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**MODIFYING HOMES TO ACCOMMODATE DISABILITIES:
CAN INTERIOR DESIGN PROFESSIONALS
FACILITATE THE PROCESS?**

by

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**A Thesis Submitted To The Faculty Of Graduate Studies For Partial
Fulfillment of the Requirements
for the Degree of**

MASTER OF INTERIOR DESIGN

Department of Interior Design

University of Manitoba

Winnipeg Manitoba

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Catherine V. Reilly

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of Manitoba in partial fulfillment of the requirements of the degree
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ABSTRACT

Changes in health care and an aging population create an increasing need to modify homes to accommodate disabilities. This study considered whether interior design professionals can play a role in facilitating the process of making these modifications. This study identified the context for modifying homes and the opportunities and constraints for interior design professionals within this context.

Semi-structured interviews were conducted with 10 households living in or near Winnipeg, Manitoba. The data were analyzed using an adaptation of the Strauss and Corbin (1990) grounded theory technique.

This study supported observations of Hovey (1993), Pynoos (1993), Ringaert (1997), Steinfeld (1994), and Wylde (1997) that cost; limited knowledge of disabilities, design, and construction; reduced mobility and vitality; and time constraints, prevent consumers with disabilities from meeting their need for modifications. This study also found that consumers wanted modifications that improved their ability to be independent, were affordable, and had a non-institutional appearance.

The main conclusion was that limitations in consumer knowledge of design and construction present opportunities for design professionals to facilitate the modifying process. However, low consumer awareness of interior design services and concerns about the cost of fees are important constraints to the involvement of the profession in facilitating home modifications. It was also determined that consumers with recent disabilities required more assistance than those with long term disabilities. The benefit of using interior design professionals relative to the cost was not determined and requires further study. Recommendations include measures to reduce the cost of design services, increase public awareness of professional skills, and the development of partnerships with the disability community and the home renovation industry.

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CHAPTER 1: INTRODUCTION

Changes in the health care system, and a shift towards an older population, have led to a growing number of people living at home with a disability. The need to provide home environments that accommodate the needs of people who have disabilities has been increasing. However, the presence of features such as stairs, narrow passageways, and small bathrooms in most existing housing has created obstacles for people who wish to live at home despite their disability. Home modifications could remove some of these obstacles, or barriers, thereby increasing opportunities for people with disabilities to live at home with a reasonable degree of independence. Despite the benefits of modifying the physical environment, many people have not made the necessary changes to their dwellings (Hovey, 1993; Pynoos, 1992, 1993; Wylde, 1997). Instead, they have adapted their activities or have exposed themselves to the risk of injury due to hazards and barriers in their physical environment. Those concerned with improving opportunities for independent living have had an interest in understanding how to facilitate home modifications.

The process of modifying a home can be stressful under any circumstance, even when disabilities are not present. This stress can become more critical when disabilities are present because of the additional burdens these disabilities create. Although numerous publications have provided guidance for designing modifications for those with disabilities (Canada Mortgage and Housing Corporation [CMHC], no date, 1996; Human Resources Development Canada, 1994; Kushner, Falta, Aitkens, 1987; Leibrock, 1993; Minister of Human Resources Development Canada, 1994), there has been little information available about the modifying process. The process of renovating or modifying dwellings to accommodate a disability has presented design problems that have typically been complex, often without clear right or wrong answers. Although design guidelines

have offered some direction, gaps have remained between theoretical possibilities and applied solutions to particular situations.

Design professionals have received considerable training in resolving design-build problems, including the application of building codes and design guidelines. However, design professionals have not received extensive training in universal or accessible design. The competence of design professionals in incorporating universal or accessible design principles into design-build problems has not been clear. The existing literature has not provided an insight into how households, who have little training in design, apply existing design guidelines to their requirements. This limited understanding has raised the question of how design professionals might be of some assistance to households who are unfamiliar with renovations and construction.

From a marketing perspective, it has appeared that the increasing requirements for home modifications may have created opportunities for services to meet consumer needs. In order to successfully address these opportunities, it will be necessary to determine consumer needs and wants in the modification process. Without understanding the context of residential modifications for people with disabilities, members of the interior design profession may be missing opportunities in a growing market for their services.

1.1 GOALS AND OBJECTIVES OF STUDY

In order to be active in the growing market for accessible housing, interior design professionals need to demonstrate that they can facilitate the process of modifying housing for people with disabilities. Because evidence of the benefits of interior design services has been lacking, the goal of this study was to determine how interior design professionals could play a role in facilitating the modification of private dwellings for people with disabilities. The two objectives of this study were to define the context for

consumers with disabilities who modify their homes, and define opportunities and constraints for interior design professionals to facilitate the modifying process. These objectives were met by accomplishing the following tasks:

Objective 1: Define the context for consumers with disabilities who modify their homes:

- (a) Identify the important needs and wants of households as they relate to modifying homes for the purposes of accommodating a disability;
- (b) Identify the barriers consumers with disabilities have in meeting their needs and wants in the process of home modification;

Objective 2: Define opportunities and constraints for interior design professionals to facilitate the modifying process for consumers with disabilities:

- (a) Identify services that interior design professionals can effectively offer that facilitate the process of home modification and differentiate them from those that can be self-met or resolved through other means;
- (b) Identify constraints to interior design professionals engaging in consumer-professional transactions with consumers who have disabilities ;
- (c) Identify issues interior design professionals should consider in order to meet the needs and wants of consumers with disabilities;

1.2 METHODOLOGY

The many questions surrounding the experience of modifying homes, and the absence of guiding theories, suggested the need for a qualitative approach that would facilitate the discernment of relevant issues, patterns, or variables surrounding the phenomenon of modifying homes (Guba & Lincoln, 1988; Strauss & Corbin, 1990; Weiss, 1994). The data for this study were derived from guided interviews with 10 participant households, living in or near Winnipeg, who had modified their home to accommodate

the disability of a household member. In 3 of the 10 households, the services of an interior design professional were used. One other household was assisted by two interior design students. The data from these interviews were analyzed using the grounded theory procedures described by Strauss and Corbin (1990). This analytical procedure was used in order to ensure that interpretations of the data were based on the experiences of the participants.

1.3 ASSUMPTIONS

The important assumptions used in this study are identified here because they raise some ethical and ontological questions. The first of these assumptions was that people with disabilities could be viewed as consumers of goods and services. This point of view has been legitimized by the principle promoted by the Independent Living Movement that independence includes the ability to freely participate in the marketplace, and make independent choices of goods and services (Nosek & Fuherer, 1992, a and b; DeJong, 1981). Using this assumption, households requiring modifications to accommodate disabilities were viewed as consumers in a segment market of the home improvement industry.

The previous assumption raised the question about the ethical appropriateness of studying groups of people from the perspective of a service provider, as it could be considered self-serving. This study relied, in part, on the argument that people may potentially benefit from having a greater range of satisfactory goods and services from which to choose. This benefit may reduce the potential harm existing in the current condition in which some people place themselves at risk by remaining in unsafe or unsuitable accommodations. This ethical question was also addressed by informing participants that the purpose of the study was to understand the role design professionals can play in modifying homes (Appendix D3, Letter of Introduction).

Another important assumption was that the competencies described by the National Council for Interior Design Qualification (NCIDQ) are representative of the typical interior design professional and design practice. The NCIDQ exam has set a common standard for professional practice. Most American and Canadian jurisdictions have required successful completion of the NCIDQ exam in order to be entitled to use the designation of Professional Interior Designer. However, as the interior design profession has not been licensed in most locations, some individuals have practiced using a designation not controlled by their local associations. It has been possible therefore, to conduct an interior design practice without meeting the basic minimum competencies tested for in the NCIDQ exam. However, given the growing trend towards title regulation using the NCIDQ standards, it was considered reasonable to use them as a baseline of professional skills and competence.

This study considered how interior design professionals could assist in modifying homes to accommodate disabilities based on the assumption that this process includes a set of tasks (Design-Build Tasks) derived from design methods theory and the NCIDQ Interior Designer Task Analysis (Appendix C Description of Interior Designer Knowledge Areas). This study considered the implications of not including these tasks in the process, but did not focus on identifying alternative approaches to the modifying process. However, the qualitative methodology provided opportunities for recognizing significant alternative approaches to the modifying process that might have emerged from the data.

The final assumption was that consumer satisfaction is a measure of the appropriateness of modifications. The analysis of the modification process relied on the reports of participants. Because this study was primarily an examination of the experience of participants, their perceptions had merit in terms of assessing consumer satisfaction. Indeed, self-perceptions of satisfaction have been considered valid measures of positive independ-

ent living outcomes (Nosek & Fuherer, 1992, a an b). Instruments that attempted to evaluate the appropriateness of modifications objectively tended to overlook individual subjective experiences, and were therefore considered inappropriate for the purposes of this study.

1.4 LIMITATIONS

This study focused on the process of making modifications and the potential of interior design professionals to facilitate the process. The results therefore, were limited to understanding the modifying process, and did not provide a detailed evaluation of the modifications or their impact on the quality of life for the participants. Thus, this study did not demonstrate what factors contributed to improved independence in home environments, but revealed those factors that enabled households to have a more positive experience in undertaking improvements to accessibility in their homes.

1.5 TERMINOLOGY

For the purposes of this report, renovations, or home improvements, are referred to as modifications. The term “modification” implies a greater emphasis on the issue of modifying the person-environment interaction than does either “renovation” or “home improvement”. However, it should be noted here that most of the participants used the term “renovation” in describing their experience.

This report also uses terminology advocated by the Independent Living Movement that places an emphasis on the person and not the disability. When the disability is important to the issue being addressed, terms such as “person with a disability” are used instead of “disabled person”.

Because many of the modifying experiences involved more than one member of the household, households were considered participant units. Therefore, the term “household” is used when referring to participants as part of a household unit. The term “participant(s)” is used when referring to specific actions or responses of individuals.

A more comprehensive listing and definition of terms is included in the Glossary of Terms.

1.6 OVERVIEW OF CHAPTERS

Chapter 2 provides a review of the literature that informs the conceptual framework used to guide the study. This chapter summarizes the literature and reports of previous studies related to the Independent Living Movement, universal and accessible design, design theory, professional practice, and marketing theory. In Chapter 3, the conceptual framework that guided the study design and analysis is explained. Chapter 4 describes the design of the research component of the study, including methodology, recruitment and sampling, ethical considerations, sources of data, managing and recording the data, analytical strategies, implementation, and chronology of the fieldwork. Chapter 5 describes the findings that were derived from the analysis of the data (interviews, questionnaires, and field observations), starting with a description of the participants and the phenomenon of modifying homes. This chapter then goes on to provide more detail about the various categories which includes the core category, causal conditions, the context, intervening conditions, strategies for action, and consequences. Finally, Chapter 6 summarizes the major findings of the study and presents a modified version of the original conceptual framework. The chapter ends with the implications, recommendations for future research and action, and general conclusions.

CHAPTER 2: LITERATURE REVIEW

The bodies of literature considered in this study were selected for their relevance to understanding the role of interior design practice in modifying homes to accommodate the needs of a person with a disability. The important aspects of this issue were identified as disability, housing, design, professional practice, and marketing. This chapter begins by reviewing the prevalence of disabilities in society. The housing issues for people with disabilities arising from the Independent Living Movement and the need for accessible housing are then presented. The next section is the accessible design literature that addresses questions related to the design of appropriate housing for people with disabilities. The section on aesthetics is included because of its possible relevance to accessible design. Design methodology literature introduces theories on the design process that are expected to be a part of modification. Following this review of design methodology, the reader is introduced to the current state of professional practice. Finally, the purpose of this study requires a fundamental understanding of the relationship between service providers and consumers that is examined in the marketing literature.

2.1 POPULATION STATISTICS

According to the Statistics Canada 1991 Health and Activity Limitation Survey, 15.5 percent of the population reported some level of disability (Statistics Canada, 1992). This survey also demonstrated that the incidence and severity of disabilities increased with age, finding that 7 percent of children under the age of 15 had a disability compared to 46.3 per cent of people 65 years of age and older. Amongst those with disabilities, 2.9 percent of children had a severe disability compared to 32.4 percent of those over 65 years. According to the Statistics Canada 1991 Population Ageing and the Elderly Survey, the percentage of people over the age of 65 will increase from 11.6 percent in 1991 to 14.6 percent in 2011 (Desjardins & Dumas, 1993). Thus, the incidence of disability in

Canadian society is expected to rise as the population group with the highest rate of disability increases in size.

At one time, many people with disabilities were under the care of the medical system, living in institutional settings. However, by 1991 over 93 per cent of people with disabilities lived in private households (Statistics Canada, 1992). This Statistics Canada report also found that amongst people over the age of 65, 85.3 percent were homeowners. Several studies have found that despite the experience of physical and cognitive changes associated with aging, the majority of older people want to stay in their homes and never move (Hare, 1992; Rohde, 1991; Stewart, Shindruk, Sloan, Cavalier, 1993; Wylde, 1997). Reports of the high percentage of home ownership amongst older people, and the associated disabilities of aging, have suggested that there will be increasing numbers of older people living in their own homes who have some type of disability. It has been reported that amongst younger people with disabilities there has also been a high percentage of home ownership. A CMHC study that used a focus group of people with disabilities found that 47.3 percent of their sample owned their homes. Their study also indicated that income levels in this group were low, yet 38 percent had incomes over \$30,000 (Hickling Corporation, RBO Architecture Société Logique, 1996). The aforementioned studies have provided evidence that there is a small but significant market of households who have the need and means to make modifications to their homes in order to accommodate a disability. This market may be even larger if those with lower incomes who receive additional funding from others are included.

2.2 INDEPENDENT LIVING

An important force in making changes to the health care system has been the Independent Living (IL) Movement. The IL Movement is an informal coalition of groups and individuals who have advocated over the past 20 years for a new emphasis on the poten-

tial for people with disabilities to have control over their lives. The IL Movement has also promoted the opportunity for people with disabilities to choose options that minimize their reliance on others in organizing and performing everyday activities (Nosek & Fuherer, 1992, a and b). The result of these efforts has been a move towards providing more opportunities for people with disabilities to live at home. DeJong's (1981) research provided much of the theory for the present understanding of the values held by the IL Movement. These values place an emphasis on achieving consumer control and self-direction, social and economic productivity, and living arrangements with minimal restrictions. The IL Movement has facilitated these outcomes through advocacy, self-help, peer counseling, and the removal of social and environmental barriers.

Recent work by Nosek & Fuherer (1992, a and b) identified four major considerations in independent living: individual self-reliance, physical functioning, amount of perceived control, and the characteristics of the physical and social environment. Nosek & Fuherer included the perceptions and satisfaction of disabled individuals, their degree of control, and their opportunities to use their skills as part of the evaluation of satisfactory outcomes. The work of Nosek & Fuherer departed from the standard emphasis on competencies in activities of daily living and functional ability. Nosek and Fuherer found that satisfactory outcomes were measured not by what an individual could do, but by their perceptions of control and satisfaction. Thus, a person with 24-hour attendant care who was in control of choices regarding this care may have had a high sense of independence and satisfaction. In contrast, an individual with greater functional abilities, but with less control over important life-quality decisions, may have been less satisfied and had a lower sense of independence.

In a recent Canadian study, Boschen (1995) compared predictor variables with a combination of outcome variables used by DeJong and Nosek & Fuherer. The predictor

variables included demographics, disability, psychosocial, and environmental factors. Outcome variables used were Productivity Status, Level of IL, Satisfaction with IL, and Quality of Life. Boschen found that the relationship between predictor and outcome variables was small but statistically significant. The association with IL was strongest for individuals with; (a) higher functioning ability, (b) fewer hours of attendant care and, (c) accessible homes and surrounding community. In general, Boschen found that IL outcomes were highly individualistic. All four predictor variables influenced outcomes, with the degree of importance of each one varying amongst individuals. Boschen's study indicated that access to affordable and accessible housing was an important factor in achieving satisfaction with independent living.

2.3 ACCESSIBLE HOUSING

As noted in the previous section, accessible housing has been identified as an important issue for people with disabilities and the infrastructure needed for independent living (Boschen, 1995; Sapey, 1995). Access to appropriate housing has been viewed by many as an important factor in transforming a disability from a "handicap" to a "difference". Kiewel described the "handicapping experience" model used by administrators of the Home Accessibility Improvement Program in Minnesota as "not being able to successfully perform the task at hand in the environment provided" (Kiewel, 1993, p.42). This model included the three elements, person, purpose, and place that interact to create an experience. According to this model, a person with a disability may be "handicapped" to a greater or lesser degree depending upon the potential for the environment (place) to either constrain or enable the person to successfully complete their tasks (purpose).

Frustration in accomplishing tasks in an environment has been understood as person-environment dissonance. According to this perspective, some people adapt to person-environment dissonance by modifying their lifestyle (Hare, 1992, Hovey, 1993; Lawton,

1980, 1998). This adjustment has been considered as a healthy response that can be stimulating when the dissonance is small. Nevertheless, it can lead to maladaptive behaviour when the difference between needs and environment is either too great or too small (Lawton, 1980, 1998). Lawton has called this person-environment dissonance “environmental press”. Lawton and others have used the phenomenon of environmental press to explain changes in behaviour that have been observed when older people were moved into institutional settings (Carp, 1986; Lawton & Nahemow, 1973).

Several studies have found that despite the benefits of adapting homes to accommodate disabilities, many people with disabilities who could have benefited from modifying their homes did not do so (Hovey, 1993; Pynoos, 1992, 1993; Sapey, 1995; Wylde, 1997). The reasons for this failure to modify homes have varied and included financial, emotional, and knowledge barriers. Consequently, rather than modify their homes, individuals have made other adaptations in their lives that may have limited their ability to live independently or achieve other life-enriching goals (Pynoos, 1993; Wylde, 1997). Hazards and barriers in the home have also exposed people with disabilities to the risk of injury. Wylde noted that in the ProMatura Group’s 1995 U.S. survey of 1,231 people over 64 years of age, 18.3 percent had fallen on the stairs in their homes.

Hovey (1993) and Pynoos (1993) identified the following five factors influencing the likelihood that modifications would be completed: (a) perceptions that attractive modifications can be easily made, (b) higher incomes, (c) adequate knowledge and skill in design and construction, (d) the belief that modification would have a “normal” appearance without the stigma associated with disabilities, and (e) the belief that modifications or products would improve the quality of life. These observations were also supported by Ringaert (1997) in a study examining access to assistive technology. Ringaert also noted the following factors that constrained access to assistive devices: (a) inflated costs for

specialized items, (b) ineligibility for financial assistance, (c) complicated bureaucracies controlling access to funding and services, (d) vendors with inaccessible facilities, and (e) difficulties finding transportation to the vendors. While Ringaert's study was about access to assistive technology, these findings may be relevant to modifications of homes.

Pynoos (1993) observed that amongst older people, there was often a lack of awareness of how the physical environment was creating limitations or safety hazards. In addition to this, many case managers had limited awareness of the impact of the physical environment on the well being of their older clients. Pynoos noted that managers "overlook home modifications and services because of their inadequate training about the environment, the lack of funding for home modifications, and the difficulty in getting modifications made in a timely manner." (p. 3).

Pynoos (1993) also noted that those people wishing to make modifications were often unable to do so because they lacked the skills, strength, or resources. As a result of these observations, Pynoos recommended three strategies to increase the incidence of home modification: (a) increase the availability of widespread and systematic home assessment by occupational therapists, case managers, neighborhood rehabilitation inspectors, and energy specialists; (b) increase public awareness about the role of the home environment, and (c) create more programmes that provide affordable home modification and repair services. While Pynoos focused on the needs of older people, there may be some merit in applying these ideas to the broader context of disability.

Sapey (1995) examined public planning and policy, believing that the public sector is where resources are committed to enable the implementation of home modification. Sapey found that the availability of services supported by public funding determined the choices for many individuals on limited incomes. Sapey and others have found that many

people are dependent upon some form of public funding and service delivery system in order to have the resources necessary for modifications (Pynoos, 1993; Ridgway, Simpson, Wittman, Wheeler, 1994; Ringaert, 1997).

In recent years, there has been an acceptance of funding modifications to accommodate disabilities through insurance settlements of both private and public plans. The availability of funding for modifying homes when disabilities are not covered under insurance plans has been more limited (Hare, 1992; Pynoos, 1992; Ridgway et al., 1994). Ironically, the absence of wide support for people who wish to live independently at home may have added to the overall cost of providing care. The ability of people to care for themselves in their homes has often only been possible when modifications were made to accommodate their disability. Completing these modifications has benefited society by keeping otherwise capable people out of costly institutions (Kiewel, 1993). In addition to reducing the costs, enabling independent living at home has improved the quality of life for these individuals and their families.

Public health policy makers have begun to appreciate the economies of supporting people in their choice to remain at home. Budgets have increased for home care that includes a wide range of services such as homemaking, personal care, meal services, minor home repairs, and security services. In 1975-76, home care expenditures were .65 percent of total public health expenditures in Canada¹. In 1997-98, it was estimated that they would rise to 3.98 percent. These percentage changes were the result of doubling the expenditures since 1990, yielding a total expenditure in 1997-98 of over \$2 million (Health

¹ Includes home care expenditures funded by provincial, territorial, and municipal governments, Worker's Compensation Board, and those made directly by the federal government.

Canada, 1998). However, despite these improvements, the funding for home care expenditures has remained very small relative to the total health budget. The funding for improving the physical environment has been only a portion of this small, but growing, home care budget.

2.4 ACCESSIBLE DESIGN

Advocates for accessible housing have maintained that accessibility includes more than getting through the door. Residents need to be able to make use of the important features of a home and provide adequate maintenance of the dwelling. Accessibility has also included issues such as the control of heat and light, maintainability, security, and activities of daily living such as preparation of food, hygiene, and dressing (Pynoos, 1992, 1993; Story, 1998, Wylde, 1997). There have been three major approaches to improving the accessibility of environments: accessible, universal, and adaptable design.

Accessible, or barrier free design, has come to be associated with the provision of special features primarily intended for people with disabilities. These special features have been associated with the stigma of having a disability because they emphasize the differences between those with disabilities and the rest of the population. A common example that has been cited in the literature is the presence of ramps immediately adjacent to stairs (Story, 1998). Ramps can have the appearance of being an after-thought intended only for those who have a disability, reinforcing the social stigma.

Universal design is an approach to accessible design that attempts to provide environments and products that meet the needs of a broad range of abilities. The Center for Universal Design (in Raleigh, North Carolina) has developed seven principles of Universal Design (Figure 1). These principles have been frequently applied in the design of large public places. Here features such as pictorial way-finding symbols, hands-free washroom

access, and ramped access have met the needs of the variety of users who pass through these spaces. By including a wide range of abilities into each element of the environment, the duplication required by providing specialized features has been avoided. Universal design advocates have attempted to incorporate features that have a normalized appearance, reducing the stigma of disabilities (Story, 1998).

Figure 1 The Principles of Universal Design

Principle One:	Equitable Use The design is useful and marketable to people with diverse abilities.
Principle Two:	Flexibility in Use The design accommodates a wide range of individual preferences and abilities.
Principle Three:	Simple and Intuitive Use Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
Principle Four:	Perceptible Information The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities
Principle Five:	Tolerance for Error The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Principle Six:	Low Physical Effort The design can be used efficiently and comfortably and with a minimum of fatigue.
Principle Seven:	Size and Space for Approach and Use Appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility.

The Principles of Universal Design, Version 2.0 /4/1/97 Copyright (c) 1997 NC State University , The Center for Universal Design. Compiled by advocates of universal design, listed in alphabetical order: Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, & Gregg Vanderheiden.

Another approach to accessible design has been what is referred to as adaptable design. Adaptable design is based on the principle of providing features on a standard structure that can be easily modified or adapted to suit variations in need (Centre for Universal Design, 1997; Story, 1998). An example of this has been the “kneeling bus” that is typically configured to accommodate the needs of ambulatory passengers, but can be

quickly reconfigured for wheelchair access. In housing, examples of adaptability have included structural reinforcement to accommodate future installation of grab bars, and removable undercounter cabinets.

While there has been a growing recognition of the benefits of improving accessibility, most of the existing older housing stock and new housing developments have not been based on universal or adaptable design principles. Indeed, most new housing stock has included stairs, narrow doors and hallways, and other details that create barriers for people with less than optimal agility and strength. Because some of these barriers are now part of the basic structure of the home, they will not be easily changed in the future.

In recent years, there has been a movement towards legislation as a means to insure that public spaces are accessible. Mace, Hardie, and Place (1990) describe the progress of legislation in the United States. The legislative movement to improve environmental conditions for people with disabilities began in 1961 with the first building standards to address accessibility, the American National Standards Institute A117.1. The ANSI specifications have been revised and expanded many times since then. These standards had been voluntary until they were formally adopted into legislation by many governing bodies having jurisdiction over the design and construction of the built environment. In 1984, the ANSI specifications were incorporated into the Uniform Federal Accessibility Standard (UFAS) as the standard for all facilities constructed with federal funding. Over the last two decades, legislation for accessible design has continued to be developed. The most recent development in the United States was the human rights legislation Americans with Disabilities Act (ADA) passed in 1991. This act established objectives for accessibility standards in all new and existing facilities in that country and is enforced through the American with Disabilities Act Administrative Guidelines (ADAAG). The ADA and ADAAG cover the design of public buildings, but do not in-

clude housing. The standards for multiple housing units are covered for accessibility under the requirements of the Fair Housing Act.

The parallel to the ANSI standards in Canada is the Canadian Standard Association (B651-95), which specifies the accessibility requirements for all facilities constructed with federal funding. In Canada, requirements for accessibility have been set in the National Building Code under section 3.8. Barrier Free Design. Similar to the US, the National Building Code used as a model code that may be modified in each jurisdiction as required. These standards have applied to new construction for all buildings except for most forms of housing (other than apartments), unoccupied or seasonal use buildings, and buildings for high hazard industrial occupancies. (Canadian Commission on Building and Fire Codes of Canada, 1995). In Canada, we do not have an equivalent to the ADA, although our human rights legislation states that one cannot be discriminated against due to disability. The exclusion of most privately owned residential housing from section 3.8 Barrier-Free Design has meant that developers have not been required to provide barrier-free design in private housing developments.

2.5 AESTHETICS

While the literature has included much information about the functional requirements of universal and accessible design, there has been little discussion about the aesthetic dimension of the environment and its relationship to emotional and spiritual well being. In addition to this, there have been few examples of attractive design presented in media that are available to the average household (Wylde, 1997). The importance of aesthetic dimensions in designing accessible environments has been acknowledged in more recent publications directed towards the interior design profession (Leibrock, 1993; Peterson, 1996; Welch, 1995).

Researchers have recently recognized that appearance is an important criterion for accessible design because of its link with identity (Batavia & Hammer, 1990; Steinfeld, 1994). Steinfeld found that individuals with disabilities did not like the medical-technical appearance of many assistive devices and adaptations because they were viewed as stigmatizing, and promoted a negative self-image. Using these findings, Steinfeld has promoted the idea of design systems with uniform aesthetics that would not make adaptations appear as after-thoughts or add-ons, but an integrated part of the product. According to Steinfeld, such systems would reduce the negative connotation of introducing assistive devices into an environment.

In the design evaluation criteria for assistive devices developed by Batavia and Hammer (1990), appearance or aesthetics were included under a more general category that they called Personal Acceptability. Batavia and Hammer found that when devices were viewed as part of personal appearance, this criterion ranked high on a list of priorities. However, when devices were viewed as equipment separate from the individual, the ranking of Personal Acceptability as a factor in selecting a device was much lower. While this study focused on the design of assistive devices, the results may have implications that could be considered in the design of interior environments. This finding, and Steinfeld's (1994) observations, supports the literature that has suggested our possessions and dwellings play an important role in both expressing and reinforcing our sense of worth and personal identity (Csikszentmihalyi & Rochberg-Halton, 1981; Rapoport, 1976; Seamon & Mugerauer, 1985).

2.6 DESIGN METHODOLOGY

Balancing issues of functional performance, identity, appearance, and financial constraints sets the context under which decisions about accessible design must be made. Transforming the physical environment from one with barriers and limitations to one that

is accessible and promotes independence presents a design-build problem. The design methodology literature has described the process of finding solutions to design-build problems.

Design is an elusive concept that has been understood from many perspectives. In the English language, the word “design” has been used as a verb, the act of designing; and a noun, the product of this endeavor. Jones (1970) put forward a definition of design as an activity to “initiate change in man-made things” (p. 4). Wade (1977) considered the goal of a design problem to be a change to existing conditions that transforms them into ones that are more desirable. Meeting this goal would require an understanding of the existing condition, the material means or resources to change it, and a vision of what the result should be. Wade maintained that design is a complex problem, because often none of these conditions can be adequately understood at the beginning of the process. Diligent inquiry can illuminate existing conditions and available resources, but rarely can a precise description of a particular solution (or desired future) be known at the beginning of the process.

According to Rittel (as cited by Diener, 1979), the difficulties in defining the aforementioned conditions, bounding the limitless alternative solutions, and the serious consequences of unsatisfactory solutions, make design problems “ill behaved” or “wicked”. Much of design theory has addressed methods to tame these “wicked” problems through improving methods of defining existing conditions, viable resources, and evaluating proposed options or solutions for desired futures.

As buildings have become larger and more complex, the tasks of design and building have become more specialized. Design professionals have attempted to assume the role of leader, providing direction for solutions that are implemented by artisans,

craftspeople, and builders (Cross, 1971; Markus, 1971; Maver, 1971). This separation of design from building (or craft) has moved away from the system used in the vernacular architecture of traditional societies. In traditional societies, the responsibility for both designing and building dwellings and other material goods had been undertaken by users, and trades or crafts people.

Jones (1970) traced the developments of design methods from craft evolution, design-by-drawing, to complex information management systems. According to Jones, trades people and lay people had evolved craft traditions over centuries, depending upon experiential knowledge, tradition, and trial-an-error. These craft traditions had developed in the context of small-scale projects where the crafter, who was intimately familiar with the requirements of the task, had the locus of control and decision-making. Jones further suggested that as projects have become larger and more complex, some form of task distribution has been required. Once groups of people had started working simultaneously on specialized tasks, ad hoc adjustments and revisions during construction created difficulties --hence, design-by-drawing. Increased complexity and separation of design from craft have created the need to devise a system of notation in order to communicate with groups of people working together on the same project. Increased complexity and larger working groups have also created the need to work out the solution to problems before construction. The constraints imposed by the scale and complexity of larger projects has required solutions that are developed in considerable detail far in advance of implementation. This requirement for advance problem solving has led to the development of design professionals who can devise solutions using abstract processes and communicate them to others using schematic representations (Jones 1970).

Design professionals have developed methodologies that have enabled them to work effectively in the context of large complex projects. Much of the design methods

theory has been written from the perspective of architectural practice. However, many of the same principles have applied to the practice of interior design professionals. The NCIDQ Definition of Interior Design (Appendix B) and the NCIDQ Description of Interior Design Knowledge Areas (Appendix C) has included the basic elements of methodology and practice employed by interior design professionals. The methods and practice of interior design and other design professionals have developed from a design-build process that includes the following tasks: (a) gathering information about existing conditions, resources, and problem objectives (programme development); (b) developing design solutions that address problems of character, function and aesthetics (problem solving); (c) preparing drawings, specifications, and schedules (documentation); and (d) tendering and administering contracts (procurement). These phases are controlled and organized in order to provide maximum efficiency (project management).

The legitimacy of professionals taking control of the design process has recently come under question because of concerns that the user has not been able to significantly inform the process (Cross, 1971; Maver, 1971; Ridgway et al., 1994). In being left out of the process, the user's needs have not been adequately addressed in the solutions developed by professionals. This concern has led to a call for design professionals to facilitate a more active role for users in determining design objectives and solutions. In this scenario, design professionals would act as facilitators, technical advisors, and project managers: users would assume a greater role in programme and design development.

It is not clear how the loss of experiential knowledge in design and building in post-industrial societies has manifested itself when people have been confronted with situations in which they must make changes to their personal environments. In the absence of the requirement to do this as part of their daily occupation, some have maintained skills through leisure activities such as craft-making, sewing, or "weekend warrior" deck

projects. The home improvement industry has grown considerably in the last decade. This growth has been evident in the proliferation of television shows such as Martha Stewart's Living and This Old House, numerous magazines such as Victoria and Western Living, as well as retail outlets such as Revy and Home Depot. The growth in this industry might be evidence of an enduring interest in shaping and maintaining our personal environments.

The numerous design guidelines for accessibility have provided options for possible solutions to design-build problems (Batavia, 1990; CMHC (no date), 1996; Center for Universal Design, 1997; Human Resources Canada, 1994; Kushner, Falta, Aitkens, 1987; Leibrock, 1993; Minister of Human Resources Development Canada, 1994). However, individuals wishing to modify their home have needed to transpose these generic solutions onto their particular situation. Reliance upon existing design guidelines and standards for solutions may have been inadequate because they have not addressed how to remedy the unique conditions of particular situations. Thus, design-build problems may have persisted despite the presence of guidelines and standards.

2.7 PROFESSIONAL PRACTICE

The differences between disciplines such as engineering, architecture, graphic design, or interior design have resided in their area of expertise. The aforementioned definition of interior design and the NCIDQ Description of Interior Designer Knowledge (Appendix C) provide a detailed accounting of areas of knowledge and skills an interior design professional is expected to have. Interior design professionals have focused on the enhancement of the function and quality of interior spaces. What has constituted the interior environment however, has been open to some interpretation, with some jurisdictions

having taken a more liberal interpretation of the interior environment than others have (Sapers, 1988).

For many years, the interior design profession has attempted to secure legislation for licensing of interior design as a professional practice, but with limited success. In most jurisdictions, interior designers have obtained legislation restricting the use of titles, but have met with limited success in licensing interior design as a professional practice. In the province of Manitoba, only practitioners who have met the standards established by the Professional Interior Designers Institute of Manitoba may use the title of "Professional Interior Designer". However, any person has been free to conduct a practice in the field of interior design so long as they have not used the aforementioned designation.

In terms of the competency of the interior design professional to manage design issues related to disabilities and access, the NCIDQ Examination Guide (1991) has included a section concerning accessible design. However, the questions in this section have been based upon understanding code requirements, and have not evaluated the comprehension of universal, adaptable, and accessible design principles. Welch (1995) has maintained that attitudinal learning of universal design concepts is an important dimension of professional design training that differs from the cognitive skills required to apply legislated codes correctly. Accordingly, Welch has advocated inculcating a consideration of other perspectives in the design process and design education curriculum in order for the profession to become an active participant in the Independent Living Movement.

