INDEPENDENT LIVING: ARCHITECTURAL AND ENVIRONMENTAL ACCESS THROUGH UNIVERSAL DESIGN

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INDEPENDENT LIVING: ARCHITECTURAL AND ENVIRONMENTAL ACCESS THROUGH UNIVERSAL DESIGN

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In Dedication and in Memorial to
the continual presence of

Dr. Thomas S. Cunningham,

1915-1994

"Be not forgetful to entertain strangers,
for thereby
some have entertained angels unawares."
(Hebrews 13:2)

If ever there walked an Angel on this Earth...

I had the privilege to call him Daddy.

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Tinta con Amor!

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Background

The Bartlett Independent Living Laboratory (BILL) is a research/demonstration facility which has showcased a barrier-free residential environment using universal design. The Bartlett Laboratory is located on the Oklahoma State University Campus and is affiliated with the College of Human Environmental Sciences. This architecturally accessible home was an existing single-family dwelling. It was remodeled from a house using conventional building design standards. Renovations to create an environment designed to support and accommodate the occupant to achieve maximum independent success, regardless of age, life-stage, or level of physical or mental ability were utilized.

It is assumed that persons with disabilities and persons who are aging can and want to maintain levels of contribution to societal productivity and retain their independence. This is most feasible if the home environment, by design, supports independence and allows maximum function in self-care, indeed, in all forms of daily functional activity. One of the most basic assumptions in human needs is *that all persons want to be able to maintain control over their own lives and have mastery over their home environment.* Building and renovating housing in an accessible manner provides an environment which accommodates the means for each individual to achieve their maximum level of independence in daily living tasks, societal

productivity, and community input. *Universal design* allows persons with and without disabilities to perform daily living tasks in their own manner, routine, and personal schedule. *Barrier-free design* can provide all persons maximum levels of independence.

Barrier-free design eliminates the individual's dependence on caregivers schedules to perform daily living tasks. It minimizes the inconvenience of scheduling all personal care time to coincide with times a paid attendant is available. By being able to bathe, cook, eat, sleep and come and go according to one's own objectives, one can better contribute to the 8 to 5 schedule of the business world and society. Earning one's own income contributes to self-esteem. User-friendly design increases an individual's chances of financial independence. When one is financially secure, one is able to attain and maintain barrier-free living environments. With barrier-free living environments, one is able to better attain and maintain financial security.

BILL is a resource center of information, services, products, and technology that relate to managing disabilities, the aging process; even the able-bodied function easier in a user-friendly environment. It is a training site for professionals who work with persons with disabilities. BILL is a visual, tangible teaching aid and demonstration facility. It is available for consciousness and/or level of awareness raising tours. By visiting BILL, with focused use of optimal design, awareness levels of aesthetic accommodation may be improved. Regardless of a person's physical abilities or age, individuals, families and the community can learn through demonstration how a home can enable persons to live independently in an environment of their choice. BILL is an accessibly adapted environment which supports independent living.

BILL also provides a research lab for students, faculty, and service providers conducting studies related to disabilities. Most important, it is a resource for research relating to universal design, consumer satisfaction with structural adaptations and technological assistive devices. The sheer design possibilities idealized at BILL can promote advocacy skills among persons with disabilities.

BILL demonstrates how an existing home can be modified, or a new home designed, to meet the needs of children, able-bodied persons, older people or persons with disabilities. Structural features include but are not limited to environmental control systems, 36-inch wide doorways, 42-inch wide halls, a roll-in shower, motorized window treatments, lifts, adjustable-height work centers in the kitchen and office space, level thresholds, adapted appliances, sophisticated alarm systems, ramps and curb cuts constructed at an optimal rise/run ratio (Architectural and Transportation Barriers Compliance Board [ATBCB] Americans with Disabilities Act [ADA] Final Guidelines, 1991).

Persons in the community have contact with BILL where the staff disseminates pertinent, information about disabilities and accommodations. Disseminating factual information about barrier-free, universal design and how designing for architectural accessibility is beneficial is assumed to be a positive experience. This exposure can help the community realize future residential building standards can be personally beneficial. This may increase consumer demand for universal design in homes, products, and commercial structures. The community can be enhanced by this positive and practical contact with BILL.

The (Americans with Disabilities Act of 1990, [P.L. 101-336]) (ADA) states one in six Americans have a disabling condition. A new consumer

demand for architectural accessible housing can be kindled. Barrier-free design is user-friendly for the entire life cycle. Design helps to modify attitudes and subtly change a person's view of architectural accessibility. The person views the architecture as ease of access for all persons rather than architecture for special populations. Barrier-free environmental design strives to provide optimal access to all levels of abilities.

As more architecturally accessible homes are provided in the private housing sector, more persons with disabilities, and persons of all abilities, will be able to more easily achieve total inclusion in community and society throughout their life cycle. History has proven that every minority group that pushed for its civil rights resulted in an outcome that achieved a better understanding on both sides and understanding is accomplished. Increased understanding benefits all groups in society helping achieve a sense of community. Through architectural accessibility, the community has more opportunities for interactions with persons who are disabled, thus broadening society. As able-bodied persons have greater contact with the disabled community, negative stereotypes, prejudices, and misconceptions will begin to change for the better (Lifchez, 1987). By increasing total inclusion in society, business interactions are established. Attitudinal exchanges occur and positive interchange is encouraged and fostered. Through architectural and environmental user-friendly design, persons who are able-bodied will begin to have greater contact with persons with disabilities, thus, developing increased understanding. Soon the preoccupation of "ability" will fade from consciousness, and persons with disabilities will begin to enjoy inclusion throughout the life cycle.

Problem Statement

For numerous reasons, accessibility rights have had a history of being overlooked, avoided, and/or neglected. Early legislation did not provide a means of enforcement, and additional laws were continually needed to ensure that a person's accessibility rights were protected, even in federally funded facilities and programs (Cannon, 1989).

Research Focus and Justification

To date there has been limited research on user-friendly, single family accessibly designed dwellings and the significant impact that adapted home design has on the lives of persons with disabilities. The focus of this research is an evaluation of the influence of universal design on home accessible adaptations and the influence of residential design for people of all ages and abilities to live most independently. An inherent value of the universal design concept considers the architectural structure from foundation to fixtures. Because of the magnitude of different types of disabilities and different ability levels within the same disability, the researcher tried to narrow the scope of disability to focus mainly on wheelchair accessibility. However, when speaking of the community of persons with disabilities, it is very difficult not to overlap accommodations as benefiting several types of disabilities. Often, this research will refer to a person who has a Spinal Cord Injury (SCI). This type of disability most always requires wheelchair assistance for mobility. A person with an SCI is paralyzed from the neck or waist down and is no longer able to walk. A person limited to a wheelchair for all environmental access faces obstacles in the constructed environment, most of which go unnoticed as barriers to access by ambulatory persons (Lifchez, 1987).

Objectives:

(1) To assess use of information acquired from the BILL by people with disabilities and professionals in occupations that work with people with disabilities.

(2) To ascertain attitudinal differences towards disabilities and assess awareness of daily functioning with a disability between the study sample, and persons who toured BILL versus the general population, represented by the Stillwater (SWO) random comparison sample.

(3) To assess and compare attitudinal and awareness differences between persons who have toured the BILL and a random sample of persons living in Stillwater who have not been exposed to this model facility.

Assumptions:

(1) It is assumed the SWO comparison sample is representative of the general population, as it was randomly drawn by computer.

(2) It is assumed participants who tour the BILL are a specialized sample, in that they have an interest in disabilities and/or accessible housing to have toured the BILL facility.

(3) It is assumed persons who are exposed to the information housed and demonstrated at the BILL via tours and literature will acquire knowledge about universal and barrier-free design and will be more apt to apply that information to their private and professional lives.

(4) It is assumed when the general population of able-bodied persons are exposed to aesthetic environmental barrier-free design, analogies that accessible design is equal to institutional design will begin to be dissolved.

(5) It is assumed persons who have toured the BILL will be more aware and possess more positive attitudes (empathy as opposed to

sympathy) about and towards persons with disabilities than will persons who have not toured BILL.

(6) It is assumed persons who are exposed to universal design and have contact with persons with disabilities will be less intimidated by persons with disabilities and will possess positive attitudinal changes about persons with disabilities than will the segmented general population.

Limitations:

(1) The SWO sample demographics are limited as it was not ascertained if respondent did or did not have a disability. Opportunities to compare demographics on disabilities between BILL and the SWO random sample are not available.

(2) Possible limitations of data results interpretations due to inconsistency of tours of BILL staff members. All are knowledgeable of BILL. One guide is wheelchair assisted, while the other guides are able-bodied. The difference between tour guides being ambulatory or wheelchair assisted, may have influenced respondents of the BILL sample, either negatively or positively, and/or possibility of heightened awareness of different tour groups due to guide is unavailable. Potential for problems with consistent reliability and validity of responses due to influence of tour guide is limited.

(3) Respondents available to the Bartlett survey were limited to those guests that provided their full mailing address when signing the guest book.

(4) Just as universal design excludes no one and accommodates everyone, children too young to complete the instrument were included in the Bartlett Sample mailing. Being a community resource, the Bartlett Independent Living Laboratory hosts field trips to area public schools, Kindergarten children through Collegiate/Vocational Technological adults.

Some recipients of the questionnaire were too young to fill out the instrument and return a usable entry, limiting interpretation of nonresponse rate, causing immeasurable inflated nonrespondents.

(5) Address information of numerous SWO sample study respondents were limited because of provisional lack of rural route box numbers and were rendered nondeliverable. Nonresponse because of incomplete addresses distorts the percentages of the SWO sample and limits accurate interpretation

Definitions:

(1) Universal design; Refers to designing all products, buildings and exterior spaces to be used by all people to the greatest extent possible (Zook, Duncan, & Jones, 1995).

(2) Barrier-free Design; Architectural design that is wheelchair accessible with minimal restriction (Bednar, 1977).

(3) User-friendly Design; Architectural design that is designed for the life span, from toddler through old age.

(4) Able-Bodied; An ambulatory individual, not limited in one or more of the major life activities.

(5) Disabled; An individual with a physical or mental impairment that substantially limits one or more of the major life activities, for example, reaching, walking, learning rate, or speaking (ADA [1990], P.L. 101-336).

(6) Independent Living Movement; Assertion of persons with disabilities beginning in the early 1960s to have control over their lives and homes. The beginning of de-institutionalization (DeJong, 1979).

(7) Attitudinal Barriers; Lack of earnest communication due to a pre-mind set (English, 1971).

(8) Architectural Barriers; Stairs, curbs, steep inclines, objects and/or obstacles in the built environment that hinders the use of a wheelchair or one using mobility assistive devices to be independently mobile (Mosley, 1989).

(9) Social Barriers; From prejudice and stereotyping to inaccessible social meeting places (DeJong & Lifchez, 1983).

(10) Total Inclusion; Enforcement of the fourteenth amendment and to regulate commerce, in order to address the major areas of discrimination faced day-to-day by people with disabilities (ADA [1990] P.L. 101-336, STAT. 329).

(11) Accessible; Refers to usable space by all people. Accessibility means removing barriers...that currently hinders or harms many people unnecessarily (Null & Cherry, 1996).

(12) Adaptable Design; Refers to designing certain products, buildings and exterior spaces to include features that can be readily adapted to the needs of particular users (Zook, Duncan, & Jones, 1995).

Summary

The purpose of this study is continual contribution to the independent living movement, specifically, by introducing the concept of accessibility in the private housing sector as a benefit that helps support and promote independent living through the evaluation of the BILL demonstration model. With this empirical data, it will be possible to increase and improve information disseminated as well as positively influence the public view of architecturally accessible modifications as being beneficial in the public and private housing sector.

In addition to assessing and improving this model demonstration facility, it will be possible to compare attitudinal differences towards and

awareness of disabilities between able-bodied people and persons with disabilities. By learning social opinion regarding disabilities, it will be possible to understand where fears and misinformation enter into the attitudes of the general public. With this new understanding of sources, reasons, and depth of prejudice, negative stereotypes can be influenced positively. This focus should allow for a better understanding of the interaction processes involved between persons with disabilities, the constructed environment, the intent of legislation to architecturally accommodate persons with disabilities, and the independent living movement.

REVIEW OF LITERATURE

Introduction

The following literature review includes citations related to the influence of home modifications, accessible adaptations, and other housing variables upon people with disabilities, their families, and care-givers. This is a relatively new field of study. When accessibility is applied to the private housing industry, the scope of study narrows.

This review explains definitions of the independent living movement; maps a review of research on independent living; and discusses legislation governing accessibility and improving development of building standards. This review also introduces consideration of architectural barriers as boundary-maintaining mechanisms as a catalyst to social barriers. Influences of structural and environmental barriers on attitudinal and social barriers is also considered.

The review hypothesizes operationalized theory of acculturation to a disability, based on Spicer (1961) theory of alternative patterns of acculturation (as cited in Bee, 1974). Also discussed is edifying accessibility into the twenty-first century through legislation and activism. This chapter concludes with summary of the literature.

Overview of the Independent Living Movement:

A review of the literature offers a number of definitions of disability and characteristics of the independent living environment. The silent

boundary of architectural barriers directly affects independent living capabilities. Cole (1978) identifies two essential elements in the independent living movement.

> 1) Assuming responsibility for directing one's own life.-
> and- [sic]
> 2) Participating actively in the day-to-day life of the community (p. 459).

The Independent Living Research Utilization (ILRU, [1978]) Project in Houston, defines Independent Living as:

> Control over one's life based on the choice of acceptable options that minimize reliance on others in making decisions and in performing everyday activities. This includes managing one's affairs, participation in day-to-day life in the community, fulfilling a range of social roles, and making decisions that lead to self determination and the minimization of physical or psychological dependence on others (p.2).

In 1977 (White House Conference for [Individuals with Disabilities], 1977) independent living defined a physical environment and a service contingent which allows an [individual with a disability] to live and function in the least restrictive circumstance in a variety of non-institutional settings.

Walton, Schwab, Cassatt-Dunn, and Wright (1978) define independent living as the ability to select and maintain a life-style consistent with desires, means, and expectations of an individual. Universal design fosters personal independence. Also the independent living movement is more than living independently, it is also a concept and a philosophy. The coalition for independent living seeks to change that concept into reality.

DeJong (1979) proposes three major assumptions that characterize the movement for independent living:

> 1) Consumer Sovereignty. Disabled persons, not professionals, are the best judges of their own interests; they should ultimately determine how services are organized on their behalf.
>
> 2) Self-reliance. Disabled persons must rely primarily on their own resources and ingenuity to acquire the rights and benefits to which they are entitled.
>
> 3) Political and economic rights. Disabled persons are entitled to freely pursue their interests in various political economic arenas, (p.41).

Overview of Independent Living Research:

Dunn (1990) makes a deductive hypothesis which is basic to his research on independent living. He defines the Independent Living Paradigm (ILP) as "the presence of environmental barriers that affects critically the level of independence of people with disabilities" (p. 37).

DeJong (1980) conceptualizes and explains the dominant thrust of policy, rehabilitation, the medical industry and the union of the three to form the ILP. His model indicates social demographic characteristics of persons with disabilities, disability-related variables of the environment, and availability of assistive devices which affect independent living arrangements and productivity. Combine these with the rehabilitation policy, and the medical trio is formed as the ILP concept.

The continuation of DeJong's research by Dunn (1988) further defines the ILP as an essential indication that persons with disabilities have their own individual needs and physical capabilities, dependent upon type

and level of disability. The research further indicates that the environment can be changed to maximize a person's level of independence.

Dunn (1990) supports "the importance of developing comprehensive housing policies for [persons with disabilities]" (p. 49). The study stresses the importance of minimal costs involved in housing modifications relative to their potential benefits. The real benefit to be gained through a comprehensive housing policy is that persons with disabilities will be better able to achieve their individual potential in the community as a whole (Dunn, 1988).

Society is made up of several communities. Within each community exists different groups, ideologies, and segments of people attracted to separate areas, often by likenesses. The BILL model reflects four overall types of persons in the community as a whole; persons who are able-bodied, persons who have disabilities, persons who understand the independent living concept, and those who are not yet aware of the benefits of barrier-free design and independent living.

The universal design concept is represented in the essence of the BILL. In the BILL model, three types of access are needed to obtain an independent lifestyle; these are architectural, attitudinal, and social. Lack of access to one of these types of access is considered a barrier. Tangible and inanimate barriers are found in the community.

Insert Figure I here

Being unaware of the need for accessibility is a barrier. Attitudes which reflect stereotypes and prejudice are barriers. Social exclusion, even for an innocent reason, is a barrier The constructed environment is full of

architectural barriers which make removal of attitudinal and social barriers obscure.

Historical Background Leading to the Independent Living Movement

From a historical chronological overview of the barrier-free/independent living movement a pattern emerges. Consider the evolution of the movement for independent living in association with the medical and pharmaceutical history, the impact of World War II on society, the climate of society, accessibility laws, and the dates these laws were enacted. Importance of the historical incidents, actions, and reactions ultimately culminated into the strongest legislation for accessibility (Americans with Disabilities Act of 1990, (ADA) [1990], P.L. 101-336).

Total inclusion is a new idea to this century. As late as 1927, eminent spinal cord injury physicians wrote "attempts to restore injured persons to their former activities seems out of the question. The general view held was, in this type of injury, death was better for all concerned." (Maddox 1987).

In the 1940s, due to World War II, massive numbers of returning veterans had endured disabilities in battle (Jeffers, 1977; Maddox, 1987). Despite the advent of neurosurgery, the treatment and survival of the spinal-cord-injured person remained problematic (Maddox, 1987). The problems themselves were intensified by the profoundly defeatist attitudes of the medical profession, whom would share these attitudes with colleagues, acquaintances, and the injured person. These attitudes affect general societal attitudes.

In 1944, a fundamentally new approach to management of the Spinal Cord Injured (SCI) patient was initiated in Great Britain (Maddox, 1987). Medical thought and treatment of the SCI patient underwent a

reorganization. Medical science began centralizing treatment and to systematically study and care for spinal cord injured service men of World War II. This produced major advancements in the treatment of SCI.

This new medical management style, along with the advent of penicillin and other antibiotics, helped SCI patients survive more than five years post-accident (Jeffers, 1977). Previous to the sulfa-based drugs, life expectancy for the SCI person was not more than five years due to secondary infections and kidney failure.

In the literature there is some disagreement as to when persons with disabilities began the push for civil rights and independent living. It is clear, however, that the first tentative tries were in the late 1950s. Citations include 1958 as the first recorded published guide to help make buildings accessible. This publication was a joint effort between the President's Committee on Employment of [Persons with Disabilities] and the Veteran's Administration.

In 1959, legislation to extend rehabilitation benefits and the American Standards Association was requested by the President's Committee on Employment of [Persons with Disabilities] to establish accessibility standards. The recognition for establishment of accessibility standards culminated into the 1961 American National Standards Institute [ANSI] then the American Standards Association published the first design standards on accessibility, ANSI A-117.1. (Bostrom, Mace, & Long, 1987; DeJong & Lifchez, 1983; Hopf & Raeber, 1984; Steinfeld, Duncan, & Cardell, 1977). Simultaneously, the beginning of the push for civil rights, especially for minorities at this time in history coincides with the beginnings of the Independent Living Movement among persons with disabilities. Because of

new medical management and antibiotics, once able-bodied individuals had a new longevity life-span, post accident.

As a result of two more wars, the Korean conflict and the Vietnam war, more previously able-bodied men and women returned home disabled. Through advocacy and activism, the Vietnam veterans created a new awareness within the public (Independent Living Research Utilization [ILRU], 1978).

Society began to become acutely aware that there was architectural discrimination against persons with disabilities. As well, justifications for accessibility and necessity for accommodations were brought into focus.

The climate of the late 1960s towards the close of the Vietnam era has been recognized by the ILRU in Houston, Texas, as providing impetus for the movement of independent living. The ILRU contends that this was a time when all Americans were beginning to seek more control over decisions which affected their lives (ILRU, 1978).

This new awareness began to be applied to all disabilities whether caused by genetics, injury, disease, or aging. The needs of a neglected minority began to surface; that is, individuals whom are disabled. People with disabilities have been subjected to barriers, which are physical, social, and attitudinal. This prevents their entry and participation into community involvement (Advisory Commission on Intergovernmental Relations, 1989; Americans with Disabilities Act, 1990; Architectural & Transportation Barriers Compliance Board, 1991; Bostrom, Mace, & Long, 1987; The Congressional Digest Corporation, 1989; Crisp, 1990; DeJong & Lifchez, 1983; Dunn, 1990; Hopf & Raeber 1984; McCrone, 1990; Mosley, 1989; Slappo & Katz, 1989; Steinfeld, 1977; Winston & Hosford, 1991;).

