance	Daily	2-3x/ wk	1x/ wk	1-2x/ mo
18	NHA	IADL: home management (vacuuming, sweeping, cleaning the bathroom)			x	
19	NHA	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom), community mobility			x	
20	NHA	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation	x			
21	HB	PADL: bathing. IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility		x		
22	HB	PADL: bathing. IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility	x			
23	HB	PADL: Bathing. IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility		x		

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Specific ADL that Participants Received Assistance with and the Frequency with Which They Obtained Assistance from Family or Paid Personnel (Continued)

Partici-pant	Group*	PADL or IADL for which participants received assistance	Daily	2-3x/ wk	1x/ wk	1-2x/ mo
24	HB	IADL: shopping, community mobility, financial management		x		
25	HB	IADL: Shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), community mobility		x		
26	HB	PADL: bathing. IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility		x		
27	HB	PADL: Bathing. IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility		x		
28	HB	IADL: shopping, home management (deep cleaning) community mobility				x
29	HB	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility	x			

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Specific ADL that Participants Received Assistance with and the Frequency with Which They Obtained Assistance from Family or Paid Personnel (Continued)

Partici-pant	Group*	PADL or IADL for which participants received assistance	Daily	2-3x/ wk	1x/ wk	1-2x/ mo
30	HB	PADL: Bathing IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), community mobility		x		
31	HB	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility	x			
32	HB	PADL: bathing IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), community mobility	x			
33	HB	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), community mobility			x	
34	HB	PADL: bathing, dressing IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility	x			

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APPENDIX A (Continued)

Specific ADL that Participants Received Assistance with and the Frequency with Which They Obtained Assistance from Family or Paid Personnel (Continued)

Partici-pant	Group*	PADL or IADL for which participants received assistance	Daily	2-3x/ wk	1x/ wk	1-2x/ mo
35	HB	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom), community mobility			x	
36	HB	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom,), community mobility			x	
37	HB	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility	x			
38	HB	PADL: bathing, dressing IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility	x			
39	HB	IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), community mobility			x	
40	HB	PADL: bathing, dressing IADL: shopping, home management (vacuuming, sweeping, cleaning the bathroom, laundry), meal preparation, community mobility	x			

Note. * HB = homebound group, NHA = nonhomebound with assistance group, and NHI = nonhomebound independent group