There has been little documentation about how the public perceives interior design professionals. The popular press and media has portrayed the interior design professional as being egocentric, impractical, and patronized by wealthy and famous personalities ("Contractor's Confidential," 1993; "Don't You Miss the Eighties?" 1995; Drab, 1996).

Drab noted that the media has portrayed interior design professionals as “helpers” and has rarely indicated “what the designer is doing that would be inadvisable for an untrained individual to attempt. Designers fail to define themselves as providers of services which untrained consumers cannot successfully perform.” (Drab, p. 301). A review of marketing strategies for interior design professionals revealed a heavy emphasis on appearance in terms of defining a corporate image. Personal grooming, wardrobe, and appearance of the office were cited as being important in establishing credibility with clients (Piotrowski, 1989; Siegel & Siegel, 1982). The emphasis on appearance may have been a reaction to public expectations that interior design professionals manage appearance. This focus on visual image has failed to take into consideration the professional skills in other domains of practice such as programming, technical knowledge, and project management. In addition to this, there appears to have been an absence of non-proprietary research on client-designer relationships.

It is interesting to note that in the literature related to home modification programmes, interior design professionals have not been explicitly identified as being a part of public strategies (Human Resources Development Canada, 1994; Pynoos, 1992; Kushner, Falta & Aitkens, 1987). This lack of recognition of the interior design profession might have had an important effect on practice, because much of the funding for modifications has been controlled by public policy. Amongst some agencies, there has been a growing recognition of the need for a more holistic approach to health that recognizes human experiences outside of the traditional medical model. These experiences include our emotional and spiritual dimensions of life as well our physiological needs. Consequently, the range of healthcare services has broadened to include services such as security, shopping, transportation, housing, and home maintenance (Health Canada, 1998). Based upon this more inclusive trend, the benefits of design services for home

modification could potentially be viewed as part of this holistic range of care services. However, at this time, the gatekeepers of funding for home care services do not appear to have recognized interior design professionals as important contributors.

In the United States, the service sector has responded to the growing demand from consumers for design services addressing issues of accessibility. Consulting practices that specialize in providing advice on accessibility have been established. These practices have usually been interdisciplinary, including health and design professionals as well as builders (Accessibility by Design, 1999; ADA Products.com, 1999; Duncan, 1998; Moreo, 1998; Shamberg & Shamberg 1996-a, 1996-b). However, the context of practice in the United States has been different from the situation in Canada. Differences in health policy, building code regulations, funding, and population density create conditions that may have affected professional practice within each jurisdiction. For example, Shamberg and Shamberg (1996-a, 1996-b) have practiced in Maryland with a population of over 5 million people (U.S. Census Bureau, 1999). Manitoba, with a population of just over 1 million people (Statistics Canada, 1998) and a land mass 24 times greater than Maryland, has offered a limited market with a population density that is less than one per cent of that on the eastern seaboard of the United States.

In Winnipeg, ProductABILITY, a not-for-profit organization, has provided specialized design services related to accessibility. Other practices offering this service were not readily identified without referrals from disability organizations. The 1999 Manitoba Telephone System Yellow Pages™ directory for the city of Winnipeg did not list any headings for Accessibility. The headings for Home Improvements, General Contractors, and Interior Designers did not include any listings (including ProductABILITY) that clearly identified a service offering expertise in accessibility design. Thus, at this time, it would appear that the interior design service sector addressing the market for those need-

ing home modifications for disabilities has either been undeveloped or has maintained a low public profile in Winnipeg

2.8 MARKETING

Marketing theory literature has described the relationships between consumers and organizations offering services or products. A principle of marketing theory has been the purchase of products (including services) that creates an exchange relationship between consumers and organizations, known as a purchase or contract (Kotler & McDougall 1983). These exchange relationships result in consumer-provider transactions. Kotler and McDougall described four concepts for managing this exchange relationship. First, the production concept is one in which production and distribution are adjusted to keep the costs low and provide convenient access to the products. The second, or product concept, assumes consumers will seek products that offer the best quality for the price. The primary goal of this management concept is to improve the quality of the product. The third, or the selling concept, relies on stimulating interest in the product. Organizations using this concept use vigorous campaigns to stimulate sales of the product. Finally, the marketing concept focuses on identifying the needs and wants of a target market. The marketing concept is based on the assumption that consumers can be grouped according to their needs and wants, forming market segments. Identifying these market segments and tailoring services and products to meet these needs efficiently and effectively are important strategies of the marketing concept.

Marketing theory has suggested that service providers such as interior design professionals can deliver their services using the normative standards set by the profession or traditional practice. Alternatively, providers can offer services using a marketing concept in which the needs of the consumer are considered in the practice. In this way, service providers shape their practice around the needs of the consumer rather than attempting to

convince consumers to purchase existing products (Kotler & McDougall, 1983). Sapey (1995) has viewed people with disabilities as consumers and has called for the evaluation of their needs. Using this perspective, Sapey has advocated for the use of consumer consultation to improve the services related to shelter for consumers with disabilities. Sapey's ideas have reflected a marketing concept for providing services that will meet the needs of consumers with disabilities.

2.9 SUMMARY

The literature review indicated that making home improvements could improve the ability of individuals to live independently with their disability. Studies have also demonstrated that despite these benefits, many people have not made modifications. The reasons for not making modifications have included limitations in financial resources, awareness of benefits, and limited skills and knowledge in design and construction. While there have been many accounts of the implications of modifying homes for people with disabilities (Boschen, 1995; Pynoos, 1992; Ridgway et. al., 1994; Wylde, 1997), little has been written about the process itself. Many resources have provided design guidelines for accessibility. What appears to have been lacking is an understanding of how consumers have applied design guidelines to their particular situations. While design professionals have received training in applying building standards and guidelines, it is has not been determined if or how their services facilitate the modifying process for households who are modifying their dwellings to accommodate disabilities.

The literature related to design methodology has revealed that the professionalization of designing environments evolved as projects became more complex and roles in society became more specialized. Design professionals have used a design process that has included the tasks of programme development, problem solving, documentation, and procurement. These tasks have been organized by design professionals using an over-

arching process of project management. What has not been clear however, is whether this design process is appropriate for the context of small-scale projects such as the modification of homes to accommodate disabilities.

The representation of interior designers in the popular media has not provided a positive image of the profession. In addition to this, agencies responsible for home care and funding modifications have not widely recognized the competence of interior design professionals in detailing and managing changes to the interior environment. Lacking credibility or professional stature, interior design professionals have generally not been included in systems delivering funding and care for those with disabilities.

In the US, there has been an increasing number of design practices specializing in design to address needs for accessibility. Currently, in Canadian markets such as Manitoba, it appears that interior design professionals have not established themselves as part of the efforts to provide adequate housing for people with disabilities. From a marketing perspective, it has not been clear what factors would encourage Canadian consumers to consider seeking the services of interior design professionals for assistance with home modifications that accommodate a disability.

CHAPTER 3: CONCEPTUAL FRAMEWORK

What emerged from the literature review was an understanding that some individuals who need to modify their homes in order to accommodate a disability have experienced barriers that prevent them from doing so. For some individuals, one of the barriers has been their perceptions that they do not have the skills and knowledge to design modifications that are both functional and aesthetically pleasing. Based on this evidence, it would seem reasonable to assume that professionally trained designers of interior environments should be active in assisting those who require aid in designing appropriate modifications. However, the literature review indicated that interior design professionals have not been identified as important contributors to the process of modifying homes to accommodate disabilities. This situation raises the question of why interior design professionals are not more recognized or active in facilitating consumers with designing their modifications to accommodate their disabilities.

The literature review provided information about the design process and how interior design professionals have used this process in their practice. Professional practice has typically included a process of project management to organize the tasks of programme development, problem solving, documentation, and procurement. These elements of professional practice form the set of skills that interior design professionals presently have to offer as services for consumers. However, there has been no evidence that consumers who need to modify their homes would find these skills relevant to achieving their goals. Perhaps consumers can rely on other, less formalized, approaches to design -- such as those used by nonprofessionals or tradespeople. From a marketing perspective, individuals with disabilities can be viewed as a group of consumers with distinct needs and wants that can be met by service providers. This perspective would require that design profes-

sionals undertake a careful discernment of what services these consumers need and want in order to determine how professional design services could be of some assistance.

A provisional conceptual framework (Figure 2 Barrier-Facilitator Framework) to guide this study was developed that organized the problem of limited participation of interior design professionals in home modification into its principal components. Using a marketing concept, the major components of this problem were identified as being consumers, providers, products, opportunities, transactions, and outcomes. Consumers were indicated as having a goal of completing modifications to their homes. Assumed barriers, as indicated by the literature review, were placed between consumers and their goals. It has been suggested that one of the barriers may be consumers' lack confidence in their abilities to design suitable modifications. This barrier creates a consumer need for a service (product) that provides design skills and knowledge, creating opportunities for interior design professionals who are experienced in the design process. The skills and knowledge required to implement the tasks in the design process typically used by interior design professionals were indicated as the product consumers needed. This product was indicated as Design Skills and Knowledge, and included Programme Development, Problem Solving, Documentation, and Procurement, as well as an overarching skill in Project Management. The literature review suggests that there may be factors that constrain the ability of consumers and interior design professionals from forming transactions or exchange relations which are indicated with the dotted line. It may be possible that consumer-professional transactions do not occur despite the availability of services that satisfy consumer needs. The modifying process used may depend upon whether or not these constraints to consumer-professional transactions are overcome. Two types of modifying processes are indicated, the design process used by interior design professional and other processes used by nonprofessionals and tradespeople. Successful

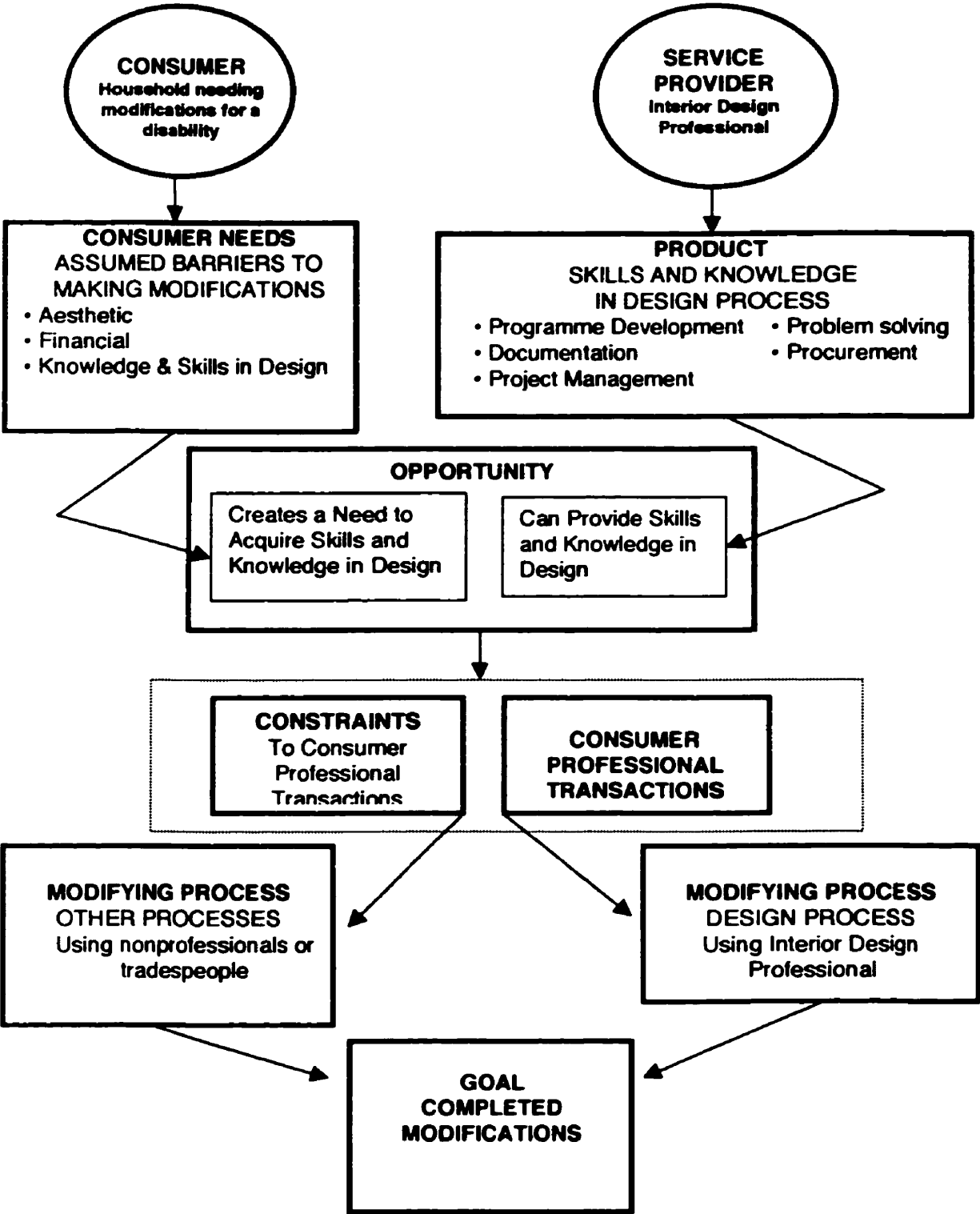
outcomes for the completed modifications may be dependant upon which of these modifying processes is used.

This conceptual framework was used to address the question of how design professionals can play a role in facilitating modifications of homes for people with disabilities, which was the goal of this study. In order to meet this goal, two objectives were identified: (a) define the context for consumers with disabilities and (b) define opportunities and constraints for design professionals to facilitate the process of home modification. In order to achieve these objectives, this study focused on identifying the needs and wants of consumers and also the barriers and facilitators in the modifying process that can be addressed by design professionals. This study also attempted to identify whether the services interior design professionals can offer provide an advantage in achieving successful outcomes. Finally, barriers between design professionals and consumers, and factors that should be considered in meeting consumer needs were also considered.

Because these objectives were broad and not addressed by existing theories, a methodology was required that would add more detail to the understanding of the situation. An inductive approach, based on detailed descriptions of human experience, was selected because of its potential to provide insight into a process that has not been previously documented in sufficient detail to warrant quantitative studies. Using the Barrier-Facilitator Framework, this methodology guided the research design, providing a detailed description of the modifying process and participant experiences. In this way, details missing from this preliminary conceptual framework were provided, giving clarity to the understanding of the problem. Using new information acquired from the findings, the Barrier-Facilitator Framework was subsequently modified (Figure 4, Chapter 6) to pro-

vide an enhanced understanding of the role of interior design professionals in the modification process.

Figure 2 Barrier-Facilitator Framework



CHAPTER 4: RESEARCH DESIGN

The study objectives called for an understanding of the process used to modify homes in order to identify barriers that can be addressed by interior design professionals. While some barriers such as cost, skills, knowledge, and appearance have been suggested in previous studies, their significance in the process and their relevance to professional practice has not been clearly understood. Previous studies have focused on the social policies, public attitudes, and benefits related to home modifications and the types of modifications that have been made. The paucity of information about the experiential aspects of modifying homes suggested the need for a methodology based on the experiences of people who have completed home modifications.

4.1 METHODOLOGY

A qualitative methodology based on the point of view of participants was used in order to better understand the experience consumers have in making modifications. Using the participants' point of view makes qualitative methodologies ideally suited to describing and developing conceptual understandings of human experiences (Guba & Lincoln, 1988; Mostyn, 1985; Strauss & Corbin, 1990; Weiss, 1994). Quantitative methodologies such as standardized surveys were considered inappropriate, because the variables and theories that they could measure or evaluate have not yet been clearly identified.

This study was designed using the grounded theory technique advocated by Strauss and Corbin (1990). This technique is based on the principle that theories should be derived from participants and their accounts of personal experiences because theories grounded in this way remain faithful to reality. This particular technique was used because it provided a structural framework that would be beneficial in guiding a focused analysis of the data, in order to meet the study objectives.

The data derived from observations or interviews yielded a multitude of concepts that were identified and organized until meaningful patterns emerged. A paradigm model was used to organize the concepts, yielding theoretical constructs or understandings of phenomena. The Strauss and Corbin (1990) paradigm model provided a systematic approach to analyzing the data by identifying many concepts and organizing them into subcategories, with properties and dimensions. These subcategories were subsequently linked to broader categories based on their relationship to each other. These categories included casual conditions, phenomena, contexts, intervening conditions, strategies, and consequences. Finally, a central phenomenon was selected as the core category, around which all the other categories were integrated. This core category, was in essence, a critical variable that accounted for the actions and subsequent outcomes.

According to Strauss and Corbin (1990) the core category is the central issue that drives and modifies the actions undertaken by the participants. There are causal conditions, or events, that lead to the context associated with the core category. This context is composed of the important properties of the core category and influences the actions and interactions (action-interaction strategies) that occur. These action-interaction strategies are the ways in which participants respond to the context of the core category and may include both action and changes in attitude. Action-interaction strategies are also modified by other intervening conditions that are not directly related to the core category, but are part of broader situational contexts such as social conditions. Finally, the action-interaction strategies result in consequences, or outcomes. The properties of these outcomes can be traced back to the core category, along with its causal conditions and ensuing actions. Conceptually grouping the data in this way provides the theoretical framework for understanding how actions, and the conditions modifying them, can influence the outcomes of human experience.

Using this inductive process, the analysis moves from an identification of many concepts related to particular cases, to an understanding of general themes that can account for many situations. The validity of the final conceptualizations is ensured because interpretations of the data are based, or grounded, upon the experiences of the participants.

4.2 TIME LINE

This study design included three phases that were carried out between November 1998 and August 1999.

1. November 1 – December 1, 1998: Sample Recruitment
 - Obtain the approval for the research design from the University of Manitoba Faculty of Architecture Committee on the Use of Human Subjects Research.
 - Contact agencies to assist with the recruitment of participants.
 - Conduct Telephone Screening Interview with proposed candidates.
 - Select participants.
 - Phone participants and arrange for interviews and mail Letters of Introduction to them.
2. December 2 – 15, 1998: Data Collection:
 - Conduct interviews and site visits with three households
3. December 16 1998-Jan 1, 1999: Analysis
 - Identify concepts, categories, and emerging themes.
4. January 1-15, 1999: Refine interview schedules
 - Refine the interviews to focus on the themes arising out of the analysis of the first 3 interviews.

5. January 16 – March 30, 1999: Data Collection:
 - Conduct interviews and site visits with the remaining 7 households.
6. March 15-30, 1999: Background Information
 - Interview background information contacts to clarify questions arising from the interviews.
7. March 30 – April 30, 1999: Analysis
 - Complete the identification of concepts and themes. Use validation procedures to confirm the analysis.
8. May 1- August 25, 1999: Prepare Report.

4.3 SAMPLE RECRUITMENT

This study was based on data obtained from semi-structured interviews of individuals and households who had modified their homes to accommodate a disability in the household. The participants were selected from a sample of convenience using candidates suggested by agencies and through personal contacts.

4.3.1 SELECTION CRITERIA

The participants were adults who were able to provide informed consent. A telephone screening interview (Appendix E1 Telephone Screening Interview) was used to select candidates who had been suggested by contacts. The following criteria were used for the selection of participants:

(a) Inclusion Criteria

Two sample groups were selected. The first group included households that had used a design professional to assist with the modification process. Participants were individuals 18 years of age and older who participated in making decisions or finding information related to the modification and construction of existing or new homes. It was

not a requirement that the participants be the individuals with the disability. The cost of the modifications or construction was to be at least \$5,000. The purpose of the modification or new construction was to accommodate the accessibility needs of a person with a mobility or agility disability as defined by Statistics Canada (1992). (See Glossary of Terms for definition)

The second group included candidates who met the same criteria but did not use the services of a design professional.

(b) Exclusion Criteria

Candidates who needed modifications but had not completed them were not included because there may have been other issues that would obscure themes related to the modifying process (Hovey, 1993). While these may have been important factors, they were outside the scope of this study. In addition to this, these individuals would not be able to discuss the experience of making modifications.

Candidates who lived beyond commuting distance of Winnipeg (more than a half-hour drive from the city limits) were not selected. These candidates were not included mainly because they were too remotely located.

Young children or other household members who were not significantly involved in making decisions related to the modifications were not interviewed, even if they were the individuals with the disability. These individuals were excluded because they would not be able to provide sufficient data on the experience of the modification process.

4.3.2 ACCESS TO PARTICIPANTS

Participants were contacted through the following agencies: Canadian Institute for Barrier Free Design, ProductABILITY, Cerebral Palsy Association, Community Therapy Services, and the Worker's Compensation Board. One participant was recruited through

personal contacts. Other agencies who were contacted that did not provide participant candidates were the Independent Living Resource Centre, Age and Opportunity, and The Professional Interior Designers Institute of Manitoba (PIDIM).

The agencies were approached after receiving approval from the University of Manitoba Faculty of Architecture Ethics Committee on the Use of Human Subjects Research (Appendix D Letters of Entry). Contact Agencies were informed of the purpose of the study and provided with copies of the Letter of Introduction, Consent Form, and a notice for posting in their facility to advertise the recruitment drive (Appendix D2 Request of Contact Participants, Appendix D3 Letter of Intent, Appendix D4 Request for Participants Advertisement, Appendix D5 Consent Form). The contact agencies undertook to approach their clients and find candidates that would be interested in participating in the study. One agency, PIDIM advertised the request for participants in a monthly newsletter, but had no results.

After receiving the names of potential participants, the candidates were contacted by telephone. Telephone screening interviews were conducted to determine whether the prospective candidates fit the criteria of the study (Appendix E1 Telephone Screening Interviews). Following the telephone screening, candidates who fit the criteria were contacted again by telephone and interview appointments were scheduled. Selected candidates were then mailed an introductory letter describing the study (Appendix D 3, Letter of Introduction).

4.4 DATA COLLECTION:

The data were derived through household visits that included semi-structured interviews, a tour of the home, and background information questionnaires. Each visit took place in the participants' home and lasted about one and one-half hours. In order to avoid

inconvenience to the participants, the 6 households that included more than 1 participant were offered the option of including all of the participants in one interview, or arranging for separate interviews for each individual. All of these households chose to include both participants in one interview.

Before proceeding with the interview, each participant signed a Consent Form (Appendix D 5 Consent Form). Participants were also asked to complete the Background Information Questionnaire (Appendix E5 Background Information Questionnaire). A summary including the results of the Background Information Questionnaire is provided in Chapter 5, Table 1 Background Information Summary.

Each visit included a tour of the home, at which time photographs were taken for the purpose of recall during the analysis phase. The tour was conducted before the interview in the first 3 households. In order to more effectively focus the interview on the modifying experience and not the modifications, the tour was moved to the end of the visit in subsequent interviews

The interview schedules for the first three interviews consisted of a series of questions that were selected because of their potential to address issues raised in the literature. These interview schedules (Appendix E2, Interview Guideline with Designer Assistance; Appendix E3, Interview Guideline Without Design Assistance) were used as guides with departures from the schedules occurring during the interview according to issues raised by the participants. Some of the questions were direct and intended to confirm perceptions derived from the literature review and the researcher's experiential knowledge. Other questions were open-ended probes that were intended to prompt responses outside of the researcher's range of immediate awareness. This approach

provided opportunities for participants to depart from the schedule and provide insight into salient issues of their experience.

Following the analysis of the first three interviews, the interview schedule was adjusted in order to increase the efficiency of obtaining data associated with emerging conceptual patterns (Appendix E4 Revised Interview Schedule). Patterns derived from the first three interviews included the importance of participant control strategies and experience with disabilities. Questions were then formulated to test the validity of these early concepts. Initial interviews also indicated that participants did not have a clear understanding of services available from design professionals. In order to open a discussion concerning design professionals, subsequent interviews prompted participants by showing them examples of design resource materials (Adaptive Environments Center, Inc. and R.S. Means Engineering, 1994; Leibrock, 1993; Lytle, Ball, Sherlock, 1991; Peterson, 1996).

Interviews were recorded and then transcribed using the word processing application Microsoft Word 6.0. Four transcriptions were prepared by a professional transcriber. The remaining six interviews were transcribed by the researcher. Interviews were stored on audiotape and written transcripts were stored in a separate location. Confidentiality was maintained by identifying transcripts and recordings with a numbered code. The master list with names and codes was kept separate from the study data. Where excerpts of the interviews were included in the report, details that might reveal the identity of the participant were omitted or changed.

In addition to interviewing the participants, interviews were conducted with representatives of the following organizations: ProductABILITY, Community Therapy Services, Canadian Paraplegic Association, Independent Living Resource Centre,

Worker's Compensation Board, and Strike Didur Associates². The purpose of these interviews was to obtain background information and verify questions arising from the analysis of the data. The information gathered in these interviews is not included in the data because these respondents did not fit the criteria used for the data sample.

4.5 DATA ANALYSIS

The analysis primarily focused on data derived from the interviews. Data from the home tours and Background Information Questionnaire were also included in the analysis of the interviews. The analysis was based on the Strauss and Corbin (1990) grounded theory technique. The analysis involved three coding phases: open, axial, and selective.

In the first phase, open coding, data from the interviews were considered phrase by phrase. Concepts were identified and later grouped into categories. In the second phase of analysis, axial coding, connections were made between these many categories. Using the Strauss and Corbin (1990) model, the categories were organized into a Modifying Process Paradigm. This model organized the categories according to their role in the modifying process. These roles included the causal conditions, contexts, intervening conditions, action-interaction strategies, and consequences. The analysis also included categories that were not evident, but would be expected under normal circumstances. In particular, this analysis considered how closely participants' experiences reflected the design process typically used by design professionals and identified in the Barrier-Facilitator Framework (Figure 2). The legitimacy of including such categories was sup-

² Strike Didur Associates is a firm specializing in the design and preparation of working drawings for custom-built homes. One of the principle partners is an interior design professional.

ported by Straus and Corbin (1990) in their statement that "failed action/interaction is just as important to look for as when action/interaction is actually taken or occurs." (P.104).

In the final phase of analysis, selective coding, the central phenomenon, or core category, was identified and related to various parts of the Modifying Process Paradigm. This core category was developed by searching for patterns in the way in which the various categories related to each other. These patterns yielded provisional theories that were used to form hypothetical statements that could explain the events of the modifying process. These hypothetical statements were then tested, or validated, against the data by searching for negative evidence, comparing extreme situations, weighing of evidence and checking for representativeness (Miles & Huberman, 1994). When cases were encountered that did not fit the hypothetical statements, the theories were adjusted to account for these variations. This process of testing and refining theories continued, until a final understanding was developed that took into account the various circumstances of each case.

As part of testing the provisional theories, important categories were subjected to particular scrutiny by preparing the data differently using counting and tabulating (see Appendix F Sample of Validation Procedure). These procedures were used for categories that were open to interpretation in order to confirm that the initial analysis of the data was not skewed because of personal impressions, order of analysis, or other factors. Of particular importance was the quantifying of control strategies, skills and knowledge, satisfaction with outcomes, experiences of stress, and the use of resources. Decision rules that were used to prepare data for counting and computation included a wide range of response. The inclusive rules were used because they were intended to capture data about the relative frequencies of occurrences, rather than absolute numbers in order to accommodate variations in speech patterns or contexts of the interviews.

Despite attempts to quantify particular parts of the data, some data were given more weight than others were. For example, greater weight was given to the parts of interviews where participants expressed a high degree of importance through repeated mention, emotional expression, or volunteering information without prompting.

4.6 LIMITATIONS OF THE METHODOLOGY

Because qualitative studies use small sample sizes, it is difficult to determine how reliable the results would be outside of the study context. Although the data cannot reliably be duplicated in another group or study, qualitative methodologies yield data that are valid representations of experiences within a particular context. In comparison, in order to ensure reliable duplication, quantitative methodologies often place so many controls on a situation, that the observed events are not valid representations of reality. Thus, with this study of 10 households, the data could not reliably be extended to other situations. However, the observation of this limited sample size provided data that yielded concepts that could be subsequently tested using quantitative methodologies.

Another limitation to be considered is the effect the researcher's background has on the responses participants provided in the interviews. Differences between the interviewer and participants in dimensions such as race, gender, financial status, age, or physical abilities may affect the motivation and communication of the participants (Mostyn, 1985; Weiss, 1994). In this study, a significant difference between the researcher and participants was experience with a disability. This researcher did not have a disability, but did have a parent with minor limitations in mobility. However, neither the researcher nor the parent has ever identified this limitation as a disability. Another researcher-participant difference was that the researcher was an insider to the design profession while the participants were not. Consequently, there was the potential that the researcher would be biased towards perceiving the need for design services. The process of committee re-

view, which included members outside of the design profession, provided opportunities to challenge tendencies to bring this bias into the study. A systematic analytical approach and validation procedure also helped to safeguard against bias in the interpretation of the data.

CHAPTER 5: FINDINGS

This chapter starts with a brief description of the participants and an introduction to the main events and conditions of modifying homes to accommodate a disability. This introduction is followed by a more detailed description of the important features of the modifying experience using terms from Strauss and Corbin's (1990) paradigm model, which includes the core variable, context, causal and intervening conditions, action-interaction strategies, and consequences. Following this, the analytic story explains how these categories are integrated to provide a theoretical understanding of the modification process, and the facilitating role of the interior design professional.

5.1 PARTICIPANT PROFILE

5.1.1 PARTICIPANTS

An overview of participant characteristics is provided on Table 1 Background Information Summary. This table provides information that was obtained from the Background Information Questionnaire Appendix E5 and from direct questioning during the interviews.

The sample included a total of 15 participants from 10 households living in privately-owned homes that had modifications costing over \$5,000, or who had built new homes to accommodate accessibility needs for a person with a disability. The sample considered the experiences of 11 modifications, as 1 household had built a cottage as well as modifying a home.

Interviews included the person with the disability in 8 out of 10 households. In the 3 cases excluding individuals with disabilities, 2 were young children, and the other had travel commitments. There was 1 household that included two people with disabilities. All household members who participated in the modifying process were invited to be

Household	1	2	3	4	5	6	7	8	9	10
Age of participant(s)	55	4	A 55 B 56	40 +/-	A 41 B 30	A 44 B 40	45	A 55 B 57	51	A 39 B 42
Gender of participant(s)	M	F	A F B M	F	F	A M B F	F	A F B M	F	A F B M
Age of person with disability	55	41	7 B 56	15	30	40	45	57	23	42
Gender of person with disability	M	F	F B M	M	F	F	F	M	M	M
Cause of disability	D	D	CD B D	CD	T	T	T	T	T	T
Wheelchair required	Y	N	Y B N	Y	O	Y	Y	Y	O	Y
Disability 2 years prior to modifications	Yes	Yes	Yes	Yes	No	No	Yes	No	No	No
Condition is stable	No	No	Yes	Yes	No	Yes	?	Yes	Yes	Yes?
Ages of other household members	55	45	NA	40	11	21,19	NA	27	52,21	16,18
Total Household Income 1K=\$1,000	60-100K	60-100K	40-50K	20-30K	20-30K	40-60K	20-30K	20-30K	60-100K	40-60K
Third-party funding for modifications	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supplemental income, pensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Monthly mortgage / Condo fees	None	\$800	\$750	None	\$180	\$948	\$1,000	\$800	None	\$800
Years in dwelling prior to modification	0	57	0	57	0	0	0	0	22	57
Education	U	U	B U A U	U	B HS A HS	B HS A U	T	B T A T	T	B HS A HS
T-Technical training U-University degree	T	No	A Pl B T	No	A Pl B HS	A No B HS	No	A Pl B T	No	A No B HS
Training or interest in design	Pl	No	A Pl B T	No	A Pl B HS	A No B HS	No	A Pl B T	No	A No B HS
Training or interest in construction	Pl	No	A Pl B Pl	No	A No B No	A No B No	No	A Pl B Pl	Pl	A No B No
Cost 1K=\$1,000	20-25K	8K	40-50K	22K	7	24K	7	60-70K	7	40K
Years between study and modifications	3	3-4	5	3	1	1	8	6	2	3
Service Providers (excluding interior design professionals) eng - engineer tech - technician, arch - architect LA - landscape architect, cont. - contractor OT - occupational therapist, PA - peer advisor	eng tech	disability groups	Eng. Arch. LA cont.	cont.	OT	PA cont.	PA cont.	PA cont.	PA cont.	cont.
Interior Design Professional Used	No	No	Yes	Yes (Student)	Yes	Yes (2)	No	No	No	No

Table 1 Background Information Summary

included in the interview sessions. However, there were 4 households with individuals who had assisted with the modifications that were unable to attend the interviews because of travel and work commitments.

With one exception, all of the participants were between 40 and 60 years of age. The majority of participants were female (11 out of 15). The gender of the individuals with disabilities was more evenly balanced with 5 out of 11 being female. The age at which disabilities were acquired varied. There were 2 cases of congenital disorders at birth. In 7 cases, disabilities occurred between the ages of 30 and 50, and in 1 at the age of 20. Thus, the majority of disabilities occurred during the productive working years for most individuals. Traumatic injuries were the cause of 6 of the 11 disabilities. Of the 6 people with traumatic injuries, 5 had acquired their disabilities within two years of making modifications. A wheelchair was required by 8 individuals with disabilities. There were 2 other individuals who required the occasional use of a wheelchair, and 1 who used a cane.

In terms of financial status, 3 households had annual incomes of over \$60,000. There were 4 households in a mid-income range of \$40,000-\$59,999 and 3 with a low income of \$20,000-\$29,999. All of the individuals who had traumatic injuries received third party funding for the modifications. In addition to this, all of the households received some form of disability pension or assistance with costs such as respite care. There were 3 households who were in the position of having no outstanding mortgage on their home. There were 2 households in the lower range of income who were very close to having monthly housing payments that were almost a third of their income. Of these, 1 was contemplating a move from a condominium apartment because the monthly fees were becoming unaffordable on a fixed income.

Of the 15 participants, 6 had a university degree, 4 had technical training, and 5 had a high school education. Of the 4 participants with technical training, 2 were health care professionals. There was 1 participant with professional training in the visual arts. There were 5 households that included individuals with a personal interest in design, all of whom were females. One of these participants has had professional contact with design professionals. The other 4 participants enjoyed interior decoration as a hobby. Previous renovation projects had provided 5 of the households with experience in construction, although none were formally trained.