Within this climate of Civil Rights and free speech, of personal and individual strides for self-control and self-directed lives, the movement for independent living began to grow from two main sources as identified by DeJong (1979):

> 1) The efforts of disabled persons to seek a more fulfilling life in an able-bodied world.
>
> 2) The efforts of rehabilitation professionals to reach disabled persons for whom a vocational goal was unthinkable (p. 4).

This climate of the 1960s, favoring individual independence for both able-bodied and disabled persons alike, coupled with the 1965 Congressional Commission on Architectural Barriers findings led to the earliest law for accessibility, (Architectural Barriers Act of 1968 [ABA], (P.L. 90-480).

The stated purpose of the ABA was to "ensure that certain public buildings, financed with federal funds, are so designed and constructed as to be accessible (to persons with disabilities)." (ABA [1968], P.L. 90-480). Cannon (1989) relays prompt adoption of the 1961 ANSI standards. Use of ANSI A-117.1, would be considered as compliance with the ABA. Yet the task of enforcing the ABA (1968) was not specified within the law and compliance remained unresolved.

In the early 1970s, the movement for independent living took a more recognizable form, which resulted in the passage of the Rehabilitation Act of 1973 (P.L. 93-112). This Act authorized funding for research, (Comprehensive Needs Study [CNS] of 1975) and provided the means to study independent living on a wide-scale programmatic basis. The CNS (1975) report states that the study served as a vehicle for "documentation of

the needs of [persons with disabilities] and of the place and role of rehabilitation in meeting those needs" (p. 2).

As well, the Rehabilitation Act of 1973 (P.L. 93-112) addressed the problem of an overseeing agency to enforce compliance with the ABA of 1968. By establishing an enforcement agency (Architectural and Transportation Barriers Compliance Board [ATBCB]) under the Rehabilitation Act of 1973 [P.L. 93-112] (Section 502). The ATBCB is authorized to investigate complaints, hold public hearings, issue compliance orders, and seek enforcement of its orders by the courts.

DeJong (1979) calls the passage of the 1973 Rehabilitation Act "the Civil Rights Act of [persons with disabilities]" and views 1973 as the "year which separates one epoch of disability policy from another" (p. 1). Further DeJong (1979) contends that the 1973 legislation cannot be understood apart from the movement for independent living, a movement which seeks a better quality of life for persons with disabilities, especially persons who have traditionally been institutionalized in long-term care facilities.

> The movement for independent living is more than a grass roots effort on the part of [persons with disabilities] to acquire new rights and entitlements. The movement is also reshaping the thinking of [specialists in the field] of disability, professionals and researchers. It has spawned new service delivery models and has encouraged new research directions (DeJong, 1979, p. 2).

Three grass-roots efforts and pioneering Independent Living Centers were developed by persons with disabilities and others concerned with the movement in Berkeley, Boston, and Houston around 1973, (Dunn, 1990; Johnson, 1987). The Independent Living Paradigm (ILP), developed by DeJong (1981), explains the dominant thrust of policy, rehabilitation, the

medical paradigms, and the union of the three to form his independent living model (Dunn, 1990).

In 1975, the first National Conference on Independent Living was held in Berkeley, California (White House Conference, 1977). This meeting brought together the leaders and developers in the field of independent living for the first time. The initial commitment to the innovation and expansion of grant funds occurred in 1976 to systematically establish independent living projects in the State of California. During 1977, independent living was the major topic of many national meetings. The independent living movement gained support when in 1977 (White House Conference on [Individuals with Disabilities]) independent living was recommended as a national priority, and the United States Department of Housing and Urban Development created an Office for Independent Living.

With the expanding interest in independent living, accessibility legislation was strengthened when Section 504 of the 1974 Rehabilitation Act Amendment (P.L. 93-516) was issued by the Department of Health, Education, and Welfare. These regulations required that programs receiving Federal financial assistance be made accessible to, and usable by, persons with disabilities in order to "provide them with effective services" (DeJong & Lifchez, 1983). Also specified within Section 504 was the mandate that new facility construction after June 3, 1977, would have to meet accessibility standards and that existing facilities would have to be made accessible by June 2, 1980. Use of ANSI A117.1 would constitute compliance.

Following the second National Conference on Independent Living held in Houston, Texas, in September, 1978 the Rehabilitation Act Amendments were signed into law by President Jimmy Carter. For the first time, a federal

program was authorized to provide independent living services and to support the development of independent living programs (ILRU, 1978).

Legislation promoting independence, combined with longevity of life facing a once able-bodied person now with a disability created an awareness by society and a preliminary government focus on the needs of persons with disabilities. Institutionalization was no longer acceptable as the only choice for housing. What was to follow was a series of legislation which intended to make society accessible.

Insert Figure II here

Attitudinal Barriers

Ancient Historic Overview

The basis for attitudinal barriers against persons with disabilities is as at least as old as the pyramids. From the beginning of recorded history, people whom appear different have been shunned by society. There is evidence of this in the Bible, in II Samuel, Chapter 4, regarding the grandson of King Saul of Israel who had a physical disability.

Records of bone structure abnormalities, mental disorders, and spinal cord injury date back to prehistoric times. Evidence of vertebral lesions is found in people of the Paleolithic age, some 750,000 years ago. Records show the Egyptian surgeons wrestled with the problems of spinal cord damage (World Book Encyclopedia, 1993; Maddox, 1987).

Prehistoric peoples believed that mental illnesses were caused by evil spirits possessing the body. Ancient Greeks believed that mental disorders were punishment from their gods and tried to cure them by the opening of

the skull, (World Book Encyclopedia, 1993). The ancient Greeks were also baffled by spinal cord injury.

About 400 BC, Hippocrates developed early treatment techniques for the spinal cord injured, as well as proclaimed that mental disorders results from an imbalance of four bodily fluids. Documentation suggests that Greeks and Romans knew that injuries to the upper portion of the spinal column usually resulted in quick death (World Book Encyclopedia, 1993; Maddox, 1987).

During the Renaissance, traction was the prescribed treatment for spinal dislocations. In the 1800s, surgery on the spinal injured individual was becoming routine "though probably no less lethal than the injury itself" (Maddox, 1987, p. 23).

United States History of Attitudinal Barriers

During the seventeenth century, Dorothea Dix, an American school teacher, began visiting mental hospitals throughout the United States. In 1840, she went before state legislators and described the miserable conditions found in institutions. Ultimately, she persuaded the legislators to pass laws providing state funds for mental institutions (Maddox, 1987).

The incongruencies and differences in society between different people and groups of people are limitless. Included groups are race, religion, creed, color, gender, and ability. All groups have known cases of discrimination and inequality of equal rights. In an attempt to right these incongruencies of social and attitudinal barriers, governments have found it necessary to mandate policies.

The Thirteenth, Fifteenth, and Nineteenth Amendments to the Constitution were some of the earliest and most famous mandates of equality in America. The Thirteenth Amendment to the Constitution, ratified

in 1865, abolished slavery. The Fifteenth Amendment, ratified in 1870, gave citizens the right to vote, regardless of race, creed or color. The Nineteenth Amendment, ratified in 1920, gave nationwide suffrage to women.

Even with the ideals of the foundation of our society and the protection of the Constitution, we as a nation have had to continue to legislate and amend public policy to protect the rights of the various sectors of society. This is demonstrated time and again by amendments to the Constitution and various public laws enacted to support those amendments. Legislation (Civil Rights Act of 1964 [P.L. 90-284]) was passed to end segregation and to lawfully enforce protection of those rights of minorities that were covered in the Bill of Rights and the Fifteenth Amendment, the right to vote. Another law, (Civil Rights Act of 1991 [P.L. 102-166]) added job discrimination protections to American workers, this time, specifying persons with disabilities.

Reflections of Societal Attitudes in the Early 1900s.

Two Case Scenarios:

Franklin D. Roosevelt (FDR)

A Washington-based political scientist and writer, Gallagher (1985), traces the moment of FDR's polio onset in 1921 and the reactions of FDR and his family and colleagues until his death in 1945. Gallagher's explanation of what was at stake in such a public deception or denial of a disability regards this as a voluntary suppression of an important aspect of the President's life.

"The veil of silence about the extent of the President's [disability] required the unspoken acquiescence of everyone - Roosevelt, the press, and the American people" (Gallagher, 1985). This was an effort so successful

that no political commentator ever wrote about his disability. The fact that he used a wheelchair or that he was ever lifted or assisted was never mentioned in press. Emphasizing this fact at the Hyde Park Presidential library, there exists 35,000 photographs of FDR of which only two (never published) show him seated in a wheelchair (Zola, 1987).

FDR's deception and the continual public denial of the President of the United States having post-polio-syndrome did nothing to enhance societal attitude and acceptance towards persons with disabilities. Roosevelt's positive efforts were pioneering in creating and establishing the Warm Springs Foundation; the National Foundation for Infantile Paralysis; and, as a governor of New York, declaring it the duty of the state to treat and rehabilitate disabled persons - just as it is the state's duty to educate the young. These ideologies were progressive. FDR recognized that much of one's disability lays in the public's attitude, in the social mores, and the physical environment.

FDR had enough power to change his environment in the 1930s. He had ramps built, elevators installed, and railings raised in the political structural theater. However, upon his death, every ramp, railing, and raised entrance was dismantled. This symbolizes that in the 1930s architectural alterations to accommodate persons with disabilities was thought of as a limited, temporary, individual problem (Zola, 1987), not a national priority. This lack of advocacy for disabilities and accessibility by FDR was a loss of a great leadership in the community of persons with disabilities.

Rose Marie (Rosemary) Kennedy

Rosemary Kennedy, eldest child of Joe and Rose Kennedy, was born mildly retarded. Rosemary's IQ was determined as low, even though IQ tests were unrefined in the 1920s. She reached an impassable barrier in her

school studies. She read, wrote, spelled, and counted on a fourth grade level. The Kennedy patriarch's frustration was evident in correspondence with Rosemary's specially hired teachers. (Leamer, 1994).

Furthering frustration, Rosemary's overall medical prognosis was vague. Diagnosed as having a low IQ, mildly mentally retarded, with occasional outbursts of emotional frustration (Kennedy, 1974), Rosemary was mentally functional on a ten to twelve year old level. The frustration of Joe Kennedy's expectations of all his children, including Rosemary, led to greater frustration and outbursts by the eldest daughter. Joe Kennedy's pursuance of a cure for Rosemary was persistent. As she matured, outbursts of frustrated rage increased. At Joe Kennedy's insistence, a frontal lobotomy was performed on Rosemary in 1941. "Thus, Rosemary Kennedy became probably the first person with mental retardation in America to receive a lobotomy" (Leamer, 1994, p. 321).

Many persons in the community of developmental disabilities knew the history of Rosemary Kennedy's life and in the 1960s privately criticized the Kennedys for being unwilling to talk about her. Leamer (1994) conveys the 1962 public unveiling of the Kennedy secret in an article titled "Hope for Retarded Children" written by sibling Eunice Kennedy.

Eunice Kennedy became an early spokesperson helping to further the evolution of concerns about persons with developmental disabilities. Using close proximity to her brother, John Fitzgerald Kennedy, President of the United States and the 1962 publication "Hope for Retarded Children", this high-level profile advocate positively influenced the history of the independent living movement and advocacy for disabilities and mental retardation in America (Leamer, 1994). National attention was gained due

to Eunice Kennedy's activism, though no mention of Rosemary's lobotomy was every acknowledged publicly.

As for Rosemary, she regressed into an infantile state and what intelligence she once had was gone. Flashes of rage still occurred. Always against institutionalization for Rosemary, matriarch, Rose Kennedy was left with no choice but to place her daughter in a mental institution. Any mention of Rosemary was restrained by the family. Ironically the "cure" to keep her daughter deinstitutionalized created the necessity of her institutionalization (Leamer, 1994).

Philosophical Reasons for Attitudinal Barriers:

The disabilities rights movement is relatively young. Traces of the Independent Living movement can be seen in the late 1950s and early 1960s. Heumann (1987) describes a unique problem to the minority-group of people having a disability. There are some people with disabilities [usually those with an acquired disability], who feel they are above the 'status quo' and do not want to associate with other persons with disabilities or disability coalitions. Denial of belonging to the largest minority only helps extend negative societal attitudes and proliferates social and attitudinal barriers.

Joiner, Lovett, & Goodwin, (1989) emphasize results of studies by Dembo, Leviton & Wright, (1975), and Wright, (1960), that "the positive acceptance of disabilities by persons with disabilities has traditionally been described as a crucial variable in the rehabilitation process because it enables individuals to accept the realities of their disabilities, reorder their values and priorities and continue productive lives", (p. 22). Joiner, et al. (1989) found that type of disability was a significant predictor for both assertiveness and acceptance of a newly acquired disability.

Heumann (1987) points out one of the problems for persons with a newly acquired disability is the conflict of the internal schemes all humans develop and grow. With persistent, consistent, communication by all persons with or without disabilities for individual rights, one can begin to make a difference and begin to advocate successfully for accessibility.

A Philosophical Change in the Community of Persons with Disabilities:

In 1975, a small group of persons with disabilities active in various groups; American Council of the Blind and Disabled In Action, met at the annual meeting of the President's Committee on Employment of [Persons with Disabilities], a committee designated to the Department of Labor. The various groups of "like-disability" decided to join forces and form a coalition. This new multi-disability group was named the American Coalition of Citizens with Disabilities. Johnson (1987) suggests the idea of organizing people of all disabilities for rights, rather than along specific disability lines for services, was the innovative key to begin the disability equal rights movement. It was the first time that government and society was faced with a large enough group to be formidable.

President Gerald Ford had assigned the Secretary of Health, Education and Welfare (HEW) to coordinate the government-wide implementation of Section 504 of the Rehabilitation Act in 1973 (Accessible Design; Minimum Guidelines and Requirements, Fed. Reg. [1981]), but regulations were not issued. In April 1977, the American Coalition of Citizens with Disabilities mobilized a sit-in in the ten HEW regional offices, vowing to remain until HEW Secretary Joseph Califano issued the new regulations. On April 28, 1977, Califano, under pressure of bad publicity, signed the regulations (Johnson, 1987) giving enforceable guidelines in how

to achieve the Rehabilitation Act (P.L. 93-112) as amended by the Rehabilitation Act Amendments of 1974, Section 504 (P.L. 93-516).

Previous to this time it was not unusual for a person with disabilities to be asked to leave a restaurant because their wheelchair was a fire hazard. Another practice was that persons in wheelchairs were designated different seating at entertainment functions away from able-bodied seating.

Burgdorf and Burgdorf (1976) outline a complete survey of such discriminatory legislation. Extensively surveying past legislation, concentrating on the "ugly laws". Statutes and city ordinances were written to keep people with disabilities on the perimeters of society. A person with a disability could be barred from public places on the grounds that their patronage and sheer presence was offensive and imposed undue legal liabilities. A Chicago city ordinance read..."no person who is diseased, maimed, mutilated or in any way deformed so as to be unsightly or disgusting be allowed in or on the pubic ways or other public places in this city shall therein or thereupon expose himself to public view", (Burgdorf, Jr., & Burgdorf, (1976), p. 859).

Attitudinal Correlations of Stigma Towards Persons with Disabilities

English (1977) reviews and follows established research protocol. Concerning attitudes towards physically disabled persons as measured by the Attitudes Toward Disabled Persons Scale (ATDP) instrument. Correlation research reveals closely related attitudes toward specific types of [disabilities].

Following another study using the Feeling Check List (FCL) Siller & Chipman (1965) correlated scores with those from the ATDP Scale.

Findings, which were the overall attitudes, were significantly related to attitudes toward specific disability types.

Siller & Chipman (1965) found overall attitudes towards persons with paralysis or deafness to have no significant correlation with attitudes towards persons with disabilities. There was significant correlation between attitudes and other types of disabilities. Generally, the more a disabled person appeared "normal" the more positive attitudes were shown towards them.

English (1971) reviews the results of Siller & Chipman (1965) as confirmation of the theoretical belief that prejudice is a general and pervasive attitudinal characteristic of certain persons. English hypothesizes, "Graphically, the results suggest that individuals who reject [persons with disabilities] also tend to see individuals as part of a minority and to reject other distinctive groups which may be identified by racial, religious, or ethnic terms". History shows social upheaval when a minority group begins to ask for what the majority takes for granted.

Hahn (1984) argues the most intense controversy considering persons with disabilities as a minority group paradigm is most likely to develop around the assessment of public attitudes concerning disability. Many able-bodied observers may admit that the effects of disabilities can be significantly reduced by modifying the environment to fit the needs of persons with disabilities and that legal and political changes are necessary to grant persons with disabilities liberty and equality. "There appears to be a widespread reluctance to agree that the primary problems associated with a disability derive from the prejudice and discrimination of others rather than from their own functional limitations [disability]" (p. 57).

Further, Hahn (1984) cites functional restrictions may have a less significant effect on the experiences of persons with disabilities than the

extent to which the disability is immediately obvious or detectable through close careful scrutiny. Hahn concludes ..."Disability thus exists primarily in the eye of the beholder," (p.57).

English (1971) summarizes the results of reported studies which confirm the theoretical belief that prejudice is a general and pervasive attitudinal characteristic of certain persons. This, in turn, reflects a tendency to systematically reject whatever groups are perceived as different rather than only one or two specific subgroups. "Graphically, the results suggest that individuals who reject [persons with disabilities] also tend to reject other distinctive groups which may be identified by racial, religious or ethnic terms. In light of the extensiveness and aliency of stigma among certain persons, it is easy to comprehend the complexity involved in changing prejudice toward [persons with disabilities] and (others who appear) different." (p. 12).

Hahn (1984) writes the able-bodied person "tends to project their own fears about the debilitation effects of a disability on [individuals with disabilities] and to reveal an observable distaste for persons whose appearance reflects a marked departure from conventional images of the human form. Although additional research obviously is needed to explore many dimensions of public attitudes toward disability, the forms of aversion which may have been discovered thus far indicate that the origins of the problems facing persons with disabilities can be traced to the prejudicial sentiments of the [able-bodied] majority." (p.58).

Research Justification

New empirical data is needed to further the understanding of universal design. This research furthers the information of user-friendly design. Further, data on environmental design fostering independent living can

serve to address information lacking in residential design for all abilities. In addition this research can advance the realization that accessible design accommodates and enhances every aspect of conscienceness. The end-user is optimally accommodated by barrier-free space and lifestyles.

Social Barriers

Development of Building Standards:

The physical relationship of the human body to a constructed environment is known as *ergonomics.* Ergonomics is based in anthropometrics (Panero & Zelnick, 1979). *Anthropometrics* is the measurement of the size and proportions of the human body.

Ergonomics is the basis for the American National Standards Institute's measurements for ANSI Standards A-117.1. Early anthropometric design took place during World War II. Standards were developed by the United States Air Force and the British Royal Air Force as to the physical relations of a pilot to the cockpit of an airplane. A 1946 Study by Randall, Damon, Benton, and Patt, "Human Body Size in Military Aircraft and Personnel Equipment," has been cited as a major contribution in this area (as cited in Panero & Zelnick, 1979, p. 27).

Bednar (1977) states that the reason for numerous physical barriers in building standards lies in the definition of "the norm." "This norm is based upon the mobility, size, strength, and capabilities of the average-sized, healthy, thirty-year old male. Most available anthropometric data commonly used in environmental design are based upon this norm." (p. 2).

By referring to the original ANSI standard, one can see criteria was stated in minimal terms. Accordingly, application of building standards criteria has usually been minimal as well, that is, the minimum features required for accessibility become the maximum provided (Steinfeld, 1977,

p.84). The four model building codes are the National Standard Building Code, Building Officials and Code Administrators (BOCA), Southern Building Code, and Uniform Federal Accessibility Standards (UFAS). This research is directed especially at residential building standards and is notable to housing. Occupation Safety and Health Act, must be compatible with the building code being used (Steinfeld, 1977). In 1985 , during the regular five-year review for ANSI A-117.1, the ANSI committee chose to adopt some of the UFAS. The revised ANSI A-117.1, 1986, make technical specifications more nearly alike and brought increased uniformity in access requirements to both the federal and private construction systems (Bostrom, Mace, Long, 1987, p. 6).

Winston Churchill once noted that we build our buildings first, then we shape our lives around them. Kilmer & Kilmer (1992) write that ideally interior spaces should reflect and fulfill rather than control the functions enclosed. Our lives, our culture, our society, our imagination should shape the building, not limit our culture by being shaped by our buildings. This philosophy is especially true for the person with a disability.

Prior to the ADA the industry building standards were formulated from the results of the army funded ergonomic studies of cockpit area, WWII studies. The professionals need a historical perspective to understand ergonomic measurement and their origins by and for whom building standards. Our buildings are not built in the optimal design for the general population. They are built for the Army definition of the average pilot height and physical build.

As design professionals begin combine these facts, it will start to revolutionize professional decisions and practical application. Creativity can once again be explored in design eliminating the promotion of cookie-cutter

design, as used by most architects and designers. Our buildings control and limit the functions of use of space to the majority of able-bodied person and the general public. One rarely thinks to question why light switches are 54 inches above finished floors (AFF). The accepted standard of 54 inches AFF is not a comfortable reach for the general public majority. If space is not designed for the ease and functional comfort of the end users, it is not good design.

Lifchez (1979) a professor in the school of architecture, University of California at Berkeley, did a classical analysis in an anthropometrical based study on persons with disabilities. Stop-motion photography and time-span film was used. Cameras were affixed to wheelchairs at the chair-user's eye level, and the world was seen for a week by architecture students via video of chair-assisted people. Problems faced daily by chair-users graphically impacted classes in moving black and white reruns. These films exposed barriers ambulatory people do not even notice. Due to Lifchez (1979) ground breaking study, evidence of optimal design as easier for the entire population gave some future designers a deep cognizance of basic design which assists all end-users.

Architectural Barriers as Boundary-Maintaining Mechanisms:

Bee (1974) notes that boundary-maintaining mechanisms help limit participation in a given culture to a well-defined "in-group" (p. 98). Architectural barriers are the boundary-maintaining mechanisms which consciously and subconsciously defines the "in-group" as well as the "outsiders", (Lifchez, 1987). Steinfeld, Duncan, & Cardell (1977) describe architectural barriers to access as territorial markers for people with disabilities, "just as surely as trespass signs are (markers of territorial rights)...The fact that the able-bodied population has full use of public

places means that they have a socially dominant position in respect to [persons] with disabilities. By building inaccessible buildings and transportation systems, (architects, designers, builders and contractors) have effectively claimed territorial possession of (inaccessible places)." (p.11).

When a person experiences a debilitating injury such as a SCI, causing the disability of paraplegia or quadriplegia, there is going to be psychological trauma as well as physical trauma. Numerous theories have been presented to explain the stages of emotional stress and adjustment experienced by the SCI individual. Researchers such as Berger and Garrett (1952), Gunther (1969), Janis and Leventhal (1965), Kerr and Thompson (1972), Litin (1957), Masterman (1961), McDaniel and Sexton (1970), Mueller (1950, 1962), Neff and Weiss (1965), Nemiah (1957), and Siller (1969) assert, in varying degrees, that persons who are physically traumatized are also psychologically traumatized and must progress through several stages of anxiety, depression, and mourning before they are able to adjust to their disability. DeJong (1981) finds fault with the studies indicating they failed to include post-injury empirical research and further states that most of the psychological theories presented are based on clinical subjective impressions, not documented research. So prevalent were the theories that acquiring a disability must be accompanied with psychological distress, that when studies done in the 1960s began to show no significant differences with like aged groups, the findings were labeled as "pseudo-hysteria" and the SCI client was said to be in a state of denial. It could also be the able-bodied researcher's disassociation with experience of having a disability or progress of knowledge since these studies were done.

Taylor (1967) compared the Minnesota Multiphasic Personality Inventory (MMPI) profiles of SCI persons (within a month of injury) with profiles of randomly selected male university students and found only minor differences. DeJong (1981) explains this disbelief of the researcher's own findings by acknowledging the fact that the psychological theories of post-injury adjustment originated in an era when SCI individuals had little hope for the quality of life now available to persons with disabilities.

Another problem with the psychological theories of post-injury adjustment, is they are the beliefs, attitudes and opinions, [possibly the psychological projections], of the able-bodied physicians, clinicians, and therapists. Perhaps a better theory of post-injury adjustment could be applied (DeJong 1981).

Spicer's Theory;
Alternative Patterns of Acculturation, Analogized to the Acquisition of a Disability

It has been established that the thrust of the independent living movement was spearheaded by once able-bodied persons who had acquired a disability after the advent of penicillin. As well, it is the person with an acquired disability who is keenly aware of the incongruencies in accessibility between ambulatory and nonambulatory persons.

Before people with an acquired disability can advocate for accessibility, they must acculturate to having a disability. Spicer (1961) chronicles four alternative patterns of acculturation (as cited in Bee, 1974).

(a) Incorporation - A person modifies and integrates new information into existing information with the least possible disturbance to the pre-existing cultural system.

(b) Replacement - In this stage an exchange of existing ideas for new information takes place.

(c) Syncretism or Fusion - This involves a combination of mixing of information or traits into new and different traits or ideas.

(d) Compartmentalization - A person uses imposed information while necessary and then discards the behavior or idea when not necessary. There is no change to existing behavior and/or thought patterns.

The set of attitudes and beliefs of a culture will influence several aspects of human behavior (Khambate & Ajami, 1992). Acquiring a disability in life requires a person to acculturate to being disabled in an able-bodied world. They now are a dichotomy of having an acquired disability with an able-bodied mind set. The existing cultural set of values, attitudes, and beliefs are forced to become altered. All four of Spicer's alternative patterns, as described by Bee (1974), and/or a combination of the four, are used when adjusting to an acquired disability.

Operationalized theory of acculturation to a disability applied to Spicer's Theory

The terms *society* and *culture* can be used interchangeably. These define the entire set of social norms and responses that dominates the behavior of a population. This makes each social environment different and gives each a shape of its own (Khambate & Ajami, 1992). A person is enculturated from birth and has acquired the societal norms, responses, beliefs, and attitudes of the dominate culture, in this case the culture of the able-bodied person. When an able-bodied person faces a person with a congenital or an acquired disability, both the able-bodied and disabled person must acculturate to an abnorm of the majority culturation. Both people are innately aware of the attitudes and beliefs of the able-bodied

society and understands the behavior of that society. But now, the disabled one must realize that some of their existing categories and schemes no longer fit the definition of that culture as far as the "others" perceive. This can sometimes lead to culture shock for either or both the able-bodied person or the person with the disability.

According to Bee (1974) the first step in identity shifting is Spicer's stage of incorporation. People with a newly acquired disability acknowledge that they are in a new and strange physical state in which they must change their pre-existing beliefs of what constitutes "normal." The hypothesis is that at the onset, every once-able-bodied individual believes that this is a temporary condition. To deal with this new situation there is acceptance that a new means of living independently must be temporarily adjusted to and tolerated. These thoughts and the use of mobility aids are incorporated into the everyday reality of the person with a new disability.

Spicer (1961) second alternative pattern of acculturation is replacement. This is best related to the process when the individual with a disability begins to realize that their previous, and erroneous, conception of what constitutes normal mobility are false. By using the first stage of incorporation, the enculturated values of a person are changed to the point that one is able to accept the replacement of old beliefs with new beliefs. Discarding the assumption that ambulatory is the only definition of normal mobility, the newly disabled individual begins to replace the able-bodied person's assumption that normal equates walking.

This replacement of false assumptions allows the next step of Spicer's alternative patterns to take place. Bee (1974) allows the next step of Spicer's Alternative Patterns, syncretism or fusion to take place. At this point a mixing of beliefs, attitudes, values and assumptions begins. Old

assumptions of an "un-enlightened" ambulatory person, ingrained or enculturated as a basic personality characteristic of newly disabled people begin to take their "able-bodied" mindset and their "disabled-bodied" mindset and fuse them together. The new person's identity becomes acutely aware of the additional needs, concerns, and realities of being disabled. Yet within these synchronized assumptions are the old and entrenched needs, concerns, wants, and realities of an able-bodied individual. There is a dichotomy within one's self; there is ability/disability and enculturated beliefs/acculturated beliefs. A fusion of ideas must take place. From this fusion new realities emerge. The individual is no longer physically the same - an able-bodied person. However; mentally, perhaps even psychologically, the exact same person still exists, now just more inconvenienced. By combining these two realities, a syncretism happens and a once able-bodied person has changed physically and mentally.

After the mental fusion of the able/disabled occurs, people with a disability learn that they must, at times, compartmentalize behavior and actions to ease and facilitate interactions with the "normal," ambulatory, able-bodied public. The person with an acquired disability understands and, in fact, has personally experienced the attitudes, ideas, beliefs, and behaviors as an able-bodied person. However, the newly disabled people also realize there are times when they will not be accepted as an equal. The disabled people must compartmentalize their behavior, language, actions, and own self-image to fit the preconceptions of an able-bodied world. This is especially true when dealing with governmental bureaucrats and agencies due to governmental red tape and fine line definitions of disability and gainful employment.

Living life with a disability demands a different lifestyle and reformat of thinking than that of the able-bodied person in society. In the United States, people react to persons with disabilities differently than they do to able-bodied persons. Even though we are all one multi-cultural society, there exists a cross-cultural minority of persons with disabilities. The person with a disability finds it is necessary to acculturate due to the disability to get one's needs met. Bee (1974) notes that boundary-maintaining mechanisms [in society] often limit participation of the entire culture to an "elite" cliche', excluding people with disabilities complete and equal access even in publicly funded buildings. The entire group instinctively know through acculturation that total access equals total power and partial access equals a lower social-status. Lifchez (1987) notes "the attitudes and assumptions about clients and co-designers which the architect often inadvertently brings to a design task, are factors which affect the way the architect will perceive the clients as people, select information about them and interpret the way in which their needs are to be met by the design; they also affect the design process itself" (p. 11). Environmental barriers strengthen able-bodied person's perception of ethnocentrism. A disabled person may multiply the magnitude of the coping technique of *compartmentalization* as part of acculturation which one must use if only to endure certain contacts. In Western cultures, the emphasis of keeping people of different age groups, backgrounds, social status, and abilities segregated is profound. Good architecture can bring different groups together by slowly allowing a choice. Good design can innately help to overcome conflicts, aggressions, and prejudice (Lifchez, 1987).

Crisp (1990) studies indicate that for persons with higher educational levels, adjustment to SCI involves less change in their value system. One's

perception of one's disability is a key to the rational acceptance of a disabled fact (Joiner, Lovett & Goodwin, 1989). People's perceptions are shaped by the societal culture in which they grow up. This presents a dichotomy to the person with an acquired disability. The psychological conflict is being cognizant of being both able-bodied/disabled and enculturated/acculturated and normal/abnormal. Equipped with the ethnocentrism of the able-bodied culture, the person with an acquired disability is acculturated but is acutely aware of the design incongruencies. Often only disabled persons, empathetic designers, architects, and contractors will understand the aesthetic, creative practicality and appreciate the existence, meaning, and logic of optimal accessible design which is so simple that it is difficult to fully grasp.

Bee (1974) calls this innovative process "the recombination of previously existing ideas into a new idea" (p.174). Architectural modification, universal design, and barrier-free design are all synonyms of the innovation process of which the person with an acquired disability must work. A focal point of the problem is the individual with a disability has little control over the built environment. Other than the personal living space, persons with disabilities have no control over any environments. This complicates a wheelchair assisted person's movements within the community. Even in the home, architects, designers, contractors and landlords use minimum standards, as opposed to optimal building regulations (Steinfeld, 1977), unaware of the simplicity of functional design, and the bureaucratic reasoning behind optimal buildings guidelines. People with disabilities, like the rest of society, enjoy environmental aesthetics and appreciate architectural designs which do not look and "feel" institutional. The lack of creative barrier-free environmental design forces all persons with

disabilities regardless of level of injury or function, to adapt to their living environments rather than adapting the environment to satisfy the individual's living needs. This is a serious design over-sight of ease of the end-user of a space.

Focusing on the attitudes and assumptions of the ambulatory architect and/or designer, Lifchez (1987) believes it is "through an inner experience of feeling oneself to be similar to or nearly identical with the other person that we have access to a certain understanding of how to act as designers on the behalf of others. By taking the role of the other (person), primary attitudes and assumptions alter to make way for human understanding, and this we know, provides for better environments" (p. 15). Until designers and architects begin to empathize with the daily ins and outs of living with a disability, voluntary creative access cannot be expected.

> DeJong & Lifchez (1983) concluded the design profession has viewed the barrier-free movement largely as an infringement on its creative freedoms, as a "cookbook" approach to design. Further the study suggests the American Institute of Architects, the national professional organization, has never come out openly against accessibility standards but it has done little to promote the concept of accessibility. The architect is often caught between the requirements of his client and the demands of people with disabilities [and local building codes]. (Yet) architects are not neutral observers merely trying to accommodate the demands of clients and [the user who is disabled]. Most architects are able-bodied and bring to the design process all the able-bodied attitudes and assumptions that have shaped design concepts in Western culture. Moreover, the architect,

like most people has become accustomed to the social segregation of [persons with disabilities] in the environment (p. 47).

Even with governmental intervention through continual legislative intervention for accessibility rights, little progress more than minimal access has been achieved in the building of barrier-free environments.

Taking Accessibility into the Twenty-First Century

Research review has mapped out a chronological time span explaining definitions of independent living, an overview of independent living research, a historical background leading to the independent living movement, a quick overview of legislation governing accessibility, development of building standards, architectural barriers as boundary-maintaining mechanisms, and offered a theory on acculturation to a disability for thought.

One of the first fundamental keys to a person with a disability being able to live independently requires barrier-free housing. Legislation (Fair Housing Amendments Act of 1988 Pub. L. No. 100-430 (42 U.S.C. § 3604(f). 24 Code of the Federal Regulations [C.F.R.]) extended Title VIII of the Civil Rights Act of 1968 (42 U.S.C. § 3604) which "prohibited discrimination in connection with the sale, rental, or financing of housing based upon the race, color, religion, or national origin of the purchaser or renter" (Winston and Hosford, 1991, p.80) to include families with children and persons with disabilities. "The purpose of the Fair Housing Amendment Act as it affects [accessibility by persons with disabilities] is to eliminate discrimination in the sale or rental of dwellings based upon the tenant's or purchaser's [disability], and to render multi-family buildings and the dwellings within them accessible to the [individual with disabilities] who

occupy them and to [persons with disabilities] who wish to visit such multi-family projects", (Winston and Hosford, 1991, p.80).

There are a few early scholars and researchers who understood and published what persons with disabilities needed to participate in society. Now the government mandates participation by removal of barriers through the Americans with Disabilities Act (ADA) of 1990 [P.L. 101-336], which covers five areas of concern; employment, public access, accommodations, telecommunications, and miscellaneous.

Current design discussion include words such as accessible, barrier-free, and user-friendly. Universal design is also being used verbally, yet the universal design concept is embryonic in all design fields. The term is appearing in publications, presentations, dialogue, and all various forms of media. Still, a literary common definition of universal design remains elusive. Each designing profession has its own design scheme in which to accommodate the term universal design. The concept needs a common understanding at all design levels.

The ADA designated an authority (Architectural and Transportation Barriers Compliance Board) (ATBCB) to author the Final Guidelines for making Buildings and Facilities Accessible (ADAAG), Federal Register, July 23, 1991). The term universal design appears in the ADA text.

Different in conception from accessible design standards, aimed at benefiting people with mobility limitations, universal design concept targets *all* people of *all* ages, sizes and abilities and is applied to *all* buildings (U.S. Department of Housing and Urban Development [HUD]; Mace, Pastalan, Lusher, Steinfeld, & Brickfield, 1988).

The term "Universal Design" was coined by Ronald Mace, FAIA, Architect and Product Designer (Null & Cherry, 1996). The primary descriptive word for the term:

> Universal: applicable or common to all purposes, conditions, and situations. The intent of the universal design concept is to simplify life for everyone by making more housing usable by more people at little or no extra cost. Universal design is an approach to design that incorporates products as well as building features and elements which, to the greatest extent possible, can be used by everyone. (U.S. Dept. HUD, et al., 1988).

Common universal design standard features include reinforcement between framing studs in bath walls at time of constructed. Reinforcements pre-constructed into the framing of the home, eliminate costly renovations when adaptive features fostering independent living are needed or added.

The final draft of The American's with Disabilities Act, 1990, enacts the same five suggestions of Hopf & Raeber 1984. The ADA identifies the five problem areas as; access to buildings, services, employment, housing, and path of travel in the environment. These are now addressed and protected by the Federal Government through the Americans with Disabilities Act, 1990. Persons with disabilities have a legal right to obtain all goods and services provided to the general public, without discrimination based upon their disabilities (P.L. 101-336). Further, the ADA, now enforces and protects the legal right of individuals to bring suit against violators. Judicial arbitration is something that was never before provided in early and previous legislation. This addition of protection of the courts finally adds the enforcement needed for the environment to become truly

barrier-free. Thus the environment will accommodate independent living and total inclusion in society by persons with disabilities.

Summary

Prior to the ADA there was acknowledgment of the need for barrier-free environments. The first legislation to require certain buildings and facilities to be accessible was enacted in 1968 (Architectural Barriers Act [ABA] of 1968 [P. L. 90-480]). The ABA requires that buildings and facilities designed, constructed, altered, or leased with federal funds be accessible to, and usable by persons with physical disabilities (Cannon, 1989). From this first piece of legislation stems the continuous growth of awareness and improvement of building standards and regulations which culminated 30 years later into a definitive endorsement (American's with Disabilities Accessibility Guidelines [ADAAG] to mandate accessibility standards for architectural accommodations. In theory, architectural modification, barrier-free design, barrier removal, and universal design are currently mandated by federal, state, and local governments. Without advocacy efforts, little, if any, architectural modifications will be made in the private sector or public accommodations. Without individual and advocacy groups for persons with disabilities lobbying for independent living as an alternative to being housed institutionally, will the push for these laws and regulations be adhered to.

The five areas of mandates written in the ADA are; Title I: which governs employment. Title II: covers public services. Title III: stipulates public accommodations and services operated by private entities be accessible. Title IV: is in regard to telecommunications. Title V: is miscellaneous provisions.

The ADA strengthened the Fair Housing Amendments Act of 1988 (P.L. 100-430). This is key legislation opening accessible doors for private housing to the person with a disability. The independent living movement would have not progressed without the Fair Housing Amendment Act. Indeed, all previous legislation prior to the ADA was virtually ineffective. Although access to public buildings was addressed, access in getting to public buildings and publicly owned lands was not addressed in legislation before the ADA (Templer & Jones, 1977). Prior to the ADAAG most all barrier-free design to support a person with a disability in the home environment was minimal.

A new century of accommodation and accessibility awaits all individuals. For universal design is design for the life span. It is user friendly for all individuals regardless of age-level, ability, or the aging process.

METHODOLOGY

Introduction

This chapter explains the methods and procedures utilized in the research design. Development of a questionnaire to ascertain the use of information acquired from the BILL by persons with disabilities and professionals in occupations who work with persons with disabilities will be discussed.

Research Design

This study was designed to compare attitudinal differences and awareness towards disabled persons between two separate groups. This study was descriptive in nature. Babbie (1989) constitutes the descriptive study as "the precise measurement and reporting of the characteristics of some population or phenomenon under study," (p. 101). The BILL post-tour questionnaire was developed to ascertain answers to the objectives of this research.

Population and Sample

The population of the BILL survey is individuals who toured the Bartlett Laboratory and signed the guest register (N=634), from outset (July 1989) until the dissemination date of instrument (April 1993). Since the whole number of the BILL population was relativity limited, the whole population was served as a sample in this study. Another sample that was

randomly drawn from residents of a small community was served as a comparison sample (N=400) as the comparison sample. As the BILL is an ongoing demonstration facility, it is not possible to obtain pretest data from the BILL sample.

The community comparison respondents were randomly selected through (Survey Sampling, Inc.) whose source of information is the annual publication Survey of Buying Power, an independent Marketing Agency based in New York City. This company provides information listed by zip code. The community zip codes of 74074 and 74075 were specified and the random sample was drawn by the company computer. According to Market Statistics, the county, in which the community is located, has 86.23 percent of residents listed by zip code. With such a high level of residents represented in this fashion, it was deemed that a list generated by this company would be representative of the community population and thus could be deemed as representative of the general population.

Instrument Design

Two questionnaires were constructed and used to correspond with the 2 sample groups. One questionnaire, developed for persons who have toured BILL (see Appendix A); the other, a modified version of the BILL survey. The questionnaire contained five sections. The first section consisted of 28 questions assessing attitudes towards persons with disabilities. The questions utilized a 5-point Likert type scale, 5 being high, 1 being low. The second section consisted of 17 questions that assess respondent's opinions of specific disabilities and whether they felt that a person with that type of disability can, 1) live independently , and 2) be

productive in an 8 to 5 work setting. The third section consisted of 50 questions that assess tangible assistive living modifications. The last question in the third section ascertained why the person toured BILL. The fourth section consisted of questions that recover background information assessing type of disability personal satisfaction with assistive living design. The fifth section consisted of questions regarding demographic information.