Costs of the modifications ranged from \$8,000 to \$70,000. One household constructed a new home for \$248,000, but could not recall what portion of that total was dedicated to improvements in accessibility. In 5 out of the 10 households, modifications were made as part of a move from previous dwellings that were not suitable for modification.

Interior design professionals assisted with the modification for 3 households. One of these households had the assistance of two interior design professionals. As well as these 3 households who used a professional interior designer, there was 1 household who received assistance from an interior design student. The remaining households did not use design professionals but relied on their own design skills or those of their peer advisors and contractors. Some households also sought advice from occupational therapists and physiotherapists.

• Household 1: Home Modification –No Design Professional.. Cottage- Engineer and Technician

Participant 1 was a man with a long-standing disability who required the use of a wheelchair. This participant and his wife lived in a modern home that they adapted after moving from an older multi-story home. The modifications to the home included a new

ramp, reconfiguration of the bath and bed spaces, handrails, and new hardwood flooring. The design of the modifications to their home was developed by the participant and his wife. She had a strong personal interest in interior decoration and had considered offering her services to others with disabilities. This couple had not considered the option of using interior design professionals to assist with their modifications.

The modifications and new construction for this household proceeded with only minor problems, although the participant reported that the experience was fatiguing. The modifications were very attractive, although a few subtle problems such as slippery floor materials were observed. Another problem was that no knee space was provided under the vanity. The participant was aware of this and intended to provide it later. It was not clear if the missing knee space was an oversight or intentional in order to save costs by reusing the existing vanity. There was also no provision of additional structure for any future relocation of grab bars.

This couple had also built a new accessible cottage. The design for the cottage was developed through a collaboration with the contractor's engineer and technician. Direct observation of the cottage was not made, but Participant 1 reported little difficulty with the construction and was highly satisfied with the results.

- Household 2: Contractor

Participant 2 was living with her husband in an apartment that was owned jointly by herself and her business partners. She had a long-standing disability arising from living with multiple sclerosis. At the time of the interviews, and during the modifications, she was able to manage without a wheelchair. This participant was working outside of the home and was an active member in the disability community.

In order to address the needs of her disability, she made modifications to her unit and the exterior access. The principal modifications have included bath and corridor re-configuration and an exterior ramp. These modifications were made gradually as time and funding permitted, and did not present serious problems. The design for these modifications was developed by Participant 2, often in collaboration with the contractor. Participant 2 did not use the services of a design professional but did seek informal advice from contacts in the disability community.

The modifications were attractive and well integrated with the rest of the home, and functional planning appeared to be satisfactory. Observed problems were slippery floor materials in the bath area, no provision for relocation of grab bars, and a long uninterrupted slope on the exterior ramp. There were innovative modifications made to a stool that presented some potential safety problems.

• *Household 3: Engineer, Architect, Landscape Architect, Interior Designer, Contractor.*

Participant 3A was a woman who lived with her husband (Participant 3B) and her child. She assisted with modifications to accommodate the needs of her husband and her child who has a long-standing disability requiring the use of a wheelchair. This participant was active in the disability community and had extensive experience in researching disability and accessible design issues. Participant 3B had a mobility disability requiring the use of a cane. Both he and his wife have strong connections to the visual arts and design community. This couple also had prior experience with home modifications, having renovated other dwellings. However, the scale of the modification discussed in the interview was beyond their perceived abilities and available time constraints.

The dwelling was a bungalow with a partially finished basement. The modifications included a new deck and ramp; reconfigurations of the bath, living, dining, and

kitchen spaces; and incidental structural repairs to the structure and roof. This household collaborated with a number of design professionals including an engineer, architect, landscape architect, and interior design professional. Prior to purchasing the home, an engineer had been retained to prepare a report on the structural integrity of the dwelling. However, this engineer's report failed to detect important structural problems. The architect, who lived outside of the province, provided the design for the renovation to the dwellings, prepared working drawings, and obtained initial approval for the plans from the City of Winnipeg's planning department. This architect had advised the household that normally, approval from the planning department would be sufficient grounds to proceed with construction, but there was a chance that an appeal could be made. Based on this advice, the household proceeded with construction before the end of the appeal period. Shortly after starting construction, the work was stopped because of an appeal made by one of the neighbours. The household was then required to defend their plans in an appeal process. At the time of the appeal, the architect had returned home and was unavailable to assist with the appeal process. The household relied on the evidence of the prepared drawings and considerable lobbying for public support in order to obtain approval to proceed. The contractor assisted the household with modifying the plans for the deck in order to meet the terms of the appeal.

The participants recalled these difficulties arising from the structural problems and zoning appeal as being very distressing, creating significant delays and cost over-runs. However, once these problems were resolved, the modifications proceeded smoothly. The contractor was able to make modifications to the plans as required and addressed the structural problems as they were encountered. The contractor also worked with an interior design professional who attended to the details of finish materials, millwork detailing, and the selection of fixtures.

Despite the initial problems, this household was very satisfied with their modifications. No obvious deficiencies or errors were observed during the home tour. The deck and ramp that had been the focus of the zoning appeal were very well integrated with the architecture and landscape.

• *Household 4: Interior Design Students, Contractor*

Participant 4 was a woman who lived in a single-family dwelling with her husband and child. She assisted with making modifications for her child who has a long-standing quadriplegia. Her husband also assisted with the modification, but was not able to attend the interview session. Neither she nor her husband had previous experience with design or construction. At the time of undertaking the modifications, she was not working, but had other significant commitments beyond taking care of her child and looking after the modifications.

The dwelling was a small bungalow with a finished basement. The modifications included the reconfiguration of the bath, corridor, and sleeping spaces as well as a new exterior ramp. Interior design students had developed the conceptual plan for the interior modifications. This plan had to be adapted by the contractor in order to accommodate the location of the plumbing ventilation stack. Once the plan had been developed, Participant 1 determined the remaining details and selected the finish materials.

The construction phase of the project took much longer than the participant had expected, resulting in some inconvenience. In addition to this, upgrades to the qualities of finish materials, and additions to the scope of work resulted in cost over-runs. This participant and her husband also had to invest a considerable amount of time and energy in attending to the modifications and locating suitable products.

The design and construction of the ramp proceeded with little difficulty. The participant explained the requirements to the contractor who was able to develop a design that met the household's stated needs. It should be noted that there is a small raise in elevation at the threshold (approximately 2.5 mm) that requires someone to assist with tilting the wheelchair over the threshold. The participant could not recall if this change in elevation resulted from an oversight or a compromise in order to address another problem. Participant 1 did not view this grade change as a problem as her child was not able to operate a wheelchair independently and the effort required for her to "bump" the chair over this grade change was not great. If circumstances or technology should change that make it possible for their child to operate a wheelchair independently, they will make the required adjustments.

Despite the difficulties that arose during construction and the cost over runs, the household was very satisfied with their modifications. The modifications were attractive and appeared to provide planning that was functional. The only problems observed by the researcher were slippery tiles on the bath area floor and no provisions for future relocation of grab bars.

• *Household 5: Interior Design Professional, Physiotherapist, Occupational Therapist*

Participant 5A was a woman who was responsible for organizing the modifications to a family member's (5B) condominium apartment unit. She assumed this responsibility on top of her obligations to her own immediate family and work commitments.

Participant 5B was a woman who had a traumatic injury that caused neurological damage resulting in impairments of coordination and vision. She lived alone, with atten-

dant care, but was gradually assuming more of her own care as her condition improved. She had a young child who stayed with her on weekends.

Participant 5A assisted participant 5B with the negotiations to purchase and modify a condominium apartment unit. The apartment was originally designed to be wheelchair accessible, but required further modifications to meet the specific needs of participant 5B. These modifications to the unit were funded by an insurance claim. The modifications included the reconfiguration of the bath, bed, and corridor spaces, the installation of new finishes, automated security systems, and an environmental control unit. This household used the services of an interior design professional who provided design and project management services. The design professional also worked very closely with participant 5 B's physiotherapist and occupational therapist, who helped to assess the functional needs for participant 5B.

Participants 5A and 5B were very satisfied with the modifications and assistance provided by the design professional. There were no observed problems with the modifications.

- Household 6: Peer Advisor, Interior Design Professional, Accessible Design Specialist, Contractor

Participant 6 A was a man who worked with his wife (participant 6 B) in overseeing the design and construction of a custom built home. Participant 6B used a wheelchair and had some limitations in the use of her hands as the result of a traumatic injury. Before the injury, the family had been living in a multi-family dwelling. They had no previous experience in construction, although participant 6 B had a strong interest in interior decoration.

Following the accident, this household decided to build a new home that would include the requirements for accessibility. An insurance settlement paid the costs for including accessibility features to the design of the new home. This household used the services of a peer advisor from the disability community, a contractor with experience in accessibility modifications, and an interior design professional. A second interior design professional, who was an accessible design specialist, also made recommendations on behalf of the funding agency. The participants selected the finish materials and made decisions related to décor.

This household had mixed feelings about the modification process and the results because there were a few features that were not included that might have improved the use of the home. Overall, the household was satisfied with their new home. The home was very attractive and appeared to provide good access. However, the plan included a large living area in the basement level that the household perceived was too cool for Participant B to comfortably use because of her limited ability to retain body heat. The participants related this problem to the decisions made regarding the basement and mechanical system design. The decisions related to the basement and mechanical system were based upon the recommendations made by the accessible design specialist, who did not perceive that providing heating to the basement through floor ducts was directly related to improving the accessibility of the home. Consequently, the additional funding for the basement and mechanical design to accommodate floor duct heating was not provided by the third party funder. There were also some problems with the vanity designed by the carpenter. In the bath area, the floor material selected by the household was slippery. There was also no provision for future relocation of grab bars. This provision had been suggested by one of the design professionals, but was not included because of cost.

• *Household 7: Peer Advisor, Contractor*

Participant 7 was a woman who lived by herself in a condominium apartment unit. As the result of a traumatic injury, she used a wheelchair. Following her accident and discharge from the hospital, she lived with a friend and subsequently moved to special purpose housing unit for people with spinal cord injuries and other disabilities. After living there for about a year, she purchased a three-bedroom condominium apartment unit and made modifications to it. Because the cause of her disability was an accident, she received insurance funding to cover the cost of these modifications.

Modifications included reconfiguration of the living, bath, and kitchen spaces. Participant 7 had assumed the responsibility for the design and project management of the modifications herself, with some assistance with transportation from a friend. At the time of the interview, this participant was considering the feasibility of selling her unit and building her own home. She was preparing to do as much of the design and management herself as possible in order to save costs.

The modifications proceeded without major difficulties, although she found the experience stressful and tiring. The apartment was attractive and provided good functional planning. The participant wanted to close in some lower kitchen cupboards that were open, but had not developed a solution that could provide convenient access at an acceptable cost. The original bathtub was not replaced due to cost and presented major problems in getting in and out safely. The tub was very large with a wide ledge around it, making access to wall mounted grab bars impractical. A roll-in shower was provided, but the participant preferred to bathe and has learned to use the tub although with considerable difficulty and risk to her safety.

• *Household 8 : Peer Advisor, Contractor*

Participant 8 A had assumed most of the responsibility for the modifications while her husband (participant 8 B) was still in the hospital. Her husband participated in the later stages of the modification after convalescing from a traumatic injury that resulted in a disability requiring the use of a wheelchair.

This household had moved from a dwelling that was not amenable to modifications to a bungalow with a semi-finished basement. The modifications included a new ramp, reconfiguration of bath and bed spaces, and a stair lift. The cost of their modifications was paid through an insurance claim.

The modification process for this household was quite difficult. They relied on the advice of a peer advisor and contractor who were unable to resolve a number of technical issues. There were many disagreements over their designs and quality of work. After several false starts, this household assumed a more active role in the modifications and engaged a different contractor. After doing this, events proceeded more smoothly.

The appearance of the interior modifications was reasonably integrated with the rest of the home. The metal grab bars in the shower, however, did have an institutional appearance. The grab bars were also showing evidence of rust. The bath floor material was slippery and difficult to maintain. No provisions had been made to provide structural support for assistive devices that would enable the participant to use a whirlpool-style bathtub. The existing high pile carpet had not been replaced and was difficult to maintain. Also, the exterior decks were not integrated with the appearance with the rest of the building.

• *Household 9: Peer Advisor, Contractor*

Participant 9 was the mother of a young man who had suffered a traumatic injury. This participant, along with her husband, had assumed the responsibility for monitoring the modifications. The injured son also contributed some input once he was sufficiently recovered from his injury.

The household decided to make the minimum modifications necessary because the insurance claim provided for a maximum lifetime cost for modifications. Therefore, it was important to the family that funds remain available for the future when their son leaves home. This household did not use a design professional, but relied on a peer advisor and their contractor who had previously worked as an occupational therapist. The contractor developed the design for the modifications that included the reconfiguration of bath spaces and an exterior ramp.

The modification process proceeded without major difficulties and the results were considered satisfactory. There were no problems observed by the researcher.

• *Household 10: Contractor*

Participant 10A was a woman who lived with her husband (participant 10B) and two adolescent children. Participant 10A assumed most of the responsibility for the modifications while her husband was still in the hospital. Participant 10B required a wheelchair and had limited use of one arm because of a traumatic injury. Because the cause of the injury was an insurable accident, the cost of the modifications was covered by a third party.

The household lived in a bungalow with a semi-finished basement. An addition was made to the home that included a new bath and bed space. As well as the addition, there were reconfigurations of corridors, laundry, kitchen spaces and the construction of

an exterior ramp. This household did not use an interior design professional, but relied on their contractor to design the plan and details of their modifications.

These participants reported that the modifications went relatively smoothly, requiring little direct involvement from them. They were satisfied with the results with the exception of the toilet location that did not fully meet their needs. The modifications were attractive and well integrated with the rest of the home. The observed problems were slippery floor materials in the bath area, no provisions to relocate grab bars, and the toilet location.

5.1.2 OTHER CHARACTERS AND ORGANIZATIONS

Other characters and organizations that will be mentioned in this study include design professionals, insurance agencies and their case managers, peer advisors, occupational and physiotherapists, disability organizations, and contractors. The interior design professionals used by the participants in this study included two individuals with a Bachelor of Interior Design degree and one whose professional qualifications were undetermined. One of the interior design professionals worked for a not-for-profit service that specializes in accessible design.

The peer advisors were individuals with disabilities who represented disability organizations. Peer advisors provided advice and support to individuals who have recently acquired a disability. The peer advisors in this study were from the Canadian Paraplegic Society, a not-for-profit group that provides assistance to people who have incurred spinal cord injuries.

The case managers of third party funders were the individuals responsible for ensuring that the needs of the client were met within the parameters of the agency's policies. The case managers assumed the official role for the financial management of the

modifying process in all cases involving third party payments. With the exception of one household, the case managers also provided guidance regarding finding contractors, design professionals, and peer advisors. The participants managed the day to day events during the process. However, the relationship between the contractors, participants, and case managers was unclear. It would appear that in at least 3 cases the contractors reported directly to the case managers, who in turn, consulted with the participants.

Occupational therapists and physiotherapists made recommendations to the case managers about the household's needs. These therapists also provided advice and referrals to participants about their functional needs while they were in the hospital. Participants with long-standing disabilities did not appear to include therapists directly in the modification process.

Several participants received guidance and information from the Canadian Institute for Barrier Free Design. This organization also assisted in providing the services of interior design students from the University of Manitoba. This service was discontinued in 1995. The Canadian Institute for Barrier Free Design currently conducts research and provides education to the public about accessibility issues.

Several participants were aware of ProductABILITY as a source of information on accessible design and products. This not-for-profit organization is associated with 1010 Sinclair, a housing complex providing transition housing for people with disabilities. ProductABILITY provides information and design services related to disability and accessibility. Design services are usually provided on a fee-for-service basis.

5.2 THE MODIFYING PARADIGM

The findings of this study are discussed here using the framework of the grounded theory procedures and techniques developed by Strauss and Corbin (1990).

This study placed particular emphasis on looking at the changes in events that took place during the modifying process. This process was composed of events and conditions that were identified as categories and subcategories in a paradigm model. The main categories used in this analysis are those identified and defined by Strauss and Corbin as follows:

Phenomenon –

When developing the paradigm model, a phenomenon is identified that is the “central idea, event, happening, incident about which a set of actions or interaction are directed at managing, handling, or to which the set of actions is related.” (p. 96)

Core Category –

In the final stages of analysis, the core category is used in the analytic story as the “central phenomenon around which all the other categories are integrated.” (p. 116).

Causal Conditions –

“Events, incidents, happenings that lead to the occurrence or development of a phenomenon.” (p. 96). These events, or changes, can lead to “a change in context, and corresponding change in action/interaction for managing, controlling or handling the phenomenon under that changed context.” (p. 151).

Context –

“The specific set of properties that pertain to a phenomenon, that is, the locations of events or incidents pertaining to a phenomenon along a dimensional range. Context represents the particular set of conditions within which action/interactional strategies are taken.” (p. 96).

Intervening Conditions –

“The structural conditions bearing on action/interactional strategies that pertain to a phenomenon. They facilitate or constrain the strategies taken within a specific context.” (p. 96).

Action/Interaction Strategies–

“Strategies used to manage, handle, carry out, respond to phenomenon under a specific set of perceived conditions.” (p. 97).

Consequences –

“Outcomes or results of action and interaction.” (p. 97).

This analysis was centered on understanding the process used in modifying homes and looked at changes in conditions that led to action/interaction strategies and their ensuing consequences. While the various categories of this paradigm model might appear to provide clear boundaries for events, in reality these boundaries were flexible. With time, the placement of events in a paradigm can shift. For example, the causal condition that defined the contexts could lead to strategies that yield yet more causal conditions and consequences. Thus, the labels in the paradigm model have been used for convenience and therefore, present a picture of situations at particular points in time and from a particular perspective. The analysis of this study focused on the events of the modifying process that related to the study objective of determining the potential role of interior design professionals. Thus, particular attention was paid to those aspects of the experience that could be influenced or should be considered by interior design professionals, in particular, the implementation of the design process. The analysis might have been quite different if another perspective had been taken.

The next section describes the Modifying Paradigm in more detail. The central phenomenon that was selected was Skill and Knowledge. This phenomenon was selected as the focus because it had relevance for interior design professionals and could be addressed by them. In the early stages of analysis, several other phenomena emerged in the data. One of these was the modifying process itself. For the purposes of this study, the modifying process was considered under the subsidiary categories of causal conditions and action/interaction strategies. In the Modifying Paradigm, the need to make modifications (Modifying) was one of the causal conditions. One of the properties of the modifying process was its course, which was composed of a series of action/interaction strategies called Design-Build Tasks. These Design-Build Tasks required particular skills and knowledge in order to yield outcomes that were satisfactory for the participants. The acquisition and application of Skill and Knowledge, therefore, became the core variable in this analysis.

The causal conditions of Skill and Knowledge were Environmental Dysfunction and Modifying. The properties of these causal conditions had an influence on the properties of Skill and Knowledge. Two contexts were identified based on the properties of Skill and Knowledge; Knowledge Acquisition and Knowledge Application. The properties of Skill and Knowledge required for the participants defined the Knowledge Acquisition Context. The context for Knowledge Acquisition along with the intervening conditions of Awareness, Financial Resources, and Human Resources influenced Consumer Strategies used to acquire Skill and Knowledge. The Skill and Knowledge that were acquired using these strategies resulted in the second context, Knowledge Application. The Knowledge Application Context was dependent upon the Skills and Knowledge that participants and service providers had available for the implementation of Design-Build Tasks. The consequences of implementing the action/interaction strategies of De-

sign-Build Tasks were the Outcomes of Modifying. Depending upon the Knowledge Application Contexts, the implementation of Design-Build Tasks resulted in either satisfactory or unsatisfactory Outcomes.

5.2.1 CORE VARIABLE: CONSUMER SKILLS AND KNOWLEDGE NEEDED FOR DESIGN BUILD TASKS

...so there was so many traumatic things, and making these big decisions, and some of it I knew by instinct, and I knew what worked and I knew what didn't work -- but until it was all said and done, I didn't know for sure.

The above quotation by Participant 7 expresses the insecurity many of the participants experienced while modifying their homes. Despite managing the modifications with considerable competence, this participant's recollections of the experience were those of stress and concern that something important would be overlooked. The anxiety expressed by this individual was related to her perceptions of her ability to design and manage her modifications. The presence and application of design skills and knowledge was a recurring theme throughout the participants' stories.

While the participants' stories included many other themes, this study focused on those that were relevant to the study objectives. Therefore, the analysis was directed towards elements of the modifying process that could be influenced by design professionals or that could guide professional practice. Other factors such as social conditions, health management policy, and psychosocial variables were not addressed except as required to provide contextual background. Acquiring and applying the necessary skills and knowledge about designing modifications was a variable that could be modified by the involvement of interior design professionals. In order to focus the analysis on the study

objectives, Skill and Knowledge was therefore selected as the core variable. The core variable, Skill and Knowledge had three main properties, domain, degree, and competence (perceived and actual). These properties are discussed in more detail as follows:

(a) Domain

Domain refers to the subject area in which Skill and Knowledge were required. The four principle areas of Skill and Knowledge that were required in this study included disability, design, project management, and construction. In order to assess their requirements for Modifying, households required knowledge about the nature of their disability, or Environmental Dysfunction. This knowledge was critical in establishing objectives for the project and in determining the details that needed to be considered in the modifications.

Skill and Knowledge was also required in the process used to design and build the modifications. The design process was part of a set of tasks, Design-Build Tasks that were the action/interaction strategies used in the modifying process. A related Skills and Knowledge domain is that of Project Management. Project management is the task of scheduling and planning all of the various tasks in order to ensure that they are carried out effectively. A description of Design-Build Tasks and Project Management is also provided in 5.2.5.2 Design-Build Tasks.

Finally, the process of making modifications required Skill and Knowledge in construction. This was an important factor in determining the quality of the modifications. However, because physical construction is outside the range of the typical practice for interior design professionals, this factor was not explored in detail.

(b) Degree

Skill and Knowledge was required in each of the domains in varying degrees. The degree of knowledge required was determined by the intensity of Modifying (a causal condition). When the modifications were of a high intensity, greater degrees of Skill and Knowledge were required. For example, one household was confident in their ability to manage the modifications to their home, but believed that they did not have sufficient Skill and Knowledge to design and construct a new cottage. Another household, who was considering an addition to their home, was considering using an architect, although they had not considered using one for their original modification. The following comment expresses their concern that the complexity of making an addition required a higher degree of Skill and Knowledge than they possessed:

I think I would definitely get somebody to come in and do a design. Mainly because I'd be worried, we're getting pretty close to the property line ... I wouldn't want to mess up .. and I think it is even more structural (than their previous modifications).

(c) Perceived Competence

Households had confidence in their ability to undertake various phases of the modifying process based upon their perceived knowledge of their disability and skills in design and construction. These perceptions of knowledge were related to past experiences and perceptions of the intensity of the modifications. Confidence in understanding the nature of the disability and environmental requirements was strongly correlated with the tenure of the disability. Those with long-standing disabilities had a high degree of confidence in their knowledge of disabilities. One participant (1) with a long-standing disability stated that:

I just (used) my knowledge of my own disability and projecting a little bit into the future, being able to see where this thing would be maybe 6 months or a year from now.

In contrast, those who had recent disabilities were unfamiliar with what they would require to accommodate their disability. One participant (8A), who had made modifications following her husband's recent traumatic injury, commented that, "We didn't have a clue ... we didn't have any idea of what would be necessary."

Confidence in design and construction was also associated with past experience in design, and construction relative to the intensity of the modifications. Households with some experience in design and construction demonstrated greater confidence in their abilities to manage a modification project, and took a more active role in Design-Build Tasks.

Some Skill and Knowledge were more obviously lacking than others were. For example, none of the households believed they had adequate Skill or Knowledge to undertake the physical Construction of the modifications. However, several households believed that they had adequate Skill and Knowledge in design because of past interest in decorating.

5.2.2 CAUSAL CONDITIONS

The two conditions that led to a need for Skill and Knowledge were the problems created by changes in human function (environmental dysfunction) and the consequent decision to modify the home (modifying). The problems created by the changes in human function are termed Environmental Dysfunction. The term Modifying is used to describe the process that the participants engaged in once they made the decision to modify their home in order to reduce their Environmental Dysfunction.

5.2.2.1 CAUSAL CONDITION: ENVIRONMENTAL DYSFUNCTION

I would tell them “well fine, you can have it (the home), it comes with a wheelchair.”

The above quotation comes from a participant (7) who was describing the frustrations of responding to comments others have made regarding her good fortune to have an attractive home as a result of an insurance claim. Another participant (4) pointed out that their modifications were different from other renovation projects in the following comment:

... we wouldn't have done major renovations had we not had somebody with a disability in our house. We might have done some cosmetic things to update the house, but not to the extent we did.

These quotations underscore the fact that the modifications were made because the participants could no longer comfortably live in their home environments due to changes in their functional abilities. The circumstances surrounding these changes in functional ability were a determining factor in the course of making modifications. The causal condition of modifying homes was a change in human functional abilities that created a conflict with using the existing physical environment in the home. This conflict between human functional abilities and the environment is identified here as Environmental Dysfunction. Environmental Dysfunction could be present in varying degrees ranging from high to low. A high degree of Environmental Dysfunction was present when the ability of the individuals to function in the environment was severely restricted. A low degree of Environmental Dysfunction was present when the individual could manage, although with some inconvenience. In this study, all of the households experienced a degree of Envi-

ronmental Dysfunction that was high enough to warrant making modifications at considerable expense and effort.

Environmental Dysfunction was characterized by the properties of the two main components; changes in human function, and the existing physical environment. The following provides a more detailed description of these components.

(a) Changes in Human Function

(i) Tenure

The tenure, or length of time Environmental Dysfunction had been present, was an important factor in determining the direction for home modifications. Participants, who undertook renovations before discharge from institutions after an accident, had experiences that were very different from those who had adjusted to their disability. As discussed later in 5.2.4.3 Human Resources, the households were still traumatized from the accident and subsequent impending changes. They were also spending considerable amounts of time with the injured person in an institutional setting. Consequently, they often had difficulty focussing their time and attention on managing the required modifications. Households with recent injuries also did not have enough experience with their disability to know their capabilities and limitations.

In contrast, individuals with long-standing disabilities had different experiences. These participants had time to adjust to their disabilities and were therefore able to direct their attention towards making modifications. These households also had more knowledge about their condition and were able to determine their requirements. One such participant (1) recalled that “functionally, I knew what works”. As noted by one participant (3A), “we’ve learned as we’ve gone where we’ve made mistakes.”

(ii) Origin

The events that led to changes in human function included accidents, disease, and congenital disorders. A major implication of the origin was its connection to funding. Participants whose Environmental Dysfunction was the result of an accident received some form of financial compensation to assist with the cost of modifications. Those with disease-based or congenital disabilities did not. These households modified their homes using their own financial resources from either disability pensions or wage earnings.

The cause, or origin, of Environmental Dysfunction also had associated rates of onset. Accidents had sudden onsets. In contrast, disease processes could have either sudden or gradual onsets. A stroke would be an example of a disease process with a sudden onset, whereas multiple sclerosis or arthritis might have a more gradual course. In this study, participants with disabilities resulting from disease processes had gradual onsets. There were 2 households who had children who were born with congenital disorders. In relation to modifying, these congenital disorders were similar to disease processes with a gradual onset, as the families had a number of years to adapt before the child was mature enough to require adaptations to the home.

The onset or period over which a change in functional abilities occurred had an important impact on the attention households could dedicate to the modification process. When the changes were sudden and abrupt, participants experienced a period when they were in a state of shock. One participant (10 A), whose husband had been in an accident, provided this description of their experience "We were still in shock, we couldn't think of anything else. We just couldn't believe what happened." This emotional state made it very difficult for participants to focus on the task of modifying a home as suggested by one participant (8) in recalling their experience following her husband's accident, " when you first come out, you're busy trying, you know, adjusting to your life without worrying

about how you're going to live." In fact, 3 of the 5 households who were modifying homes within two years of an accident indicated a desire to have someone else manage the process on their behalf. For example, the participant (10A) quoted previously stated:

I just didn't care at that point, it was all I could do to keep going. In hindsight it would have been better for me to have been more involved, but I just don't think I could have given anyone a straight answer then.

In contrast, those with long-standing disabilities did not indicate significant distractions from their projects. They appeared to have made an emotional adjustment and acceptance of their condition. Participants with long-standing disabilities viewed the modifications as a way for them to improve their ability to live more independently. One such participant (1) who took an active part in modifications commented on how moving from the family home of 22 years into a more accessible home was perceived as a positive move because it would make life easier:

Just knowing that your day to day life would be a little easier and your daily routine wasn't going to be a torture test, and dangerous perhaps. So, you try to eliminate those sort of things as much as possible.

(iii) Range, Location and Intensity

The range, location, and intensity of functional impairments, to a certain extent, determined the severity of Environmental Dysfunction individuals experienced. This in turn determined the type of modifications that were appropriate. The range refers to the number of areas where functional ability was impaired. Location, as the name suggests, refers to the part of the body with the impairment, such as arms, legs, or fingers. Inten-

sity relates to the degree of impairment. It was possible to form a picture of the functional abilities that needed to be considered in planning modifications by considering these properties. For example, a participant who did not require a wheelchair, but had moderate functional limitations in all areas of the body, had requirements that were different from an individual who required a wheelchair, but had excellent upper-body strength and coordination.

Understanding the particulars of the disability was critical to providing a suitable environment. This point was illustrated in the following reference by a participant (7) who compared the needs of someone with paraplegia with a person having impairments that are more extensive:

... we looked at one other one (apartment). It was set up for a quad. It was a two bedroom ... they had taken out the corner at the end of the hall to make the turn, ... they had taken out the master bedroom closet to gain access into the bathroom, ... and the toilet was between the sink and the tub. Well that's fine for a quad, because he got lifted and had 24 hour attendant care.

(b) Physical Environment

Features of the physical environment constituted a second group of conditions that created Environmental Dysfunction. Physical features restricting the use of and movement around a dwelling created barriers. One participant (1) recalled his experience living in an older multi-story home where, "it was difficult and it was frustrating." The most frequently reported barriers were grade or level changes with stairs, narrow hallways or door openings, and small bathrooms. The more barriers present, the more modifications

were required. This had an impact on choices between moving and modifying, and in terms of purchasing a home.

The properties of the physical environment that were identified as being important included adaptability, location, attachment, and structural integrity. The properties of the physical environment that were relevant in determining the severity of the disabilities are described here in more detail.

(i) Adaptability

Adaptability refers to the potential to make renovations without incurring excessive cost. Any type of change that required the demolition and construction of walls and the relocation of building systems was a serious undertaking. This was an important factor in conjunction with the number of barriers present. If only one or two barriers required a major adjustment, changes were made. Similarly, dwellings that required many small modifications were modified. However, there came a point where too many modifications to existing structures made modifications unfeasible. Multiple level changes, and small confining hallways and door openings often led to the need for a complete "gutting" of the interior. Several participants opted to move from their original dwelling because the potential for modification was too limited. The home feature that was considered most desirable when selecting a new dwelling was an open plan with barriers confined to one or two areas. One participant (8A) recalled the reason why their household purchased their present dwelling.

What attracted me to this place was the way that it was laid out. It was open. I knew that I needed something that he could get around in. It's very accessible for him. He comes in the front door, there's lots of room, he can move around.

(ii) Location

There were 3 households who reported location as being an important feature of their home. This was particularly true for households that included children of school age. The desire to remain in a particular neighborhood influenced decisions about whether or not to stay. It also influenced the range of available housing from which to make a selection. Two households specifically wanted to remain in a part of the city that was known for its older homes. One household (3), who had lived in a multi-story house before moving to another house in the same neighbourhood stated that, "it was never going to be acceptable. So we loved the area and we looked for a flat house in the area." This restricted the availability of homes that could be easily modified, leading to the additional expense of modifying an older structure and difficulties with zoning restrictions. Another participant (7) was also "very specific about the area ... that was my main criteria at that point when we first started looking (for an apartment)." This participant was also somewhat restricted in the selection of housing in the area, eventually finding something suitable, but was finding the fees too costly.

(iii) Attachment

The degree of attachment or identification to a home influenced the decisions to make modifications, and had implications for the commitment of the household to the project. There were no participants who remained in their homes if they were unsuitable. However, several participants had acquaintances that were prepared to "put up with a lot of inconvenience because they just can't part with their house" (2).

(iv) Structural Integrity

The structural integrity of a dwelling had serious implications for the feasibility of making modifications. In one case, the participant's dwelling had serious structural problems that were discovered during construction. Had these problems been identified before

construction, the feasibility of investing in modifications for this dwelling might have been questioned.

5.2.2.2 CAUSAL CONDITION: MODIFYING

The events that took place to change the home environment from one that was inaccessible to one that supported independent living constituted the modifying process, or Modifying. The presence of Environmental Dysfunction led to the need to make modification to the homes. The degree of Environmental Dysfunction had an impact on the properties of Modifying. The critical properties of Modifying were pace, complexity, and course. Pace refers to the rate at which the process proceeded. Some modifications were required urgently because individuals were awaiting discharge from hospital pending their completions. Others faced timelines imposed by climate or lease obligations. In some situations, modifications proceeded at a more gradual pace, often taking place in phases. Modifications ranged from complex changes to structure and building systems to the simple placement of grab bars.

When considered together, pace and complexity formed a Modifying Intensity. Modifying was of high intensity when the pace was urgent and the complexity was high. One participant (7) recalled the experience of Modifying as being very intense because of the extent and urgency of the work, "... we had one month to pull it all together. That was one of my biggest regrets; that I didn't take a further away possession date." Modifying was of low intensity when the pace was gradual and the complexity low. A participant (2) who phased in a series of improvements found the Modifying to be, "... manageable, not too much to handle at one time." While modifying intensity can be high for any household making modifications, the likelihood that modifications were perceived to be of high in-

tensity appeared to be common for households dealing with the stresses related to their disability.

5.2.3 .CONTEXTS

There were two groups of Skill and Knowledge contexts, Knowledge Acquisition and Knowledge Application. Knowledge Acquisition refers to the perceived need to acquire Skill and Knowledge from others. Knowledge Application was the actual set of Skill and Knowledge available for the implementation of Design-Build Tasks. These two knowledge contexts are described in further detail in the next two sections.