The questionnaire for the comparison sample duplicated only the attitudinal and awareness questions numbers 1 through 31 (section one of the BILL study). As well as the demographic questions (sections five of the BILL study) for data comparison (see Appendix A).

Questions eliminated in the random sample version of the questionnaire were those questions that pertain specifically to the BILL tour. Inquiries pertaining to how architectural modifications have helped and which adaptations chosen to be used were to be answered only by those persons who have a disability or professionals who work with persons with disabilities. Questions pertaining only to BILL environmental adaptations were eliminated from the comparison random sample instrument.

Questions regarding the architectural modification of BILL were to be answered only by respondents who toured BILL and have a disability, a family member or close friend with a disability, or work with people with disabilities. Those respondents that have no disability or, were not professionals working with persons with disabilities were instructed to by-pass disability-specific/adaptation-specific questions and advance directly to the demographic section. The Bartlett questionnaire requested response as to why BILL was toured. An additional question was posed in the comparison sample study to ascertain if the respondent has toured the BILL

in the past. This promoted control for response bias and makes it possible to factor out random sample responses if a respondent has experienced a tour of the BILL.

Research involving human subjects requires approval of the University Institutional Review Board (IRB). This is to ensure the rights, privacy and welfare of participants are properly protected. The proposed research questionnaire was submitted for review to the University IRB and approval given to proceed (see Appendix B).

Pre-Testing the Research Instrument

The pilot study (n=31) was given to junior-level design students in the Department of Design, Housing, and Merchandising enrolled in the course Studio I - Residential in the Fall semester of 1992, Oklahoma State University, College of Human Environmental Sciences. Students toured the BILL as a class field trip and completed the questionnaire voluntarily in the fall semester. Based on the results of the pilot study, modifications to the instrument were made. The purpose of the tour was to emphasize through demonstration the concept of universal design for innovative educational purposes.

Answer options to the pilot questionnaire contain the same variety of response types as does the BILL instrument. This helped to establish the validity and reliability of the instrument. Pilot test data results were analyzed and researchers realized that more information was needed to gather appropriate information from the questionnaires. Modifications to the instrument were made as a result of the pilot study.

Data Collection

The data collection method involved in mailing out a modified version of the instrument to both the BILL and the comparison samples using the

Total Design Method (TDM) developed by Dillman (1978), (and as cited in Babbie, 1989, Touliatos & Compton, 1988). Dillman (1978) suggests three mailings of the questionnaire following with a post card after the first mailing. Dillman (1978) recommends the final mailing to non-respondents be in the form of a registered letter after the first two mailings. In this study, the protocol of sending registered mailings to non-respondents was dropped due to cost constraints.

Three individual sets of mailing address labels were printed along with a master copy of the mailing lists. An identification number was assigned to each survey for mailing purposes only. The master mailing list contained the corresponding identification numbers so that duplicate mailings for persons already responding could be avoided. Total confidentially was a primary concern to this study.

The first mailings were accompanied with a cover letter giving a synopsis of the topic of investigation; universal design and barrier-free access (see Appendix C). This mailing went out in April of 1993 and requested response by mid-May, 1993. A postage paid pre-addressed return envelope was included in the mailing.

A detailed return rate graph was kept for both response groups as suggested by Babbie (1989). This is an important guide to track the data collection process. As well, it also helps to visually serve as a barometer of the effectiveness of follow up mailings and requests of respondent's questionnaires not yet received.

Insert Figures III & IV here.

Report of Response Rate

Touliatos & Compton (1988), note mail distribution and return of questionnaires as being a heretofore popular method of attaining data for research. "Despite many advantages of the mail survey, a major problem with this method is obtaining a sufficient percentage of responses" (p. 271).

The number of questionnaires sent out to persons who toured the BILL totaled N=634. Of these, 249 usable questionnaires were returned after all follow-up mailings. The number of questionnaires deemed non-usable due to non-forwarding mailing addresses was n=61 making a 9 percent non-usable response rate for the BILL sample. This resulted in a 44 percent overall response rate of usable questionnaires from the BILL study.

Beginning number of the random sample comparison survey was a mailing list totaling N=400. The questionnaires which were returned non-forwardable equaled 104. This was due to a lack of box numbers not being included on the rural route addresses. Rural route box numbers were not provided by the Survey Sampling Company, leaving some respondents unattainable. This caused one-quarter of the sample survey respondents to be deemed non-deliverable based on incomplete address. The 104 returned undeliverable questionnaires gives the comparison sample an overall non-return rate of 26 percent. The number of answered questionnaires returned was n=131. Of those not all were usable surveys leaving the community comparison study at n=116, yielding a 29 percent usable response rate. The total of questionnaires not returned at all in the comparison sample is n=235 or a return rate of 42 percent.

The first mailing was sent on April 29, 1993. Two weeks later, a postcard was mailed, May 15, 1993, to all subjects thanking those who had

sent in their survey and subtly reminded those who had not participated of the importance of their contribution to the study, (see Appendix D).

The second mailing was distributed June 7, 1993 to both sample groups. A new cover letter was included stressing the importance and urgency that individual response is vital to this study (see Appendix E). Enclosed in this second mailing, was a clean copy of the questionnaire, including a postage paid self addressed returned envelope.

To attempt to achieve the maximum level of response rates, letters returned with forwarding addresses provided were updated. On May 25, 1993, preliminary mailings were sent to the corrected forwarding addresses of both the comparison sample and the BILL participants. Follow-up post card was mailed June 15, 1993. The study sample had a total of 6 updated mailings. The comparison study had only 4 corrected address mailings.

Data Analysis

Three statistical procedures were used to find solutions to Objectives one through Objective three as follows. Chi-square statistic was utilized to answer to the Objective one: "To assess use of information acquired from the BILL by people with disabilities and professionals in occupations that work with people with disabilities."

Factor analysis was applied to 32 questions assessing attitudinal differences. T-test was performed to answer the second objective; "To ascertain attitudinal differences towards disabilities and assess awareness of daily functioning with a disability between the study sample; persons who toured BILL versus the general population, represented by the random comparison study." On both samples question/variable 33 was factored by questions 1 through 32. Attitudinal differences between able-bodied

individuals and disabled persons was factored by questions 1 through 28; attitudinal questions. Question 30 dealt with how one felt about persons with certain types of disabilities and whether they could be productive in an 8 to 5 work setting. Question 31 ascertained attitudes on how respondents felt about the feasibility of persons with specific types of disabilities types could living independently.

Questions 30 and 31 listed specific types of disabilities. The instrument was designed to assess the respondent's knowledge of the type of disability in question by asking about some disabilities twice. The non-detection of redundancy was masked by using different terminology for the same type of disability. In making provisions to spot "guess" responses, factor analysis was effective in making answers more reliable and valid.

T-tests were used to apply answers to Objective three; "To assess and compare attitudinal and awareness differences between persons who have toured the BILL and a random sample of persons living in the community who have not been exposed to the model facility." The answers of both samples were compared by using T-test analysis.

In addition to the previously mentioned methods of data analyses, frequencies were also used to compare responses. In order to analyze the two study groups separately, results of both groups were combined and factor analysis was used to correlate attitudes on both independent living and feasibility of working from 8 to 5 according to type of disability.

MANUSCRIPT

Introduction

Currently there is much discussion about barrier-free, user-friendly and universal design. This terminology has become common is publications, presentations, indeed, as common dialogue in all various forms of media. Still, a literary/literal commonly accepted definition of universal design remains elusive.

Each design profession approaches universal design within their own subtle style, indicative of each specialized discipline. Often this fragments a design project, compartmentalizing the various steps and procedures of design from concept through construction. Differing design ideologies may cause subtle differences in professional design schemes. Each profession in design has theory indoctrination unique and due to the differences of the area. Recently the design industry is moving to a team approach integrating all areas of construction schemes, this will strengthen the universal design concept.

Null & Cherry (1996) suggest there are "four essential cornerstones or principles necessary for universal design. Four questions should always be kept in mind. 1) Is the environment supportive? 2) Is the environment adaptable? 3) Is the environment accessible? 4) Is the environment safety oriented?" (p. 27). If the design includes these four fundamental characteristics, universal design concepts are being generated.

Behar's (1991) study refers to the four A's as the core for designing in an elementary universal nature: accessibility, adaptability, aesthetics, and affordability . A union of the four A's and the four cornerstones is all encompassing of universal design. The combination of the four A's and the four cornerstones result in six characteristics of universal design. To achieve universal design, every aspect of construction affects and effects all facets of the design concept, uniting and networking the concept of optimal space throughout every aspect of design. Basic fundamental questions should be asked at the beginning of each stage of design. From the stage of conception through the process and construction phase, by focusing on the six characteristics will help achieve universal design throughout all aspects of the designing process.

If each designer asks the following questions at each stage in the design process, then universal design will be incorporated. These questions are: 1) Does the design consider adaptability 2) Is the space supportive? 3) Is the finished space aesthetic? 4) Is the housing affordable? 5) Are all areas accessible? 6) Is the environment safety oriented? These are minimal consideration at each level of design and in all aspects of the design profession. When incorporated into the thinking scheme of the design professionals, as basic common sense design, a new designing dimension will emerge to be standards of the future. The sterile, clinical, institutional, and cold industrial atmosphere of accessible design for special populations will become obsolete. These six criteria create and support the ambiance made possible using universal design. Aesthetics, the third essential element of designing in a universal nature is perhaps the most important element of universal design. Consideration of aesthetic pleasure and

functional use of space by the end-user design is important in the universal design concept. The primary descriptive modifier for the term:

> Universal: applicable or common to all purposes, conditions, and situations. The intent of the universal design concept is to simplify life for everyone by making more housing usable by more people at little or no extra cost. Universal design is an approach to design that incorporates products as well as building features and elements which, to the greatest extent possible, can be used by everyone (U.S. Department of Housing and Urban Development [HUD]; Mace, Pastalan, Lusher, Steinfeld, & Brickfield, [1988], p. 1).

The universal design concept is different in conception from accessible design standards. Accessible design standards are aimed at benefiting special populations, whereas, universal design targets all people of all ages, sizes and abilities and is applied to all buildings (U.S. Dept. HUD, et al., 1988).

Universal design should be incorporated at all phases of the design process including conception, drafting, and construction. A basic universal concept is reinforcement of framing between studs at 34 inches above finished floor in bath walls and places where a future grab bar might be installed. These types of structural features, and numerous other design features of universal design ought to become inherent is the design thought process. Universal design minimizes costs by, eliminating expensive, intrusive renovations. Reinforcements, door widths, height placement of wall and electrical plates are examples of standard universal design. Optimal access for independent living and self-support is pre-constructed into building a home or a high-rise work-place, from foundation to fixtures.

This strategic type of design eliminates costly renovations when or if adaptive features are necessary.

The (Architectural and Transpiration Barriers Compliance Board [ATBCB]), is specified responsible for enforcing compliance to the Americans with Disabilities Act (ADA Final Guidelines for making Buildings and Facilities Accessible, [Federal Register], January 23, 1991). The (Americans with Disabilities Act [1990] [P.L. 101-336]) chronicles the term universal design in text.

Problem Statement

The focus of this research is to evaluate the influence of universal design on accessible adaptations in the home and to evaluate perceptions of residential design as supportive and functional for people of all ages and abilities to live most independently. Through design and appropriate modifications, one with a disability can live a comfortable, independent lifestyle. A society that includes universal design concepts in their structures eliminates barriers so persons with disabilities can enjoy access to public and private buildings as other citizens do (Null & Cherry, 1996).

In the natural and the structured environment, there exists multifacets of barriers ranging from tangible to inanimate. A structural barrier is considered a man-made architectural barrier. Barriers in nature are limitless. Sand, gravel, steep inclines, gopher holes, thick grass, and babbling brooks are common, natural barriers to access of nature. Pristine vistas are often "barricaded" by multiple natural barriers. Barriers in nature prevent opportunity for leisure and social interaction in the wilderness. Structural barriers include stairways, steep inclines, absence of appropriately placed curb-cuts, any man-made barricade. The built environmental barriers limit opportunities for social interaction of one of the largest growing societal

minorities, persons with disabilities. The goal behind universal design is for those with disabilities to enjoy full use of public and private buildings, as other citizens do (Null & Cherry, 1996).

Objective:

To assess and compare attitudinal and awareness differences in knowledge of accommodating a disability between persons who have toured the BILL and a random sample of persons who have not been exposed to the model facility.

Literature Review

Architectural Barriers:

The earliest legislation for access was enacted in 1968 (Architectural Barriers Act [ABA] [P.L. 90-480], 1968). Even so the ABA failed to provide a means of enforcement of architectural barrier compliance. Additional laws were needed to assure protection of a person's accessibility rights, even in federally funded facilities and programs (Cannon, 1989).

Lifchez (1987), terms accessibility as the quality of the experience as one uses the surrounding spatial environment. "Accessibility for able-bodied people refers to the degree of ease with which one can reach a destination. ... But for a [person with a disability], getting there is only half the problem. For once there, [one] may not be able to enter easily, circulate through, and enjoy full use of the building or facility" (p.40).

Research of Steinfeld, Duncan, & Cardell (1977), define architectural barriers in vivid emotion-provoking terms. Their study describes barriers as boundary-maintaining mechanisms which consciously and subconsciously defines the "in-group" as well as the "outsiders". For people with disabilities, architectural barriers are legible denial of access to areas accessible to all

others. These structural barriers are as legible a barrier of access denial, as any written territorial marker.

Earliest legislative regulations specifying enforceable guidelines specifying how to achieve access, is Section 504 of the (Rehabilitation Act [P.L. 93-516]), issued on April 28, 1977. The Amendment to Section 504 was transcribed into equal access in educational facilities legislation. This added to the earlier (Rehabilitation Act [P.L. 93-112] Amendment Section 502).

Lifchez (1987) notes that a decrease in architectural barriers, increases opportunities for casual social interaction of all persons. Increased social and/or business interactions decreases attitudinal barriers which helps negate stereotyping. Through social exchange, commonalties are recognized and fostered. Elimination of architectural barriers increases social exchange and decreases attitudinal barriers increasing opportunity for understanding. Attitudinal acceptance can lead to decrease of attitude and social barriers.

Attitudinal Barriers:

English (1971) reviews previous work and reconstructs a study following an earlier protocol of Siller & Chipman (1965). Results reveal information about prejudice and stereotypes towards persons with disabilities and persons who are able-bodied. Attitudes towards type of disability was measured by the Attitudes Toward Disabled Persons Scale (ATDP) instrument. Correlation research results reveals close correlation related to attitudes toward specific types of [disabilities].

Siller & Chipman (1965) correlated scores using the Feeling Check List (FCL) with those from the Attitudes Toward Disabled Persons Scale (ATDP). Overall attitudes, were found to be significantly related to attitudes

toward disability by specific type. Significant results were shown between the ATDP instrument with Social Distance Scale (SDS) instrument. Though the correlations in the ATDP and SDS scores were lower than in correlations between scores ATDP and FCL scores, all findings were significant. Siller & Chipman (1965) found of all, overall attitudes towards persons with disabilities; with the exception of paralysis or deafness, there was significant correlation between attitudes towards persons with disabilities.

Results of Siller & Chipman (1965) supported the theoretical belief that prejudice is a general and pervasive attitudinal characteristic of certain persons. Based in this theory, English (1971) theorizes "Graphically, the results suggest that individuals who reject [persons with disabilities] also tend to reject other distinctive groups which may be identified by racial, religious or ethnic terms. In light of the extensiveness and aliency of stigma among certain persons it is easy to comprehend the complexity involved in changing prejudice toward [persons with disabilities] and [others who appear] different" (English, 1971, p. 12). In socialization, attitudes are influenced. This can cause a negative cyclical pattern of social attitudes to emerge. Social barriers foster attitudinal barriers which continue to influence each other. This influences social attitude and compounds negative attitudes, which allows social and attitudinal barriers to become self-perpetuating.

Social Barriers:

Heumann (1987) describes unique problems indicative to the largest minority group in America, those who are disabled. Majorially, there is no role model in the family unit of the disabled person that can help support and teach coping skills and social techniques of survival to the next generation. This is unique to the minority of people with disabilities.

Supportive environmental design can minimize structural constraint, easing barriers. Environmental supports maximum physical supports body usage and is a means to attain desired physical independence.

Heumann (1987) describes some disabled minority members as strongly disassociating with others with disabilities; he calls this peer-denial. There are some people with disabilities [usually those with an acquired disability] who feel they are above the 'status quo' of having a disability; they do not want to associate with other persons with disabilities or support advocacy for disability rights access. A dichotomy occurs within the self-concept of one with an acquired disability. When a newly disabled people segregates themselves from their "new" disabled peers and seeks peer-recognition with mostly able-bodied persons only disillusionment is served. This can foster a negative self-image. Denial of one's disability from their mind scheme can be self-destructive. When this type of disabled person is out with able-bodied friends, it seems to the person with a disability, "just like old times," "as if nothing has changed". A person with an acquired disability, by using this type of coping technique, seeks to be fully integrated with able-bodied persons, whom ironically view a person with a disability as being different. This denial of self-actualization, denial of having a disability by some persons, only reinforces and helps to further social and attitudinal barriers. Social denial of being disabled and ignoring one's status of belonging to a minority only helps extend negative societal attitudes and proliferates social and attitudinal barriers.

Legislative Barriers: Legal Segregation.

Legislative barriers have been enacted which caused legal segregation, reinforcing socially ingrained barriers. Burgdorf & Burgdorf (1976) extensively surveyed legislation known as the "ugly laws," effective

into this mid-century. City and state laws were written solely for the purpose of segregating people with disabilities. The existence of these statutes proves and directly reveals social and attitudinal barriers, justified and legalized by legislative verbiage. Statutes and city ordinances were written to keep people with disabilities on the perimeters of society. A person with a disability could be barred from public places on the grounds that their patronage and sheer presence was offensive and opposed undue legal liabilities. A Chicago city ordinance read..."no person who is diseased, maimed, mutilated or in any way deformed so as to be unsightly or disgusting [italic added] be allowed in or on the public ways or other public places in this city shall therein or thereupon expose himself to public view", (Burgdorf, Jr., & Burgdorf, [1976], p. 359). Obviously public attitude favored no accommodation. This means of segregation openly opposed assimilation. These laws assured denial of basic human civil rights without embarrassment or acknowledgment of societal intolerance of differences. The extent of writing and passing ordinances legally preventing persons with disabilities from public establishments is blatant segregation, as sure as were Jim Crow laws.

An Alternative to All Type of Barriers by Means of Design:

An inherent part in the concept of universal design is to consider the architectural structure from foundation to fixtures. Use of optimal space through subtle means of use is provided for by design. Aspects of utilizing barrier-free design in all construction, including commercial, residential, and recreational environments, is inherent in the conceptualization to actualization of universal design. Considered user-friendly, universal design maintains conventional, contemporary, environmental aesthetics, avoiding any ambiance of cold institutionalization. Universal design is aesthetically

pleasing. It is functional, and it is marketable. "Millions of Americans want to buy what universal design can provide ... independence" (Null & Cherry, 1996, p. 31). Maintaining residence in one's home as abilities naturally wan with age means a higher quality of life for millions of people, as well as people with disabilities.

Universal Design: Supportive of Independent Living.

The Independent Living Research Utilization (ILRU) Project in Houston (1978), describes Independent Living as:

> Control over one's life based on the choice of acceptable options that minimize reliance on others in making decisions and in performing everyday activities. This includes managing one's affairs, participation in day-to-day life in the community, fulfilling a range of social roles, and making decisions that lead to self determination and the minimization of physical or psychological dependence on others (p.2).

Dunn (1990) furthered the Independent Living Paradigm (ILP) research began by DeJong (1980). The ILP study indicates significant social demographic variables such as characteristics of persons with disabilities, disability-related variables, and environmental barriers. The ILP combines these variables with the availability of assistive devices which affect independent living arrangements measures for increase and ease in productivity. The ILP also considers the public policy of physical rehabilitation. The medical trio of the Independent Living Paradigm (ILP) concept is concerned with all the variables previously described.