5.2.3.1 KNOWLEDGE ACQUISITION CONTEXT (Households Perceived Skills And Knowledge)

The context for Knowledge Acquisition formed the conditions under which the intentions to acquire Skill and Knowledge were formed. This analysis focused on the context related to acquiring design Skill and Knowledge although the need to acquire skills and knowledge in disability and construction is also considered. All of the modifications required relatively high degrees of Skill and Knowledge in design as was demonstrated by shortcomings in the modifications when these skill were absent as described in 5.2.6.2 Actual Outcomes. There were two possible Knowledge Acquisition Contexts, Low Need and High Need, that were based on the properties of the households' perceived Skill and Knowledge situations. A Low Need to acquire Skill and Knowledge was associated with a context where households perceived that they had adequate competence in design. Conversely, in the High Need context, households perceived that they did not have sufficient competence in design to proceed without some assistance.

A Low Need Knowledge Acquisition Context was associated with perceptions of having Skill and Knowledge in both disability and design. The only households (1&2) who did not perceive a need to acquire design Skill and Knowledge from others had both

long-standing disabilities and experience in design and construction. One of these participants (1) had considerable confidence in his ability to “rely on past experience” in both his disability and previous home renovation projects. He also relied on his wife’s skills in design, as she was “very good at visualizing things.” While she did not have formal training in design, she enjoyed interior decoration as a hobby. Indeed, she had enough confidence in her abilities to consider offering her services to others who need assistance with modifying to accommodate a disability. In contrast, those with High Need Knowledge Acquisition Contexts lacked Skill and Knowledge in either disability or design.

Participants needed to have confidence in their understanding of both domains before they felt comfortable with their ability to proceed without acquiring Skill and Knowledge from others. For example, one household (8) had past experience in construction and home renovations that provided confidence in their general ability to undertake modifications, as recalled by participant (8A), “We had remodeled so many things, and we just knew that it could not be done again. And I knew what to look for as far as structure goes.” However, in terms of determining the details of how to modify the home to accommodate her husband’s injury, this participant “just didn’t know what to look for.”

In general, the need to acquire design (including Project Management) Skill and Knowledge was less obvious than the need for Skill and Knowledge in construction. Before starting their projects, most participants did not recognize the complexity of design and management of modifications, and consequently did not see the benefit in having assistance in this aspect of the project. Indeed, one participant (4) who had some difficulty with Project Management in their project stated that:

I wouldn't hire a general contractor again. I think a lot of our expense was for his services, and I'm not really so sure that he did that much to make his money. I guess we wouldn't have found the people he had in place to do all the little things here and there, but I think we could probably do it ourselves the next time.

This example may demonstrate that the participant had gained Skill and Knowledge through the experience of having completed modifications. On the other hand, it does suggest that the critical nature of Project Management Skill and Knowledge was not recognized.

5.2.3.2 KNOWLEDGE APPLICATION CONTEXT (Service Providers And Households Actual Skills And Knowledge)

The second context related to Skill and Knowledge was that of Knowledge Application. This context represented the actual Skill and Knowledge service providers (households, peer advisors, contractors, occupational therapists, physiotherapists, and design professionals) had available in specific domains. Knowledge Application Contexts ranged from High Skill and Knowledge to Low Skill and Knowledge. The level of Skill and Knowledge was partly determined by direct questioning and inferred through participant reports of the modification process and observations of the completed projects. Table 2 Service Providers Task Performance compares the competence individuals in four service groups had in applying Skill and Knowledge to Design-Build Tasks. These Design-Build Tasks are the phases of the modifying process typically used by interior design professionals. A more comprehensive description of these tasks is provided in 5.2.5.2 Action/Interaction Strategies: Design Build Tasks. The four groups considered are; (a) the participants, (b) peer advisors and others in the caring professions such as occupational therapists, (c) contractors, and (d) design professionals (interior designer, architects, en-

gineers, architectural technicians). This table provides a condensed listing of typical Design-Build Tasks and indicates whether the performance by individuals in each task was satisfactory or unsatisfactory as determined by the researcher using reports of households and direct observations. In the table, the performance of tasks was indicated as negative or positive based on their impact on the Outcomes of the modifications. Tasks that should have been completed by an individual, but were neglected were also indicated as unsatisfactory. Some performance areas were both satisfactory and unsatisfactory, indicating that the performance levels were inconsistent. This table indicates only actions that were referred to in the data. It is possible that individuals may have applied Skill and Knowledge in other areas, but there was not sufficient evidence in the data to include these. A more comprehensive description of how the application of Skill and Knowledge in Design-Build Tasks had consequences for the Outcomes is provided in 5.2.6.2 Actual Outcomes.

This table demonstrates that each service group had a different set of Skill and Knowledge in which they were competent. Participants were reasonably competent in terms of setting priorities. Those with long-standing disabilities were also competent in determining their functional needs. Most participants were also able to undertake Procurement tasks. The Skill and Knowledge areas that presented the most difficulty for participants were in developing appropriate plans and assembly of materials, selecting appropriate materials, and documentation. Assistance with project management might have relieved these participants of some the stress and fatigue that they experienced.

Peer advisors and occupational therapists applied their Skill and Knowledge with high levels of competence in the area of Assessment and Programme Development. They were particularly helpful in assessing functional needs. However, in the case (8) where the peer advisor acted in the capacity of project manager, the Skill and Knowledge in that domain were not sufficient to provide satisfactory performance. Peer advisors and occu-

Table 2 Service Providers Task Performance

Knowledge Acquisition Context (Households' perceived need to acquire Skills Knowledge)	Participant					Peer Advisor / Occupational Therapist, Physiotherapist					Contractor					Interior Design Professional / Architect, Landscape Architect, Engineer, Architectural Technician														
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	6	7	8	9	10					
Household																														
Service Provider																														
Assess functional needs	+	+	+	+	+																									
Assess physical environment	+	+	+	+	+																									
Assess resources	+	+	+	+	+																									
Identify priorities & objectives	+	+	+	+	+																									
Select materials	+	+	+	+	+																									
Develop plan/assembly	+	+	+	+	+																									
Specifications																														
Drawings	+																													
Written Contracts																														
Obtain Quotations	+	+	+	+	+																									
Purchasing	+	+	+	+	+																									
Contract Administration	+	+	+	+	+																									
Scheduling	+	+	+	+	+																									
Budget planning	+	+	+	+	+																									
Monitoring	+	+	+	+	+																									
Conflict Resolution	+	+	+	+	+																									

+ satisfactory results - unsatisfactory results or neglected task resulting in negative consequences + both satisfactory and unsatisfactory results.

pational therapists were especially helpful in the context where participants with recent injuries had low Skill and Knowledge about disability.

Contractors were reasonably competent in applying Skill and Knowledge in the tasks of developing appropriate plans and assemblies of materials. They were also able to prepare some documentation and undertook much of the purchasing. Some contractors were also competent project managers. One area in which contractors were not active was in Assessment and Programming. In one case (10), Assessment of functional needs for the modifications was not addressed by the contractor, resulting in an unsatisfactory performance in this area.

Design professionals were active in all aspects of Design-Build Tasks. The instances in which design professionals had a negative performance were in the area of assessing the physical environments. In case 3, the engineer failed to note structural problems in the dwelling. In case 4, interior design students did not consider the location of the plumbing stack in their plans. There was also one case in which there was a difference in opinion between the participant and an interior design professional (who was acting on behalf of a third party funder) regarding a request for a special foundation design. The request was denied based on the recommendation of the interior design professional, resulting in dissatisfaction for the consumer. This conflict is indicated by the two negative performance areas. Interior design professionals did not apply Skill and Knowledge in Procurement except for case 5, where the designer acted under a design-build contract.

This table demonstrates that for interior design professionals, their Knowledge Context would be one of a high degree of Skill and Knowledge in Assessment & Programme Development, Problem Solving, and Documentation. What is not shown in this

table is the potential range of interior design professional Skill and Knowledge. Because participants did not include interior design professionals in the full range of Design-Build Tasks, the data does not demonstrate that interior design professionals actually could have a Knowledge Application Context that is much broader. Based on the literature review and the past professional experience of the researcher, it was expected that interior design professionals would have played a greater part in Procurement and Project Management. Some of the households who undertook these activities themselves had weak performances in these areas and could have benefited from some assistance. The absence of interior design professionals in these activities amongst households who had High Need Knowledge Acquisition Contexts suggested a gap in the households' awareness of the interior design professionals' ability to provide this full range of service. This gap in awareness was confirmed as being an intervening condition to acquiring Skill and Knowledge.

As well as providing an illustration of the Knowledge Application Contexts for the four groups, this table also demonstrates how differences in Knowledge Acquisition Contexts were related to the application of Skill and Knowledge. Those with Low Need Knowledge Acquisition Contexts demonstrated relatively High Skill and Knowledge in the implementation of Design-Build Tasks. Those with High Need Knowledge Acquisition Contexts had less personal involvement and competence in the implementation of Design-Build Tasks.

5.2.4 INTERVENING CONDITIONS

There were three principle intervening conditions that facilitated Consumer Strategies to acquire Skill and Knowledge. These conditions included Awareness, Financial

Resources, and Human Resources. These conditions are discussed in more detail in the following sections.

5.2.4.1 INTERVENING CONDITION: AWARENESS OF PRODUCTS AND SERVICES

Participants varied in their awareness of products and services that were available for modifications. The only household who clearly understood the services that interior design professionals could offer had previous contacts with the design community. The participants (3A, 3B) in this household were exceptional in terms of their knowledge and sensitivity to design issues. The following two comments illustrate their understanding and appreciation of interior design professionals.

Well architects and designers have a sense of space that is different and they know the proportions of things and dimensions ...

They (architects) are often very good in creating spaces, but you need an interior designer to be able to make the space functional and human.

When other participants were asked about what services they thought interior design professionals could offer, most responses indicated an impression that the profession could provide floor plans, CAD (computer assisted drafting) services and select finishes. Five households were shown the kinds of reference materials that are used by interior design professionals (Adaptive Environments Center, Inc. & R.S. Means Engineering, 1994; Leibrock, 1993; Lytle, Ball, Sherlock, 1991; Peterson, 1996). These references illustrated aspects of professional service that included evaluating needs, cost estimating, and millwork detailing. These participants were not aware that interior design services included these tasks as well as those of contract administration, and project management.

There were 2 participants who indicated that they believed the design community has been insensitive to the needs of people with disabilities. One participant (1) commented on the poor access of many buildings.

I see new businesses open all the time and quite often the handicap access is very poor. I think the architectural community has a long way to go.

Although this comment was directed at architects, it should be noted that the distinction between architects and interior design professionals was quite vague for most participants. The general perception was that architects were trained to address technical and structural issues, whereas interior design professionals were primarily concerned with decorating and interior finishes.

Self-funded households relied on referrals of friends, colleagues, and disability organizations to locate service providers. Several households found contractors “just by asking and talking to people” (1). The households who had long-term disabilities were aware of support agencies, the services of ProductABILITY and the Canadian Institute for Barrier Free Design as possible service providers. Two of them had used student design services provided by the Canadian Institute for Barrier Free Design in the past. There were 3 households with recent disabilities who were not actively involved with support agencies and did not know about ProductABILITY or the Canadian Institute for Barrier Free Design. One participant (1) suggested that occupational therapists were good contacts for finding contractors and designers, “occupational therapists have names of people who have done projects ...”

In cases relying on third party funding, referrals were made by an occupational therapist, insurance agencies, and a contractor. These referrals were the first introduction these households had to the idea of using interior design professionals.

Another common factor was that many of the households were constrained in their ability to learn about products and services because of the poor accessibility of many of the showrooms, retail offices, and offices. One participant (6A) recalled how his wife had to “wait in the car ... I would run back and forth showing her what we (himself and the designer) came up with.”

5.2.4.2 INTERVENING CONDITION: FINANCIAL RESOURCES

Having adequate financial resources was an important factor in both setting priorities and enabling households to procure services to assist with Modifying. Budget constraints were considered when procuring knowledge services for 2 households (3,4). One participant (4) indicated that cost was a barrier to retaining the services of design professionals available from ProductABILITY.

I wasn't sure if I would have to pay a fee to have somebody help us with that kind of stuff and if we did, then that's another thing to add to the cost that was starting to add up higher and higher and higher. So by that point we were just sort of scrambling trying to do as much as we could by ourselves.

A participant (7) who might have been constrained from obtaining design services because of cost, was considering building a new home and had inquired about fees for drafting services. The fees were definitely a concern in this case. An estimate of \$1,600 had been received from a technician experienced in preparing working drawings for accessible housing. This estimate was for preparing a complete set of working drawings for

a 1,600 square foot house with a total budget of approximately \$150,000- \$160,000 including lot and landscaping. I contacted several drafting services advertised in the 1999 Manitoba Telephone System Yellow Pages™ directory and determined that the industry standard at the time of this study was approximately \$1.50 per square foot yielding a cost of about \$2,400. This participant was hoping to have the drawings prepared for about \$400 – \$500. This budget was obviously not going to be adequate to acquire the required Skill and Knowledge from others.

5.2.4.3 INTERVENING CONDITION: HUMAN RESOURCES

Human resources, were also important factors in determining whether assistance was needed. This refers to the ability of the individual, family, or friends to direct attention towards the modification process. The ability to do so was affected by the stress arising from the causal event, general health, other commitments such as work, and physical or intellectual capacity.

If the person with the disability was a young child or had severe disabilities, they relied on the willingness of others to take on the responsibility of making modifications. Even in situations where the person with the disability was able to assume much of the work, they relied on friends and family to assist with transportation and provide emotional support. This participant (7) describes the reliance on a friend to provide support before viewing the completed modifications for the first time.

I could not visualize, and when it was done, my friend was with me, and I said 'you're going to have to go in' ... So my friend went in first, and just looked all through and said "No, I think it's really going to be OK and look nice..."

Visiting the showrooms of suppliers created problems for participants who used a wheelchair. Many of these outlets had limited accessibility, creating a situation where participants with disabilities relied on others to assist with gaining access to these facilities.

The stamina of individuals taking on the responsibility for modifications was also important. The modifying process demanded an expenditure of both physical and emotional energy as described by this participant (7) who was very independent and undertook much of the work and responsibility, resulting in high levels of stress and fatigue.

I was not physically and emotionally ready at that point ... one week there was rugs and floors; another week we designed the kitchen; the next week we picked out the lamps and everything; the next week we had to go and do appliances, and it was 12 transfers that day.

5.2.5. ACTION INTERACTION STRATEGIES

There were two groups of action/interaction strategies: those used to acquire Skill and Knowledge (Consumer Strategies), and those used to apply Skill and Knowledge (Design-Build Tasks).

5.2.5.1 ACTION/INTERACTION STRATEGY: CONSUMER STRATEGIES

Households used a range of Consumer Strategies to acquire the skills and knowledge needed for the Design-Build Tasks. These Consumer Strategies included a reliance on existing skills and knowledge (Independent Consumer Strategies), collaboration (Collaborative Consumer Strategies), or dependence on others (Dependent Consumer Strategies). Households collaborated or depended upon peer advisors, occupational thera-

pists, physiotherapists, contractors, interior design professionals, and other design professionals (architect, landscape architect, engineer, architectural technicians).

There were a number of factors that were associated with the choice of consumer strategies as illustrated in Table 3 Consumer Strategies. This table shows that using the services of an interior design professional was associated with a High Need Knowledge Acquisition Context for design Skill and Knowledge and a high awareness of their services. The tendency to relate to interior design professionals using Collaboration was associated with the intervening condition of High Human Resources. Dependent Strategies were associated with the intervening conditions of Low Human Resources and High Financial Resources. Conversely, Low Knowledge Acquisition contexts were associated with Independent Consumer Strategies where interior design professionals were not used. The following provides a description of each of the ways participants related to service providers.

(a) Independent Consumer Strategies

Households using Independent Consumer Strategies relied on their own experience and knowledge to give direction to service providers. These households used the services of contractors and trades people for construction but did not retain the services of others to provide information or advice on design issues. Households using Independent Strategies provided instruction and direction to their contractor on design issues. This ability to provide direction was expressed by a participant (1) who used Independent Strategies. We told them “We just don’t like those doors. We want some kind of cedar door that’s not going to cost an arm and a leg,” and their carpenter was able to make them.

Households using Independent Consumer Strategies made considerable efforts to

Table 3 Knowledge Context and Consumer Strategies

No.	Tenure Of Environmental Dysfunction	Knowledge Acquisition Context			Intervening Conditions			Consumer Strategies		
		Disability	Depth	Construction	Awareness of Interior Design Professionals	Financial Resources Modifications funded by third-party	Human Resources stabilized	Interior Design Professional	Other Service Providers	Relationship
1 (a)	Long-standing	High	High	Low	Low	Yes	No	Contractor	Independent	
1 (b)	Long-standing	High	Low	Low	Low	Yes	No	Engineer Technician Contractor	Collaborative	
2	Long-standing	High	High	Low	Low	Yes	No	Contractor	Independent	
3	Long-standing	High	Low	High	High	Yes	Yes	Architect Landscape Architect Contractor	Collaborative	
4	Long-standing	High	Low	Low	Moderate	Yes	Yes (student)	Contractor	Collaborative	
5	Recent	Low	Low	Low	High	No	Yes	None	Dependent	
6	Recent	Low	Low	Low	High	?	Yes	Peer Advisor Contractor		
7	Long-standing	High	Low	Low	Low	Yes	No	Peer Advisor Contractor	Independent	
8	Recent	Low	High	Low	Low	No	No	Peer Advisor Contractor	Dependent	
9	Recent	Low	High	Low	Low	No	No	Peer Advisor Contractor	Dependent	
10	Recent	Low	Low	Low	Low	Yes	Yes	Contractor	Dependent	

get information related to their disability, accessibility, products, and services available.

These participants actively sought referrals from friends and associates as well as from agencies involved in their care. In addition to this, they gathered information by using resources such as the Internet, print material, and disability organizations.

(b) Collaborative Consumer Strategies

Households who used Collaborative Consumer Strategies worked closely with their service providers, sharing information and ideas. One participant (3A) described how consultations with the contractor and designer were a positive experience:

Oh Yes, weekly (meeting with contractor and designer). Days sometimes to make changes. It was very much an on-going process in which we were all involved. As I said, perhaps my husband more so, but we were all involved in it. We had a lot of meetings and discussions. We were very much a part of the process. It was fun, it was fabulous you know. It was exciting watching it grow.

When using Collaborative Consumer Strategies, households tended to select their service providers based on their impressions that the providers would work in a collaborative way. These households wanted to work with service providers who listened and appeared to respect their ideas and needs. When searching for a contractor to build their cottage, Participant 1 recalled the cooperative approach one developer had when approached:

... this fellow came along and said "what do you want?" I mean he actually listened to us and listened to what we wanted ... he really

was the only one who listened to our needs. That's the main reason we chose him.

It was this cooperative attitude that impressed this household and convinced them to select that particular contractor.

(c) Dependent Consumer Strategies

Households who used Dependent Consumer Strategies tended to make limited attempts at seeking information. They were very reliant on the advice and referrals offered by others, as described in this passage from a participant whose husband had suffered a traumatic injury.

Well first of all we didn't have a clue. He was still in the hospital when we bought the place, and we didn't have any idea of what would be necessary for it. So we had left that to the contractor.

In some situations, households were offered advice that they were not comfortable with accepting. Households with Independent or Collaborative Consumer Strategies balanced their own opinions against those of others and came to their own conclusions. In some instances, households with Dependent Strategies went along with the advice of others despite their own misgivings. The consequences of this dependent approach were a function of the skills of those providing the advice. If the service provider gave sound advice, the outcomes were satisfactory. However, if the service providers lacked skill or knowledge, there were often negative consequences. One participant (8B) whose project went seriously off course described misgivings about the advice provided by a peer advisor.

...he said "Well, let them finish it and try it for awhile and it will grow on you." So, what are you going to do? You know, you're getting the advice of somebody that's been in a chair for eons. So we just said "OK fine, go ahead." So they went ahead and did (it) this way.

Participants using Dependent Consumer Strategies relied on referrals from agencies when selecting service providers. They tended not to seek proposals or interview service providers before hiring them, but trusted the advice of their referring agency.

5.2.5.2 ACTION/INTERACTION STRATEGY: DESIGN-BUILD TASKS

A sequence of actions formed the course of the modifying process. These actions were Design-Build Tasks that included Assessment and Programme Development, Problem Solving, Documentation, Procurement, and Construction. For convenience, unless indicated, references to Design-Build Tasks in this report do not include Construction because this task would normally be outside of the Skill and Knowledge domain of interior design professionals. These actions were held together by an over-arching strategy of Project Management. It should be noted that Design-Build Tasks were not clearly articulated by the participants, but were derived from elements identified in design methods theory, professional practice, and participant reports. Design-Build Tasks were also inferred from problems created when components of this strategy were missed.

There was some variation in the order Design-Build Tasks were undertaken. The placement of Procurement was particularly flexible, and was closely associated with the perceptions households had of their ability to undertake various stages of the process. Households acted to procure services from others when they perceived that they lacked the skills or knowledge to proceed further in the process. These service providers were

brought in at the very beginning of the process if households perceived their skills were very low. Alternately, when households were confident in their abilities, they delayed obtaining services until the construction phase.

As well as variations in the ordering of these phases, there was a range in the degree to which all of them were included. Not all of the phases were included in every case. In some situations, omissions had implications for subsequent phases and the eventual outcome of the modifying process.

The following description defines the Design-Build Tasks in theoretical terms. In reality, the Design-Build Tasks were applied with varying degrees of competence. The way in which these Design-Build Tasks were applied and their consequences is described in more detail under section 5.2.6.2 Actual Outcomes.

(a) Assessment and Programme Development:

This phase included the assessment of special functional requirements for the household, the conditions of the physical environment, and the available resources. The priorities were identified and incorporated into the information gathered in the assessment in order to determine the objectives for the modifications.

(b) Problem Solving:

During Problem Solving information about the modifying objectives, existing conditions, products, and building technology was synthesized and incorporated into possible solutions. Successful Problem Solving provided solutions that used appropriate materials assembled in the most effective manner to meet the functional and aesthetic requirements of the programme objectives.

(c) Documentation:

Documentation enabled the communication of information amongst all of the players involved in the modifying process. Good communication ensured that issues were correctly identified, appropriate solutions were developed, and that solutions were correctly implemented. Preparing written documents such as specifications, drawings, and contracts facilitated clear communication of many pieces of information and complex ideas.

(e) Procurement:

The required products and services were procured after the desired ones were identified, and acceptable prices and conditions were negotiated. After reaching an agreement on price and terms, contracts were made, either formally or informally. If this contract extended over a period of time, it required a phase of contract administration. During contract administration, the delivery of the products (or services) was monitored and payments were made at the appropriate times.

(f) Construction:

The material production of proposed solutions constituted the Construction phase of Design-Build Tasks. During Construction, the correct materials were assembled as indicated by the design drawings and specifications, industry standards, or verbal instructions. This task required a considerable degree of craftsmanship in order to ensure that all of the elements of the built form were accurately placed, securely attached, and were aesthetically pleasing.

(g) Project Management:

All of these phases in the Design-Build Tasks were organized through Project Management. Project Management used information to anticipate future events in order to create conditions that maximized the efficiency of the modifying process. The primary

tasks of Project Management included scheduling, budget planning, monitoring, and conflict resolution.

5.2.6 CONSEQUENCES: OUTCOMES

The consequences of the action/interaction strategies yielded Actual Outcomes for the modification process. Intended Outcomes were defined by the participants in the very early stages of the process, when they set their priorities. The success of the Actual Outcomes was evaluated according to the degree to which households reported that their Intended Outcomes were met without creating unnecessary personal experiences of stress and fatigue. Intended and Actual Outcomes are described in more detail in the following sections.

5.2.6.1 INTENDED OUTCOMES

Participants had certain objectives or Intended Outcomes when they started their modifications. These Intended Outcomes were defined by the priorities set by the participants. These Intended Outcomes included functional performance, cost, appearance, and resale value. Two other outcomes, maintenance and safety, that the researcher had expected to be important were not indicated as being a priority by most of the participants.

Functional Performance

The top priority amongst all of the participants was functional performance. It was essential that the modifications improved the capacity of the household to maintain a relatively independent and normal lifestyle by enabling individuals to function effectively in the home environment. The following quotation summarizes the priorities of one participant (7), and is a fair representation of the other households, "...function was the first thing, then once I got the function, what I had to have, then on the basis of cost, I chose the aesthetics and that kind of thing."

Budget

The importance of keeping costs within the budget was strongest amongst households who received no third party funding. Of the 6 households receiving third party funding, only 2 considered budget as a priority. One of these households was trying to meet the needs of a young adult family member still living at home but almost of age to establish independence. This household decided to keep the costs down because the terms of the insurance settlement provided for a limited lifetime budget for modifications. This household wanted to leave more money available to use when the young person eventually leaves home. The other household with third party funding had incurred the injury 2 years before modifying. This participant used an independent strategy and worked diligently at getting value for the money awarded in the insurance settlement. The 3 participants who made no mention of budget as a priority received funding from a third party.

Appearance

Many of the participants wanted their home to have an acceptable, normal appearance. The participants wanted the modifications to be integrated with the appearance of the rest of the home without having an institutionalized appearance. One participant (4) described the frustration of trying to find contractors who were sensitive to this issue.

Their mindset wasn't on a homey accessible bathroom. Their mindset was on an institutional bathroom. You could tell from talking to them that what they wanted to do was going to be very plain, very stark, very typically institutional bathroom, which is not what we wanted at all.

Participants were interested in aesthetic qualities in terms of their perceptions of what was attractive. For example, the following comment was made by a participant (3A) who focused on aesthetics at a very sophisticated level:

We wanted light, ... and we wanted it cleaner. Like a lot of Winnipeg architecture is quite cluttered and quite built inward, I think because of warmth almost as if you are building against the prairies.

Other households had less sophisticated opinions about aesthetics, generally stating that they wanted modifications that fit in with the rest of their home.

Some participants incurred additional expenses in order to ensure that the appearance of their home was acceptable. It was perceived that this investment was worthwhile because of the benefits derived from having an attractive environment. For example, one participant (4), who experienced significant cost over-runs, made the following comment:

We probably went beyond what we should have. But mostly, it was because we felt this is our home. (Our child) is going to be with us for a long time. We want to make sure this is nice -- for all of us.

Resale Value

There were 2 households who were concerned about the prospect of resale value and placed a high priority on a socially acceptable appearance. This concern is expressed in the following quotation of a participant (4) for whom resale was a priority.

...It was always in the back of my mind, I was really concerned about eliminating a bathtub and making this house "different" I

didn't want it to be "different". I wanted it to be something people would like to look at and if we ever did need to sell it (the home), we might have a half-decent chance of doing so. So I think that every time we went to do something that was always in the back of my mind "Is this something that would appeal to everyone?" Just in case.

Maintenance

It is notable that none of the participants mentioned maintenance as an important priority. Despite not identifying maintenance as a priority, this was the most frequently mentioned shortcoming of the completed modifications. Of particular concern was the effect of wheelchair traffic on the flooring.

Safety

Like maintenance, safety was not identified as an important issue. In fact, only one participant volunteered any comment about safety. In several households the floor tiles in the bath area were slippery. When this was pointed out in the interviews, the replies suggested that this issue was not a factor in the selection of materials. One participant (4) who used attractive but slippery floor tiles commented, "Oh, I don't know, I guess you're right, but I really like them anyway." It was unclear if the dearth of comments on safety was indicative of a lack of concern or limited awareness of the risks.

Avoiding stress and fatigue were not specifically articulated as outcomes by the participants, but were noted as problems in their recollections of the quality of their experiences. It was possible to have satisfactory outcomes in the functional, financial, and aesthetic objectives, yet still have a negative experience of stress and fatigue. One partici-

part (4) who had no previous experience in design or construction stated that “it was stressful, it was an extremely stressful time for us, we didn’t know where to start.” The following comment made by a participant (7) who had undertaken much of the work and responsibility for modifications illustrated how stressful and fatiguing the process could be:

I was not physically and emotionally ready at that point ... one week there was rugs and floors; another week we designed the kitchen; the next week we picked out lamps and everything; the next week we had to go and do appliances, and it was 12 transfers that day.

Some participants were concerned about whether they had made appropriate decisions. This concern was expressed by a participant (4) who described the feelings experienced as modifications progressed:

When I saw walls all come down, and I saw them starting to put things back up again, I started to get scared that it wasn’t going to be big enough ... and I started to think that “oh we’re doing all this for nothing”.

While these reports of stress and fatigue were similar to what any household might incur during modifications, the consequences for individuals with disabilities was potentially more critical. Under the best of conditions, disabilities presented challenges to activities of daily living. Adding to this stress contributed to the fatigue experienced by individuals with disabilities. For some, such as those with multiple sclerosis, the additional fatigue and stress posed a threat of aggravating their conditions of disability. As one participant (2) commented, “conserving energy is important. I don’t want to relapse.”

Thus, stress and fatigue were outcomes that could have had serious negative consequences for those with disabilities, and were important concerns for the participants.

5.2.6.2 ACTUAL OUTCOMES

The Actual Outcomes were those experienced during and at the end of the modifying process and were the consequences of the action/interaction strategies. Table 4 Outcomes illustrates the relationship of Consumer Strategies and the implementation of Design-Build Task Problems to Actual Outcomes. The Outcomes section of the table refers to the degree to which the Intended Outcomes of functional performance, aesthetics, and budget were achieved. Outcomes also include the degree to which maintenance and safety issues are addressed and the stress and fatigue experienced by the households. With the exception of the column indicating Observed Performance, Outcomes were based on household reports of general satisfaction. Observed Performance outcomes were based on observations made during the home tours. A good Performance rating was given if all functional, aesthetic, maintenance, and safety issues were addressed. A fair rating was awarded if only one of these issues was adequately met. A poor rating indicated that two or more of these three issues were not resolved. Budget and Stress and Fatigue outcomes were based upon the reports of the participants.

There were only 2 households (5 and 9, indicated in the shaded rows) that achieved all of their outcome objectives. One of these households (5), relied on the services of an interior design professional with considerable experience in accessible design. The other household (9) used the services of a contractor who had previous experience as an occupational therapist. The household with the worst outcome (8), depended on a contractor and peer advisor who ultimately proved to be incapable of providing adequate design services.

Table 4 Outcomes

Design-Build Task	Outcomes				Provider of Design Skills				No.
	Stress and Fatigue	Budget	Observed Performance	Perceived Performance	Others	Contractor	Interior Design professional	Household	
Problems									
Problem Solving Documentation	Moderate	On	Fair	Good		•	•	•	1 (a)
None Reported	Moderate	On	Not observed	Good	engineer, technician	•		•	1 (b)
Problem Solving Documentation		On	Fair	Good		•	•	•	2
Zoning dispute Structural problems Project Management	High	Over	Good	Good	architect, engineer, landscape architect	•	•	•	3
Problem Solving Documentation Project Management	High	Over	Fair	Good		•	•	•	4
None	Low	On	Good	Good	occupational therapist		•		5
Problem Solving	Moderate	?	Fair	Fair	peer advisor	•	•	•	6
Problem Solving	High	On	Fair	Good	peer advisor			•	7
Problem Solving Documentation Project Management	High	Over	Not Observed	Poor	peer advisor	•			8 (a)
Problem solving			Fair	Fair		•		•	8 (b)
second attempt									
9	Low	?	Good	Good	peer advisor	•			9
Assessment Program Development (minimal documentation)	Low	?	Fair	Fair	peer advisor	•			10

When Actual Outcomes of households whose Consumer Strategies included using interior design professionals are compared with those who did not, the benefits of using interior design professionals were not clear. This was because there was only 1 case (5) in which the interior design professional had significant control over the modification. This household was also the only one where there was a relationship between those involved with the modification and occupational therapists. The presence of the occupational therapist may be a confounding factor in determining the contribution of interior design professionals. All of the other cases included other services providers, or had limited involvement of the interior design professionals. In household 3, the primary problem arose when there were conflicts with zoning authorities and with structural failures. These problems were outside of the scope of the responsibility of the interior design professional. In household 4, interior design students were engaged only at the conceptual design stages, with the remaining design responsibilities undertaken by the household and the contractor. In household 6, there was a significant dispute involving an interior design professional regarding the basement design. There was also an error in the working drawings related to the clearance dimensions required for equipment. The design for the interior cabinetry and interior finishes was undertaken by others.

Participants had mixed opinions when asked about the potential of interior design professionals to facilitate the Design-Build Tasks. Participants who had used independent strategies were of the opinion that people with little experience with their disability, design, and construction could use some assistance. One participant (1) believed that “there is a place for interior designers ... or an expert on layout in terms of washroom facilities and so on. Sometimes its only a few inches, or having a door open out instead of in.” Despite having a few small problems with managing their own modification, several par-

participants made comments such as this by participant 2 that they "... wouldn't have done things much differently..."

Other participants who had used interior design professionals generally had positive impressions of the assistance they received. These participants shared the impression that interior design professionals should not impose their ideas, but help guide households in making decisions. One participant (3B) expressed the prevalent attitude in this group that:

... the idea of laying it all out for people is not always the answer
... this is where the design role comes in .. to say "I'm here to help you organize all of these (ideas) and it's all out there for you."
You can start to have that show room so you can see " oh yeah, I never thought of that" or "this is good" and all that. The designer is the person there to help piece it together ...

One household (8) had a High Need to acquire design Skill and Knowledge, and who used a Consumer Strategy of depending on a peer advisor and contractor. In this situation, the service providers were not able to provide adequate service. When members of this household were shown examples of reference materials interior design professionals use (Adaptive Environments Center, Inc. and R.S. Means Engineering, 1994; Leibrock, 1993; Peterson, 1996), they stated that, "If we'd have had someone like yourself (an interior design professional) to come out and say to us, well look, now this might work better, and show how it would work better, it would have helped." From this statement, it would appear that they believed they would have benefited from the assistance of an interior design professional.

It should be noted however, that two participants (4,7) were considering future projects and were not interested in acquiring assistance from others, except as required for

technical skills in drafting construction drawings and providing structural design. This lack of interest was present despite the problems they had experienced without professional design services on their first projects. These participants were not convinced that design professionals could offer services beyond the aforementioned technical services that would be worth the cost.

Although it was not clear whether the services interior design professionals provided were critical to the modifications, Table 4 does show that the tasks in which they typically receive training were important. When comparing the Design-Build Task Problems column with Outcomes, there is a correlation between poor task performance and unsatisfactory outcomes. This next section explains in more detail how the implementation of each of the actions in the Design-Build Tasks affected the Actual Outcomes. The Design-Build Task Problems in Table 4 were derived from reports of how the process of making the modifications proceeded, and indicate instances where Design –Build Tasks either were absent or poorly executed.

(a) Assessment and Programme Development

Important objectives and priorities were established by identifying the precise nature of a person's ability to operate in the physical environment. The following comment from a participant (7) who had a narrow range of comfortably making transfers described the importance of ensuring that modifications were tailored to accommodate the participant's particular needs:

... details are important... and so one inch is like a foot. An inch is impossible. It can make or break the transfer or the turn. That is how fine a line you're doing when you do this.

Ideally, this information was obtained from the individual with the disability. Yet providing this information was a problem for households that were new to their situation and were not able to determine their abilities or requirements. Providing information was particularly problematic when individuals were under care in institutions designed to accommodate disabilities and staffed with people to provide assistance. This was the situation described by one participant (8A) who had limited knowledge about accessibility immediately after her husband's hospital discharge:

... they don't have you in chairs in the hospitals. You get off the bed, onto the gurney. They wheel you in and shower you in this gurney, and then they bring you back in one. It's totally different there.

In order to compensate for this lack of experience with their disability, participants with traumatic injuries were referred to peer advisors from agencies such as the Canadian Paraplegic Society. These peer advisors were intended to provide some insight into what would be required for modifications. Participants reported mixed reviews on this type of support. Out of 4 households who used peer advisors, 2 (6, 9) were satisfied with the support they had received, while 1 other household (7) believed the advice regarding their modifications was too general. The remaining household (8) had a very negative experience with a peer advisor who did not appear to understand how to accommodate different types of disabilities in a variety of physical environments. These negative comments were focused on the limited ability of the peer advisors to provide practical design options. However, the participants found the peer advisors to be of some benefit in terms of enabling them to understand what types of modifications they required.

Households that had experience with their disability were competent in determining their own needs without assistance from others. A participant (3B) with a long-standing disability described the advantage of drawing on experience instead of relying on advice from others:

... people come from experience and they may not have the experience that is necessary for your particular needs. I think you also have to be well aware of what you're trying to get out of it as well.

Some participants delegated the responsibility of designing the modifications to others, relying on the service provider to identify the specific requirements of their disability. If the service provider did not ensure that assessments of functional abilities were considered in Programme Development, the Outcomes were compromised. For example, the contractor for household 10 developed design solutions that were ineffective because the household was not consulted in detail about their specific requirements. In this case, the contractor appeared to have relied on guidelines such as the National Building Code Barrier-Free Design section and had not consulted with the participants about their specific needs. The contractor missed identifying a requirement for the toilet transfer to be on a particular side because of the nature of the participant's disability. Because of this oversight, the modification was inappropriate because it did not accommodate the individual's particular disability, despite the excellent quality of construction and meeting National Building Code standards for accessible washrooms. Consequently, this one oversight limited the capacity of the participant to use the environment independently.

Another Programme Development issue that emerged was the need to determine the aspirations and preferences of the households. For example, 2 households (5 and 6) had used the same design professional with considerable experience in accessible design.

In both situations the designer made suggestions about finishes and products that made sense from the perspective of accessibility and safety. However, both of these households had aesthetic values that conflicted with the designer's proposals and preferred products with a more residential character than those proposed by the design professional. In these situations, the designer was able to respect the household's opinions, and alternative solutions were found.

Households also had a range of goals or desired futures in terms of accessibility that needed to be identified. Not all participants desired access throughout their dwelling. Some were willing to accept changes in activity. For example, a participant (6B) recalled the decision not to use adjustable height cupboards in the kitchen because responsibilities for food preparation were assumed by other members of the household, "the cupboards in the kitchen ... just because I wouldn't be the one making the use of them, so that wasn't of real interest." This household was unhappy that the third party funder would pay for this feature because it was specifically intended to accommodate a disability, yet they would not fund a special foundation design that was not so clearly related to accessibility. For this household, the additional warmth on the lower floor that they hoped to achieve with the foundation design was important to both their lifestyle and the difficulty participant (6A) had in maintaining her body temperature. Had the funding policies been more sensitive to individual preferences, this household's requirements may have been accommodated.

Determining what financial resources were available was an important factor in determining what options could be considered in the modifications. It was interesting to note however, that 3 of the households who received third party funding did not have a clear idea of their budget. The participants receiving third party funding were not able to articulate how budgets were determined and what items could be covered under their in-

insurance plan. For example, one household (8) who required wheelchair accessibility had an existing carpet with a high pile. This of course, should have been replaced. However, because they were not clear on what work could be included in their modifications, they did not ask to have the carpet replaced. Consequently, they have had to endure the limitations of a carpet that is difficult to maintain and manage with a wheelchair.

Amongst those households who were self-funded, there was a better awareness of budget limitations. However, even in this group, one of the households (4) had not set a firm budget at the start of the project, and mid-way through the process, found costs were becoming higher than they had expected. The participant suggested that setting a firm budget early in the process would have been very helpful

It was also important to determine what resources, such as attendant care, would be available when modifications were completed. For example, in household 5, the individual was dependent upon paid attendant care during the day but was alone at night. This person required automated controls for devices such as blinds and security systems. Another person (6B) with similar disabilities, but who lived with a family, found the aesthetic and cost disadvantages of automated controls were greater than the disadvantage of requiring the occasional assistance of a family member in opening the blinds.

“It’s just that every window that you had a curtain on, you had to have a plug ... Who needs that? The whole point, like I say, was to be away from the disability accessible house.”

Identifying the particular requirements for the modifications required a high degree of self-awareness on the part of the households. Service providers needed good interviewing skills and a sufficient awareness of the context to understand what information was critical. When critical information about the household’s lifestyle and nature of the

disability were not identified, problems arose in the subsequent phases of the modifying process.

(b) Problem Solving

Competence in Problem Solving varied considerably amongst the participants and their service providers. These variations were based in two Problem Solving domains: cognitive style and technical knowledge.

Cognitive Style

The effectiveness of Problem Solving was limited by the type of cognitive style used. There were concrete and abstract problem solvers. Concrete problem solvers relied on developing solutions on site and through trial and error. This reliance on manipulating concrete materials to develop solutions made it more difficult to plan and anticipate problems before they arose. For example, in the following situation, the participant (8A) described how a contractor relied on using a coat hanger to determine where a closet door should go:

I measured it out and I said, "this is how big I want the closet."

Well they took a hanger and put a hanger in there, and they started cutting the doorway for the outside, which gave the closet just enough room to hang a hanger, but not enough room for the clothes. They (the clothes) keep being caught in the door.

Another participant (4) described how the selection of a sink was addressed only after the cabinet-maker was able to complete the vanity.

We couldn't tell until we had the vanity put in. He actually had that vanity custom made. We didn't know what kind of sink we could choose until we had everything, all the measurements and

everything all figured out. Once we got all that figured out, we didn't have a choice of a sink because it's extra small. So we had to buy a space saver sink, which is more expensive. And then when we went to find a faucet, because it's a different style of sink. It was hard to find a faucet with a neck long enough ... so those things added up.

An interesting variation in using concrete problem solving that had positive results was the case of a participant who lived in transitional housing designed to accommodate disabilities. This participant (7) described using this housing as a concrete model to work out solutions, bringing a reasonable level of planning and design ability to the situation.

... we had a basic outline, (and) then I came home with it. I kept going through it, and thinking "OK if I'm sitting here at the wall oven, how will this work, which way should it open? Which way should the wall oven be? On that side? And the microwave there"? I just kept going through it in my head, and I put everything everywhere, in my head, rearranged the kitchen sink in my head ... and it always came back to being best in a certain place.

When abstract problem solving methods were used, it was possible to evaluate the effectiveness of the proposed solutions and make adjustments before construction. This methodology required some skill in communicating ideas, typically using schematic drawings. Two of the design professionals used abstract problem solving methods, developing solutions well in advance of construction. Interviews that related to the third designer did not provide sufficient detail to comment on the problem solving methods that

were used. Two of the more competent contractors also were able to sketch out their proposed ideas and resolve problems before construction.

Technical Knowledge

In addition to understanding the salient issues of particular needs, the Problem Solving phase required skills in resolving the technical problems of selecting the appropriate materials, planning, and detailing appropriate assemblies. This aspect of problem solving was most problematic for participants and service providers not experienced in design or construction.

The materials selected were often inappropriate for their intended purpose and assembly. Problems of safety and maintenance were particularly evident in the bath areas, where slippery floor materials were selected in all but 2 cases. Finishing materials were usually selected by participants to meet their aesthetic needs. Indeed, participants enjoyed this part of the modification process. However, participants demonstrated a general lack of awareness of the characteristics of basic building products in relation to function, maintenance, durability, and safety. Several contractors were not aware of the importance of durable finishes in situations where wheelchairs would be used. This was illustrated by one participant (4) who had many years of experience with a wheelchair in the home and understood the problems they created:

We asked for it (the cupboard) to be covered. He (the carpenter) was just going to do Melamine cupboards, and we said, "no because you bonk it with the wheelchair and you take chunks out of it, then you're in trouble" If we cover them (with high density plastic laminate) at least they're protected.

The design professionals were knowledgeable about products that would be suitable for these projects. They were able to suggest products that the participants had not known about, such as slip resistant flooring, corner guards, moveable cupboards, and computerized home system managers. While participants did not opt to use all of these products, they appreciated being informed about the options, as noted by one participant (6), "All in all, the suggestions were very good. We chose not to go with a lot of them, that's all."

As well as selecting suitable materials, it was important that their assembly was appropriate. Developing suitable plans and details proved to be the most difficult aspect of Problem Solving. One example involved a group of students from the Department of Interior Design with the Faculty of Architecture at the University of Manitoba who assisted household 4. The plan the students developed failed to take into account the location of the plumbing stacks, which discouraged several contractors from providing quotations. The following account describes how the successful contractor was able to resolve the problem:

I know why (there were problems with a student design), because the standing pipe for the sewer out of the small bathroom ended up being right in the middle of the door. We had a number of general contractors come and say "we can't do it, we can't use the design, it's useless because there's no way that we could move it." It was the exhaust for the sewer. So the fellow came and said, "well ... let's go downstairs." We went downstairs and looked at what he could possibly do to get an "L" in to get it moved in enough to get it out of the middle of the doorway. It's right smack in the middle of the door, right in front of the shower and the entrance ... he

was the one who figured out how to do it, so that's why we hired him.

However, the solution required additional expenses. It was not clear if a more effective solution that did not require the reconfiguration of the plumbing stack could have been developed.

In another situation (8), a peer advisor and the contractor appeared not to understand design or construction. They recommended a bathroom layout that was unfeasible. It appeared that neither the contractor nor the advisor could resolve how to reduce the depth of the floor joists in order to accommodate the drain for a roll-in shower. Another important issue was their failure to include structural reinforcement to accommodate a lift into the bathtub. A special bathtub had been purchased but the participant had never been in it because of this omission. The participant (8B) stated that, "if it had been planned right, I would have put them (structural supports) in at the time." As well as limiting the household's ability to use the environment, these unresolved technical problems resulted in much stress and conflict as demonstrated in the following excerpt about the difficulties surrounding the construction of a closet:

so then he finally huffed and puffed and he turned around and said "well, we've already cut the doorway there." And I said, "well fix it." (then he said) "Well what are we supposed to do?" I said "Well you're the contractor, you figure it out!" So rather than using stucco, they asked us if we minded using wood siding.

In contrast, a different peer advisor who had been in the construction industry before acquiring a disability, provided useful design advice for 2 households. Experience in

construction supplemented this peer advisor's experience and knowledge about disabilities.

With one exception, design professionals appeared to have adequate knowledge of building systems and technology. In the exceptional situation (6), the interior design professional was asked by the funding agency to provide an opinion on heating systems and foundations, areas of building technology that are normally out of the range of expertise for the profession. The participants believed that because of the designer's recommendation, the third party funder was unwilling to pay for the additional feature. In the opinion of the participants, this decision has proven to be a mistake, and they bear some resentment about this. A delay in the construction was also created when the interior design professional noted a concern that the house plans would not fit the lot, requiring additional survey work. As it turned out,

It was tight, within a few inches at one point, but it fit with all the setbacks that the city required and (the designer) had to send another letter to (the third party funder) which apologized and explained (the designer) wasn't an expert on all of this.

The accuracy of these reports was not verified, but they did point to the risks the professional assumed in terms of providing advice in areas outside of his/her area of expertise.

(c) Documentation

There was a wide range to the extent of documentation used to prepare for these projects. With the exception of 1 case, contractors working on projects with third party funding provided plans with their proposals. Only 2 of the 6 privately funded projects included working drawings. The rest of the projects were based on sketches suggesting a

general plan and verbal instructions. The 4 cases (1, 3, 5, 6) that included both specifications and working drawings (including elevations and details) used design professionals. In household 6, an error was made in the working drawings prepared by an interior design professional that required some alterations to previous work. The error was made because the equipment supplier provided the designer with incorrect information. The participant (6) was not sure if the additional cost was assumed by the equipment supplier, the design professional, or the household. In 4 households (1, 2, 4, 8), contractors and participants failed to adequately document the proposed work, resulting in disagreements about the quality of work and cost.

Misunderstandings about the quality of materials that were included in original verbal quotations created cost over-runs or disagreements because the original quotations were based on assumptions and could not be verified without documentation. The disputes created stress and occasionally additional expense for the households. Households that were firm in their negotiations with contractors expected their contractors to assume additional expenses arising from these disputes. One participant (1) had the contractor proceed with the work based on general instructions and cost estimates. While this strategy may have worked in his favour, the contractor may not have been as content. Had this participant been less confident, and the contractor more assertive, there may have been many opportunities for the contractor to request extra payment:

We weren't sort of nickel and diming it. We weren't saying, "How much is this? How much is that?" for every little thing. It was kind of just a ballpark figure, and I just said, "do all of this stuff for that price, even if it takes you an extra two or three days longer than you thought it would. Well, that's your problem. Just keep going until the job is done." I know he was way off in his estimation of

time with this thing. We thought he would be in and out of there in a couple of weeks. It was two months.

Another role of documentation was communicating proposed design solutions to all stakeholders. In 2 cases (3 and 5), households ran into difficulties when the proposed designs for their modifications were nonconforming to the existing standards of their communities. One participant spent considerable time and money defending the proposed plans from a neighbour's complaint filed with the City of Winnipeg planning department. This participant (3A) relied, in part, on the credibility of design professionals and the evidence of their drawings to convince the authorities that the proposed plans would not have a negative impact on the neighborhood.

We could prove to them that we were trying to do the best job. I mean, they (the complainants) kept saying a ramp would be ugly, that a deck would be ugly, that we would ruin the park-like atmosphere of the place. I said we were making it more beautiful, you know, that by having an architect, we were attempting to integrate our structure into the space. That's what an architect or a designer can do for you.

In the other case (5), the interior design professional, the participant, and the occupational therapist made a presentation to a condominium board in order to facilitate approval of a proposed deck development. The participant described the value of this professional service in this following comment.

So our designer came with myself and the therapist (OT) to the Condo board to help us out with them. We had all of the specifications and drawings, and (the designer) pleaded our case.

In the above situations, the credibility of design professionals and the availability of documentation appeared to reassure the regulatory bodies that the proposed designs were sensitive to community concerns.

(d) Procurement of Products and Services

Contractual arrangements and negotiations for procuring products and services ranged from verbal agreements to tendering procedures. Participants who were self-funded were responsible for their own contractual arrangements. None of these participants included detailed specifications and working drawings in tendering prices from contractors. Prices were negotiated based on sketched plans supplemented by general descriptions of work to be included and general descriptions of materials. As discussed under Documentation, this occasionally led to misunderstandings as the work progressed.

When contracts extended over a period of time, there was a need for contract administration. The progress of work needed to be monitored and payments made in stages to ensure satisfactory completion of the work. It was also necessary to ensure that sub-trades and suppliers had been paid. One of these participants (4) reported having difficulty in having the contractor return to complete deficiencies.

... I would definitely holdback a decent sum of money at the end for a little while, because we did find some things after they were finished that we were really unhappy with ... I would definitely do that differently next time.

Another participant (7) also had difficulty in properly administering the payments of contracts. This participant experienced the problems that can arise when subcontractors are not paid.

I found that there was lots of stuff they wouldn't come back for after. He used my ignorance about not knowing about certain things. Stuff wasn't fixed under warranty because ... they (the general contractor) wasn't paying their bills. The subcontractors wouldn't come back anymore to fix things, because they never were paid.

Several other participants were unaware of the risks that they assumed once the general contractor was paid. They were unaware of the potential to have their property lien-ed by unpaid subcontractors, as mentioned by this participant (4), "when we were doing this, I did not realize that we could have been held responsible."

The procurement of materials was generally undertaken by the contractors. The contractors were helpful in terms of finding sources of materials and products at very competitive prices. Contractors referred households to suppliers where they were able to get special discounts. In 5 cases (1,2,4,7,10), households found that these suppliers did not have enough selection and searched other sources until they found the product they wanted. One participant (4) described the effort of locating a special piece of equipment "... we searched for hours—hours and hours of searching. Literally. We went to every plumbing place there was going." Two of the self-funded participants (1,2) acted as their own general contractor and undertook the procurement of specialty items, finishes, and fixtures. Shopping around for these products was a task that took much of their time. There were 2 participants (3,9) who were satisfied with their contractor's ability to locate

products at good prices. One of these contractors worked closely with a design professional and provided much assistance in locating products. "They were good buyers. We would say what we needed and they would come up and they would find us what we wanted."

(e) Project Management

There was a wide variation in the competence of Project Management for these projects. Some projects were carefully scheduled, whereas others went from one crisis to the next. When problems emerged, inadequate Project Management was one of the important factors. Smooth progress was dependent upon tasks being completed in the proper sequence of the modifying process. Ideally, the process moved through a logical progression of Programme Development, Problem Solving, Documentation, Procurement and Construction. It was also important that the progress of the work was properly monitored to ensure that there were no errors.

In this analysis, good Project Management skills were considered present when the projects met their functional objectives, were within budget, there were no serious errors or omissions, and no undue stress. Two out of the 11 cases met these criteria. In 8 cases, modifications were adequately planned, meeting two of four items in the criteria. There were 3 cases (3,4,8) where project management was not adequate.

Case (3) appeared to lack good management, but had so many exceptional circumstances that it is difficult to determine the root of the problem. There were a number of design professionals involved, although none of them assumed the role of project manager. Zoning issues and structural failures interrupted the flow of work, causing additional expense and delays. The zoning issue arose after the household had made the decision to proceed with construction before the end of the zoning appeal period. Their

architect advised them that under normal circumstances this might have been reasonable, but that it was a calculated risk. In this case, it resulted in a stop work order until the appeal was resolved. Prior to purchasing the house, an engineer prepared a structural report finding the house structurally sound. Mid-way through construction, the contractor discovered significant structural failures that had to be resolved at a great cost. These unexpected costs had an impact on the budget available for the rest of the modifications. Securing the engineering report had been a good Project Management initiative, but in this case, failed to prevent the problems. Despite these difficulties, this household found that their contractor was reasonably competent in project management and was able to “make things happen at the appropriate time ...”

In households 4 and 8, escalating costs occurred because design decisions were made during construction. In household 4, the contractor was reasonably competent, but there was no clearly articulated plan at the outset of the process to guide the work. Estimates were based on a preliminary plan, and a general indication of finishes. Significant changes to this early proposal were made as the work progressed.

... we ended up putting more tile in than I originally thought we would. I thought we would have vinyl on the floor, but when we realized that we were going to have water coming out (of the shower), we decided that we had better have the tile on the floor as well. So it did bump the price up.

Thus, because Problem Solving was not adequately resolved before beginning construction, the household incurred unexpected additional costs. The additional costs may have been unavoidable if the household was determined to have all of the products and features that were included. However, they did not have a clear idea of the total costs

before starting the project. Had they known how much everything was going to cost at the outset, they would have had the opportunity to make some revisions to keep within their budget. Priorities could have been established and decisions made accordingly. In the end, they were pleased with the results. However, they found the effort of trying to keep costs down towards the end of the project very draining. The lack of clarity resulting from not developing design details before quoting on costs also led to conflicts with the general contractor who was trying to avoid unexpected costs.

When scheduling was not adequately managed, there were delays that created inconvenience for the households. For these households, already struggling with activities of daily living, it was a considerable hardship. One participant (4) recalled the problems created when their project was delayed:

... there were many promises made about deadlines that were missed. So we ended up putting a port-a-potty in his bedroom because I was lugging him up and down stairs, and it was getting to be too much.

The third case (8) involved a participant with a recent injury. This household did not have a designer, and at first, used very dependent control strategies. This project was, according to the participant, "unbelievable." There appeared to be little coordination and no resolution of design issues before commencing construction. Because the design was not well developed, changes were required after construction. There were frequent disputes about the quality of the materials used and workmanship. Events moved from one mistake to another, until the participant requested that the funding agency step in and remove the contractor. This case also illustrated the need for good skills in conflict resolution when problems do arise. The peer advisor, who appeared to be acting as a project manager, did not have very good skills in conflict management, leading to distress for the

household. For example, in response to the household's concerns about the unsatisfactory arrangements in the bath area, the participant recalled the peer advisor's comment, "well just try it (the ramp in front of the vanity) for awhile. You'll get use to it with that incline." This comment was very upsetting to the participant who, "left (the meeting) in tears."

There was one case (5) where a design professional provided a complete package of services including design, construction, project management, and administration. This participant reported very satisfactory results and was pleased with the designer's ability to plan and manage the entire project on their behalf. Participant (5A) stated that this interior design professional "basically took control and dealt with her (5B) needs ... (this control) was very positive because we basically didn't know where to start."

Monitoring the work to mitigate the problems created through error was very critical. There were several recollections of participants taking active roles in supervising the work and avoiding problems. In order to supervise the progress on a new cottage, one participant (1) made weekly trips to the lake and would then contact the contractor saying, "I've got fourteen things here I want to draw to your attention.... this is too high, you forgot to do this." Another participant (4) recalled how her vigilant supervision avoided a near disaster with the installation of the tile:

They did something like, where they were supposed to put neutral coloured grouting, they put green grouting on the white tile and it looked like hell. So I made them take it all apart and do it over again. So it was more of me picking on them. They wanted to leave those kinds of things, and I just wouldn't accept it.

As illustrated in the previous examples, it was difficult to isolate Project Management from the other Design-Build Tasks. Project Management was the over arching strategy that coordinated all of the other actions. This management task was usually shared informally by the households and contractors. With the exception of household 5, Project Management was not formally delegated to any particular individual. This lack of delegation could be why there were occasions when details were missed, such as when the contractor installed the toilet on the wrong side for household 10. The occupational therapist knew what would be required, but there was no link between the occupational therapist and the contractor other than the case manager for the funding agency. In households with third party funding, the data were not clear on what role the case managers were expected to assume. There were situations where they intervened when the projects were experiencing some difficulties, such as happened for household 8. However, this intervention only happened after difficulties occurred. The case managers appeared to play more of a role in linking the participants with appropriate support than direct Project Management of the modifications. Consequently, the participants were reliant on their own management skills or those of their service providers. For those households with private funding, they assume the task of Project Management themselves. While some of these households had responsibility success in managing their own projects, they did experience the stress and fatigue of assuming this responsibility

5.3 THE ANALYTIC STORY:

The analysis of the participants' stories yielded concepts that addressed the study objectives. The following analytic story explains how these concepts were integrated as components of modifying homes to accommodate a disability. Figure 3 Modifying Paradigm illustrates the relationships between the various components of this analytic story. An important theme running throughout this story was the acquisition and application of

skills and knowledge by both the households and their service providers. The presence and application of skills and knowledge was the core variable that contributed to successful outcomes in the modifying process. In particular, successful outcomes were facilitated by skills and knowledge in the areas of disability, design and construction.

Skill and Knowledge had three principle properties: domain, degree, and competence. The domain refers to the type of Skill and Knowledge that was required. There were three principle domains of Skill and Knowledge, disability, design, and construction. The degree of Skill and Knowledge required varied from high to low. Individuals also had high or low levels of competence in the required Skill and Knowledge. Competence had the additional property of being perceived or actual. This is an important distinction, as some individuals perceived that they had greater levels of Skill and Knowledge than they in fact possessed.

As well as the core variable Skill and Knowledge, other important categories that emerged in this study were (a) Environmental Dysfunction and Modifying (the causal conditions), (b) Knowledge Acquisition Context (the households' perceived need to acquire more Skill and Knowledge), (c) Knowledge Application Context (the actual Skill and Knowledge available to service providers and households to apply to the modifying process), (d) Awareness, Financial Resources and Human Resources (the intervening conditions that modified the action/interaction strategies), (e) Consumer Strategies (the action/interaction strategies taken to acquire Skill and Knowledge), (f) Design-Build Tasks (the action/interaction strategies used to implement Modifying), and (g) Outcomes (the consequences of the action/interaction strategies in achieving functional, aesthetic, budget, maintenance, and safety requirements with a minimum of stress and fatigue). The

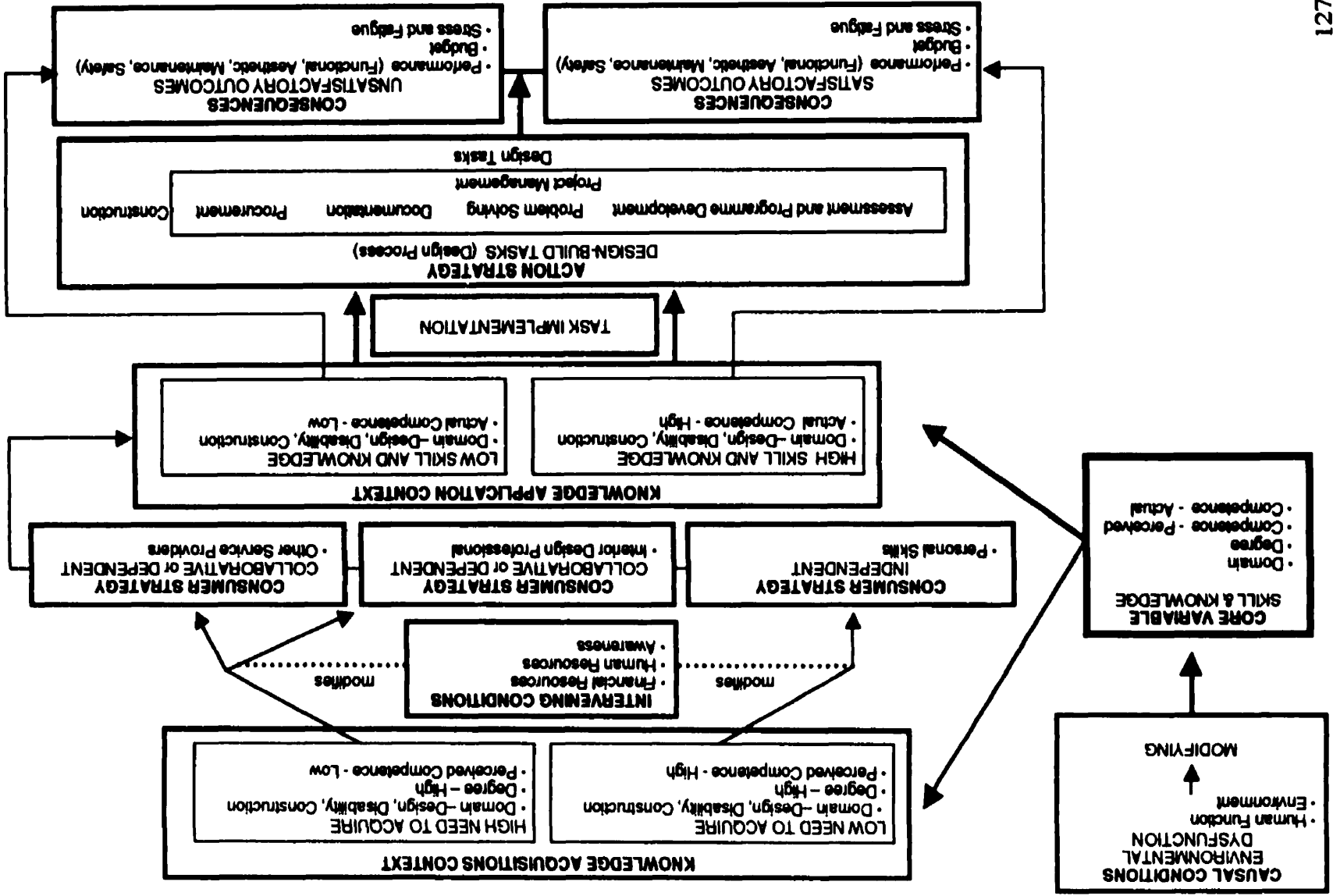


Figure 3 Modifying Process Paradigm

analytic story shows how the core variable, Skill and Knowledge, was integrated with these other categories in the Modifying Paradigm.

The causal conditions that led to the need for Skill and Knowledge in Design-Build Tasks were Environmental Dysfunction and Modifying. Changes in an individual's functional abilities created the conditions leading to the need to make modifications. These changes reduced the individual's ability to function in his or her physical environment, creating a condition of Environmental Dysfunction. The two principal conditions creating Environmental Dysfunction were human function, and environmental conditions. Environmental Dysfunction arose when there was a discrepancy between these two conditions that limited the individual's independence. The interaction of these two conditions created the properties of Environmental Dysfunction that included tenure, origin, and severity. These properties in turn influenced the intensity of the required modifications and had an impact on the skills and knowledge required for completing the modifications successfully.

Tenure, or length of time Environmental Dysfunction had been present, was associated with the amount of experience households had with their condition, which in turn, affected the knowledge they had about their needs. Those households with long-standing disabilities had more knowledge about their Environmental Dysfunction and their modification needs than their counterparts with recent traumatic injuries.

The origin refers to the event that changed an individual's abilities to function in their environment. Environmental Dysfunction was caused by disease processes, congenital disorders, and traumatic injuries. This property was associated with the financial resources available for the modifications. When Environmental Dysfunction originated in an insurable accident, households received third party funding to assist with the cost of

the modifications. Households used personal financing from wage earnings or pension incomes if the disability arose out of a disease or congenital disorder.

The origin and tenure of Environmental Dysfunction were also associated with the emotional adjustment households had made to their situation. Those with recent traumatic injuries were in an acute phase of adjustment to their situation. These households were preoccupied with providing support to the injured person and coping with their changed circumstances and future. Under these circumstances, households were less attentive to the modifying process than those who had adjusted to their situation.

The condition of the physical environment together with the level of human functional abilities determined the severity of Environmental Dysfunction. The greater the gap between functional abilities and the environment, the more severe was Environmental Dysfunction. The severity of Environmental Dysfunction, in turn, had implications on the extent of modifications that were required. Greater restrictive conditions in the environment required more changes.

In order to reduce the degree of Environmental Dysfunction, changes were made to the physical environment. These changes were made using a process called Modifying. The properties of Environmental Dysfunction conditions determined the intensity of Modifying, that varied depending upon the pace and degree of changes required. Some environmental conditions were also more complex than others were. For example changing building structures and systems were more complex than changing finish materials. This complexity added to the difficulty in making modifications. Thus, the greater the urgency, complexity, and degree of changes required, the greater the Modifying Intensity.

Environmental Dysfunction led to a need to acquire Skill and Knowledge. The perception households had of their need to acquire Skill and Knowledge created Knowl-

edge Acquisition Contexts. Depending upon the properties of Skill and Knowledge, the two possible Knowledge Acquisition Contexts observed in this study were; (a) Low Need for Skill and Knowledge in disability, design, or construction that was associated with self-perceptions of competence in these areas; (b) High Need for Skill and Knowledge in disability, design, or construction that was associated with a lack of confidence in perceived abilities.

Perceptions of the need to acquire assistance with design were influenced by the household's confidence in their knowledge about their disability and design. The greater the confidence, the lower the perceived need. Confidence in knowledge about accommodating disabilities was associated with the tenure or experience with Environmental Dysfunction. In addition to experience with Environmental Dysfunction, households had varying degrees of experience with design and construction. Another factor that contributed to the amount of confidence households had in their abilities was the intensity of the required modifications. Thus, Modifying Intensity, Environmental Dysfunction, and existing knowledge and skills in design or construction contributed to the perceptions households had of their ability to undertake the project themselves and their perceived need to acquire skills and knowledge.

A second group of contexts, Knowledge Application, was based upon the actual Skills and Knowledge the service providers had available to apply to the Modifying Process. The service providers, who included households, peer advisors, contractors, occupational therapists, physiotherapists, and design professionals had varying degrees of competency in different domains. For example, peer advisors were very knowledgeable about the needs of individuals in order to cope with their disability. However, their Skill and Knowledge related to technical or design issues was not as great. Similarly,

design professionals were more knowledgeable about the design process than assessing disability needs.

Depending upon the Knowledge Acquisition and Knowledge Application Contexts, the action/interaction strategies used by the participants in the Modifying Process included Consumer Strategies and Design-Build Tasks. These action/interaction strategies were modified by the intervening conditions. Intervening conditions that played an important role in modifying Consumer Strategies included financial and human resources, and awareness of resources. Both financial constraints and human resources were associated with the properties of the disability. Households with traumatic injuries who received third party funding appeared to have fewer financial constraints to retaining service providers and were more likely to use the services of interior design. Recent disabilities were associated with a lack of time, energy, and focus to dedicate to the modifying process. These households were more reliant on having others assist them. Those with long-standing disabilities tended to have fewer financial resources because they did not receive funding for their modifications and their historical earning capacity was often diminished. On the other hand, households with long-standing disabilities had adjusted to their conditions, and were able to focus attention on their modifications. Households had varying degrees of awareness about the services available to assist with the modifying process. With reference to interior design professionals, most of the households considered the option of using an interior design professional only after being referred to this service by an agency. Very few households were aware of the full range of interior design professional Skill and Knowledge.