Previous research by Dunn (1990) defines the ILP as indicating that persons with disabilities have their own individual needs and physical

capabilities dependent upon type and level of disability. Further research indicates "the environment can be changed to maximize a person's level of independence. The importance of developing comprehensive policies, universal design, housing policies for [all persons of all abilities] is emphasized" (p. 49). This study stresses the importance of minimal costs involved in housing modifications at time of construction as consumer beneficial, thereby eliminating costly renovations. The inherent benefits are that persons with disabilities will be better able to achieve their individual potential in the community as a whole (Dunn, 1990). With more accessible housing stock available for disabled persons, additional benefits are achieved. Those persons who wish to age comfortably and remain in their own home without having to make housing renovations/modifications are able to do so.

Lawton (1983) coined the term "person-environment-fit" as unity between a person's capabilities and an environment supportive of and challenging to the individual. Research findings show that a sense of security of the familiar home setting can serve as a stable component in the lives of persons with disabilities. Other findings recognize that many persons remain in housing that provides a poor person-environment-fit post physical trauma or degeneration of abilities (Lawton, 1983). Individuals tend to adapt to the constraints of their environment instead of adapting the environment to meet their personal needs (deLaski-Smith & Ames, 1991).

Winston Churchill once noted that we build our buildings first, then we shape our lives around them. Kilmer & Kilmer (1992) write that ideally interior spaces should reflect and fulfill rather than control the functions enclosed. Our lives, our culture, our society should shape the building, not be shaped by them.

Universal design seems to satisfy and eliminate numerous problems cited in previous research findings. Universal design is beneficial to *all* people of *all* ages, sizes, and abilities and is applied to *all* buildings (U.S. Dept. of HUD, et. al., 1988). If universal design principles are incorporated in living environments, living independently for all persons is an attainable goal and a feasible reality.

Methodology

Population and Sample

Two samples participated in this study. One sample consisted of 249 individuals who toured the BILL and signed the guest register from outset of opening (July 1989) until the dissemination date of the research instrument (April 1993.) The age of the participants ranged from 19 to 76. Approximately 21% of the participants were males, and 79% were females. The ethnic composition of this sample was as follows: White (93.0%), Black (2.3%), Native American (0.8%), and Asian (3.9%). More demographic information for the participants is reported in Table 1.

The other sample comprised of participants who were randomly selected form a small midwestern community. A survey sampling company whose source information is the annual publication, Survey of Buying Power, assisted in the selection of this sample. This company provides information listed by zip code. The zip codes of 74074 and 74075 were randomly selected and a random sample of 400 was drawn from that population. According to market statistics of the county, in which the community is located, over 86% of residents are listed by zip code. Thus, this sample was considered to be fairly representative of the population. The age of the participants in this sample ranged from 20 to 76. Approximately 67% of the participants were males and approximately 33%

were females. The ethnic composition of this sample was as follows: White (97.3%), Black (0.9%), Native American (0.9%), and Asian (0.9%).

The two samples in this study were comparable in terms of their demographic characteristics. For example, participants in both samples were predominantly white, professionals (about 32% of the BILL sample, and about 36% of the community sample), and had high level of education (80% of the BILL sample, and about 85% of the comparison sample had Bachelors degree or higher). The only characteristic that distinguished the two samples sharply was gender of the participants. In the BILL sample over 50% of the participants were females, whereas over 50% of the participants were males in the sample.

Insert Table I here

Site Evaluated

The BILL is a research/demonstration single-family dwelling which has undergone progressive renovation in a user-friendly manner of design. BILL is a barrier-free residential environment displaying tangible, visual, usable , and accessible design, yet BILL is conventionally and environmentally aesthetic. Institutionalized ambiance is avoided when universal design is achieved.

BILL is located on a campus in affiliation with a College of Human Sciences. An endowment from the "Pete" Bartlett family, designated for the purpose of making an architecturally accessible demonstration home, was used to renovate the existing home.

This research laboratory proves beneficial to students, faculty, service providers, research studies. Topics of studies related to disabilities, design

evaluation, affordability, accessibility and buyer/owner interests and demand are researchable. It is a state-of-the-art facility with full-public access. Most important, it is a resource for research relating to universal design regarding consumer satisfaction in structural adaptations and technological-assistive devices. The BILL also serves as an invaluable resource in the promotion of advocacy and activism skills and education among persons with disabilities, family members, and professionals. A goal of the BILL is to enlighten and inform the public of the benefits of universal design. Also, BILL staff disseminates pertinent, up-to-date information on accessible products.

Instruments

Two questionnaires were constructed by the authors for use with the two groups. A questionnaire was first developed for the BILL sample. The questionnaire consists of five sections. The first section dealt with attitudinal assessment of respondents. The second section asks opinions as to whether a specific disability would be able to live independently and be productive in an 8 to 5 work setting. The third section assessed universal design features of the BILL and if the respondent was familiar with the accessible feature prior to touring the BILL. Additionally respondents were asked if they would incorporate each specific feature in their home or provide a client with recommendation of home renovation as to that specific feature. The fourth section dealt with disabled individuals on a personal level, how much assistance was needed to live independently, and if accommodative features helped them to achieve more independence in certain aspects of self-care. The last section consists of demographics for comparison assessment. The second questionnaire was developed based on the first one with some modifications. The comparison survey deleted

sections three and four, assessment of universal design features at BILL, and individual benefits of accommodative design features.

Pilot Study:

A pilot sample (n=31) was selected from junior-level design students enrolled in the Studio 1-Residential course in the Department of Design, Housing, and Merchandising in the fall semester of 1992. These students toured the BILL as a class field trip. Toward the end of the trip students voluntarily completed the questionnaire designed for the BILL sample. Based on the results of the pilot study, a few modifications were made and final forms of the questionnaires were produced. Since this study was designed to collect data by a self-administered questionnaire by mail, utmost care was assigned to the design of the cover letter so that the questionnaire would draw the interest of the potential participants. A synopsis of the topic of investigation, universal design, and barrier-free access was provided in the cover letter. The final form of the questionnaire included a questionnaire and a cover letter.

Data Collection

A mail survey was used to collect data. The data collection method utilized in this study followed the suggestions made by Dillman (1978). Dillman (1978), who advocates Total Design Method (TDM; see Babbie, 1989, Dillman, 1978; Touliator & Compton, 1988), recommends three mailings of the questionnaire and a follow-up post card following the first mailing. Dillman also recommends the last mailing be in the form of a registered letter to those who have not yet responded to the first mailing, a follow-up reminder/thank-you post card or the second mailing. In this study, Dillman's (1978) suggestions were closely followed except for the third mailing. The protocol of sending a third mailing by registered letter to

nonrespondents was not carried out due to cost constraints. Prior to the first mailing, the proposal of this study was submitted to the University Institutional Review Board and received full approval.

The questionnaire survey was mailed to potential participants in both samples in April of 1993 and respondents were requested to complete the questionnaire and return it by mid-May, 1993 (634 to the BILL sample and 400 to the sample). A envelope with pre-paid postage and pre-addressed was included along with the questionnaire. A follow-up post card was mailed to all potential participants in both groups two weeks after the first mailing. A second and final mailing included a questionnaire, a cover letter, and a pre-paid, pre-addressed envelope and was mailed to those who had not responded to the first two contacts. Of the 634 surveys sent to the BILL sample, 249 surveys were returned (44% return rate). One hundred and sixteen surveys were returned from the comparison sample, indicating 29% return rate.

Results and Discussion

Factor Analysis:

A factor analysis of the 32 attitudinal variables was conducted to identify the underlying structures of the variables. A principal component was utilized for this purpose. Kaiser's eigne value greater than 1 and Cattell's scree test suggested a nine factor solution. The nine factors were rotated orthogonally. Varimax solution was utilized for the orthogonal solution. Factor loadings greater or equal to .50 , a conservative cutoff, were examined. Twenty-two of the 32 items exceeded this cutoff. The pattern of factor loadings was clear and conceptually meaningful. The nine factors were named Subsidies (6 items), Barriers (3 items), Work Equality (2 items), Mobility Barriers (2 items), Universal Design (2 items), Temporarily

Able-Bodied (1 item), Public Accessibility (2 items), Housing Stock Affects Independent Living (2 items), and Functional Access (2 items).

Factor 1 (Subsidies) represented items regarding subsidies for persons with disabilities. Factor 2 (Barriers) represented all types of barriers: attitudinal, social, and architectural. Factor 3 (Work Equality) reflected items regarding employment. Factor 4 (Mobility Barriers) reflected items related to surface textures and wheelchair maneuverability. Factor 5 (Universal Design) encapsulated core concepts of universal design. Factor 6 (Temporarily Able-Bodied) reflected the possibility of everyone facing a disability within their lifetime. Factor 7 (Public Accessibility) was oriented toward accessibility of public places. Factor 8 (Housing Stock Affects Independent Living) represented housing accessibility and availability. Factor 9 (Functional Access) reflected accessible use of public areas. The summary of the nine rotated factors are presented in Table 2.

Insert Table II here

T-Tests:

Based on the results of the factor analysis, a series of t-tests were conducted to compare the two samples on the items loaded significantly on the nine factors. The results of the t-tests are briefly explained by each category represented by the nine factors and are reported in Table 3. The .05 alpha level was used for statistical significance.

Insert Table III here

Factors:

Factor 1 (Subsidies) : The BILL sample showed significantly higher means on medical expenses, medical supplies, housing, home care, and pay taxes. The results indicated that BILL sample was more sensitive to the necessity of these services for persons with disabilities to live independently. Transportation was the only service in this category that did not show a statistically significant difference between the BILL sample and the comparison sample. This may possibility be due to the rural setting in Oklahoma in which the study took place; the benefits and convenience of mass transit is not available.

Factor 2 (Barriers): The BILL sample showed significantly higher means on all three items in this category. The items represented all types of barriers attitudinal, social, and architectural. This may indicate that the BILL sample was more aware of all types of barriers.

Factor 3 (Work Equality): There were two items loaded significantly on this factor. Of these, the only item reflecting equal employment opportunities was statistically significant. The BILL sample showed a higher mean on this item, which may indicate that the BILL sample was more supportive of equal employment opportunities for disable persons.

Factor 4 (Mobility Barriers): The BILL sample showed a significantly higher mean on the item assessing their attitudes toward interior floor coverings. On the other hand, the sample showed a significantly higher mean on the item assessing their attitudes toward exterior surface conditions impeding maneuverability. This seems to indicate that the sample perceived accessibility to be easier for personal with limited mobility than does the BILL sample.

Factor 5 (Universal Design): On both of the two items, the BILL sample showed significantly higher means than the comparison sample. One item assessed the respondents' attitudes toward the functions of housing design; the other item assessed if all housing should be designed to be accessible. The results seems to suggest that exposure to universal designs at BILL combined with an expressed desire to investigate functional design, had a very positive effect on the BILL sample.

Factor 6 (Temporarily Able-Bodied): There was no significant difference in means when asked if all persons would experience a disability during their lifetime.

Factor 7 (Public Accessibility): There was no significant difference in the means of the two samples when asked if the Uniformed Federal Accessibility Standards meet access needs. However, when asked if public buildings are accessible, the comparison sample showed a significantly higher mean than the BILL sample. The results from this category indicate that the BILL sample was more eager to incorporate features profiled at the BILL as appropriate for personal situations, acknowledging accommodative comfort, which is aesthetically-functional in incorporating accessibility into the environment.

Factor 8 (Housing Stock Affects Independent Living): There was no significant difference in their attitudes toward the difficulty of maintaining a house with a disability between the two samples. However, regarding expense of purchasing accessible housing, the BILL sample showed a higher mean that the comparison sample. The difference was statistically significant with alpha set at .05. This may indicate knowledge through experience.

Factor 9 (Functional Access): The comparison sample showed a significantly higher mean than the BILL sample when asked about use of accessible restroom stalls. This could indicate that the comparison sample or the general population comparison, is more likely to use an accessible stall, not separating roomy convenience from minimal accommodation space. However, no significant difference was detected with regard to use of accessible parking. This might indicate that both sample groups acknowledge the importance of reserving accessible parking for persons most severely disabled.

A series of t-tests were conducted to assess 1) individual opinions of living independently and 2) working productively with various disabilities between the BILL and the comparison sample. The following reports the results of the t-tests, which are presented in Table 4.

Attitudinal Differences Towards Working Productively:

There were statistically significant mean differences in respondents' opinions towards twelve different types of disabilities in terms of working productively. These disabilities include:

- paraplegic
- quadriplegic
- breathing assisted by respirator
- spinal cord injury
- brain injury
- muscular dystrophy
- multiple sclerosis
- cerebral palsy
- developmental disabilities
- requiring oxygen tank to breathe

- mental retardation
- emotionally disabled.

The BILL sample reported higher means in these categories indicating that they thought these types of disabled persons could live productively and independently. There were no significant mean differences between the two samples in hearing impaired, vision impaired, speech impaired, amputee, and double amputee. This may suggest that both samples felt a disability of hearing, vision, speech, or amputees would not negatively affect productivity in an 8 to 5 work setting.

Attitudinal Differences Towards Living Independently:

There were statistically significant mean differences in respondents' opinions towards nine different types of disabilities in terms of living independently. Those disabilities include paraplegic, quadriplegic, double amputee, spinal cord injury (also know as paraplegic and quadriplegic), multiple sclerosis, cerebral palsy, developmentally disabled, mental retardation, and emotionally disabled. The BILL sample reported higher means in these categories indicating that they thought these types of disabled persons could live independently. This possibly indicates that the BILL sample held higher attitudes towards productive living for persons with disabilities and were knowledgeable as to living productively, depending upon the severity of a particular disability. There were no significant mean differences between the two samples in needing a respirator, hearing impaired, vision impaired, speech impaired, amputee, muscular dystrophy, and needing an oxygen tank to breathe to live independently.

The results of the t-tests to examine attitudinal differences of the two samples showed that the BILL sample was significantly different from the comparison sample in both categories towards physically disabled people

working productively and living independently. This could possibly stem from a level of understanding close companions or they understand their own level of ability and point of limitations. One wonders why the BILL sample reacted more positively than did the comparison sample. One possibility for the more positive BILL response is that individuals in the BILL study put forth the effort of seeking out this specialized information. As they desire the knowledge, it is likely that the BILL sample is more aware and informed about disabilities, or they already understand their own level of ability to perform daily rituals and do not possess attitudinal stereotypes. The significant differences might be due to the primary and/or secondary experience of having a disability considering that the BILL sample actually sought out the information assembled at the BILL. This significant difference between the two studies, combined with a generality of more progressive attitudes towards living independently and working productively with a disability, suggests that the BILL sample is already more aware of functioning with a disability on a daily basis.

Insert Table IV here

Summary and Conclusion

In summation, the BILL sample showed more positive attitudes towards disabilities in many different categories than did the comparison sample. For instance, the BILL sample showed more positive attitudes toward subsidies for persons with disabilities, including their willingness to pay higher taxes if designated to subsidize persons with disabilities. The BILL sample also showed more positive attitudes toward eliminating social, attitudinal, architectural barriers, improving work equality, independent living

of disabled person, and productive work of disabled person. From the responses of the BILL sample, it is clear that persons with disabilities, family members of persons with disabilities, and professionals specializing in service for persons with disabilities have more positive attitudes toward the ability of one to live independently and work productively within the community.

In contrast, the comparison sample showed more negative attitudes toward factors related to disabilities. These sample respondents were more hesitant and less sure of persons with disabilities being able to live independently and work productively. They were not supportive of disabled individuals' abilities to contribute positively to the American work force and were less supportive in the pursuit of total inclusion for disabled persons via social avenues within the general population. Nevertheless, the responses of the comparison, representative of the general population, were higher than expected. This provides much needed updated information on attitudinal awareness and knowledgeable insights that can be beneficial to the field of design and accessibility.

The major implication of this study is that social contact of disabled persons with able-bodied persons may lead to better understanding of barriers and may generate more accommodative environments, both public and private. Another implication is that a higher visibility by disabled individuals in the community can generate awareness leading to positive change.

Based on the findings of this study, the following recommendations are made. First, that the survey questionnaire would be better if it were subdivided into three or four separate questionnaires. This would also allow the opportunity to use various statistical measures to obtain and compare

results of responses with a randomly selected comparison sample. This was not previously available as the random sample survey contained only the attitudinal and demographic questions. Dividing the BILL instrument into categorical topics and asking corresponding hypothetical questions to a random sample could provide valid results on all areas which the BILL questionnaire sought better understanding. Secondly, comparing the BILL attitudinal questions to the Attitudes Toward Disabled Persons Scale instrument would be a good validity test. As well, using the Feeling Check List from Siller & Chipman (1965) research would be interesting. Third, using the portion of the BILL accessible features as a questionnaire sent to contractors, builders, architects, and designers inquiring which features are regularly used could be very beneficial to the existing research.

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TABLE I
DEMOGRAPHICS OF RESPONDENTS
(page 1 of 2)

Question	Bartlett		Community	
	percent	n	percent	n
Age				
19 and under	10.3	27	0.0	0
20 through 30	21.5	56	27.4	31
31 through 40	18.0	47	16.1	18
41 through 50	18.4	48	19.6	22
51 through 60	12.6	33	12.6	14
61 through 75	15.0	39	13.4	15
76 and above	4.2	11	11.7	13
Gender				
Male	21.2	55	66.7	76
Female	78.8	205	33.3	38
Education Level				
H.S.	20.0	25	14.9	17
B.S.	48.1	125	45.5	52
M.S.	25.0	65	17.5	20
Ph.D.	6.9	18	22.0	25
Marital Status				
Single	28.8	75	23.7	27
Married	59.2	154	60.5	69
Divorced	5.8	15	5.3	6
Widowed	6.2	16	10.5	12

TABLE I
DEMOGRAPHICS OF RESPONDENTS
(page 2 of 2)

Question	Bartlett		Community	
	percent	n	percent	n
Occupation				
Manager/Professional	10.0	26	21.9	25
Professional Specialist	21.6	56	14.0	16
Technical Sales/Administrative	8.5	22	5.3	6
Sales	1.2	3	5.3	6
Administrative Support	5.4	14	2.6	3
Service Occupation	3.1	8	2.6	3
Farm/Forestry/Fish	1.5	4	0.9	1
Precision Craftsman/Repairs	0.0	0	1.8	2
Construction	1.2	3	0.0	0
Extractive	0.0	0	0.0	0
Operator/Labor	0.0	0	1.8	2
Packaging/Filling/Machine Oper	0.0	0	0.0	0
Transportation/Moving	0.0	0	0.9	1
Hand/Equipment Cleaner/Helper	0.0	0	0.0	0
Self-Employed	0.8	2	3.5	4
Retired	13.5	35	16.7	19
Student	21.6	56	19.3	22
Homemaker	10.0	26	3.5	4
Unemployed	1.2	3	0.0	0
Race				
White	93.0	238	97.3	110
Black	2.3	6	0.9	1
Native American	0.8	2	0.9	1
Asian	3.9	10	0.9	1

TABLE II
FACTOR ANALYSIS
Combined Response Groups
INDEPENDENT LIVING CORRELATIONS

Factor	Factor Loading
Factor 1: **Subsidies**	
Subsidize Medicinal Expenses	0.88691
Subsidize Medical Supplies	0.88645
Subsidize Transportation	0.85714
Subsidize Housing	0.85109
Subsidize In Home Support Service.	0.84690
Pay Higher Taxes If for Subsidies	0.73803
Factor 2: **Barriers**	
Attitudinal Barriers	0.78717
Social Barriers	0.72735
Architectural Barriers	0.68629
Factor 3: **Work Equality**	
Work; Any Job Qualified To Do	0.70033
Equal Employment Opportunities	0.67540
Factor 4: **Mobility Barriers**	
Interior Floor Coverings	0.86155
Exterior Path Surface Conditions	0.85014

TABLE II
FACTOR ANALYSIS
Combined Response Groups
INDEPENDENT LIVING CORRELATIONS

Factor	Factor Loading
Factor 5: **Universal Design**	
All housing Design for Accessibility	0.75496
Accessible Housing Functions for All	0.63364
Factor 6: **Temporarily Able-Bodied**	
During Lifespan, Disability is Experiences by All	0.71940
Factor 7: **Public Accessibility**	
Uniform Building Standards Access Adequate	0.70224
Public Buildings Are Accessible	0.60437
Factor 8: **Housing Stock Affects Independent Living**	
Home Maintenance Difficult for Person with a Disability	0.63846
Accessible Housing Expensive to Purchase	0.60149
Factor 9: **Functional Access**	
I Use Accessible Restroom Stall	0.75325
I Use Accessible Parking Spaces	0.68508