Households used a number of Consumer Strategies to acquire Skills and Knowledge needed to implement Design-Build Tasks according to their Knowledge Acquisition Context and intervening conditions. Households used Independent, Collaborative, or

Dependent Consumer Strategies to acquire and apply Skill and Knowledge. These Consumer Strategies compensated for constraints or took advantage of facilitators in the household's situation or Knowledge Acquisition Context. Households either carried out Design-Build Tasks independently or they acquired assistance from service providers. When service providers were used, households either collaborated with them or depended upon the providers' Skill and Knowledge.

The degree of need for Skills and Knowledge (Knowledge Acquisition Contexts) determined the likelihood that service providers were considered. Awareness of available resources or service providers determined what service providers were selected. The availability of financial and human resources also facilitated or constrained the decision to use a service provider. Households with limited financial resources used Independent or Collaborative Consumer Strategies to limit the involvement of paid service providers. In order to save money, these households undertook as much of the modifying process as they could themselves, using service providers for specific tasks. Consumer Strategies were also affected by the Human Resources households could direct towards the modifying process. When households were unable to attend to the modifying process, they used more Dependent Consumer Strategies to acquire Skill and Knowledge from service providers. These households relied on their service providers to undertake many aspects of the modifying process.

In a context of Low Need Knowledge Acquisition and when there was a low awareness of service providers; households acquired information and performed design-related activities independently without the assistance of a design professional. They gave direction to their contractors verbally or used simple sketches; expecting contractors to resolve the technical details.

When there was a context of High Need Knowledge Acquisitions, and there was a high awareness of the benefits of using an interior design professional, households used Collaborative or Dependent Consumer Strategies with consultants on issues related to design. Households with recent disabilities also engaged the services of peer advisors to assist them in determining their needs related to disabilities.

In situations of High Need Knowledge Acquisition and low awareness of design professionals, households used strategies that were dependent upon the tenure of the disability. In cases involving long-standing disabilities, Independent and Collaborative Consumer Strategies were used to acquire design skills from peer advisors and contractors. Households with recent disabilities depended upon peer advisors and contractors for skills and knowledge in design. Those with long-standing disabilities collaborated with peer advisors, contractors, and other service providers.

The process of Modifying was composed of a series of actions or Design-Build Tasks. Some of these tasks had been identified in the study's conceptual framework as the Design Process. The analysis of the modifying experience considered the implications how these tasks were implemented. The Design-Build Tasks included; (a) assessing needs and resources (Assessment), (b) identifying modification objectives and requirements (Programme Development), (c) developing solutions (Problem Solving), (d) preparing the necessary documents (Documentation), purchasing the required services and materials (Procurement), and implementing the proposed solutions (Construction). All of these actions were organized by an overarching Project Management. The order and competency of completing these tasks varied according to the way in which Skill and Knowledge were applied.

There was no clear pattern to the consequences of using various Consumer Strategies. In particular, it was not possible to determine the effectiveness of using interior design professionals. While the effectiveness of various Consumer Strategies was inconclusive, there was a relationship between the implementation of the Design-Build Tasks and Consequences. The success of the modifications was primarily a function of how the core variable Skill and Knowledge were applied to the Design-Build Tasks. Thus, Knowledge Application Contexts determined the likelihood that Design-Build Tasks would be successfully implemented. Interior design professionals facilitated the modifying process through their skills and knowledge in the Design-Build Tasks. However, some participants and other service providers were also competent in implementing design tasks.

Consequences were evaluated by considering how effectively the household's Modifying objectives, or Intended Outcomes, were met. The most important Intended Outcomes identified by the households were improved functional performance, a normalized appearance, and the adherence to budget limitations. Another Intended Outcome that was inferred from the reports provided by the households, was the reduction of stress and fatigue involved in achieving these objectives. Most of the households expressed satisfaction with the appearance and functional improvements of their modifications. Some households were dissatisfied with the functional performance of their modifications. Other households incurred cost over-runs. Observations of the completed modifications revealed problems in safety, durability, and maintenance that were not immediately identified by the participants.

The Actual Outcomes were dependent upon how well the Design-Build Tasks were implemented. When Assessment and Programme Development skills were inadequate, the potential to develop appropriate solutions was compromised. Proposed

solutions were inappropriate if they did not address the household's needs or respect their available resources. Problem Solving was difficult when there was a lack of technical knowledge or ability to use abstract cognitive skills in order to resolve design problems before construction. Failures in the Documentation of proposed solutions created misunderstandings and confusion during Procurement and Construction. This in turn, often resulted in significant cost over-runs and stress. In addition to being competent in each task, it was essential that the order and competency in which they were completed be properly managed. When Project Management was weak, there were increased errors, cost over-runs, and stress.

Thus, what finally emerged as being essential to achieving good outcomes was the competent application of Skill and Knowledge to the Design-Build Tasks. These tasks required Skills and Knowledge in three domains, disability, design, and construction. The interior design professionals demonstrated good abilities in design and the potential to form links between others with Skills and Knowledge in disability and construction.

5.4 SUMMARY

The previous discussion has considered the participants' experiences using the format of the Strauss and Corbin's (1990) paradigm model. While this model is a useful tool for understanding the data, some interpretation of the insights that were gained using the model is required in order to comprehend how they relate to the study objectives. This summary begins with a description of the wants and needs of the participants that were identified. Following this, the services interior design professionals were able to offer and the benefits of their participation in the modifying process are described. The constraints to including interior design professionals are then discussed. Finally, some important

general considerations that interior design professionals must consider in developing their practice for this market are presented.

The priorities that were identified by the participants revealed what they wanted to accomplish with their modifications. The most important objective for participants was to improve their ability to function in their environment. The other two priorities for the participants related to budget and aesthetic considerations. For some participants, keeping the costs of the modifications within the budget was very important. All of the participants also indicated that they wanted their modifications to be attractive and well integrated with the rest of the home environment. These participants wanted the modifications to have a normalized appearance that was not institutional.

The findings of the study revealed that depending upon the causal events, the participants required a range of Skill and Knowledge in what was termed Design-Build Tasks. The requirement for Skill and Knowledge led to perceptions of the need to acquire assistance from others. These perceptions were dependent upon the experience the participants had with their disability, design, and construction. This perceived need to acquire Design-Build Skill and Knowledge was present in the two contexts, Low and High Need.

A Low Need to acquire additional skills and knowledge was associated with having long-standing disabilities and past experience in design or building that was comparable to the scope of work considered in the modifications. These participants did not use the services of others except for the contractor. They worked independently, directing the contractor and managing the project themselves, although in some situations, they relied on the contractor's Skill and Knowledge to resolve technical problems. These participants were generally satisfied with the outcomes of their modifications, but they did

find the experience fatiguing and stressful at times. Some of this stress may have been related to minor confusion and conflict with contractors that arose due to a lack of Documentation about the work they were expected to perform. This suggests that some skills in Documentation, Procurement and Project Management might have been lacking. It was also observed that some of the materials used were inappropriate in terms of safety and maintenance. There were also some details, such as provisions for relocating grab bars that were not included. These observations suggested that these participants were perhaps lacking some technical skills and knowledge. Overall however, they completed their modifications with an acceptable level of competence.

A perceived High Need to acquire additional skills and knowledge was associated with a lack of experience in disability, design, or construction. Participants with recent injuries were unfamiliar with their needs and required assistance with Assessment in order to determine the requirements for their modifications. These participants also needed assistance with the Design-Build Tasks, either because they did not have sufficient experience, or were in a state of crisis and lacked the human resources to attend to the modifications. Those with long-standing disabilities, but who lacked sufficient experience in design and construction, were confident in their ability to assess their needs but needed to acquire skills and knowledge related to the Design-Build Tasks.

Although the participants had perceptions of their need to acquire Skill and Knowledge, the application of their actual Skill and Knowledge revealed variations in competency. Participants had High or Low Skill and Knowledge in the various tasks of making modifications. Tasks in which participants had Low Skill and Knowledge indicated a need to acquire Skill and Knowledge that may not have been obvious to them at

the start of the modifications. Indeed, some of the participants were not able to identify that their Skills and Knowledge were low, even upon completion of the project.

The participants needed assistance with Design-Build Tasks to varying degrees. Some participants required limited assistance in specific phases of the process, while others required a comprehensive range of services. As discussed previously, those with long-standing disabilities were able to assess their needs and develop a functional programme for their modifications. Those with recent disabilities needed assistance with this task. In terms of developing appropriate solutions, or Problem Solving, there was a general need for technical expertise. However, most participants were comfortable making decisions related to the aesthetic dimensions of Problem Solving. While selecting finishes demanded an expenditure of time and effort, participants enjoyed the opportunity to express themselves in this way. Participants were generally satisfied with the appearance and function of their modifications, but were often unaware of the safety hazards, or realized in hindsight that some materials were difficult to maintain. Some participants also needed assistance with Documentation and Procurement issues related to contract negotiations and administration. In addition, some participants needed assistance with managing the project, or Project Management.

The findings indicated that when interior design professionals were used, they facilitated the modifying process through their skills and knowledge in the Design-Build Tasks. These skills and knowledge include; (a) discerning user needs and environmental conditions (Assessment), (b) defining the problems to be resolved and priorities (Programme Development), (c) locating information related to accessible design, regulations, and emerging technologies, and developing solutions to technical and aesthetic problems in the built environment (Problem Solving); (d) preparing contract documents such as drawings and specifications (Documentation); (e) negotiating and administering contracts

(Procurement), and (f) coordinating and managing the entire process (Project Management). The skills and knowledge that interior design professionals brought to the modifying process contributed to good functional performance, budget control, and reduced stress for consumers. It should be noted however, that these skills were not exclusive to interior design professionals. Others, such as contractors and peer advisors were capable of providing some of these services. Therefore, while interior design professionals provided assistance, their services were not critical to satisfactory outcomes.

Some domains of skill and knowledge were better provided by others. One of these was in the area of disability. Interior design professionals relied on the experience of the participants, peer advisors, or occupational therapists to guide them in determining the functional requirements for the environment. Contractors had skill and knowledge that was useful in resolving technical problems that could arise as construction proceeded.

The intervening conditions that constrained decisions to use service providers were a lack of awareness about the Design-Build Tasks, the interior design profession, as well as cost. Some participants underestimated the complexity of the design process and were unaware of the need to acquire additional skills and services. Many of the participants were also unaware of the range of services that interior design professionals could offer. Very few participants were aware that interior design professionals could provide services in project management, assist with the assessment of their needs, and could address technical issues. Most participants perceived that interior design professionals were primarily skilled in the selection of attractive products and finishes, as well as the preparation of drawings. In conjunction with this perception, many of the participants were confident in their own ability to select finishes, and were able to have drawings prepared by the contractor. Under such circumstances, there did not appear to be a need to include interior design professionals in the process. The fees for interior design professionals

were more than many participants were prepared to pay, particularly if they perceived that the services were not critical to achieving their intended outcomes. This was especially so for participants who did not receive third party funding to pay for their modifications. Participants who received third party funding were not as aware of their financial constraints and were prepared to use interior design professionals when this was suggested by others.

Finally, the causal conditions leading to the need for modifications had important implications for the way in which services were selected and delivered. Participants with long-standing disabilities had considerable skill and knowledge about their disability and had adjusted to their situation. These participants were able to manage their modifications with a high degree of independence. Participants with recent traumatic injuries required much more assistance and support. They had little understanding of their disability, and were often in a state of trauma. These participants were more likely to be quite dependent upon their service providers to provide advice and manage the process than their counterparts with long-standing disabilities. In particular, these participants required the assistance of service providers who had considerable Skill and Knowledge about living with a disability. This type of service was provided by peer advisors, occupational therapists, and physiotherapists. Under such circumstances, these non-design service providers were a critical part of the team working on the Design-Build Tasks.

In summary, these findings suggested that the services that interior design professionals could offer were important to providing successful outcomes. However, it was not clear whether these services were provided by interior design professionals with any greater degree of competence than could have be found with other service providers or the participants themselves.

CHAPTER 6 RECOMMENDATIONS AND CONCLUSIONS

This final chapter presents the implications, recommendations and conclusions that emerged from the study. First, the major findings are considered in terms of the study goals and objectives as well as other unanticipated findings. This summary of findings is then used to revise the original conceptual framework describing the relationship interior design professionals can have with consumers in the experience of modifying homes to accommodate a disability. Following this, limitations and methodological issues are considered that might have an impact on the implications of the findings. The implications and recommendations of the findings are then considered, including support for previous work, directions for future research, professional practice, policy, and education. The chapter ends with the overall conclusions of the study.

6.1 MAJOR FINDINGS

The principal conclusion of this study is that interior design professionals can play a role in home modifications to accommodate disabilities. However, this role is conditional upon the needs of consumers arising from the nature of their disability, experience with design and construction, and other intervening variables. This conclusion is also based upon the assumption that interior designers can provide certain services with a high degree of competence. The NCIDQ Definition of Interior Design (Appendix B) and NCIDQ Description of Interior Designer Knowledge Areas (Appendix C) form the basis of this assumption. This study had limited success in confirming that interior design professionals do provide these services with high levels of competence. Limitations in the sample size and the ability of participants to recall accurately details of the process made it difficult to compare the experiences of those who used interior design professionals and

those who did not. Therefore, it was not clear that using an interior design professional offered a distinct advantage.

The findings indicated that most of the participants were generally satisfied with their outcomes whether they used interior design professionals or not. Most of the participants also had some problems with either the outcomes or the implementation of the Design-Build Tasks used in the process of making modifications. These problems included additional expenses, delays, and frustrations that emerged when the process did not flow smoothly. In addition to this, functional outcomes were compromised when the households' needs were not adequately incorporated into the programme development phase, or the resolution of design problems was inappropriate. Some of these problems occurred even when interior design professionals were included in the process. Likewise, there was generally good satisfaction when projects did not include interior design professionals.

On large commercial or institutional projects, delays and errors can have serious consequences because of the potential magnification of problems, such as occurs when an error on a typical floor plate is repeated many times. The small scale of these residential projects appeared to provide some flexibility that accommodated making adjustments and corrections on site. The homeowner was also available to indicate acceptance of any compromises. On the other hand, these residential projects were directed towards accommodating unique individual needs, requiring considerable skill in adapting standard guidelines and codes to provide customized solutions that worked for a particular household. In addition to this, some of these households could not afford a large contingency in their budget for errors and omissions. Thus, while these small-scale projects permitted some flexibility, the consequences of error were not easily accommodated on limited

budgets. Rather than make the necessary corrections, householders were more inclined to modify their behaviour or use of the space if necessary.

While compromises, delays, and additional costs may have been avoided with careful design and project management, it was not clear that the benefits of acquiring professional design services warranted the additional fees on such small-scale projects. Some of the participants believed that the benefits of having assistance were, or would have been, worthwhile; but others were not clear on this question.

The failure to demonstrate that there is an advantage to using interior design professionals was also related to the finding that the participants could not be viewed as one homogeneous group. In terms of the involvement of interior design professionals, two groups emerged: (a) low need, (b) high need for assistance. The presence of these groups made it clear that the role of interior design professionals is contingent upon the context of the consumer and other variables.

Despite the limited success in achieving the primary goal of defining how interior design professionals can facilitate modifications, this study was able to address the two major study objectives; determining the context for consumers with disabilities who modify their homes, and defining the opportunities and constraints for interior design professionals to facilitate the modifying process. In doing so, this study was able to establish the important considerations for how interior design professionals should offer their services for facilitating the modification of homes to accommodate disabilities. What follows is an examination of the findings related to each of the study objectives.

Objective 1: Define the context for consumers with disabilities who modify their homes.

The participant's experiences led to conclusions that are related to the first objective of defining what consumers wanted and needed when they modified their homes to accommodate their disabilities. The barriers that consumers had in meeting their needs and wants were also identified.

Consumer Wants

Consumers want modifications that meet the following objectives:

1. Modifications provide improved functional performance;
2. The cost of the modifications do not exceed the consumer's budget;
3. The modifications are attractive and integrated with the surrounding environment.

Consumer Needs

In order to have modifications that meet their needs, consumers need the following:

1. Skills and Knowledge in the domains of disability, design, and construction;
2. Adequate funding to acquire the required services and products;
3. Time, energy, and ability to direct their attention towards making the modifications.

Objective 2: Define opportunities and constraints for interior design professionals to facilitate the modifying process for consumers with disabilities.

Based upon observations of the participant's needs and wants, it was possible to identify services that interior design professionals could offer to facilitate the process of home modification. Some of the constraints to using the services of interior design professionals were also identified. This study also identified important issues that interior design professionals should consider in the context of consumers who are making modifications to their homes to accommodate disabilities.

Interior Design Professional Services

Interior design specialists can offer their skills and knowledge related to the Design-Build Tasks of modifying homes. The services that interior design professionals can offer to facilitate the process of modifying homes are dependent upon the needs of the consumers and can include:

1. Provide a link between those with expertise in disability, participants, and contractors;
2. Provide services as required in the Design-Build Tasks which includes: (a) Assessment and Programme Development, (b) Problem Solving, (c) Documentation, and (d) Procurement;
3. Provide Project Management services.

Competent provision of these services related to Design-build Tasks contribute to the following outcomes:

1. Functional performance is improved;
2. Budget control is maintained;

3. Stress and Fatigue for consumers are reduced.

Constraints to Providing Interior Design Services to Consumers

The major constraints to interior design professionals providing services to consumers include the following:

1. There is a lack of awareness on the part of consumers of the complexity of the design process and the need for skills and knowledge;
2. There is a lack of awareness on the part of consumers about the range of skills and knowledge available from interior design professionals;
3. The cost of interior design professional fees is perceived to be too high in relation to the potential benefits;
4. Other service providers are able to perform some of the Design-Build Tasks.

Important Considerations for Practice

The important issues that interior design professionals need to consider in order to meet the needs and wants of consumers with disabilities include:

1. Consumers with long-standing disabilities have more awareness of their needs than do consumers with recent traumatic injuries and are less likely to need assistance with assessing their needs. Consumers with long-standing disabilities are also in relatively stable situations and are able to direct their attention towards making modifications;
2. Consumers with recent traumatic injuries are often in a state of crisis and may require additional support. In particular, these participants need the assistance of service providers who have expertise in disability issues, such as peer advisors or occupational therapists in order to

assess their needs. These consumers may also require a more comprehensive range of services in order to have more time to attend to other personal issues.

While it is not possible to make an unconditional statement that there are advantages to using an interior design professional, this study does indicate that successful home modifications are facilitated by skills and knowledge in disability issues, design, and construction. This observation is supported by the finding that when any one of these knowledge domains was missing, the outcomes of the modifications were compromised. The corollary was also demonstrated that the households with the most satisfactory modifications included skills and knowledge in all of these domains.

The skills and knowledge associated with the design domain include those required for the tasks of Assessment and Programme Development, Problem Solving, Documentation, and Procurement. Assuming that interior design professionals are competent in these tasks, it can then be argued that they do facilitate the modifying process. This assumption is supported by comparing these tasks with the Interior Designer Knowledge Areas as determined by NCIDQ (Appendix C, NCIDQ Description of Interior Designer Knowledge Areas). The NCIDQ Interior Designer Knowledge Areas include components that are very similar to those identified in the Design-Build Tasks of the study.

6.2 FINDINGS BEYOND ORIGINAL OBJECTIVES

The above summary of the major findings focuses on the study goals and objectives. There were other findings that were not directly related to the study objectives, but stand out as being particularly relevant to interior design professionals and those interested in the modifying process. These observations are described below.

The first of these observations is the domination of the contracting industry in the home modifying process. A great deal of trust was placed in contractors to make design decisions. In some situations, this trust was well founded, but in others, it was not. When the contractor had experience with providing accessible environments, their advice was very sound. However, some contractors appeared to rely too heavily on past experience in construction or existing building codes or guidelines, and did not engage in the process of discerning the unique needs of the household.

A second, and related finding, was the limitation of relying on peer advisors who were unfamiliar with design, construction, and the process of facilitating people in identifying their particular needs. Peer advisors who could only draw upon their personal experience were limited in their ability to provide guidance to others whose situations were somewhat different.

The third finding was the benefit of transitional housing in providing opportunities for people to learn about their disabilities. The participant who lived in transitional housing before moving into private housing had more confidence in her knowledge about her disability than the other participants who had recent injuries. The experience of learning about the disability and how to interact with the environment was useful in guiding decisions when it came time to move into private housing.

This study also found that guidelines and codes such as the National Building Code did not account for the requirements of particular individuals. It was possible to make modifications according to the National Building Code, yet still not meet the specific needs of the household. Several participants also used the term Universal Design to describe their modifications, yet the completed modifications did not always adhere to the principles of Universal Design. Indeed, households often made decisions that limited

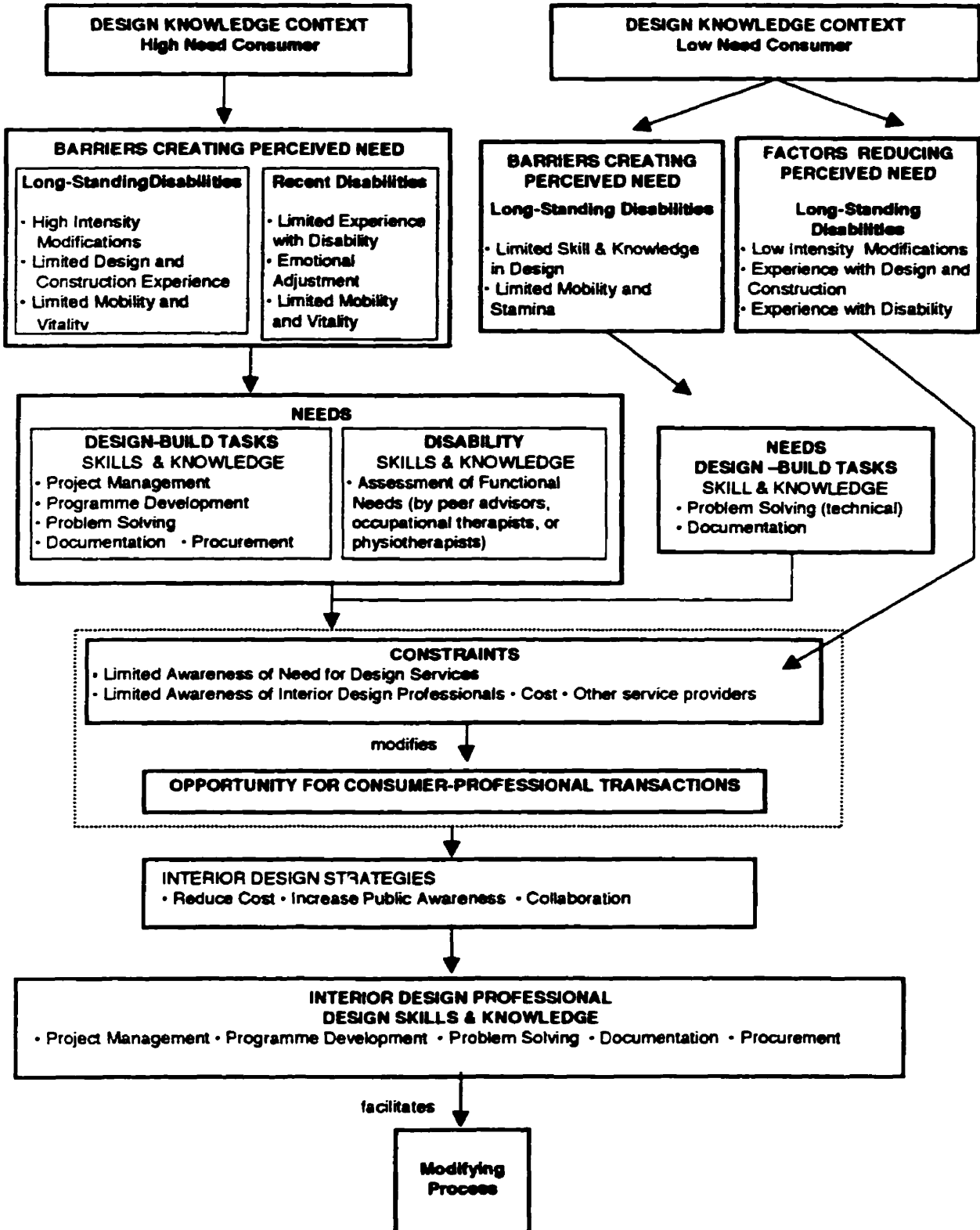
universal accessibility in favour of options that suited their own particular needs and budget.

6.3 MODIFIED CONCEPTUAL FRAMEWORK

The original Barrier-Facilitator Framework (Figure 4 Revised Barrier-Facilitator Framework) was modified to reflect the conclusion of this study that the way interior design professionals can facilitate home modifications for disabilities is conditional upon consumer needs arising from the nature of their disability, past experience with design and construction, and other intervening disabilities. The most significant change to the conceptual framework was that two groups of consumers were identified according to their contexts for acquiring skill and knowledge. There are consumers with high needs acquire design knowledge and those with low needs. The framework indicates that the two groups experience different barriers that create the perceived need to acquire design skills. In addition to this, the revised framework provides details about the consumer barriers, the skills and knowledge required for the design process, and constraints between interior design professionals and consumers. Another change is that the term Design-Build Tasks is used for the design process. Design-Build Tasks was the term used in the Modifying Paradigm to define the action/interaction strategies used in the design process.

Consumers with low perceived needs to acquire design skills have three characteristics: (a) their modifications are less complex, extensive or urgent (low intensity), (b) they believe they have skills and knowledge in design from previous experience, and (c) they have long-standing experiences with their disability. These characteristics facilitate their ability to proceed with design tasks without acquiring assistance from others such as interior design professionals. However, these consumers do experience limitations in mobility and stamina that can create a barrier that might encourage them to consider acquiring some assistance with design. They may also have additional skill and knowledge

Figure 4 Revised Barrier-Facilitator Framework



needs that they are not aware of, but could be encouraged to consider. In particular, they may need technical advice and assistance with preparing contract documents.

Consumers with a context of high perceived needs to acquire design skills and knowledge can be divided into two subgroups, those with long-standing disabilities and those with recent disabilities. Consumers with long-standing disabilities experience the following barriers to making their modifications: (a) their modifications are of a high intensity, (b) they have limited design skill and knowledge, and (c) they have limited mobility and stamina. Consumers with recent disabilities experience a somewhat different set of barriers: (a) they have limited awareness of their disability, (b) they have not adjusted emotionally to their situation and are in a state of crisis, and (c) they have limited mobility and stamina.

Consumers need Skill and Knowledge in the Design-Build Tasks that are termed Project Management, Assessment and Programme Development, Problem Solving, Documentation, and Procurement. Consumers need a range of services depending upon their situations. Those with high needs who have long-standing disabilities are most in need of assistance with Problem Solving, Documentation, Procurement, and Project Management. Consumers with recent disabilities require these services as well as assistance with Assessment and Programme Development. Consumers with low needs to acquire design assistance are most interested in technical information in Problem Solving, and Documentation.

In addition to needing skills and knowledge, all consumers modifying their homes to accommodate a disability require improved physical access to show rooms, service providers, and retail outlets because of their limited mobility and stamina.

The need to acquire skills and knowledge in design and have more convenient access to suppliers creates an opportunity for interior design professionals to engage in transactions with consumers. Assuming that interior professionals do have the necessary design skills, they could potentially address consumers' needs. Interior design professionals can also reduce the number of visits that are required to retail outlets by doing much of the preliminary selection of materials and bringing samples to the consumer's home as a part of Procurement services.

There are a number of factors that constrain the ability of consumers to take advantage of the services interior design professionals are able to offer. The constraints include the following factors: (a) a limited awareness of the need for design skill and knowledge, (b) a limited awareness of interior design professionals and the services they offer, and (c) the ability of others to offer similar services. Interior design professionals must develop strategies to overcome these constraints in order to take advantage of opportunities to engage in Consumer-Provider Transactions. These strategies include reducing costs, improving public awareness of the profession, and collaboration with the disability community.

If the interior design professional adopts strategies that overcome the constraints to Consumer-Professional Transactions, then they will be able to contribute their Design Skills and Knowledge. This contribution will facilitate the Modifying Process, enabling consumers to achieve their goal of having completed their modifications with satisfactory results.

6.4 STUDY LIMITATIONS AND METHODOLOGICAL ISSUES

Caution should be used in assuming that the perspectives of these participants are representative of other groups. The range of participants in the sample places limitations

on the ability to apply these findings outside of the context of the study. Of particular importance was the exclusion of participants over sixty years of age, rural dwellers, and participants who had traumatic injuries or recent disease processes yet did not receive funding for modifications. Although the exclusion of these and other variables limits the range of situations where the conclusions can be applied, including many variables may have reduced the reliability of the results by creating too many under-represented groups. As would be expected in a qualitative study, the findings provide insights into general patterns of experience, which should then be used to guide investigations using a larger sample size and a more focused set of questions.

One of the difficulties encountered in this study was in recruiting older participants. There appeared to be two principle reasons for this. The first was that contact agencies for older people had procedures for participant recruitment that were very protective of their clientele, many of whom were vulnerable to exploitation and harm. In addition to this, the large number of studies involving this age group was placing high demands on contact agencies to assist with access to the sample pool. In retrospect, the attempts to contact participants through Age and Opportunity were too unfocused to locate candidates who fit the criteria of the study. This agency included people from too wide a range of income to focus recruitment on those likely to be homeowners or have an interest in housing issues. Contacts through senior's housing associations might have resulted in better recruitment.

There were also difficulties in arranging interview appointments when all of the people who participated in a household modification could be present. In four households, other members who had assisted with modifications were not included in the interviews. In three of these households, the member excluded was a male wage earner. The other case was a female wage earner. Thus, it is possible that there could be gender

differences in the approaches used in the modification process. Differences in approaches might be expected because of possible gender differences in orientation towards construction, design, home decoration, and care giving. These activities were identified as important components of the modifying process. However, participants indicated that they personally played a significant role in the modification process and therefore, their experiences were relevant to the study.

Another group that was not adequately covered in this sample was people living in rural communities. The benefits of prior experience in construction demonstrated in this study suggest that there might be differences between urban and rural populations. This suggestion is based on the assumption that rural life includes more practical experiences and access to tools for fabricating the necessary buildings and equipment.

In addition, people who have recent disabilities who do not qualify for funding to make home modifications were not included in this study. It would appear that these people would be doubly penalized, in that they would experience the negative aspects of a crisis compounded with limitations in financial resources.

Recruitment of participants who had used the services of a design professional was also difficult. An advertisement in the Professional Interior Designers Institute of Manitoba monthly newsletter did not yield any results. Contacts through ProductABILITY did yield some results, but they were biased towards the inclusion of one designer. Time constraints did not permit a more extensive recruitment effort in this study. In addition to the limited number of households that used interior design professionals, the interior design professionals included in the study had limited involvement in the projects. An interior design professional was the prime consultant in only one household, providing comprehensive project management and design services. In the remaining situations,

interior design professionals were involved in limited ways in various phases of the process. With only one household having significant involvement of an interior design professional, the ability to make a comparative analysis of cases using designers and those not using designers was constrained. However, comparisons were made between actual events and those that would be expected under typical professional practice.

6.5 IMPLICATIONS OF FINDINGS

This section identifies the implications arising from the conclusion that the role interior design professionals can play in the modifying process that is conditional upon consumer needs and other constraining variables. There are important implications for interior design professionals interested in engaging in residential design, and who want to focus their practice on the increasing number of consumers who will require accessible home environments. There are also implications for educators and leaders in the professional associations in terms of ensuring that interior design professionals have skills and knowledge that are relevant to consumers. Other professional and service groups, who have an interest in meeting the needs of consumers with disabilities through home modification, are also considered in this discussion. These implications lead to a number of recommendations that include strategies for design professionals, design education, disability organizations, policy, and future research.

6.5.1 SUPPORT FOR PREVIOUS STUDIES

This study supported the findings of others working in the field of accessible housing that cost, concerns over appearance and limited personal skills create barriers to modifying homes (Hovey, 1993; Pynoos, 1992, 1993; Ringaert, 1997; Steinfeld, 1994).

There were also several observations of the way in which people will adapt their behaviour rather than make changes in the environment. These observations support the

reports of others that some individuals will limit their ability to be independent rather than make modifications (Hovey, 1993; Pynoos, 1992, 1993; Sapey, 1995; Struyk, 1987; Wylde, 1997).

The study also supports theories in design methodology that there are differences between design professionals and others in the way they engage in the design-build process. The differences in concrete and abstract problem solving paralleled design-by-drawing and craft evolution (Jones, 1970).

6.5.2 DIRECTIONS FOR FUTURE RESEARCH

This study should be considered a first step towards understanding the way in which individuals and households manage changes to their dwellings. Some issues in this study warrant further investigation because of limitations in the sample and scope of the objectives.

The first of these recommendations is to conduct a larger quantitative study that can test the hypotheses that skills and knowledge in Design-Build Tasks facilitate the modification of homes that accommodate disabilities. Such a study should survey participants in more detail about the different modification tasks, who performed them, and the results. This information would improve the precision of locating gaps in skill and knowledge, and assist in directing resources to where consumers need them.

Another important recommendation is to conduct a similar study that includes older adults. This study did not include any people over the age of sixty, yet it is in that age group where we can expect to see the greatest increase in demand for home modifications. Because this study reveals that modifications typically involve several members of a

household, future studies focusing on older populations might also include adult children who are instrumental in assisting with modifications.

A limitation of this study is that it is biased towards the experiences of people who do make modifications. Another study that compares the characteristics of people who do not complete modifications with those that do, might produce useful data about other impediments for undertaking modifications.

It would appear that there is no shortage of information about products and accessible design. There is a barrier, however, for some people in terms of accessing this information. Further study is needed about how people locate information and support. In particular, the emerging role of the Internet in providing consumers with information is particularly important. Questions about who uses it, when, why, and its value need to be answered. There is also a need to evaluate how people use existing guidelines to develop solutions for real and individual problems.

This study was a retrospective study that relied on the ability of participants to recall the experiences they had in completing their modifications. It is possible that the data may have been influenced by inaccuracies in recall due to the passage of time and changes in perspective. A prospective study using participants who are using interior design professionals at the time of the study may yield data that are more accurate.

It would also be beneficial to use questions based upon the results of this study to survey interior design professionals who presently are involved in this type of work in order to determine their viewpoint of the experience. Such a study should examine the constraints and benefits of working on issues of accessibility, and whether these professionals consider this work worthwhile for their practice.

Finally, in order to establish credibility with consumers and funding agencies, it is critical that interior design professionals can establish the benefit of using their services. While it is demonstrated that interior design professionals can make positive contributions to the quality of the modifying process, the benefit relative to the cost of doing so is not clear. Under conditions where cost is a critical factor, it is important that the profession demonstrate the benefits of using their services relative to the cost of their fees. This condition calls for a quantitative cost-benefit analysis study that considers the ability of interior design professionals to make improvements in the efficiency of the modifying process, quality of life, safety, and life span of the modifications. The benefits of these improvements can then be evaluated in terms of the costs of the fees and improvement to the quality of life.

6.5.3 PRACTICE IMPLICATIONS AND RECOMMENDATIONS

Implications

Guided by a conceptual framework using a market concept, this study identified factors that would be important to professionals interested in developing their practice to meet the needs of an increasing number of consumers who require accessible environments. As more interior design professionals become trained in universal design, addressing issues of accessibility will become the normal expectations of practice. However, the needs and priorities of clients who require modifications to accommodate their disabilities may be quite different from those of corporate clients or those seeking improvements to their homes for reasons such as aesthetics or improvements in resale value.

The findings that there were participants with different requirements to acquire skill and knowledge suggested that there were three market segments. In terms of market opportunities for design professionals, this report identifies two major market segments, high need and low need consumers (Table 5 Market Segments). The high need segment is

further divided into those with long-standing disabilities and those with recent ones. Each of these market segments requires specific attributes of professional service. Salient Attributes are those ones that consumers are most aware of and should be obviously addressed by providers. Important Attributes are those that are not in the foreground when consumers are making consumer choices, but would be considered as important if offered as an option (Kotler, 1983). These attributes are important in planning strategies to attract consumers to a service previously overlooked. When developing marketing strategies, design professionals must be sensitive to the differences between the groups as identified under Salient and Important Attributes.

Table 5 Market Segments

* Attribute primarily considered by funding agency

Perceived Need	Market Segment	Salient Attributes	Important Attributes	Market Strategies
High Need Consumer	<ul style="list-style-type: none"> • Long-standing disabilities • Self-funded • High intensity modifications 	<ul style="list-style-type: none"> • Cost of fees • Technical and aesthetic design knowledge Collaborative approach	<ul style="list-style-type: none"> • Convenience • Reduced work-load • Improved maintenance and safety and long term effectiveness • Potential cost savings 	<ul style="list-style-type: none"> • Increase consumer awareness of Interior Designer services • increase consumer awareness of maintenance and safety issues • Reduce costs • Flexibility in direction/collaboration
High Need Consumer	<ul style="list-style-type: none"> • Recent trauma • Limited experience • Emotional trauma • Third party funding 	<ul style="list-style-type: none"> • Knowledge of disability, design, and construction • (Cost of fees) • Convenience • Reduced work-load 	<ul style="list-style-type: none"> • Improved maintenance, safety and long-term effectiveness • (Potential cost savings)* 	<ul style="list-style-type: none"> • increase consumer awareness of maintenance and safety issues • Establish relationship with funding agencies • Collaborate with disability groups • May require more direction • Reduce costs * • Increase consumer awareness of Interior Designer services
Low Need Consumer	<ul style="list-style-type: none"> • Long-standing disabilities • Self-funded • Low intensity modifications 	<ul style="list-style-type: none"> • Cost of fees • Technical knowledge Collaborative approach	<ul style="list-style-type: none"> • Improved maintenance, safety and long-term effectiveness • Potential cost savings 	<ul style="list-style-type: none"> • Reduce cost • Workshops, manuals • Increase consumer awareness of maintenance and safety issues • Increase consumer awareness of Interior Designer services

Consumers in the high need group are motivated to seek advice related to design. However, subtle differences between those with long-term and recent disabilities should

be addressed. Those with long-standing disabilities are likely to be sensitive about design fees. This consumer group will tend to be well informed about their disability and will want to collaborate with design professionals, providing their own direction in establishing the functional program. While this consumer will be informed about their disability, they may seek advice on technical and possibly aesthetic problems of design and construction. This group could also be encouraged to consider the convenience of having a design professional assume some of the work-load involved in managing the modification process, relieving consumers of some stress and fatigue. In addition to the benefits of added convenience, these consumers could also be encouraged to consider the contributions design professionals can make in ensuring that the modifications are safe and will provide long-term durability and effectiveness. Finally, design professionals may be able to justify some of the cost of professional fees through their ability to reduce the costs of unnecessary expenditures due to error or inappropriate design.

The consumers with recent disabilities have characteristics that create different needs from those with long-term disabilities. They will tend to receive third party funding to assist with the modifications. They will also have little experience with their disabilities and are often in a state of emotional upheaval because of the trauma of the recent injury. Those with recent disabilities will require different marketing strategies because of differences in their characteristics.

First, because a third party funds the modifications, the design professional must market their services to the funding agency as well as to the consumer. This will require some sensitivity to the different perspectives each group may have. Funding agencies that use a client-centered approach to management will have an interest in ensuring clients are satisfied with their modifications and that the process proceeds without undue delay. These funding agencies will also have an interest in ensuring that the modifications will be

safe and have enduring effectiveness. The assumption that funding agencies are client-centered is based upon observations of organizations involved with households in the study. While this assumption may not hold true in all cases, it is probably safe to assume that most agencies will have an interest in ensuring that modifications are cost effective. They will want to know that the design fees can be justified by potential cost savings as well as client satisfaction. Working with third party funders will also require sensitivity to the decision-making process. The design professional will need to establish agreements about who gives direction and has decision-making authority in this context.

Secondly, because consumers with recent disabilities will have little experience with their condition, they will be quite reliant on the advice of others (especially peer advisors) on how to cope with their disability. The design professional will need to demonstrate an ability to work collaboratively with team members who are oriented towards disability issues, such as peer advisors, occupational therapists and physiotherapists.

A third consideration is that design professionals will also need to be sensitive to striking the correct balance between directing consumers and enabling them to make their own decisions. Some consumers will benefit from service providers who can assume much of the responsibility for modifications, leaving households more time for personal issues. Others may find that the experience of engaging in the modification process enables them to develop emerging insights into their condition. These consumers can be encouraged to articulate their needs while design professionals relieve them of the burden of attending to technical and contractual details.

Consumers with low perceived needs are most likely to have long-standing disabilities and are undertaking small-scale or low intensity modifications. They will have a

high degree of confidence in their ability to undertake their project, seeking information on particular technical issues. These consumers can be encouraged to consider the benefits of obtaining professional advice that will ensure their safety and the effectiveness of their modifications. These consumers also tend to be cost sensitive, and will be interested in the benefits of services that are cost effective. The relationships design professionals have with these consumers will be quite different from the ones they have with high need consumers. These low need consumers will tend to view the design professional as an information resource rather than a working partner. Providing workshops, manuals, product information, or other forms of information service would be effective strategies to provide assistance to this group.

The strategies used to meet the needs of the market segments will also need to address the important constraints to using interior design professionals. The constraints include cost, limited awareness of the need for and availability of design services, and the ability of others to provide similar services. The barrier presented by cost occurs in some degree in all situations of home modification. The constraint of limited budgets combined with the specialized nature of the work presents particular problems. Most of the modifications in this study were under \$40,000, placing them in a category with lower budgets than most commercial and institutional projects. Like many other design problems, home modifications to improve accessibility present issues that the designer must become familiar with. This creates a steep "learning curve" the first time this type of project is encountered. Unless a practitioner develops some experience, the learning curve required for accessibility modifications may have a serious impact on the profit margin. Consumers who place a high priority on budget may object to the fees that would be required to compensate for this learning curve. Therefore, practitioners must develop the necessary

skills and knowledge through training and experience. Acquiring this experience requires a market that is large enough to provide repeated exposure to similar problems.

There will be an increasing market of people who will benefit from including some elements of accessibility in their housing considerations as they age. The literature suggests that many older people adapt their lifestyles rather than make adaptations to their homes (Pynoos, Cohen, Davis, Bernhardt, 1987; Struyk, 1987). Of those households who do make changes, many make small improvements that may not provide sufficient budgets for designers in private practice. There will however, be an increasing market of people who will upgrade their homes for aesthetic reasons after they retire. Kitchen and bath renovations will be especially popular in this market (Stewart, Shindruk, Sloan, Cavalier, 1993). Because accessibility is not the focus of these home improvements, design professionals interested in specializing in design for disabilities would need to increase the older consumers' awareness of this issue in order to expand that potential market size.

There may also be increasing numbers of consumers who would need to consider issues of accessibility because they are adapting homes to meet the needs of aged parents. These consumers will be in mid-career with children still at home. The popular term "the sandwich generation" describes a consumer whose time is squeezed between the needs of their children, employer, and parents. Because of the constraints on their time, these consumers may be interested in delegating some of the responsibility for home modification to others.

Besides the growing number of households with older people, there will also continue to be a small number of households with individuals who have disabilities arising from trauma, disease, or congenital disorders. These households will often require

modifications that are more extensive than the minor adaptations required by most older people. Some of these modifications will be funded by institutions that will provide adequate budgets. Others will face the constraints of trying to make modifications on limited budgets. Those in practice must determine if the numbers of these households warrants cultivating a niche specializing in this market.

In terms of income, the participants in this study were representative of the middle income consumers that represents a large potential market. However, most of the participants did not believe that they could afford a designer. Assuming this belief is widely held, the perception that interior design professionals are expensive and for the wealthy would create difficulties for interior design professionals to participate in this market. In addition to this, the association of interior design with accessibility is not strong. Indeed, most participants were unaware that interior designers had knowledge in issues beyond aesthetics, and possibly the durability of finishing materials and products such as carpet. The profession must address these attitudes if it wishes to be seen as both accessible and relevant to the general public.

As well as having a limited awareness of the skill of design professionals, a limited consumer awareness of the design process creates a constraint that interior designers must overcome. The image of design as portrayed in popular media and do-it-yourself kits rarely mentions issues such as safety, durability, or function. The popular presentation of design that focuses on appearance makes the process appear to be deceptively simple. This tendency to underestimate the complexity of design is likely common amongst the general public. However, design that addresses issues of human function, safety, and maintenance is more critical for consumers who are vulnerable to falls, stress,

and fatigue. Unless consumers are informed of the complexity and critical nature of the design process, they may be reluctant to pay for professional services.

Many consumers with disabilities turn to their funding agencies or support groups for advice. Because these agencies are important sources of referrals, it is critical that the interior design professional establishes credibility with funding and referral agencies. This is particularly important because many of these agencies are players in consumer strategies through their provisions of funding.

Presently, general contractors and peer advisors are active in the home modification market. Although these service providers offer a necessary service, interior design professionals can enhance their skills and knowledge. The interior design profession must differentiate its' product from the services available from these other service providers in order to increase awareness of the benefits of including a design professional in the process. Interior design professionals must also ensure that they do have an adequate awareness of disability issues in order to work with other specialists and effectively offer consumers a service that integrates knowledge in both design and disability.

Recommendations

The implications for professional practice suggest a need for the profession to develop strategies to reduce cost, increase public awareness and credibility of the profession, and work with other service providers. The following text outlines some strategies that should be considered in order for the interior design professional to be more effective in participating in this market.

This study indicated that cost was an important constraint to using interior design professionals. Cost may also be an important factor in the future home modification market that will come from the increasing numbers of older people because many of these

modifications will be small in scale and likely on restricted privately funded budgets. The design profession must address these conditions by finding ways to reduce costs to the consumer. One option is to improve efficiency and reduce overhead. In design practice, these efficiencies could be achieved through gaining experience and specializing in environments for people with disabilities. This has been the experience of professional practice in the U.S. market, where design practices specializing in accessibility are firmly established. However, the context in a smaller market place such as Winnipeg is quite different. It is unclear if there are enough potential consumers with both the interest and financial means to warrant the development of specialized private practices.

Another alternative is the establishment of not-for-profit design centres that specialize in disability issues. Supporting a not-for-profit service raises the question of competition with private practice. However, unless private practice is willing to undertake small less profitable accessibility projects, criticisms of not-for-profit services are, in the opinion of this researcher, unwarranted. These not-for-profit centres must be carefully considered if they are to be effective in providing good service at a reasonable cost. Design centres need to be organized in a way that they can provide competent service and have enough prominence to reach those in need of the service.

In Winnipeg, ProductABILITY is an active not-for-profit design service specializing in issues of accessibility. ProductABILITY offers a complete range of design consultation services as well as acting as a resource for finding information related to accessible design. While ProductABILITY has much to offer in terms of experience and expertise, this study finds that it does not have the prominence or image that it could have, especially with people who are newly disabled. People who are active in the disability community are aware of it, yet there are many other people with disabilities who are un-

aware of this service. The awareness of ProductABILITY may be even more limited amongst people with moderate limitations that do not identify themselves as “disabled”.

In order to increase public awareness of accessibility issues and design, this study recommends that services such as ProductABILITY should consider positioning themselves in a way that will appeal to a larger audience and provide more convenience to the consumer. Convenience is an important attribute of any service offered to the disability market because these people typically have problems with mobility and stamina. This observation reflects observations in Ringaert’s (1997) study about accessible technology. A design service in a location with a retail presence and in close proximity to other services in the home modification (renovation) industry would improve the acceptability of accessible design and provide convenient access to products and suppliers. A mall location with a show room depicting attractive modifications would provide a positive profile for the concept of design for accessibility in a context that is non-institutional. This more normalized profile may attract a wider range of potential consumers. Close proximity to parking and the showrooms of suppliers would make it more convenient for clientele to include a visit to the design outlet as part of the many shopping excursions required in a home modification.

Currently, the major service providers in the home modification process are contractors and peer advisors. It is recommended that rather than viewing other service providers as “competition”, the profession should establish partnerships with them. Collaborative partnership between the consumer, builders, peer advisors, occupational therapists, physiotherapists, and design professionals would provide many benefits to consumers and enable providers the opportunity to focus on those aspects of modification in which they are most skilled. In order to achieve this, the interior design profession

needs to inform consumers and other service providers of the complementing skills the design profession can offer.

Interior design professionals need to promote the range of skills they have to offer and inform potential consumers of the role of the interior design professional in facilitating a project. Most consumers and other service providers are aware that interior design professionals have skills in aesthetic domains, yet this is the aspect of design that consumers enjoy and are most interested in undertaking by themselves. However, in the absence of attractive examples of accessible environments in the popular media and retail marketplace, many consumers and other service providers may not be confident in their ability to provide aesthetically pleasing solutions that meet the technical challenges of accessibility. The ability to combine both technical and aesthetic skills may prove to be a special skill that distinguishes the interior design professional from other service providers and consumers. Interior design professionals also have skills in programme development and project management that enable them to act as the link between other service providers.

At this time, it appears the contracting industry has the greatest contact with the home modification market. Design professionals are in the business of selling ideas, an intangible and seemingly available commodity. Contractors however, build things using materials and tools that most households do not possess. Thus, the perception of a need for building services is more obvious. If designers wish to participate in the home modification market, they might consider strengthening their relationships with the contracting industry, which is already well established in this field. Perhaps focused initiatives to convince contractors of the merits of using interior design professionals would be more effective than broad attempts to change public opinion. General contractors need to be informed about the benefits of having a design professional work out design issues in

consultations with themselves and the client before construction. In particular, the potential to reduce costly errors and delays by resolving design problems and preparing appropriate documentation before construction should be emphasized.

Modifications that are complex enough to lead consumers to seek advice may involve structural changes that are outside of the mandate of interior design professional practice. Some consumers will elect to use an architect as their service provider because of these structural changes. Interior design professionals may still make an important contribution in these circumstances through their skill in designing the microenvironment. In order to do this, interior design professionals need to establish good working relationships with colleagues in architectural practice who could work as partners on projects extending beyond the interior design professional's range of competence.

Peer advisors and professionals such as occupational therapists and physiotherapists can be identified as useful partners to design professionals in helping clients identify their needs. This information can be incorporated into the programme; yielding design solutions that are appropriate for the consumer's functional abilities and long-term independent living objectives.

In order to make contact with potential partners, clients, and consumers, the profession must consider appropriate promotional strategies. Written material is one medium that can be used to reach potential partners if it is carefully targeted in a way that it can be noticed in the large volume of literature available to the disability community. The Internet is another medium that has potential. A good web page will provide contact with those actively seeking related services. Again, care must be taken to ensure that the site provides information that is useful to consumers and that the site is tagged using terms that result in a high number of visits. It is important to remember that consumers may use a different

vocabulary than professionals. For example, consumers may use the term “home renovations” rather than “home modifications”. Strategic listing under appropriate headings in the Yellow Pages Directory™ and the use of the accessibility symbol might also be an effective way of reaching people outside of the organized disability community. In small market areas such as Winnipeg, personal contacts may be an effective method of increasing awareness. This could be accomplished through participating in workshops, training sessions, and other activities with targeted groups. Many people with disabilities also turn to disability organizations for advice and referrals. Design professionals must establish good relationships with these important consumer resources. This can be achieved through volunteer work, writing articles for newsletters, and assisting groups in their advocacy efforts within the profession and with the public.

6.5.4 POLICY IMPLICATIONS AND RECOMMENDATIONS

Implications

There are policy implications for agencies that are mandated to assist with home modifications. The contribution of competent design skills and knowledge to positive outcomes suggests that agencies should include this factor in their management and funding of home modifications.

Recommendations

The implication that a greater emphasis is needed on the role of design in public policies directed at improving the availability of home modifications gives rise to a number of recommendations. The first of these recommendations is that these considerations must be given to how home modifications are managed by institutions. This consideration includes issues of client versus institutional control in designing modifications, project management, and setting acceptable standards.

Secondly, it may be unreasonable to expect case workers, with backgrounds such as social work or occupational therapy, to assume responsibility for capital projects that involve tasks such as evaluating design proposals, tendering, contracting with designers and general contractors, and approving payments. Institutions responsible for funding home modifications need to consider the relative benefits of managing home modifications using specialists in capital project design and management from either staff positions or contracted services.

Finally, consideration must also be given to the ways in which access to design services can be more affordable. Two approaches could be considered. One approach is to provide adequate funding to not-for-profit design centres so that they may be able to offer services to the public for minimum cost. The other approach is to provide funding directly to the consumer, who may then apply this to the services of whichever design professionals they choose. This could be achieved through direct funding or through special tax deductions. Some tax deductions are presently available to make modifications and should be continued and possibly expanded in their scope. It is not within the scope of this project to suggest which alternative is preferred. However, in small market areas, it is important to provide a means of support that will ensure that there are resources available from which to choose. If the market is not large enough to support a private sector specializing in this type of practice, then it is suggested support should be given to a not-for-profit centre that can become the focus of this type of service.

6.5.5 EDUCATION IMPLICATIONS AND RECOMMENDATIONS

Implications

The findings suggest that there are requirements for both students and professionals to improve their skills and knowledge of disability issues. In order to be more effective in working in a context of accommodating differences in ability, interior design

professionals and design students need to acquire knowledge in issues related to disability, accessibility, and also develop appropriate interpersonal skills.

Recommendations

Interior design students need to develop skills and knowledge that are relevant to working in the contexts of residential and accessible design. The benefits of experiential learning could raise the suggestion of using student design service as a means to develop skills and knowledge and meet the public's need to access design services at a low cost. However, the use of student design services presents some very serious problems that must be addressed. It must be emphasized that students are learning, and without close supervision, cannot be expected to assume the responsibility of accounting for all of the practical problems that may arise. The primary purpose of an educational institution is to provide learning opportunities. While the students may gain some benefit in terms of learning, the service to the consumer may be less than satisfactory. Home modifications provide a context that is different from larger institutional projects that include phases permitting exploration of conceptual possibilities. Home modifications are small-scale projects often relying on limited personal funding. Householders are looking for practical advice that can be implemented without creating unnecessary cost. Errors and omissions can have direct consequences for the individual household. It would be irresponsible to expose both students and the public to this risk.

In order for community service to be effective in providing both services to clients and learning experiences for students, educators must provide the resources needed to ensure services are delivered with adequate levels of professional competence. If the praxis of practical experience is deemed of sufficient value to warrant the appropriation of resources, then partnerships with more experienced professionals or design centres may be worth exploring. In this way, students may benefit from the learning experience while

the consumer is protected by having the work adequately supervised by qualified practitioners. The missing piece to this proposal that would need to be explored is the costs and benefits (if any) for the professional partner.

The curriculum of interior design education should be evaluated for its relevance in preparing students to practice in the context of highly personal interactions. Students need to be sensitized to the issues arising from working in situations that may be laden with emotional issues or outside of their regular social context. Students may benefit from having meaningful interaction with a range of user groups. These interactions should take place in a context that does not present undue harm or risk to either the student or the user. For example, participating in joint campaigns to promote awareness of issues related to disability would provide opportunities for students to work with this user group. In such a project, the consequences of failure are not severe, and the emotional context would not be too intimate or highly charged.

The methodology used by design professionals can improve both the efficiency and efficacy of modifications if it is well informed by the user. The designer, with the assistance of peer advisors and builders, needs to facilitate the discernment of what the client or consumer “believes makes for a good environment, and what the personal meaning of home is for the client” (Ridgway et al., 1994, p. 411). The importance of this consultative process implies that design education must place sufficient emphasis on the consultative or facilitation skills of students. This emphasis is needed in order that students may be comfortable working in a collaborative context, guiding and not directing the course of events.

Interior design students must also be encouraged to move beyond interpreting accessibility codes and guidelines and to enter the spirit of accessibility and universal design

(Welch, 1995). Students can benefit from experiential training that enables them to get a glimpse of the environment from the perspective of those with a range of abilities. This type of affective learning is critical to developing lasting values that will inform their professional development. It is also important that educational goals include these values in order to ensure that they find a place in the educational curriculum (Posner & Rudnitsky, 1994).

The need for additional training in disability issues is not limited to interior design students. Interior design professionals also need to ensure that they have interpersonal skills appropriate for working in the context of assisting households with modifying their homes to accommodate disabilities. Facilitator training workshops might be useful in helping interior design professionals work in contexts such as this where they are assisting people with the development of their personal environments. In these contexts, the interior design professional must be skilled in enabling consumer to make many of the decisions, yet provide appropriate guidance and advice.

In addition to this, interior design professionals need to expand their knowledge of accessible design beyond what is required in the building codes. In Canada, interior design professionals are not currently required to demonstrate competence in accessible or universal design beyond what is required by building codes in the NCIDQ exam. Members of most Canadian professional interior design associations are recommending that members take continuing education courses for credit. It is anticipated that this recommendation will eventually be a requirement in order to maintain a professional designation. However, there is presently no requirement, nor is it anticipated in the future that these continuing education credits be in any particular area of practice. It is recommended therefore, that professional associations encourage their members to consider earning some of their continuing education credits in accessible design. This option can be

promoted by informing members of the increasing relevance accessible and universal design will have on professional practice in our changing demographic situation.

Disability organizations have an important role to play in terms of training and education of peer advisors, interior design professionals, and contractors. Care should be taken however, to inform participants about the limitations this training provides in terms of preparing individuals to apply it in a professional practice. For example, a one day workshop in designing accessible homes would not prepare a person without previous design training to present themselves to the public as a designer. In a similar manner, a design professional would require extensive training and experience in disability issues in order to have a high level of competence in customized accessible design.

Disability organizations should continue their efforts in sponsoring workshops for consumers about the benefits and process of home modification. Including presentations from service providers such as design professionals, peer advisors, contractors, and therapists could provide opportunities for consumers to be better informed of available services. Workshops may be particularly effective if facilitators guided consumers in identifying their environmental needs, resources and strategies for achieving their goals. There is a particular need for workshops that focus on older people who may not identify themselves as disabled, but would benefit from making adaptations in their homes to accommodate their changing abilities.

6.6 CONCLUSION

This study was limited in its ability to define how interior design professionals facilitate the modification of homes to accommodate disabilities. What did emerge from the data was the conclusion that the acquisition and implementation of design and management skills and knowledge facilitates the modification of homes to accommodate

disabilities. If it could be assumed that interior design professionals are highly skilled in the design process, then it could be concluded that interior design professionals facilitate home modifications to accommodate disabilities. This facilitation is contingent upon the needs of consumers arising from their disability, experience with design and construction, and other intervening variables.

It is not sufficient to have a good understanding of disability issues alone. The issues of design and construction are also an integral part of the process that must be addressed. This study demonstrated that a gap between existing accessible guidelines and concrete solutions for the individual consumer will remain if the modification process does not include a careful consideration of individual needs and existing environmental conditions. This study also demonstrates that inefficiencies in the modifying process resulting in cost over runs and delays can be very stressful for a group of consumers who are already burdened with many other difficulties. These conditions create an opportunity for interior design professionals to contribute their design and management skills. These skills have been identified using the terms Assessment and Programme Development, Problem Solving, Documentation, Procurement, and Project Management.

For some consumers, the need for professional interior design services is minimal. Such consumers have long-standing disabilities that give them a good insight into their needs. If their modifications are of a modest scale, consumers can rely on their past experiences and the competency of their builder to make the required modifications. For other consumers, the need for assistance is great. For these consumers, interior design professionals can provide a comprehensive range of services to complement the skills of other service providers who have expertise in disability or construction. By providing these services, interior design professionals can facilitate the modifying process under circumstances where consumers are in need of assistance. What remains unclear how-

ever, is whether consumers, and others interested in the modifying process, perceive that the benefits of these services justify the costs of including design professionals in the modification process.

GLOSSARY OF TERMS

Accessible design - This term, along with barrier free design was originally used to describe universal design values, but has come to be associated with an emphasis on meeting the needs of people with disabilities rather than on the inclusive connotation of universal design. Often this term was associated with special features such as ramps alongside stairs (Center for Universal Design, 1997; Ostroff & Iacofano, 1982; Story, 1998; Welch, 1996).

Action-Interaction Strategies: see “Paradigm Model”

Adaptable Design - This term describes an approach that provides the characteristics of universal design, but includes features that can be adapted to meet specific and changing needs of the individual (Canadian Mortgage and Housing Corporation, 1996; Story, 1998).

Agility Disability - “is a limitation in bending, dressing, getting in or out of bed, cutting toenails, grasping objects, reaching, or cutting food.” (Statistics Canada, 1992)

Barrier-Free Design - see Accessible Design.

Causal Conditions: see “Paradigm Model”

Coding - Axial - A set of procedures whereby data are put back together after open coding, making connections between categories. This is done by utilizing a coding paradigm including conditions, context, action-interaction strategies and consequences (Strauss & Corbin, 1990, p. 96).

Coding - Open - The process of breaking down, examining, conceptualizing, and categorizing data. (Strauss & Corbin, 1990, p. 61)

Coding - Selective - The process of selecting the core category and systematically relating it to other categories, validating those relationships, and filling in categories that need further refinement and development (Strauss & Corbin, 1990, p. 116).

Consequences: see "Paradigm Model"

Consumer - For the purposes of this study, the consumer is considered to be a person living in a household who actively participates in the decision making and implementation of home modifications. As such, the consumer may or may not have a disability. For example, in a situation where it is a young child who has the disability, the parents would be considered as the consumers.

Context: see "Paradigm Model"

Disability - For the purposes of this study, disability is defined as a mobility or agility impairment according to the criteria used in the Statistics Canada 1991 Health and Activity Limitation Survey (Statistics Canada, 1992). This will include people that have a limitation in:

- bending, dressing, getting in or out of bed, cutting toenails, grasping objects, reaching, or cutting food.

- walking, moving from room to room, carrying an object 10 meters, or standing for long periods.

Intervening Conditions: see "Paradigm Model"

Marketing - is a “human activity directed at satisfying needs and wants through exchange processes” (Kolter, 1983, p.8). These needs and wants can be satisfied with objects, services or ideas.

Mobility Disability - “is a limitation in walking, moving from room to room, carrying an object 10 meters, or standing for long periods.” (Statistics Canada, 1992)

Modifications -This study will consider modifications to be any change in the physical environment that is made to facilitate independent living for a person with a mobility or agility impairment. This will include new building construction or any repairs, refinishing, or modifications of adjacent areas that are disturbed as a consequence of these physical changes. For example, if a wall were moved in a hallway to improve accessibility, replacement of carpet and refinishing of adjacent rooms would be considered as part of the modification. However, refinishing of a room not affected by this change would not be considered under the term modification, but is viewed as part of a larger renovation project

Needs - include physiological requirements such as food and shelter as well as social dimensions such a sense of belonging and self-actualization. When needs are not satisfied, there is a sense of anxiety. The response to this anxiety is to either satisfy it or extinguish the desire (Kotler, & McDougall, 1983, p.8).

Paradigm Model – The relationship of categories identified by Strauss and Corbin (1990, p. 96) in axial coding. This model includes:

Causal Conditions: “Events, incidents, happenings that lead to the occurrence or development of a phenomenon.”

Phenomenon: “The central idea, event, happening, incident about which a set of actions or interactions are directed at managing, handling, or to which the set of actions is related.”

Context: “The specific set of properties that pertain to a phenomenon.”

Intervening Conditions: “The structural conditions bearing on action-interaction strategies that pertain to a phenomenon. They facilitate or constrain the strategies...”

Action-Interaction Strategies: “Strategies devised to manage, handle, carry out, respond to a phenomenon under a specific set of perceived conditions.”

Consequences: “Outcomes or results of action and interaction.”

Person First Language - This study uses terminology advocated by the Independent Living Movement. Because the emphasis is on the person and not the disability, terms such as “person with a disability” are preferred over “disabled person”. Identification as a consumer or other role that is normalized in our society is also acceptable.

Phenomenon: see “Paradigm Model”

Private Housing - For the purpose of this study, private housing will be defined as a dwelling unit for which the occupant has the rights and responsibilities to repair and modify.

Universal Design – an approach to the design of products and environments that can be used and experienced by all people to the greatest extent possible, without adaptation (Center for Universal Design, 1997; Story, 1998).

Wants - Culture and individual context defines the expression of needs as wants. The needs are symbolized as objects that can vary according to the situation. For example, we all share the need for shelter, but have different ideas about what kind of shelter we want. Marketing does not create a need, but makes the connection between a need and a product or service that is experienced as a want or desire (Kotler, & McDougall, 1983, p.8).

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Appendix A

Principles of Universal Design:

Authorization To Reproduce Copyright Material

CATHERINE REILLY

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umtimber@cc.umanitoba.ca

The Center for Universal Design
North Carolina State University
Box 8613
Raleigh, NC
27695-8613
USA

April 31, 1999

I am a graduate student in the Master's of Interior Design programme at the University of Manitoba, Faculty of Architecture. As part of the requirements of the programme, I am writing a research practicum provisionally titled "The Role of Interior Design Practice in the Modification of Housing for People with Disabilities". In this report I would like to use the 7 principles of Universal Design Version 2.0 -4/97 from the Center for Universal Design.

Please indicate your approval to use the above reference and any conditions you require by returning this letter with your signed authorization to the above address.

Thank you


Catherine Reilly, B.I.D., P.I.D.M., I.D.C.

Permission to use the above noted references granted under the following conditions:

plz see attached guidelines



Signature

Andrea Gabriel

Name

May 10, 1999

Date

Director of Outreach & Dissemination

Title

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1. The Principles of Universal Design must be reprinted intact, without interpretation or abbreviation or any other alteration. It is acceptable to reprint the Principles of Universal Design in one of two formats:
 - ALL of the seven Principles alone or
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2. The Principles of Universal Design must be clearly labeled "Copyright (c) 1997 NC State University, The Center for Universal Design."
3. Whenever feasible, all ten authors of the Principles of Universal Design should be listed.
4. If the Principles of Universal Design are being used as the basis for other work, it must be made clear that The Center for Universal Design is responsible only for the Principles themselves and not other work developed from them. We suggest the following disclaimer: "The Principles of Universal Design were conceived and developed by The Center for Universal Design. Use or application of the Principles in any form by an individual or organization is separate and distinct from the Principles and does not constitute or imply acceptance or endorsement by The Center for Universal Design for the use or application."

For more information, please contact The Center for Universal Design at (voice/TTY) (919)515-3082 or (800)647-6777, (fax) (919)515-3023, or (e-mail) <cud@ncsu.edu>.

Appendix B

NCIDQ Definition of Interior Design

From:

NCIDQ Examination Guide (6'th ed.) (1991)

A.1 DEFINITION OF INTERIOR DESIGN

Preamble

The definition of interior design embraces elements of practice including theory, process, knowledge, tasks, and responsibilities of the interior design practitioner. The definition is intended to clarify the professional's occupational title for licensing bills, publicity, educational development and so forth.

The process of definition development included the following five steps:

1. A job analysis (documentation through research) of the profession was conducted by NCIDQ and Educational Testing Service to determine the knowledge and task areas of interior design practice. The data was reviewed and confirmed by panels of experts representing the interior design profession and published in the *NCIDQ Report of the Job Analysis of Interior Design* in 1988. (The job analysis is available from the NCIDQ office for \$20 per copy.)
2. An initial meeting for definition development was conducted to assimilate the research data.
3. A review period was established to receive comments from meeting participants, interior design organizations and NCIDQ directors as well as from the architecture community. NCIDQ's legal counsel participated in the meeting and review processes.
4. A second meeting on the definition was facilitated to incorporate all suggested modifications to the definition.
5. A second review period, including final review by legal counsel, was established.

DEFINITION OF INTERIOR DESIGN

Short Definition

The Professional Interior Designer is qualified by education, experience, and examination to enhance the function and quality of interior spaces.

For the purpose of improving the quality of life, increasing productivity, and protecting the health, safety, and welfare of the public, the Professional Interior Designer:

- analyzes the client's needs, goals, and life and safety requirements;
- integrates findings with knowledge of interior design;
- formulates preliminary design concepts that are appropriate, functional, and aesthetic;
- develops and presents final design recommendations through appropriate presentation media;
- prepares working drawings and specifications for interior construction, materials, finishes, space planning, furnishings, fixtures, and equipment;
- coordinates with professional services of other licensed practitioners in the technical areas of mechanical, electrical, and load-bearing design as required for regulatory approval;
- prepares and administers bids and contract documents as the client's agent;
- reviews and evaluates design solutions during implementation and upon completion.