TABLE III
T-TEST RESULTS OF DIFFERENCES BETWEEN BARTLETT AND COMMUNITY RESPONDENTS ACROSS NINE FACTORS

	Bartlett Mean	Community Mean	T-Test	Prob.
Factor #1 - Subsidizes				
Subsidize Medical Expenses	3.88	3.46	3.19	.0016
Subsidize Medical supplies	4.00	3.67	2.59	.0100
Subsidize Transportation	3.76	3.59	1.21	.2273
Subsidize Housing	3.87	3.42	3.28	.0011
Subsidize In home care	3.76	3.46	2.17	.0305
Would pay higher taxes if for Subsidize	3.55	3.04	3.41	.0007
Factor #2 - Barriers				
Enter work there are attitudinal barriers	4.22	3.90	2.84	.0047
Enter work there are many social barriers	4.03	3.75	2.18	.0299
Enter work, there are architectural barriers	4.31	4.05	2.61	.0094
Factor #3 - Work Equality				
Person w/ dis should work any job qualified for	4.76	4.66	1.34	.1805
EEOP for person w/ disabilities	4.61	4.37	2.32	.0216

TABLE III
T-TESTS RESULTS OF DIFFERENCES BETWEEN BARTLETT AND COMMUNITY RESPONDENTS ACROSS NINE FACTORS

	Bartlett Mean	Community Mean	T-Test	Prob.
Factor #4 - Mobility Barriers				
Inter floor coverings may impede maneuvering	4.74	4.55	2.28	.0230
Exterior road conditions may impede maneuvering	4.78	4.71	0.95	.3425
Factor #5 - Universal Design				
All housing should design for accessibility	3.74	2.83	5.27	.0000
Accessible housing is functional for all	4.09	3.37	4.58	.0001
Factor #6 - Temporarily Able-Bodied				
Disability is experienced by all during a lifetime	4.00	3.90	0.72	.4742
Factor #7 - Public Accessibility				
Uniform Fed Access Standards meet access needs	3.01	3.05	-0.28	.7821
Public buildings are accessible	2.58	2.89	-2.13	.0341
Factor #8 - Housing Stock Affects Ind Living				
It is difficult to maintain a house w/ a disability	3.52	3.67	-0.92	.3571
Accessible housing is expensive to purchase	4.03	3.63	2.85	.0045
Factor #9 - Functional Access				
I use the accessible restroom stall	3.50	4.14	-3.98	.0001
I use accessible parking	4.70	4.76	-0.67	.5317

TABLE IV -- T-TEST ANALYSIS;

ATTITUDINAL DIFFERENCES BETWEEN

BARTLETT (BILL) AND COMMUNITY RESPONDENTS

(page 1 of 2)

	Work Productivity				Living Independently			
Specific Disability	BILL Study Mean	Sample Mean	T-Test	p	BILL Study Mean	Sample Mean	T-Test	p
Hearing Impaired	4.38	4.25	1.21	.2243	4.65	4.74	-1.24	.2149
Vision Impaired	3.94	3.71	1.72	0860	4.25	4.23	0.16	.8679
Speech Impaired	4.20	4.14	0.46	.6453	4.66	4.77	-1.63	.1023
Paraplegic, (paralyzed, waist down)	4.15	3.86	2.23	.0263	4.06	3.74	2.40	.0166
Quadriplegic, (paralyzed, neck down)	2.70	2.37	2.25	.0244	2.37	2.03	2.21	.0273
Amputee	4.51	4.39	1.33	.1837	4.45	4.44	0.13	.8935
Double Amputee	3.90	3.71	1.39	.1632	3.84	3.54	2.08	.0378
Needing Respirator to Breathe	2.70	2.41	2.02	.0432	2.95	2.95	2.02	.9763
Spinal Cord Injury	3.20	2.66	3.43	.0007	3.21	2.68	3.38	.0008
Brain Injury	2.55	2.27	1.97	.0493	2.65	2.48	1.06	.2888

TABLE IV -- T-TEST ANALYSIS;

ATTITUDINAL DIFFERENCES BETWEEN

BARTLETT (BILL) AND COMMUNITY RESPONDENTS

	Work Productivity				Living Independently			
Specific Disability	BILL Study Mean	Sample Mean	T-Test	p	BILL Study Mean	Sample Mean	T-Test	p
Muscular Dystrophy	3.31	2.96	2.55	.0109	3.32	3.06	1.83	.0626
Multiple Sclerosis	3.42	2.89	3.81	.0002	3.41	3.03	2.67	.0078
Cerebral Palsy	3.34	2.80	3.83	.0002	3.39	2.88	3.10	.0020
Developmentally Disabled	3.28	2.85	3.20	.0015	3.29	2.91	2.74	.0064
Needing Oxygen Tank to Breathe	3.15	2.84	1.97	.0488	3.40	3.25	0.89	.3722
Mental Retardation	3.22	2.69	3.60	.0004	3.13	2.66	3.22	.0014
Emotionally Disabled	3.09	2.75	2.52	.0120	3.22	2.90	2.17	.0307

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APPENDIXES

APPENDIX A

INSTRUMENTS

UNIVERSAL DESIGN:

Applications for Living

BARTLETT INDEPENDENT LIVING LABORATORY
College of Human Environmental Sciences
OKLAHOMA STATE UNIVERSITY

COLLEGE OF
Human Environmental Sciences

Research and Graduate Studies

COLLEGE OF HUMAN ENVIRONMENTAL SCIENCES
OKLAHOMA STATE UNIVERSITY

The mission of the College of Human Environmental Sciences at Oklahoma State University is to design and deliver innovative and superior instruction, research, and service in globally oriented, scientifically based, human environmental programs which enhance individual wellness and quality of life in an ethical and socially responsible manner.

FOR THE FOLLOWING QUESTIONS, CIRCLE THE NUMBER OF YOUR ANSWER. ANSWER ONLY ONE TIME PER QUESTION.

Agree		No Opinion		Disagree		
5	4	3	2	1	(1)	All housing should be designed to be accessible.
5	4	3	2	1	(2)	Accessible housing is functional for all individuals regardless of level of ability or age.
5	4	3	2	1	(3)	Houses designed to be accessible should receive tax credits.
5	4	3	2	1	(4)	Accessible housing is more expensive to purchase.
5	4	3	2	1	(5)	It is difficult for a person with a disability to locate accessible housing.
5	4	3	2	1	(6)	Due to affordability or cost of housing, people with disabilities are often forced to live in high-crime and/or substandard neighborhoods.
5	4	3	2	1	(7)	Maintenance of a private residence would be difficult for a person with a disability.
5	4	3	2	1	(8)	I use a designated handicapped parking space for a quick in and out errand.
5	4	3	2	1	(9)	I use the handicap stall in the public rest room because it is roomier and more convenient.
5	4	3	2	1	(10)	When there is a line in the public rest room, a person with a disability should have priority for the handicap stall regardless of their placement in line.
5	4	3	2	1	(11)	Public buildings are accessible to people with disabilities.
5	4	3	2	1	(12)	Legislation concerning accessibility should be mandated for public buildings.
5	4	3	2	1	(13)	A person with a disability should be allowed to work flexible hours in a job.
5	4	3	2	1	(14)	A person with a disability should have equal employment opportunities.
5	4	3	2	1	(15)	A person with a disability should work in any job they are qualified to do.
5	4	3	2	1	(16)	As a person with a disability enters the work force, there are many architectural barriers.
5	4	3	2	1	(17)	As a person with a disability enters the work force, there are many attitudinal barriers.

Agree		No Opinion		Disagree		
5	4	3	2	1	(18)	As a person with a disability enters the work force, there are many social barriers.
5	4	3	2	1	(19)	I feel uncomfortable around someone who has a disability.
5	4	3	2	1	(20)	Disabilities are typically encountered by all individuals during their lifetime.
5	4	3	2	1	(21)	Using a manual push wheelchair for mobility (around town) is as easy as using a bicycle.
5	4	3	2	1	(22)	Communities are readily and easily accessible.
5	4	3	2	1	(23)	When maneuvering a wheelchair indoors, different floor coverings (i.e., throw rugs, area rugs, wall to wall carpets), may impede mobility.
5	4	3	2	1	(24)	When maneuvering a wheelchair outdoors, road conditions (i.e., cracks, chug-holes, gravel, sand, grass) may act as barriers.
5	4	3	2	1	(25)	A person who uses a wheelchair does not tire easily because they spend their time sitting.
5	4	3	2	1	(26)	There are uniform building standard guidelines in existence that meet accessibility requirements.
					(27)	Subsidies should be available for persons with disabilities for...
5	4	3	2	1		a) housing
5	4	3	2	1		b) in home personal care/paid attendant
5	4	3	2	1		c) transportation, public and/or private
5	4	3	2	1		d) medical care costs, doctor bills, surgery
5	4	3	2	1		e) medical supplies or equipment, i.e., prosthesis, canes, walkers, wheelchairs, incontinency equipment, medicines.
5	4	3	2	1	(28)	I would pay higher taxes if they were designated to subsidize necessities for persons with disabilities.

(29) Briefly, discuss your thoughts on the amount of time it takes for a person with disabilities to function daily; i.e., bathe, dress, straighten the house, etc.

_____

_____

_____

_____

FOR THE FOLLOWING QUESTIONS, READ AND FOLLOW INSTRUCTIONS CLOSELY.

The following two questions ask for your opinion about specific disabilities on two different scenarios; working 8 to 5 AND living independently. Please answer both questions per disability listed.

(30) Please indicate for each disability, if a person is capable of being productive in a typical 8 to 5 work setting. SEE LIST BELOW.

(31) Please circle beside each disability, your opinion as to the feasibility of living in one's own home. SEE LIST BELOW.

Very Productive — Not At All Productive — Feasible — Not Feasible

(30) Work 8 to 5	(31)Live Independent	Type of Disability
5 4 3 2 1	5 4 3 2 1	hearing impaired
5 4 3 2 1	5 4 3 2 1	vision impaired
5 4 3 2 1	5 4 3 2 1	speech impaired
5 4 3 2 1	5 4 3 2 1	paraplegic, paralyzed from waist down
5 4 3 2 1	5 4 3 2 1	quadriplegic, paralyzed from neck down
5 4 3 2 1	5 4 3 2 1	amputee
5 4 3 2 1	5 4 3 2 1	double amputee
5 4 3 2 1	5 4 3 2 1	needing a respirator to breathe
5 4 3 2 1	5 4 3 2 1	spinal cord injury
5 4 3 2 1	5 4 3 2 1	brain injury
5 4 3 2 1	5 4 3 2 1	Muscular Dystrophy
5 4 3 2 1	5 4 3 2 1	Multiple Sclerosis
5 4 3 2 1	5 4 3 2 1	Cerebral Palsy
5 4 3 2 1	5 4 3 2 1	developmentally disabled
5 4 3 2 1	5 4 3 2 1	needing oxygen to breathe
5 4 3 2 1	5 4 3 2 1	mental retardation
5 4 3 2 1	5 4 3 2 1	emotionally disabled

IT IS VERY IMPORTANT THAT YOU THOROUGHLY COMPLETE THE FOLLOWING QUESTION

THERE ARE TWO PLACES TO RESPOND TO EACH ADAPTATION LISTED. PLEASE ANSWER BOTH PLACES. CIRCLE THE APPROPRIATE CHOICE FOR (1) WHERE YOUR IDEA WAS OBTAINED FOR THE ADAPTATION [A,B,C] AND (2) HOW THE ADAPTATION PERTAINS TO EITHER; YOUR HOME, YOUR CLIENT'S HOME, OR THE HOME OF YOUR FAMILY MEMBER OR FRIEND WITH A DISABILITY [1,2,3,4].

(32) Which adaptations showcased in the Bartlett Independent Living Laboratory (BILL) have helped you in understanding accessibility, or in adapting your own home, or in modifying houses, and/or prescribing modifications for your clients?

	A) Received idea from BILL	B) Received idea from other source	C) Was not aware of feature at BILL	1) I have the adaptation	2) I plan to make the adaptation.	3) House was already adapted	4) I do not plan to make the adaptation
Entrance doors are automatic.	A	B	C	1	2	3	4
Package shelves are located at exterior and interior of entry.	A	B	C	1	2	3	4
Thresholds are level.	A	B	C	1	2	3	4
Door openings are at least 36" wide.	A	B	C	1	2	3	4
Light switches and controls are mounted 42" above floor, or lower.	A	B	C	1	2	3	4
A single switch to control multiple lights is available.	A	B	C	1	2	3	4
Electrical outlets and telephone jacks are 18" above floor.	A	B	C	1	2	3	4
All carpeting is low pile-1/4" thick.	A	B	C	1	2	3	4
Windows and draperies are electronically controled (motorized).	A	B	C	1	2	3	4
Thermostats are adapted.	A	B	C	1	2	3	4
Fireplace is remote controlled gas with permanent logs.	A	B	C	1	2	3	4
Rooms have available space for a wheelchair to turn around (5'x 5').	A	B	C	1	2	3	4
There is a clear path of travel through all rooms.	A	B	C	1	2	3	4

	A) Received idea from BILL	B) Received idea from other source	C) Was not aware of feature at BILL	1) I have the adaptation	2) I plan to make the adaptation.	3) House was already adapted	4) I do not plan to make the adaptation
Smoke detectors include both audible and visual alarms.	A	B	C	1	2	3	4
The kitchen work area is efficient to conserve physical energy.	A	B	C	1	2	3	4
Hard floors are non-skid surfaces.	A	B	C	1	2	3	4
Smooth top cooktop.	A	B	C	1	2	3	4
Oven is located next to a counter that has knee clearance space.	A	B	C	1	2	3	4
Oven is side opening wall unit at seated height.	A	B	C	1	2	3	4
Pull-out counter tops below oven.	A	B	C	1	2	3	4
Counter top heights are adjustable.	A	B	C	1	2	3	4
Roll-under counter work tops.	A	B	C	1	2	3	4
Sinks are mounted on brackets to adjust the height.	A	B	C	1	2	3	4
Dishwasher, washing machine and dryer are all front loading.	A	B	C	1	2	3	4
Braille templates for appliances.	A	B	C	1	2	3	4
Cabinet handles are "D" shaped.	A	B	C	1	2	3	4
Easy-pull-out drawers in cabinets.	A	B	C	1	2	3	4
Nine inch toe space below cabinets.	A	B	C	1	2	3	4
Hallways are at least 42" wide.	A	B	C	1	2	3	4
Bed is connected to fire alarm and vibrates to alert sleeper.	A	B	C	1	2	3	4
Clothes rods are located 54" above finished floor, or lower.	A	B	C	1	2	3	4
An accessible place for exercise is available.	A	B	C	1	2	3	4
Bathtub or shower has a hand-held adjustable shower head.	A	B	C	1	2	3	4

	A) Received idea from BILL	B) Received idea from other source	C) Was not aware of feature at BILL	1) I have the adaptation	2) I plan to make the adaptation.	3) House was already adapted	4) I do not plan to make the adaptation
Bathtub or shower has a seat that allows bathing in a seated position.	A	B	C	1	2	3	4
Bath bench has cut-out for access to personal hygiene.	A	B	C	1	2	3	4
Shower is a 5'x 5' roll-in type that keeps water in the shower area.	A	B	C	1	2	3	4
Water faucet controls are lever type handles.	A	B	C	1	2	3	4
Faucets have anti-scald temperature controls.	A	B	C	1	2	3	4
Scald guards around pipes under sinks.	A	B	C	1	2	3	4
Walls are reinforced to hold 250 pounds at grab bars.	A	B	C	1	2	3	4
Grab bars are securely installed around toilet, bathtub, and shower.	A	B	C	1	2	3	4
Doors swing out if the room is small.	A	B	C	1	2	3	4
Doors have off set door hinges.	A	B	C	1	2	3	4
Doors have lever handles (not knobs).	A	B	C	1	2	3	4
Pull-handles are placed near hinged side of door for leverage/easy close.	A	B	C	1	2	3	4
Door has keyless push button combination lock.	A	B	C	1	2	3	4
Curb cuts are available.	A	B	C	1	2	3	4
Accessible parking is available.	A	B	C	1	2	3	4
Access aisle next to parking space is as wide as a parking space, (9ft.).	A	B	C	1	2	3	4
Was there an adaptation you noticed which was not specified? Specify adaptation & Answer accordingly	A	B	C	1	2	3	4

Check the appropriate answer(s) for the following question.

(33) I attended a tour of the Bartlett Independent Living Laboratory because:

[ ] I am disabled } If you answer one of these two
[ ] A family member has a disability } please complete all questions.

[ ] My friend has a disability } If you answered here,
[ ] I work with persons with disabilities } SKIP to question #43
[ ] I am a contractor, architect or designer } NOW.
[ ] A class tour
[ ] Other _____ (specify)

IF YOU OR A FAMILY MEMBER DO NOT HAVE A DISABILITY PLEASE SKIP TO QUESTION # 43.

PLEASE ANSWER THE FOLLOWING QUESTIONS ACCORDING TO YOUR DISABILITY OR THAT OF YOUR FAMILY MEMBER'S DISABILITY.

(34) What is your main or most extensive disability or family member's disability?

[ ] Alzheimers Disease
[ ] Amputation
[ ] Arthritis
[ ] Cerebral Palsy
[ ] CVA (stroke)
[ ] Head Injury
[ ] Hearing Impaired
[ ] Mental Retardation
[ ] Multiple Sclerosis
[ ] Muscular Dystrophy
[ ] Orthopedic
[ ] Parkinson's Disease
[ ] Polio
[ ] Spina Bifida
[ ] Spinal Cord Injury, paraplegic
[ ] Spinal Cord Injury, quadriplegic
[ ] Vision Impaired
[ ] Other _____
(SPECIFY)

(35) Have adaptations to your present housing enabled you to go to work or to school?

YES	NO	
[ ]	[ ]	School
[ ]	[ ]	Work

If yes for either, list adaptation that helped you most to attend work or school.

_____

_____

_____

(36) Have these housing adaptations enabled you and your household to remain in your present home and not move?

[ ] Yes [ ] No

If yes, explain how the adaptation has helped: _____

_____

_____

(37) Do you or your family member have or require any of these mobility aids?

Have This Equipment And Use It	Need, But Don't Have This Equipment	Do Not Need This Equipment or Do Not Use It	
[ ]	[ ]	[ ]	Manual Wheelchair
[ ]	[ ]	[ ]	Motorized Wheelchair
[ ]	[ ]	[ ]	Respirator
[ ]	[ ]	[ ]	Cane
[ ]	[ ]	[ ]	Walker
[ ]	[ ]	[ ]	Crutches
[ ]	[ ]	[ ]	Brace or Braces
[ ]	[ ]	[ ]	Prosthesis
[ ]	[ ]	[ ]	Aids for Vision
[ ]	[ ]	[ ]	Hearing Aid
[ ]	[ ]	[ ]	Other Assistive Device_____

_____

(SPECIFY)

(38) How would you rate your ability (or your family member's ability) to undertake the following activities by your(them)self or with assistance from another person?

Independent (Can do by self) 5		A Little Assistance Is Needed 4		Some Assistance Is Needed 3	A Lot of Assistance Is Needed 2	A Great Deal of Assistance Is Needed 1
5	4	3	2	1	Taking medication	
5	4	3	2	1	Getting dressed	
5	4	3	2	1	Bathing or showering	
5	4	3	2	1	Eating	
5	4	3	2	1	Toileting	
5	4	3	2	1	Cooking Meals	
5	4	3	2	1	Light Housework	
5	4	3	2	1	Heavy Housework	
5	4	3	2	1	Doing laundry	
5	4	3	2	1	Paying bills	
5	4	3	2	1	Grocery shopping	
5	4	3	2	1	Getting in and out of bed	
5	4	3	2	1	Getting around inside	
5	4	3	2	1	Getting up and down stairs inside	
5	4	3	2	1	Going outside	

(39) Do you currently have or require a personal care attendant in any capacity?

Have	Need, but Do not have (Require)	Do Not Need	
[ ]	[ ]	[ ]	Visiting care attendant
[ ]	[ ]	[ ]	Live-in care attendant
[ ]	[ ]	[ ]	Medically trained attendant
[ ]	[ ]	[ ]	Lo-tech trained attendant

If yes, how often do you need your attendant? _____

(40) Have the housing adaptations ideas from the Bartlett Independent Living Laboratory been useful to other family members?

Yes	No	
[ ]	[ ]	Reduced help required from family members
[ ]	[ ]	Allowed family members to go to work
[ ]	[ ]	Improved family members health (e.g. back problems)
[ ]	[ ]	Improved family relations
[ ]	[ ]	Increased safety of helper
[ ]	[ ]	Improved state of mind or reduced anxiety of helper
[ ]	[ ]	Allowed family member to live easier within the house

If yes, please list the adaptation that has helped the most: _____

_____

(41) From the housing adaptations ideas received from Bartlett Independent Living Laboratory, do you feel that they have improved any of the following aspects of your life?
(Check one for Each Line)

A Great Deal 5			A Lot 4		Some 3	A Little 2	None 1
5	4	3	2	1	Sense of Independence		
5	4	3	2	1	Safety		
5	4	3	2	1	Privacy (Can be alone)		
5	4	3	2	1	Privacy (Can do personal intimate care alone)		
5	4	3	2	1	Self-care		
5	4	3	2	1	Self-esteem		
5	4	3	2	1	Involvement in the community		
5	4	3	2	1	Family relations/life		
5	4	3	2	1	Satisfaction with your home		
5	4	3	2	1	Sense of Control over your life		

(42) Explain in your own words, how much say/input you had in deciding upon the items to be adapted in your home?

_____

_____

Please Continue to answer the following questions as a personal response.

IF YOU SKIPPED FROM QUESTION # 33, BEGIN AGAIN HERE & CONTINUE TO THE END.

(43) How would you rate your visit to the Bartlett Independent Living Laboratory?

Excellent	Good	Average	Fair	Poor
[ ]	[ ]	[ ]	[ ]	[ ]

(44) How many stories/floors does your house/building have?_____ (# of Floors)

(45) Which best describes the type of housing unit in which you live?

[ ] Condominium
[ ] Group Home
[ ] Duplex to Quadplex Family House
[ ] Apartment
[ ] Retirement Village/Apartment
[ ] Single Family House/Detached
[ ] Mobile Home/Trailer
[ ] Nursing Home
[ ] Rehabilitation Center
[ ] Other _____ (Specify)

(46) PLEASE FILL IN THE APPROPRIATE ANSWER FOR EACH BOX.

AGE	SEX	EDUCATION HIGHEST LEVEL	RACE	MARITAL STATUS	OCCUPATION

(47) State or Country of your permanent residence. _____
(Specify Where)

(48) How large is the town in which you live?

[ ] less than 2,499
[ ] 2,500 to 4,999
[ ] 5,000 to 24,999
[ ] 25,000 to 49,999
[ ] more than 50,000

(49) Taking into consideration all sources of income, what was your total family income before taxes this past year?

[ ] Under $ 4,999
[ ] $ 5,000 to $ 9,999
[ ] $10,000 to $14,999
[ ] $15,000 to $19,999
[ ] $20,000 to $24,999
[ ] $25,000 to $29,999
[ ] $30,000 to $34,999
[ ] $35,000 to $39,999
[ ] $40,000 to $49,999
[ ] $50,000 to $59,999
[ ] $60,000 to $69,999
[ ] $70,000 and over

(50) Do you own your home, pay rent, or have some other arrangement?

[ ] rent
[ ] own
[ ] provided by friend/relative
[ ] provided by employer
[ ] other _____ (Specify)

(51) Do you live alone or with someone else?

[ ] Alone [ ] With Family [ ] Other
[ ] With roommate [ ] Spouse

(52) I know someone who has a disability.
[ ] Friend / Acquaintance
[ ] Co-Worker / employee / employer
[ ] Family member / relative, if checked, _____
(Specify Relationship)

_____
(Specify disability for any checked)

[ ] I have never known someone with a disability.

(53) Please indicate who filled out this questionnaire.
[ ] Self
[ ] Family member
[ ] Personal Care Attendant
[ ] Friend
[ ] Other _____ (Specify)

THANK YOU FOR YOUR TIME, THOUGHTS, AND PARTICIPATION.

If you have additional comments or information you would like to share with us, please do so in this space.

_____
_____
_____
_____
_____
_____

Return Address:

CENTRAL MAILING SERVICES
OKLAHOMA STATE UNIVERSITY
STILLWATER, OK 74078-0550

UNIVERSAL DESIGN:

Applications for Living

BARTLETT INDEPENDENT LIVING LABORATORY
College of Human Environmental Sciences
OKLAHOMA STATE UNIVERSITY

FOR THE FOLLOWING QUESTIONS, CIRCLE THE NUMBER OF YOUR ANSWER. ANSWER ONLY ONE TIME PER QUESTION.

Agree		No Opinion		Disagree		
5	4	3	2	1	(1)	All housing should be designed to be accessible.
5	4	3	2	1	(2)	Accessible housing is functional for all individuals regardless of level of ability or age.
5	4	3	2	1	(3)	Houses designed to be accessible should receive tax credits.
5	4	3	2	1	(4)	Accessible housing is more expensive to purchase.
5	4	3	2	1	(5)	It is difficult for a person with a disability to locate accessible housing.
5	4	3	2	1	(6)	Due to affordability or cost of housing, people with disabilities are often forced to live in high-crime and/or substandard neighborhoods.
5	4	3	2	1	(7)	Maintenance of a private residence would be difficult for a person with a disability.
5	4	3	2	1	(8)	I use a designated handicapped parking space for a quick in and out errand.
5	4	3	2	1	(9)	I use the handicap stall in the public rest room because it is roomier and more convenient.
5	4	3	2	1	(10)	When there is a line in the public rest room, a person with a disability should have priority for the handicap stall regardless of their placement in line.
5	4	3	2	1	(11)	Public buildings are accessible to people with disabilities.
5	4	3	2	1	(12)	Legislation concerning accessibility should be mandated for public buildings.
5	4	3	2	1	(13)	A person with a disability should be allowed to work flexible hours in a job.
5	4	3	2	1	(14)	A person with a disability should have equal employment opportunities.
5	4	3	2	1	(15)	A person with a disability should work in any job they are qualified to do.
5	4	3	2	1	(16)	As a person with a disability enters the work force, there are many architectural barriers.
5	4	3	2	1	(17)	As a person with a disability enters the work force, there are many attitudinal barriers.

Agree		No Opinion		Disagree		
5	4	3	2	1	(18)	As a person with a disability enters the work force, there are many social barriers.
5	4	3	2	1	(19)	I feel uncomfortable around someone who has a disability.
5	4	3	2	1	(20)	Disabilities are typically encountered by all individuals during their lifetime.
5	4	3	2	1	(21)	Using a manual push wheelchair for mobility (around town) is as easy as using a bicycle.
5	4	3	2	1	(22)	Communities are readily and easily accessible.
5	4	3	2	1	(23)	When maneuvering a wheelchair indoors, different floor coverings (i.e., throw rugs, area rugs, wall to wall carpets), may impede mobility.
5	4	3	2	1	(24)	When maneuvering a wheelchair outdoors, road conditions (i.e., cracks, chug-holes, gravel, sand, grass) may act as barriers.
5	4	3	2	1	(25)	A person who uses a wheelchair does not tire easily because they spend their time sitting.
5	4	3	2	1	(26)	There are uniform building standard guidelines in existence that meet accessibility requirements.
					(27)	Subsidies should be available for persons with disabilities for...
5	4	3	2	1		a) housing
5	4	3	2	1		b) in home personal care/paid attendant
5	4	3	2	1		c) transportation, public and/or private
5	4	3	2	1		d) medical care costs, doctor bills, surgery
5	4	3	2	1		e) medical supplies or equipment, i.e., prosthesis, canes, walkers, wheelchairs, incontinency equipment, medicines.
5	4	3	2	1	(28)	I would pay higher taxes if they were designated to subsidize necessities for persons with disabilities.

(29) Briefly, discuss your thoughts on the amount of time it takes for a person with disabilities to function daily; i.e., bathe, dress, straighten the house, etc.

_____

_____

_____

_____

FOR THE FOLLOWING QUESTIONS, READ AND FOLLOW INSTRUCTIONS CLOSELY.

The following two questions ask for your opinion about specific disabilities on two different scenarios; working 8 to 5 AND living independently. Please answer both questions per disability listed.

(30) Please indicate for each disability, if a person is capable of being productive in a typical 8 to 5 work setting. SEE LIST BELOW.

(31) Please circle beside each disability, your opinion as to the feasibility of living in one's own home. SEE LIST BELOW.

Very Productive — Not At All Productive — Feasible — Not Feasible

(30) Work 8 to 5	(31)Live Independent	Type of Disability
5 4 3 2 1	5 4 3 2 1	hearing impaired
5 4 3 2 1	5 4 3 2 1	vision impaired
5 4 3 2 1	5 4 3 2 1	speech impaired
5 4 3 2 1	5 4 3 2 1	paraplegic, paralyzed from waist down
5 4 3 2 1	5 4 3 2 1	quadriplegic, paralyzed from neck down
5 4 3 2 1	5 4 3 2 1	amputee
5 4 3 2 1	5 4 3 2 1	double amputee
5 4 3 2 1	5 4 3 2 1	needing a respirator to breathe
5 4 3 2 1	5 4 3 2 1	spinal cord injury
5 4 3 2 1	5 4 3 2 1	brain injury
5 4 3 2 1	5 4 3 2 1	Muscular Dystrophy
5 4 3 2 1	5 4 3 2 1	Multiple Sclerosis
5 4 3 2 1	5 4 3 2 1	Cerebral Palsy
5 4 3 2 1	5 4 3 2 1	developmentally disabled
5 4 3 2 1	5 4 3 2 1	needing oxygen to breathe
5 4 3 2 1	5 4 3 2 1	mental retardation
5 4 3 2 1	5 4 3 2 1	emotionally disabled

(32) I have attended a tour of the Bartlett Independent Living Laboratory at Oklahoma State University.
[ ] Yes [ ] No

(33) I know someone who has a disability.

[ ] Friend / acquaintance
[ ] Co-Worker / employee / employer
[ ] Family member / relative, if checked, _____
(Specify the relationship)

_____
(Specify the disability for any checked)

[ ] I have never known someone with a disability.

"IT IS VERY IMPORTANT THAT YOU THOROUGHLY COMPLETE THE FOLLOWING QUESTIONS"

(34) PLEASE FILL IN THE APPROPRIATE ANSWER FOR EACH BOX.

AGE	SEX	EDUCATION, HIGHEST LEVEL	RACE	MARITAL STATUS	OCCUPATION

(35) State or Country of your permanent residence._____
(Specify Where)

(36) How large is the town in which you live?

[ ] less than 2,499
[ ] 2,500 to 4,999
[ ] 5,000 to 24,999
[ ] 25,000 to 49,999
[ ] more than 50,000

(37) Taking into consideration all sources of income, what was your total family income before taxes this past year?

[ ] Under $ 4,999
[ ] $ 5,000 to $ 9,999
[ ] $10,000 to $14,999
[ ] $15,000 to $19,999
[ ] $20,000 to $24,999
[ ] $25,000 to $29,999
[ ] $30,000 to $34,999
[ ] $35,000 to $39,999
[ ] $40,000 to $49,999
[ ] $50,000 to $59,999
[ ] $60,000 to $69,999
[ ] $70,000 and over

(38) Do you own your home, pay rent, or have some other arrangement?

[ ] rent
[ ] own
[ ] provided by friend/relative
[ ] provided by employer
[ ] other _____
(Specify)

(39) Which best describes the type of housing unit in which you live?

[ ] Condominium
[ ] Mobile Home/Trailer
[ ] Single Family House/Detached
[ ] Duplex to Quadplex Family House
[ ] Apartment
[ ] Retirement Village/Apartments
[ ] Group Home
[ ] Nursing Home
[ ] Rehabilitation Center
[ ] Other_____
(Specify)

(40) How many stories/floors does your house/building have?

_____
# of Floors

(41) Do you live alone or with someone else?

[ ] Alone
[ ] With roommate
[ ] With Family
[ ] Spouse
[ ] Other

THANK YOU FOR YOUR TIME, THOUGHTS, AND PARTICIPATION.

If you have additional comments or information you would like to share with us, please do so in this space.

_____

_____

_____

_____

_____

_____

Return Address:

CENTRAL MAILING SERVICES
OKLAHOMA STATE UNIVERSITY
STILLWATER, OK 74078-0550

APPENDIX B

IRB

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
FOR HUMAN SUBJECTS RESEARCH

Proposal Title: BARTLETT INDEPENDENT LIVING LABORATORY POST-TOUR INFORMATIVE SURVEY

Principal Investigator: MARGARET WEBER/ DeVonna L. CERVANTES

Date: 9-16-92 IRB # HES-93-010

This application has been reviewed by the IRB and

Processed as: Exampt [XX] Expedite [ ] Full Board Review [ ]

Renewal or Continuation [ ]

Approval Status Recommended by Reviewer(s):

Approved [XX] Deferred for Revision [ ]

Approved with Provision [ ] Disapproved [ ]

Approval status subject to review by full Institutional Review Board at next meeting, 2nd and 4th Thursday of each month.

Comments, Modifications/Conditions for Approval or Reason for Deferral or Disapproval:

Signature: Marcia K. Tilley
Chair of Institutional Review Board

Date: 9-17-92

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
FOR HUMAN SUBJECTS RESEARCH

Date: 03-05-93 IRB#: HES-93-010

Proposal Title: BARTLETT INDEPENDENT LIVING LABORATORY POST-TOUR INFORMATIVE SURVEY

Principal Investigator(s): Margaret Weber, Devonna Cervantes

Reviewed and Processed as: Modification

Approval Status Recommended by Reviewer(s): Approved

APPROVAL STATUS SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD AT NEXT MEETING.
APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD APPROVAL. ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval are as follows:

MODIFICATION RECEIVED AND APPROVED

Signature: Marcia K. Tilley
Chair of Institutional Review Board

Date: March 10, 1993

APPENDIX C

COVER LETTER
FIRST MAILING

Oklahoma State University

OFFICE OF THE ASSOCIATE DEAN FOR RESEARCH
AND GRADUATE STUDIES
COLLEGE OF HUMAN ENVIRONMENTAL SCIENCES

STILLWATER OKLAHOMA 74078-0337
HUMAN ENVIRONMENTAL SCIENCES 108
405-744-5054

April 29, 1993

Dear

There is currently a lot of discussion about barrier-free access, the Americans with Disabilities Act, and universal design and the constructed environment. Access in our communities throughout the U.S. is changing. This change is being reflected in some residential environments.

You are one of a small number of people who have toured the Bartlett Independent Living Laboratory. Your opinion on the different adaptations featured in the Bartlett is of crucial importance. We are contacting each of you who have toured the facility to help us assess how information gained from Bartlett is being applied to private housing. Your response is very important to the continued development of the house.

You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. Your name will never be placed on the questionnaire.

The results of this research will be made available to any interested individual. You may receive a summary of results by writing "copy of results requested" on the back of the return envelope, and printing your name and address below it. Please <u>do not</u> put this information on the questionnaire itself.

Please return the questionnaire by May 13, 1993. We would be most happy to answer any questions you might have. Please write or call. The telephone number is (405) 744-8683.

Thank you for your assistance.

DeVonna L. Cervantes
Graduate Research Assistant

Margaret J. Weber
Professor & Graduate Advisor

Oklahoma State University

OFFICE OF THE ASSOCIATE DEAN FOR RESEARCH
AND GRADUATE STUDIES
COLLEGE OF HUMAN ENVIRONMENTAL SCIENCES

STILLWATER, OKLAHOMA [illegible]
HUMAN ENVIRONMENTAL SCIENCES 109
405-744-5059

April 29, 1993

Dear

There is currently a lot of discussion about barrier-free access, the Americans with Disabilities Act, and universal design and the constructed environment. Access in our communities throughout the U.S. is changing. This change is being reflected in some residential environments.

The College of Human Environmental Sciences at Oklahoma State University is undertaking a research study and is seeking your opinion on the truths and myths of living with a disability. We believe that individual opinion should be taken into account in the formation of future residential environmental policy recommendations therefore, your response is very important to this research.

You are one of a small number of people whose name was selected through a scientific sampling process in which every household in Stillwater had an equal chance of being selected. You may be assured of complete confidentiality. The questionnaire has an identification number for mailing purposes only. Your name will never be placed on the questionnaire.

The results of this research will be made available to any interested individual. You may receive a summary of results by writing "copy of results requested" on the back of the return envelope, and printing your name and address below it. Please do not put this information on the questionnaire itself.

Please return the questionnaire by May 13, 1993. We would be most happy to answer any questions you might have. Please write or call. The telephone number is (405) 744-8683.

Thank you for your assistance.

DeVonna L. Cervantes
Graduate Research Assistant

Margaret J. Weber, Ph.D.
Professor & Graduate Advisor

APPENDIX D

FOLLOW - UP POST CARD

Cervantes & Weber
Research & Graduate Studies
College of Human Environmental Sciences
108 Human Environmental Sciences
Oklahoma State University
Stillwater, OK 74078-0337

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 325 STILLWATER OK

POSTAGE WILL BE PAID BY ADDRESSEE

CENTRAL MAILING SERVICES
OSU
Stillwater OK 74075-9919

Last week a questionnaire seeking your opinion about the adaptations featured in the Bartlett Independent Living Laboratory and your views on disabilities was mailed to you.

If you have already completed and returned the survey to us please accept our sincere thanks. If not, please do so today. Because it has been sent to only a small, number of individuals who toured Bartlett, it is extremely important that yours also be included in the study if the results are to accurately represent the opinions of all individuals who have visited the Laboratory.

If by some chance you did not receive the questionnaire, or it got misplaced, please call me right now, collect (405) 744-8683 and I will put another one in the mail to you today.

Sincerely,

DeVonna Cervantes
Graduate Research
Assistant

Margaret J. Weber
Professor and
Graduate Advisor

APPENDIX E

COVER LETTER
SECOND MAILING

Oklahoma State University

OFFICE OF THE ASSOCIATE DEAN FOR RESEARCH
AND GRADUATE STUDIES
COLLEGE OF HUMAN ENVIRONMENTAL SCIENCES

STILLWATER, OKLAHOMA 74078-0337
HUMAN ENVIRONMENTAL SCIENCES 108
405-744-5054

June 5, 1993

Dear

I am writing to you about our study of individual preferences for independent living adaptations. We have not yet received your completed questionnaire.

The large number of questionnaires returned is very encouraging. But, whether we will be able to describe accurately how persons who have toured the Bartlett Independent Living Laboratory feel on these important architectural adaptations depends upon you and the others who have not yet responded. This is because our past experiences suggest that those of you who have not yet sent in your questionnaire may hold quite different preferences for independent living than those who have already responded.

This is the first architectural adaptation assessment study of this type that has ever been done on the Bartlett Independent Living Laboratory. Therefore, the results are of particular importance to the many individuals, program planners, and donors now assessing what improvements should be encouraged so as to best meet the needs of persons like yourself. The usefulness of our results depends on how accurately we are able to describe what architectural modifications are important to all individuals who toured.

It is for these reasons that I am sending this additional copy of the questionnaire you. In case our other correspondence did not reach the person who toured the Bartlett Laboratory, a replacement is enclosed. I urge you to complete and return it as quickly as possible.

I'll be happy to send you a copy of the results if you want one. Simply put your name, address, and "copy of results requested" on the back of the return envelope. We expect to have the results ready to send early this Summer.

Your contribution to the success of this study will be appreciated greatly.

Most sincerely,

DeVonna L. Cervantes
Graduate Research Assistant

Margaret J. Weber, Ph.D.
Professor & Graduate Advisor

Oklahoma State University

OFFICE OF THE ASSOCIATE DEAN FOR RESEARCH
AND GRADUATE STUDIES
COLLEGE OF HUMAN ENVIRONMENTAL SCIENCES

STILLWATER, OKLAHOMA 74078-0337
HUMAN ENVIRONMENTAL SCIENCES 108
405-744-5054

June 5, 1993

Dear

I am writing to you about our study of individual opinions about persons with disabilities. We have not yet received your completed questionnaire.

The large number of questionnaires returned is very encouraging. But, whether we will be able to describe accurately how persons in Stillwater feel on these important matters depends upon you and the others who have not yet responded. This is because our past experiences suggest that those of you who have not yet sent in your completed questionnaire may hold quiet different opinions about people with disabilities than those who have already responded.

This is the first Stillwater resident opinion study of this type that has been done since the passing of the Americans with Disabilities Act. Therefore, the results are of particular importance to the many individuals, program planners and University faculty and staff now considering what kinds of improvements should be encouraged so as to best meet the needs of persons like yourself. The usefulness of our results depends on how accurately we are able to describe the opinions and beliefs of Stillwater residents.

It is for these reasons that I am sending this additional copy of the questionnaire to you. In case our other correspondence did not reach the person in your household whose response is needed, a replacement questionnaire is enclosed. May I urge you to complete and return it as quickly as possible.

I'll be happy to send you a copy of the results if you want one. Simply put your name, address, and "copy of results requested" on the back of the return envelope. We expect to have the results ready to send early this Summer.

Your contribution to the success of this study will be appreciated greatly.