Long Definition / Scope of Services

The interior design profession provides services encompassing research, development, and implementation of plans and designs of interior environments to improve the quality of life, increase productivity, and protect the health, safety, and welfare of the public. The interior design process follows a systematic and coordinated methodology. Research, analysis, and integration of information into the creative process result in an appropriate interior environment. Practitioners may perform any or all of the following services:

Programming. Identify and analyze the client's needs and goals. Evaluate existing documentation and conditions. Assess project resources and limitations. Identify life, safety, and code requirements. Develop project schedules, work plans, and budgets. Analyze design objectives and spatial requirements. Integrate findings with their experience and knowledge of interior design. Determine the need, make recommendations, and coordinate with consultants and other specialists when required by professional practice or regulatory approval.

Conceptual Design. Formulate for client discussion and approval preliminary plans and design concepts that are appropriate and describe the character, function, and aesthetic of a project.

Design Development. Develop and present for client review and approval final design recommendations for: space planning and furnishings arrangements; wall, window, floor, and ceiling treatments; furnishings, fixtures, and millwork; color, finishes, and hardware; and lighting, electrical, and communications requirements. Develop art, accessory, and graphic/signage programs. Develop budgets. Presentation media can include drawings, sketches, perspectives, renderings, color and material boards, photographs, and models.

Contract Documents. Prepare design development drawings and specifications for interior construction, materials, finishes, furnishings, fixtures, and equipment for client's approval. Coordinate with professional services of specialty consultants and licensed practitioners in the technical areas of mechanical, electrical, and load-bearing design as required by professional practice or regulatory approval. Identify qualified vendors. Prepare bid documentation. Collect and review bids. Assist clients in awarding contracts.

Contract Administration. Administer contract documents as the client's agent. Confirm required permits are obtained. Review and approve shop drawings and samples to assure they are consistent with design concepts. Conduct on-site visits and field inspections. Monitor contractors' and

suppliers progress. Oversee on their clients' behalf the installation of furnishings, fixtures, and equipment. Prepare lists of deficiencies for the client's use.

Evaluation. Review and evaluate the implementation of projects while in progress and upon completion as representative of and on behalf of the client.

EDUCATION, EXPERIENCE AND AFFILIATION

Interior Design as a profession achieved recognition in North America in the early 1930's. At that time it was known as interior decoration, a term that suggested only the decorative completion and furnishing of an existing interior.

However, recognition of the need to address human concerns and the increasing complexity of interior environments prompted interior design education to grow and expand. Today, professional interior designers share a common body of knowledge of interior design. This common body of knowledge is exemplified by the first professional degree level of interior design education, reinforced and broadened by experience in the profession, and attested to by the successful completion of a qualifying exam.

As a result, interior designers are employed in a variety of settings (e.g., sole practice, interior design firms, architecture firms, facilities management, government agencies, corporations, education, etc.). Some elect to specialize (e.g., retail, space planning, hospitality, office planning, schools, health care, restoration, residential, transportation, laboratories, etc.).

Appendix C

NCIDQ Description of Interior Designer Knowledge Areas

From:

NCIDQ Examination Guide (6'th ed.) (1991)

H.7 INTERIOR DESIGNER KNOWLEDGE AREAS (as outlined in the *NCIDQ Report of the Job Analysis of Interior Design*, copyright 1988 by the National Council for Interior Design Qualification).

I. THEORY

- principles of design (balance, harmony, gradation, unity, variety, dominance, repetition)
- elements of design (line, shape/form, site, scale, direction, texture, color/value, light, light source)
- human factors (e.g., ergonomics, anthropometrics, special needs)

II. PROGRAMMING, PLANNING, AND PRE-DESIGN

- research techniques
- programming/needs assesment
- field survey
- volume/area calculations
- space planning
- project cost estimating

III. CONTRACT

- working drawings (plans, details, elevations, and sections)
- specifications
- coordination of consultant documents

IV. FURNITURE, FIXTURES, EQUIPMENT, FINISHES

- identification, characteristics, and appropriateness
- fabrication and installation methods
- testing and evaluation
 1. life safety standards
 2. wearability standards

V. BUILDING AND INTERIOR SYSTEMS

- building construction
- interior construction (wall, ceiling, flooring)
- lighting
- electrical
- plumbing
- mechanical (HVAC, vertical transportation)
- acoustics
- security
- millwork and cabinetry
- window treatments

VI. COMMUNICATION METHODS

- concept statement
- free-hand sketching
- drafting (manual and computer-aided)
- abbreviations and symbols
- perspective/axonometric drawings

VII. CODES/STANDARDS KNOWLEDGE

- life safety
- building codes
- barrier free
- testing standards
- clients' insurance requirements

VIII. BUSINESS AND PROFESSIONAL PRACTICES

- professional ethics
- business development
- business and financial management
- scope of interior design services
- professional liability
- trade relations

IX. PROJECT COORDINATION

- contract administration
- project management
- client and contractor relations
- post-occupancy evaluation

X. HISTORY

- identification of major periods and styles in architecture
- identification of major periods and styles in interior design and furnishings
- identification of major periods in art

H.8 INTERIOR DESIGNER TASK ANALYSIS (as outlined in the *NCIDQ Report of the Job Analysis of Interior Design*, copyright 1988 by the National Council for Interior Design Qualification)

I. DESIGN PROCESS

A. Programming/Pre-design

Determine:

- objectives of the problem
- functions of the space to be designed
- special requirements of client
- resources and limitations (human, physical, financial)

Review:

- existing documents (drawings, specifications, lease agreement, etc.)
- existing conditions
- zoning requirements
- conduct building code search
- analyze spatial relationships (adjacencies, traffic flow, etc.)

B. Schematic/Conceptual Design

Formulate preliminary:

- design directions (philosophy, three-dimensional design, character, etc.)
- space planning
- furniture/furnishings/equipment layouts
- statements of probable cost
- materials, furnishings, colors, finishes
- review building/environmental systems
- prepare preliminary presentation materials
- coordinate consultant involvement
- verify and update programming requirements
- secure client approval

C. Design Development

Refine/finalize:

- design concept
- space planning
- furniture/furnishings/equipment layout
- material, furnishings, color, finishes
- statement of probable costs

Prepare design development documents and presentation materials:

- floor plans
- lighting/reflected ceiling plans
- furniture/fixtures plans
- elevations and sections

H. Post Occupancy Evaluation

- review and evaluate design solution
- conduct periodic and ongoing evaluation of the facility

II. PROFESSIONAL PRACTICE

A. Professional Development

- review industry journals
- attend meetings, exhibitions, markets
- pursue continuing education opportunities
- monitor code revisions
- monitor industry and construction costs

B. Project Management

- prepare owner/designer contract:
- establish scope of services
- establish method of compensation
- develop project time schedules
- establish project team (client's representative, consultant, etc.)
- utilize industry related forms and documents
- understanding of design process

- key details
- outline specifications
- perspective/axonometric drawings
- presentation boards
- develop art, accessories, graphics/signage, interior plantscaping programs
- verify and update programming requirements
- coordinate consultant involvement
- secure client approval

D. Contract Documents

Prepare:

- working drawings
- specifications for interior construction
- general and special conditions to the contract
- specifications/furniture, fixtures, and equipment
- furniture/fixtures/equipment drawings
- coordinate consultants' documents (drawings and specifications)
- obtain required governmental approvals
- secure owner approval

E. Bidding/Tendering and Negotiation of Contract

- issue necessary addendum or supplements
- prepare and issue instructions to bidders
- clarify information to bidders
- prepare qualified bidders' list
- collect open bids and make recommendations
- review list of sub-contracts
- assist client in preparation of contract/owner contract

F. Purchasing

- purchase for resale by designer
- prepare and issue purchase orders as clients' agent
- prepare client invoices for specified products on purchase orders

G. Contract Administration

- issue documentation in relation to revision and supplements
- review submittals of shop drawings and samples
- review contractors' schedules
- conduct on-site visits and field inspections
- attend project meetings
- review and approve contractors' application for payment
- prepare list of deficiencies (punch list)
- oversee installation of furniture, furnishings, equipment, and materials

Appendix C.2

Authorization to Reproduce Copyright Material

NCIDQ Examination Guide

Definition of Interior Designer and Description of Interior Designer Knowledge Area

CATHERINE REILLY

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umtimber@cc.umanitoba.ca

National Council for Interior Design Qualification
1200 18th St. NW
Suite 1001
Washington, DC.
20036

July 14, 1999

I am a graduate student in the Master's of Interior Design programme at the University of Manitoba, Faculty of Architecture. As part of the requirements of the programme, I am writing a research practicum provisionally titled "The Role of Interior Design Practice in the Modification of Housing for People with Disabilities". In this report I am proposing to use the standards developed by NCIDQ as a model of interior design professional practice. I am requesting permission to include the following material in my thesis:

- NCIDQ Examination Guide, 6th edition, 1991
- Overview, Definition of Interior Design, pages 2-3
- Interior Designer Knowledge Areas, pages 58 - 62

If you have a more recent version of the above references, I would appreciate having copies of the relevant pages and permission to use the most recent version.

Please indicate your approval to use these references and any conditions you require by returning this letter with your signed authorization to the above address.


I am hoping to have my thesis ready for my defense in late August. I realize that this is very late notice. I had sent a letter in April to your New York address and just recently received the letter returned as undeliverable. I would be very grateful if you could respond to my request as soon as possible. If you have any questions, please call me collect or e-mail at the above numbers.

Thank you

Catherine Reilly, B.I.D., P.I.D.I.M., I.D.C.

Permission to use the above noted references granted under the following conditions:

Use restricted to above-referenced purpose.


Signature
Todd A. Bastide
Name

7/15/99
Date
Exec. V.P.
Title

Appendix D

Letters of Entry

D.1 Request for approval by University of Manitoba Faculty Committee on the Use of Human Subjects Research

D.2 Request to contact participants through agencies D-2 Letter of Introduction

D.4 Request for participants advertisement

D.5 Consent form



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Appendix D.1

Approval From Ethics Committee

August 4, 1999

Catherine Reilly
5522 - 44th Street
Yellowknife, NT
X1A 1H9

Dear Catherine,

I have received your revised version of your thesis "The Role of Design Practice in the Modification of Private Housing for People with Disabilities", letter dated 12.11.98; but in fact is a revised version of the 12 November document which I will date as 20 November according to the date it was faxed.

With the revisions as now accomplished your proposal for research involving human subjects is approved.

Best wishes and good fortune in your work.

Yours,

W. P. Thompson

WPT/gl

**Request for approval by the University of Manitoba Faculty Committee
Faculty of Architecture Committee
on the Use of Human Subjects Research**

Attention: Dr. W. P. Thompson

November 12, 1998

Following our conversation of November 6, I am resubmitting my request for approval by the Faculty of Architecture Committee on the Use of Human Subjects Research with your suggested changes. My understanding is that I may proceed now with contacting participants. Please confirm your approval by e-mail as soon as possible as I plan to start phoning my contacts early next week. A written notice of approval may be left in my mail slot in the Arch 2 building.

Enclosed, please find copies of the following:

1. Request To Contact Participants Through Agencies
2. Request For Participants Advertisement
3. Letter Of Introduction
4. Telephone Screening Interviews
5. Consent Form
6. Interview Guideline With Designer Assistance
7. Interview Guideline Without Designer Assistance
8. Background Information Questionnaire

Name of Study:

The Role of Interior Design Practice in the Modification of Private Housing for People with Disabilities

This is a thesis in partial completion of the requirements for a Master's in Interior Design.

Contact:

Catherine Reilly
164 Wildwood Park
Winnipeg, Manitoba
R3T 0E2
204-475-1312 umtimber@cc.umanitoba.ca

Committee

Dr. Sheri Blake: Advisor - Department of City Planning
Leon Feduniw: Department of Interior Design
Dr. Nancy Higgitt, Faculty of Human Ecology
Laurie Ringaert: Manager , Canadian Barrier Free Institute

Purpose

The purpose of the study is to understand if and how interior design professionals can

help in the process of renovating homes to accommodate the needs of a person with a disability.

Dissemination of Study:

This report will be reproduced according to the requirements of the Faculty of Graduate Studies and will be placed in the collections of the University of Manitoba library. This thesis report may also form the basis of future reports submitted for peer review and publication in professional journals.

Nature of Study

Approximately twelve participants are required for semi-structured interviews and the completion of a background information questionnaire. Interviews will be conducted using the attached Interview Schedules as general guides.

Access to Participants

Participants will be contacted through the advocacy groups listed below. These contact groups will be contacted by telephone:

1. Canadian Institute for Barrier Free Design
2. ProductABILITY, Ten Ten Sinclair Street
3. Age and Opportunity
4. Independent Living Resource Centre
5. Canadian Paraplegic Association
6. Community Therapy Services
7. Worker's Compensation Board
8. Cerebral Palsy Association of Manitoba
9. Professional Interior Designer's Institute of Manitoba
- 10.

Agencies interested in considering this request will be provided with the following:

1. Request To Contact Participants Through Agencies
2. Letter Of Introduction
3. Request For Participants Advertisement

Some households may be contacted directly through personal contacts and will be provided with a Letter of Introduction.

After receiving the names of households provided by contact agencies, I will contact each household. At this time I will confirm their interest and that they have received the Letter of Introduction describing the study. If they have not received the Letter of Introduction, I will arrange for them to receive one. At this time I will conduct a telephone screening interview (see attached Telephone Screening Interview) to ensure that participants meet the criteria of the study.

Participants will be selected from the telephone screening interviews and contacted by telephone to arrange for appointments and answer any questions.

Prior to starting the interview, each participant will sign a copy of the attached Consent Form. Interviews will be conducted in the participant's home at a time of their convenience.

Type of Participants

The participants will be adults who are able to provide informed consent. The participants will be interviewed either by household (adult members only) or as individuals according to the convenience of the participants.

Access to Data and Confidentiality

Interviews will be tape recorded. Each tape, set of field notes and photographs, will be labeled with a number that will not reveal the participant's identity. A key listing names with these codes will be kept in a separate location accessible only to the investigator.

Recorded tapes and transcripts will be available only to the investigator, members of the committee, and the transcriber, and will be destroyed upon completion of the study.

Photographs of the participants' homes will be taken to assist in investigator recall and for reference in the study. Care will be taken not to include images in the published report that would permit ready identification of participants or locations of home.

References to names, locations, or other data that might reveal identities will be excluded in written reports to maintain confidentiality

Benefits:

Participants may benefit from taking part in this study as the result of insights into their situation they may gain during the course of the interview process. Other households may benefit from the study if the knowledge gained can be used to improve the accessibility of design services when modifications to the home are required. Educators, professionals, and policy makers will use this information to guide their work in a way that addresses the needs of people with disabilities.

Caution:

For some people, talking about the issues of disabilities and the experiences of needing to modify their homes may provoke difficult memories or feelings.

There is also the risk that their identity may be revealed through the study, although every attempt will be made to reduce the likelihood of this happening.

If you have any questions, please feel free to call me at 475-1312 or e-mail umtimber@cc.umanitoba.ca

Catherine Reilly

Appendix D 2

Request to contact participants through agencies

Brian Everton
Manager: ProductABILITY Consulting
1010 Sinclair Street
Winnipeg, Manitoba
R2V 3H7

Dear Brian

I am writing in response to our telephone conversation. I am a graduate student at the University of Manitoba in the Department of Interior Design. As part of my program, I am conducting a research study titled "The Role of Interior Design Practice in the Modification of Private Housing for People with Disabilities". Your assistance in locating suitable participants would be appreciated. I will need a list of prospective participants by the end of November in order to be able to commence interviews in December and complete them by the end of March.

This study will consider the role of professional design services in the modification of private housing for people with disabilities, in order to understand if and how these services can enhance the process of making homes more accessible. Understanding the nature of this role will contribute to making design services more available for those in need, and aid the interior design profession in reaching and serving this market.

Participants will be interviewed about their experience in modifying or building a new home. They should meet the following criteria:

- Are members of households who have participated in the modification of their home (or construction of new homes) in order to accommodate the needs of a member of a family who has a disability. The participants do not necessarily need to be the person with the disability.
- Modifications or new construction should have cost at least \$5,000
- Households include at least one member who has a mobility or agility impairment.

If you know of any people who might fit these criteria, I have enclosed a copy of a Letter of Introduction that you could distribute to prospective candidates. I have also included a poster advertising my request if you think it would be appropriate to post in your facility.

Thank you for offering to assist with this study.

Yours truly,

Catherine Reilly

Appendix D 3

Letter of Introduction

You are being invited to participate in a study on the role of design professionals in the renovation of private housing for people with disabilities. This study is being conducted by myself, Catherine Reilly, a graduate student in the Master's of Interior Design Program at the University of Manitoba, Faculty of Architecture.

I can be contacted at:

- Home phone: 204-475-1312
- Mail: Attention: Catherine Reilly : Graduate Student MID, University of Manitoba, Faculty of Architecture, Department of Interior Design, Winnipeg, Manitoba, R3T 2N2
- e-mail: umtimber@cc.umanitoba.ca

Purpose

The purpose of the study is to understand if and how design professionals can help in the process of renovating homes to accommodate the needs of a person with a disability.

Dissemination of Study:

This report will be reproduced according to the requirements of the Faculty of Graduate Studies and will be placed in the collections of the University of Manitoba library. This thesis may also form the basis of future reports submitted for peer review and publication in professional journals.

Procedures:

You will be asked to do three things, fill out a questionnaire, participate in an interview that will be audio taped, and give a tour of your home to the researcher explaining features that have worked out well and those you are less satisfied with. The interview and tour of your home will take about 2 hours. Photographs of these features will be taken for the purpose of reference in the study.

Benefits:

Participants will receive no financial benefit from taking part in this study. Some participants may benefit from insights into their situation they might gain during the course of the interview process. Other households may benefit from the study if the knowledge gained can be used to improve the accessibility of design services when renovations (or new construction) to the home are required. Educators, professionals, and policy makers will use this information to guide their work in a way that addresses the needs of people with disabilities.

Caution:

For some people, talking about the issues of disabilities and the experiences of needing to renovate or build new homes may provoke difficult memories or feelings.

All information will be kept as confidential as possible, however, due to the small population of Manitoba and the number of people who have modified their homes to accommodate a disability, it is possible some identities may be recognized.

Confidentiality:

The records of this study will be kept confidential. The interview tapes and photographs will be identified using a numbered code. The key to the code matching recordings to

participant names will be placed in a secure location accessible only to the myself. Written transcripts of the recordings will be prepared by myself and a typist. The written transcripts will be made available only to myself and my thesis committee. Quotations from the interviews may be used in the report. References to names, locations, or other information that might reveal identities will be excluded in written reports to maintain confidentiality. The interview tapes and transcripts will be destroyed upon completion of the study.

If photographic images are included in the published report, care will be taken not include any that could allow easy identification of participants or locations of homes.

Participation

You are under no obligation to participate in this study and your relationship with the University will not be affected whether or not you decide to participate. Prior to starting the interviews, you will be given a consent form to sign indicating your approval and consent to proceed with the interview. However, even after signing this form, you are free to terminate the interview at any time.

If you have any questions you can contact Catherine Reilly at 475-1312.

Appendix D 4

Request for Participants Advertisement

RENOVATING AND BUILDING HOMES FOR INDEPENDENT LIVING

Have you renovated your home or built a new home to accommodate the needs of someone in your household who has a disability?

I'm a graduate student in Interior Design at the University of Manitoba. I'm looking for volunteers who would be willing to be interviewed as part of a study about the experience of renovating or building new homes to make them accessible for a household member with a disability. You would be asked about your experience in finding good products, advice, pricing, and contractors. If you think you might be interested, please call me for more information.

**Catherine Reilly, Graduate Student
Department of Interior Design, Faculty of Architecture
University of Manitoba
475-1312 umtimber@cc.umanitoba.ca**

Appendix D 5

Consent Form

Consent to Participate in Study

This consent form indicates that I, _____
(print name in full) agree to take part in the study, "The Role of Interior Design Practice in the Modification of Private Housing for People with Disabilities". I have been given the researcher's name and university address, and an oral and written explanation of the study.

I have been given the chance to ask questions and understand that I can ask more questions at any time. I realize that I can choose to take part, or not to take part in this study and that I can stop the interview at any time. I have been told this study may not benefit me in any way financially. However, my participation will help add to the knowledge about providing appropriate housing for people with disabilities.

I understand that all information will be kept as confidential as possible, however, due to the small population of Manitoba and the number of people who have modified their homes to accommodate a disability, it is possible some identities may be recognized.

My signature on this page indicates that I understand and agree to take part in the study.

Date

Signature of Participant

I have fully explained to _____ (print name in full)

The nature and purpose of this research project on the information sheet which has been given to the participant. I have asked the participant if there are any questions about the study and have answered these questions to the best of my ability.

Date

Investigator: Catherine Reilly

Would you like a copy of the summary of results? ____

If yes, send to: _____

Appendix E

Interview Schedules

E-1 Telephone screening interviews

E-2 Interview schedule with designer assistance

E-3 Interview schedule without designer assistance

E-4 Background information questionnaire

Appendix E 1

Telephone Screening Interviews

My name is Catherine Reilly. I am a graduate student in the Master's of Interior Design programme at the University of Manitoba. Your household was suggested to me by _____. I am doing a study of how people modify their homes to accommodate a disability as part of my thesis requirements. Would you be willing to spend a few minutes with me answering 5-6 short questions? *If yes, then go to 1. If no, then go to 11 to terminate interview.*

I will ask you 5 or 6 questions that will need a yes or no answer. You do not have to answer any or all questions and are free to stop this interview at any time. Your answers will be kept confidential and will be used only for the purposes of this study. Is this agreeable to you? Shall we proceed?

1. Have you spent at least \$5,000 renovating your home or constructing a new one to accommodate a disability of someone in your household in the last 10 years?
yes _____ no _____
2. Would you consider this person to have a disability that limits their ability to walk, move from room to room, carry an object 30 feet or stand for long periods of time?
yes _____ no _____
3. Does this person have difficulty bending, dressing, getting in or out of bed, grasping objects, reaching, or cutting food?
yes _____ no _____
4. Did you use the services of a design professional when you renovated your home?
yes _____ no _____
5. Did you help with the renovation or construction of your home by making decisions or finding information?
yes _____ no _____ *If yes then: Go to question 6. If no, then go to question 7.*
6. Would you be willing to consider participating in a personal interview by myself in your home? (*if no, then go to #10 to end interview: if yes, go to #11 to end interview*)
yes _____ no _____
7. If the person who did these things is home, would you mind asking them if they could talk to me or could I leave my number for them to call me back at their convenience?
yes _____ no _____ (*If person comes to phone repeat introduction and then go to 8, & 9. If no, then go to 10 to terminate interview.*)
8. I understand that your household spent at least \$5,000 renovating or constructing your home to accommodate a disability of someone in your household in the last 10 years. Is that correct?
yes _____ no _____

9. Did you help with the renovation or construction of your home by making decisions or finding information?
yes _____ no _____ (If yes then: Go to question 6. If no, then go to 10 to terminate interview.)

Thank you for your time. If you have any questions about this call, you may call me at 475-1312 or you may call the Department of Interior Design 474-9386

Thank you for your time. If you are selected to be a participant, I will call you in the next two weeks to arrange a time for the interview. If you have any questions, you may call me at 485-1312 or you may call the Department of Interior Design 475-9386.

Appendix E 2

Interview Guideline with Designer Assistance

1. Major renovations or construction of a home are a serious undertaking for any household. Can you give your general impression of how things went for you? Did things go smoothly, or were there complications?
2. Before you started the renovations (construction), did you have any ideas of what your home would look like when everything was finished?
3. Can you tell about 2 or 3 things you thought were very important when making decisions about the renovations (construction)?
4. In any project as complex as renovations (construction) we usually need to set priorities because we often can't afford everything. What factors were important to you in making decisions and choices?
5. How do did you feel about your home before you started the renovations (construction)?
6. How do you feel about it now?
7. I understand that you used a design professional to help you with this project. Can you tell me what type of professional this person was? For example, was (s)he an architect, interior designer, industrial designer or engineer?
8. Why did you decide to use one?
9. How did you go about selecting one?
10. Can you tell me how things worked out with this person?
11. Now I'd like to talk about the various phases of a renovation or construction project. How did you go about figuring out how much space you needed, where to place things, how to construct things?
12. How did you go about selecting products, finishes?
How was that? Was there an adequate selection?
13. How did you go about getting your building permit? Did you prepare the documents yourself or get help. How was that?
14. What kind of drawings and documents did you need to get the work done?
- Who did them for you? Can you remember what they charged for this service?
15. How did you go about choosing a contractor?
-Did you get competitive quotations?
- What documents did they use is preparing a quotation
16. How satisfied are you with the quality of their work?
17. How close was their final bill to their original quotation?

18. What did you do to keep control of the progress of the work?
 - Did you hold back money
 - How did you ensure subtrades were paid so that your property would not be subjected liens?
19. What did you find helpful in getting you renovations (construction) done?
20. What were the worst problems?
21. Who or what did you find helpful?
22. If you had to do it all over again, what would you do differently? Why?
23. What do you think is the best piece of advice you could give someone like yourself who needs to renovate their home because of a disability in the family?

Appendix E 3

Interview Guideline without Designer Assistance

1. Major renovations (construction) to a home are a major undertaking for any household. Can you give your general impression of how things went for you? Did things go smoothly, or were there complications?
2. Before you started the renovations (construction), did you have any ideas of what your home would look like when everything was finished?
3. Can you tell about 2 or 3 things you thought were very important when making decisions about the renovations (construction)?
4. In any project as complex as renovations (construction) we usually need to set priorities because we often can't afford everything. What factors were important to you in making decisions and choices?
5. How do did you feel about your home before you started the renovations (construction)?
6. How do you feel about it now?
7. What did you find helpful in getting you renovations (construction) done?
8. What were the worst problems?
9. Who or what did you find helpful?
Why?
10. Had you considered getting professional help with this project?
11. How did you go about figuring out how much space you needed, where to place things, how to construct things?
12. How did you go about selecting products, finishes?
How was that? Was there an adequate selection?
13. How did you go about getting your building permit? Did you prepare the documents yourself or get help. How was that?
14. What kind of drawings and documents did you need to get the work done?
- Who did them for you? Can you remember what they charged for this service?
15. How did you go about choosing a contractor?
-Did you get competitive quotations?
- What documents did they use in preparing a quotation
16. How satisfied are you with the quality of their work?
17. How close was their final bill to their original quotation?
18. What did you do to keep control of the progress of the work?
- Did you hold back money

- How did you ensure subtrades were paid so that your property would not be subjected to any liens?

19. Now that we've talked a bit more about your experience, do you think a design professional might have helped with this project?
20. If you had to do it all over again, what would you do differently?
Why?
21. What do you think is the best piece of advice you could give someone like yourself who needs to renovate their home because of a disability in the family?

Appendix E4

Revised Interview Schedule

1. Major renovations or construction of a home are a serious undertaking for any household. Making a home accessible is an additional consideration that most home improvement projects don't include. I'm interested in learning about the experience you had with your project.
2. Can you recall what your thinking was before you started this project?
3. Why did you build a new house?- knowledge
4. What did you think were the most important issues when making decisions about the design or construction of your home? cost, accessibility, appearance?
5. What kind of standard did you have in mind? e.g. what did you consider an acceptable appearance?- awareness- values
6. How did you determine your requirements to make your home accessible?- knowledge- problem solving
7. I understand that you used design professional to help you with this project. Why did you decide to use this type of service?
8. How helpful were they in addressing your accessibility needs? What services did they provide?- programming - knowledge - planning - problem solving - detailing - documentation - material selection - management- documentation- construction- supervision
9. What role did you play in determining the design of your home? How did you go about figuring out how the details of including them in your home. For example determining how much space you needed, where to place things and how to construct things?
10. How did you go about selecting products, finishes?
11. How was that? Was there an adequate selection?
12. What kind of drawings and documents did you have prepared to get the work done?
13. Who did them for you? Can you remember what they charged for this service?
14. How did you go about choosing a contractor
15. -Why did you select the contractor you used? what evidence did you use?
16. -Did you get competitive quotations?
17. What documents did they use in preparing a quotation? Was all of the required work clearly defined in written specifications and drawings, or did they have a general guide and set of plans?

18. Did you find you had many changes and revisions as the work proceeded?
19. How did you work out extra payments and credits?
20. How did you work out disagreements- conflict
21. How close were you in meeting your budget?
22. What did you do to keep control of the progress of the work? Did you hold back money
23. How did you ensure subtrades were paid so that your property would not be subjected liens?
24. How satisfied are you with the quality of their work?
25. What other resources did you find helpful in getting you renovations (construction) done?
26. If you had to do it all over again, what would you do differently? Why?

Appendix E 5

Background Information Questionnaire

INTERVIEW SURVEY FORM

1. Name of Participant

2. Age of Participant _____
3. Age of Person with Disability _____
4. Age of onset of Disability _____
5. Type of disability: Please give a brief description.

6. Condition is stable: YES _____ NO _____
7. Condition is unstable and may go into remission or become more advanced YES _____ NO _____
8. Ages of Other Household Members age _____ age _____ age _____
age _____ age _____ age _____ age _____ age _____
9. Total Household Income
under \$5,000 _____ \$5,000 to \$19,000 _____
\$20,000 to \$29,000 _____ \$30,000 to \$39,000 _____
\$40,000 to \$59,999 _____ \$60,000 to \$99,999 _____
\$100,000 and over _____
10. Does your household receive other income to assist in the care of the person with the disability such as disability pensions or insurance settlements?
YES _____ NO _____
11. What are your monthly rent or mortgage payments?

12. Do you own your home or rent? Own _____
Rent: _____
13. How long have you lived in this home? _____
14. What type of education best describes you?
High School _____ University or college (Bachelor's)
_____ University Master's or Ph.D. _____ Technical training

15. Please indicate any special training or interest in design before you started your renovations (construction). University degree _____
Certificate _____ Leisure courses _____ Personal interest

16. Please indicate any special training or interest in construction before you started your renovations (construction). Journeyman or certification _____
leisure courses _____ personal interest _____
17. What would you estimate you spent on your renovations (construction) or construction in total? _____

Appendix 7

Validation Procedures

RESEARCH ISSUE:

What is the relationship between service providers and skills and procedures used to complete modifications? What relationship do these skills have to outcomes?

DATA SETS	PROCEDURAL STEPS	DECISION RULES	ANALYSIS OPERATIONS
<ul style="list-style-type: none">• Transcripts• Provisional Categories	Use provisional categories identified in a previous step, and indicate who did tasks and negative or positive impact.	<ul style="list-style-type: none">• Include any statement of action that is directly linked to an outcome or obvious problem created because action was omitted• Do not include statements that repeat or rephrase comments within same response.	<ul style="list-style-type: none">- classification- counting- systematic contrast

CONCLUSIONS:

- There is not a strong correlation between using design professionals and avoiding actions or omissions resulting in negative consequences

- The households with the most negative consequences also had the highest numbers of omitted actions.

- The actions / omissions that created the most problems were the following: (a) Problem Solving – selecting appropriate materials and assemblies or configurations of materials, (b) Project Management – planning budgets.

Legend

*+ positive result :others

•- negative result: participant

*+ positive result: participant

-- action not undertaken

*- negative result: others

- negative results

CATEGORY	1	2	3	4	5	6	7	8	9	10	TOTAL Negative or omitted action
PROGRAMME DEVELOPMENT											
priorities	*+1	*+1	*+1	*+1	*+1		*+1		*+1		
Nature of disability	*+2	*+1	*+3 *+1	*+1	*+2	*+1	*+2 *+1	*+1	*+1	-1	1
Accessibility needs	*+1	*+1	*+1	*+1	*+2	*+2	*+1	*+1	*+1	-1	1
Products/technology	*+2	*+1	*+2 *+2 *-1	*+1	*+1	*+3 *-1	*+1	-1	*+1	*+1	3
Building codes	*+1		*+1	*+1					*+1	*+1	
Existing conditions			*+1 *+1 *-1	*+1 *-1	*+1	*+1		*+1	*+1	*+1	2
PROBLEM SOLVING											
material selection	*+1 *+1 *-2	*+1 *-1	*+1 *+5	*+3 *-1	*+1 *+1	*+1 *-1 *+3	*+5 *-1	*-2	*+1	*+2 *-1 *+1	7
aesthetics			*+1 *+1	*+2	*+1 *+1	*+1 *+2		*+1 *-2	*+1		2
assembly	*+2 *+2	*+1 *-1	*+4 *+8 *-1	*+3 *-1	*+4	*+4 *-1	*+5 *-1	*+1 *-5	*+3	*+2 *-1	11
concrete				*+2			*+3	*+1 *-2			2
abstract	*+1			*+1	*+1	*+2					
DOCUMENTATION											
drawing	*+1 *+1		*+2	*+1	*+1	*+3	*+1 *+2	*+1 *-3	*+1	*+1	3
written				-2	*+2			-3			5
spoken	*+1	*+1 *+1		*+1	*+1 *+1		*+2		*+1	*+1	
PROCUREMENT											
tenders / quotations	*+3	*+1	*+2	*+1	*+1	*+1	*+1				
purchase	*+2 *+3	*+1 *+1	*+4	*+2 *+2	*+1	*+1	*+2 *+2	*-2		*+1 *+1	2
written contracts	*+1		*+1	*+2	*+1	*+1	*+1	*-1			1
verbal contracts	*+1	*+1					*-1				1
PROJECT MANAGEMENT											
plan budget	*+2 *+2	*+1	*-1 *+1 *-1	*-4	*+1		*+2	*-2	*+1	*+1	8
plan schedule	*+3 *+2 *-1	*+1	*-1	*-1	*+1		*+1	*-1		*+1	4
permits & licenses	*+1	*+1	*-1 *+1	*+1	*+1				*+1	*+1	1
mediating conflict			*+4	*+2	*+1	*+2 *-1					1
decision-making	*+2	*+1	*+2 *-1 *+1	*+1	*+1 *+1	*+2 *+1	*+4	*+1 *-1	*+1 *+1	*+1	2
monitoring	*+1	*+1	*+1	*+3	*+1	*+2 *+1	*+1	*+2	*+1	*-1	1
directing	*+2	*+1		*+3	*+1		*+2	*+4 *-1	*+1		1
consulting	*+1 *+1	*+1 *+1	*+2 *+4	*+2	*+2 *+2	*+3	*+1 *+1	*-1	*+2		1
Advising (regarding procedures not design)	*+1		*+1	*+2 *-1	*+2	*+4	*+1	*-3	*+2		4