Most sincerely,

DeVonna L. Cervantes
Graduate Research Assistant

Margaret J. Weber, Ph.D.
Professor & Graduate Advisor

APPENDIX F

ASSESSMENT OF OBJECTIVES AND RESULTS

ASSESSMENT OF OBJECTIVE AND RESULTS

Objective:

To assess and compare attitudinal and awareness differences between persons who have toured BILL and a random sample of persons living in Stillwater (SWO) who have not been exposed to the model facility.

Even though the SWO sample was scientifically selected at random by computer, results of demographics reveals SWO to be more of a convenience sample. It is not representative of the general population. Half of the SWO random sample respondents held a Bachelor degree. The percentage of SWO respondents holding higher academic degrees was half of the respondents. A full 22% of SWO respondents held Ph.D.'s. This is not representative of the general population where higher academic degrees are in the single digit percentages.

T-Tests results showed BILL and SWO samples to have the same positive attitude towards work productivity, living independently, and attitudinal awareness towards four types of disabilities; hearing, vision, speech, and amputees. All four of these types of disabilities have been enculturated into society for literally thousands of years. These findings support the findings of Siller & Chipman (1965).

When the disabilities were more newly visible in society, the BILL respondents were more favorable towards them. Disabilities indicated; paralysis, double amputees, developmental disabilities, Multiple Sclerosis,

mental retardation, and emotionally disabled persons could enculturate and live productively according to BILL results. This progressive thinking could be due to the fact that the BILL respondents sought out the information and demonstration of barrier-free living. This could indicate a personal need for these types of facts, possibly indicating positive attitude due to close personal contact of a family member, friend, or self. In fairness to SWO respondents, one must remember persons with the types of disabilities mentioned above, have only been in society for 50 to 60 years, thanks to science, a more humane approach to mental illness, and penicillin. The general population is not familiar with these new and not-so-long-ago, life-threatening, or institutionalizing disabilities.

Of all types of disabilities neither BILL nor SWO respondents thought a person needing a respirator to breath could live independently. This is probably due to the lack of information of the multitude of types of disabilities that need respirators. Certainly, the respondents have concern about someone dependent on a respirator living alone if they did not have the physical ability to, as in quadriplegia, fix a mishap in the functioning of the life-support-system. However, if the disability were server Muscular Dystrophy, needing a respirator to breath, the risk of living independently would be minimal, as the muscles are weak but still receive nerve messages.

The positive attitudes of the BILL respondents towards most types of disabilities as being morally supportive of a person's productivity or self-reliance supports findings of the Independent Living Paradigm (ILP) of DeJong (1980) and Dunn (1990). Both the ILP and BILL recognize Universal Design, or a supportive person-environmental fit, as researched by Lawton (1983), as making the difference if a person with a disability can live independently and productively.

Universal design is a practical solution to the Independent Living problem evident in the process of the Literature Review. The results of the Bartlett Independent Living Laboratory research can not be totally conclusive due to the small return rate and the even smaller sub-category of having or working with people with disabilities.

Chi Square was used to assess how professionals and end-users were incorporating information gleaned from BILL; if accommodations were being recommended and/or applied and utilized in day-to-day life functions. Regretfully the numbers of respondents of this sub-category was not large enough to substantially consider Chi Square values, these results had to be considered not valid.

Most consistently the BILL sample had the higher means indicating a more favorable attitude and better awareness towards persons with disabilities than did the means scores of the random sample respondents. Consistently, BILL sample respondents were more positive in general attitudes, attitudes towards work productivity, and attitudes supporting Independent Living and acknowledging the feasibility of control over one's own life.

Using factor analysis with Varimax rotation, on the combined responses of both groups, results of attitudes towards persons with disabilities differed significantly than attitudes towards able-bodied people. The factor loading was unexpected. Variables not hypothesized as correlating variables factored, where many variables hypothesized to correlate were eliminated. Legislation variables factored out as did questions pertaining to the ease or discomfort of using a wheelchair for mobility.

One surprising factor was the first and strongest, that of subsidized. Even tax increases were considered practical to help subsidize persons with

disabilities. The only variable in the category of subsidization that did not rate significantly differently was Mass-Transit. This may reflect the mostly non-existence of Mass-Transit Systems in Oklahoma. This lack of appreciation of access and subsides for transportation may be due to the lack of association and access to Mass-Transit by the majority of the population in the State. Mass-Transit is not a familiar concept to respondents of either sample group. It is possible the need was not acknowledged because the service is offered to few of the respondents.

Recommendations for Future Research

It was believed this study would solidly support Universal Design as a necessary and cost efficient means to attain Independent Living. The number of professionals who have toured BILL but have not incorporated the message of environment accommodation to their clients with disabilities as a means to achieve self-reliance was disturbing. Persons with disabilities saw the advantages but were hindered by finances or lack of advocacy skills and knowledge of pertinent legislation to attain legally prescribed accommodations through their landlords was presumable.

This study proves residential environments such as BILL are invaluable in environmental support, making independent living possible for persons who could not live independently in conventionally constructed housing. It was hoped this study would prove merit due to the many Hissom Memorial clients who toured and had court ordered, Federal and State assisted environmental renovation accommodations.

This study does provide a basis for future research. A large scale randomly selected mail-survey study using and correlating the Attitudes Towards Disabled Persons Scale and the Attitudinal questions from the Bartlett Independent Living Laboratory Questionnaire would prove

informative and offer a result hypothesized to have a validity high statistical analysis. One that better represents the general population and provides results that could be the axis which revolutionizes the construction/design industry.

LIST OF TABLES

Table **Page**

TABLE I
DEMOGRAPHICS OF RESPONDENTS
(page 1 of 2)

Question	Bartlett		Community	
	percent	n	percent	n
Age				
19 and under	10.3	27	0.0	0
20 through 30	21.5	56	27.4	31
31 through 40	18.0	47	16.1	18
41 through 50	18.4	48	19.6	22
51 through 60	12.6	33	12.6	14
61 through 75	15.0	39	13.4	15
76 and above	4.2	11	11.7	13
Gender				
Male	21.2	55	66.7	76
Female	78.8	205	33.3	38
Education Level				
H.S.	20.0	25	14.9	17
B.S.	48.1	125	45.5	52
M.S.	25.0	65	17.5	20
Ph.D.	6.9	18	22.0	25
Marital Status				
Single	28.8	75	23.7	27
Married	59.2	154	60.5	69
Divorced	5.8	15	5.3	6
Widowed	6.2	16	10.5	12

TABLE I
DEMOGRAPHICS OF RESPONDENTS
(page 2 of 2)

Question	Bartlett		Community	
	percent	n	percent	n
Occupation				
Manager/Professional	10.0	26	21.9	25
Professional Specialist	21.6	56	14.0	16
Technical Sales/Administrative	8.5	22	5.3	6
Sales	1.2	3	5.3	6
Administrative Support	5.4	14	2.6	3
Service Occupation	3.1	8	2.6	3
Farm/Forestry/Fish	1.5	4	0.9	1
Precision Craftsman/Repairs	0.0	0	1.8	2
Construction	1.2	3	0.0	0
Extractive	0.0	0	0.0	0
Operator/Labor	0.0	0	1.8	2
Packaging/Filling/Machine Oper	0.0	0	0.0	0
Transportation/Moving	0.0	0	0.9	1
Hand/Equipment Cleaner/Helper	0.0	0	0.0	0
Self-Employed	0.8	2	3.5	4
Retired	13.5	35	16.7	19
Student	21.6	56	19.3	22
Homemaker	10.0	26	3.5	4
Unemployed	1.2	3	0.0	0
Race				
White	93.0	238	97.3	110
Black	2.3	6	0.9	1
Native American	0.8	2	0.9	1
Asian	3.9	10	0.9	1

TABLE II
FACTOR ANALYSIS
Combined Response Groups
INDEPENDENT LIVING CORRELATIONS

Factor	Factor Loading
Factor 1: **Subsidies**	
Subsidize Medicinal Expenses	0.88691
Subsidize Medical Supplies	0.88645
Subsidize Transportation	0.85714
Subsidize Housing	0.85109
Subsidize In Home Support Service.	0.84690
Pay Higher Taxes if for Subsidies	0.73803
Factor 2: **Barriers**	
Attitudinal Barriers	0.78717
Social Barriers	0.72735
Architectural Barriers	0.68629
Factor 3: **Work Equality**	
Work; Any Job Qualified To Do	0.70033
Equal Employment Opportunities	0.67540
Factor 4: **Mobility Barriers**	
Interior Floor Coverings	0.86155
Exterior Path Surface Conditions	0.85014

TABLE II
FACTOR ANALYSIS
Combined Response Groups
INDEPENDENT LIVING CORRELATIONS

Factor	Factor Loading
Factor 5: **Universal Design**	
All housing Design for Accessibility	0.75496
Accessible Housing Functions for All	0.63364
Factor 6: **Temporarily Able-Bodied**	
During Lifespan, Disability is Experiences by All	0.71940
Factor 7: **Public Accessibility**	
Uniform Building Standards Access Adequate	0.70224
Public Buildings Are Accessible	0.60437
Factor 8: **Housing Stock Affects Independent Living**	
Home Maintenance Difficult for Person with a Disability	0.63846
Accessible Housing Expensive to Purchase	0.60149
Factor 9: **Functional Access**	
I Use Accessible Restroom Stall	0.75325
I Use Accessible Parking Spaces	0.68508

TABLE III
T-TEST RESULTS OF DIFFERENCES BETWEEN BARTLETT AND COMMUNITY RESPONDENTS ACROSS NINE FACTORS

	Bartlett Mean	Community Mean	T-Test	Prob.
Factor #1 - Subsidizes				
Subsidize Medical Expenses	3.88	3.46	3.19	.0016
Subsidize Medical supplies	4.00	3.67	2.59	.0100
Subsidize Transportation	3.76	3.59	1.21	.2273
Subsidize Housing	3.87	3.42	3.28	.0011
Subsidize In home care	3.76	3.46	2.17	.0305
Would pay higher taxes if for Subsidize	3.55	3.04	3.41	.0007
Factor #2 - Barriers				
Enter work there are attitudinal barriers	4.22	3.90	2.84	.0047
Enter work there are many social barriers	4.03	3.75	2.18	.0299
Enter work, there are architectural barriers	4.31	4.05	2.61	.0094
Factor #3 - Work Equality				
Person w/ dis should work any job qualified for	4.76	4.66	1.34	.1805
EEOP for person w/ disabilities	4.61	4.37	2.32	.0216

TABLE III
T-TESTS RESULTS OF DIFFERENCES BETWEEN
BARTLETT AND COMMUNITY RESPONDENTS ACROSS NINE FACTORS

	Bartlett Mean	Community Mean	T-Test	Prob.
Factor #4 - Mobility Barriers				
Inter floor coverings may impede maneuvering	4.74	4.55	2.28	.0230
Exterior road conditions may impede maneuvering	4.78	4.71	0.95	.3425
Factor #5 - Universal Design				
All housing should design for accessibility	3.74	2.83	5.27	.0000
Accessible housing is functional for all	4.09	3.37	4.58	.0001
Factor #6 - Temporarily Able-Bodied				
Disability is experienced by all during a lifetime	4.00	3.90	0.72	.4742
Factor #7 - Public Accessibility				
Uniform Fed Access Standards meet access needs	3.01	3.05	-0.28	.7821
Public buildings are accessible	2.58	2.89	-2.13	.0341
Factor #8 - Housing Stock Affects Ind Living				
It is difficult to maintain a house w/ a disability	3.52	3.67	-0.92	.3571
Accessible housing is expensive to purchase	4.03	3.63	2.85	.0045
Factor #9 - Functional Access				
I use the accessible restroom stall	3.50	4.14	-3.98	.0001
I use accessible parking	4.70	4.76	-0.67	.5317

TABLE IV
Chi Square analysis of Accommodative Features by Characteristic of Having a Disability or Working With Persons with Disabilities

Accommodating Feature (page 1 of 4)	X^2	P Value
Entrance doors are automatic.	1.32	.725*
Package shelves are located at exterior and interior of entry.	0.95	.813*
Thresholds are level.	2.56	.464*
Door openings are at least 36 inches wide.	1.15	.766*
Light switches and controls are mounted 42 inches above floor.	1.80	.616*
A single switch to control multiple lights is available.	0.46	.928*
Electrical outlets and telephone jacks are 18 inches from floor	1.05	.787*
All carpeting is low-pile, 1/4 inch thick.	0.25	.975*
Windows and draperies are electronically controlled (motorized)	0.83	.842*
Thermostats are adapted.	3.05	.383*
Fireplace is remote controlled gas with permanent logs.	1.55	.671*
Rooms have space for a wheelchair to turn around 5' x 5'.	0.17	.982*
There is a clear path of travel through all rooms.	1.16	.763*

* Cut to sample size for disabled individuals (n=21) versus able bodied respondents (n=219) Chi Square values were not valid.

TABLE IV
Chi Square analysis of Accommodative Features by Characteristic of Having a Disability or Working With Persons with Disabilities

Accommodating Feature (page 2 of 4)	X^2	P Value
Smoke detectors include both audible and visual alarms.	6.13	.106*
The kitchen work area is efficient to conserve physical energy.	1.64	.650*
Kitchen has smooth-top cook top.	4.86	.182*
Oven is located next to a counter that has knee space clearance	11.59	.009*
Oven is side opening wall unit at seated height.	4.60	.203*
Pull-out counter top located below oven.	1.50	.682*
Counter top heights are adjustable.	4.06	.255*
Roll-under counter work space in kitchen.	3.25	.354*
Sinks are mounted on brackets to adjust the height.	4.82	.186*
Dishwasher, washing machine and dryer are all front loading.	2.18	.535*
Braille templates for appliances are available.	2.96	.398*
Cabinet handles are "D" shaped.	4.49	.213*
Easy-pull-out drawers lower inside cabinets.	2.84	.417*
Nine inch toe cove space below cabinets.	1.98	.576*

* **Cut to sample size for disabled individuals (n=21) versus able bodied respondents (n=219) Chi Square values were not valid.**

TABLE IV
Chi Square analysis of Accommodative Features by Characteristic of Having a Disability or Working With Persons with Disabilities

Accommodating Feature (page 3 of 4)	X^2	P Value
Hallways are at least 42 inches wide.	3.29	.349*
Beds are connected to fire alarm to vibrate and alert sleeper.	3.83	.281*
Clothes rods are located 54 inches above floor; or lower.	0.27	.965*
An accessible place for exercise is available.	3.366	.339*
Bathtub or shower has a hand-held adjustable shower head.	3.12	.373*
Bathtub or shower has a padded seat that allows bathing seated.	0.99	.803*
Bath bench has cut-out for access to personal hygiene.	5.43	.143*
Shower is a 5' x 5' roll-in type and keeps water in shower area	1.39	.708*
Water faucet controls are lever type handles.	6.59	.086*
Faucets have anti-scald temperature controls.	1.04	.792*
Scald guards are located around pipes under sinks.	3.79	.286*
Walls are reinforced to hold 250 pounds at grab bars.	0.630	.890*
Grab bars are securely installed around toilet, tub, and shower	2.60	.457*
Doors swing out if the room is small.	2.89	.410*

* **Cut to sample size for disabled individuals (n=21) versus able bodied respondents (n=219) Chi Square values were not valid.**

TABLE IV
Chi Square analysis of Accommodative Features by Characteristic of Having a Disability or Working With Persons with Disabilities

Accommodating Feature (page 4 of 4)	X^2	P Value
Door handles are levers, not knobs.	2.92	.403*
Auxiliary pull-handles are 12 inches from hinges for easy close	0.27	.966*
Door has key less push button combination lock.	1.35	.718*
Curb cuts are available.	2.13	.545*
Accessible parking is available.	4.00	.262*
Access aisle next to parking space 9 feet wide for lift on van.	0.33	.954*

* Cut to sample size for disabled individuals (n=21) versus able bodied respondents (n=219) Chi Square values were not valid.

LIST OF FIGURES

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FIGURE I

Bartlett Independent Living Laboratory Model

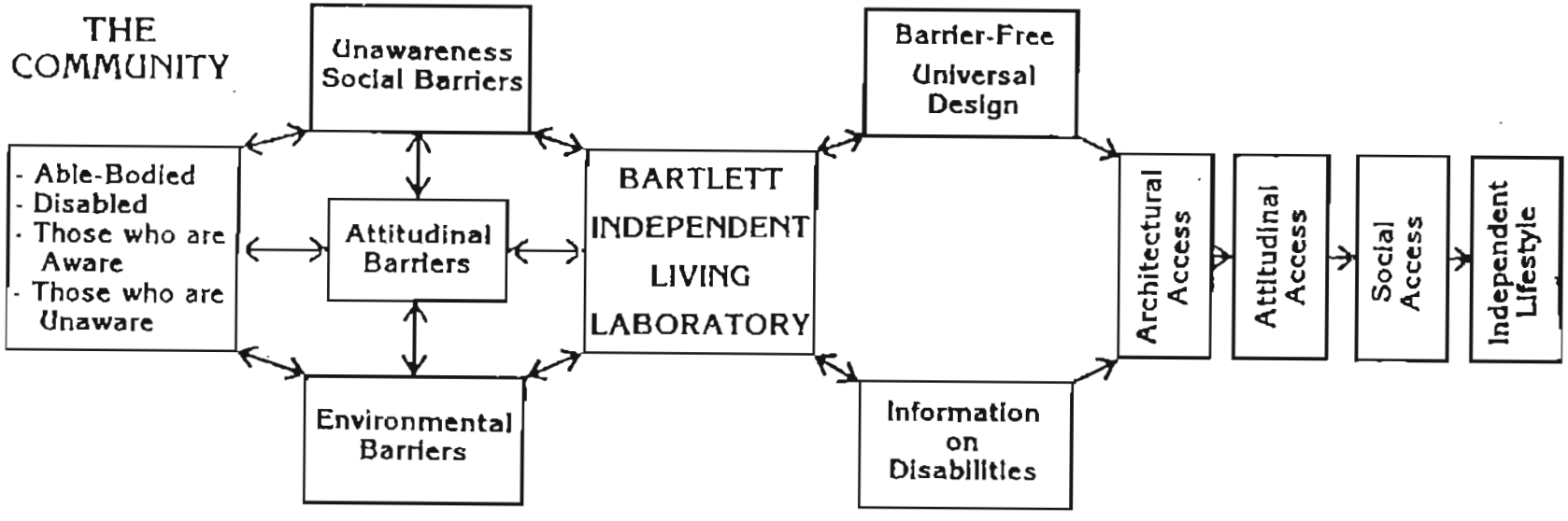

FIGURE II

A Quick Overview of Legislation Governing Accessibility

YEAR	PUBLIC LAW NO.	TITLE OF LAW	KEY PROVISIONS
1965	89-333	Vocational Rehabilitation Act Amendments of 1965	Congressional Commission established to discover achievements in Architectural barriers elimination
1968	90-480	Architectural Barriers Act	Requires that buildings built with Federal funds or leased by the federal Government be make accessible
1970	91-453	Urban Mass Transportation Act	Requires eligible local jurisdictions to plan & design accessible mass-trans
1973	93-87	Federal Aid Highway Act	Requires that trans facilities receiving Fed assist under the act be access.
1973	93-112	Rehabilitation Act	Prohibits discim against qualified (disabled) persons in prog, serv, & benefits that are Fed funded. Creates ATBCB
1974	93-516	Amendments to the Rehabilitation Act	Added Dept of Defense as board member of ATBCB, revised definition of Disabled, designated Sec of DHEW as permanent chair of the board.
1975	93-391	Dept of Transportation Appropriations Act	Prohibits purchase of mass-transit equip or construction of facilities unless accessible.
1975	94-103	Developmental. Disabilities assist bill of rights Act	Establishes protection and advocacy systems for DD people. Establishes State Councils
1975	94-142	Education for all Children with Disabilities	Provides for a free appropriate educa for dis child in the least restrictive setting
1975	95-173	National Housing Act Amendment	Provides for the removal of barriers in Fed supported housing. Establishes Office of Independent Living in HUD
1978	95-602	Rehab Comprehensive Services & persons w/ Developmental Disabilities Amends	Establishes independent living as a priority for state Voc rehab program. Provide Fed Fund for ILC
1980	96-265	Social Security Disabilities Amendments	Removes certain disincentives to work by allowing dis people to deduct indep liv expen in computing income benefits
1988	100-430	Fair Housing Amendment Act	Added Non-Discrimination due to Dis.
1990	101-336	Americans W/ Disabilities Act	Prohibits discrimination solely on disability.
1991	102-166	Civil Rights Act of 1991	Specified job discrimination protection to the disabled American worker.

(DeJong, 1989; Jeffers, 1977)

FIGURE III

Bartlett Survey Mailing
and Return Rate

(page 1 of 2)

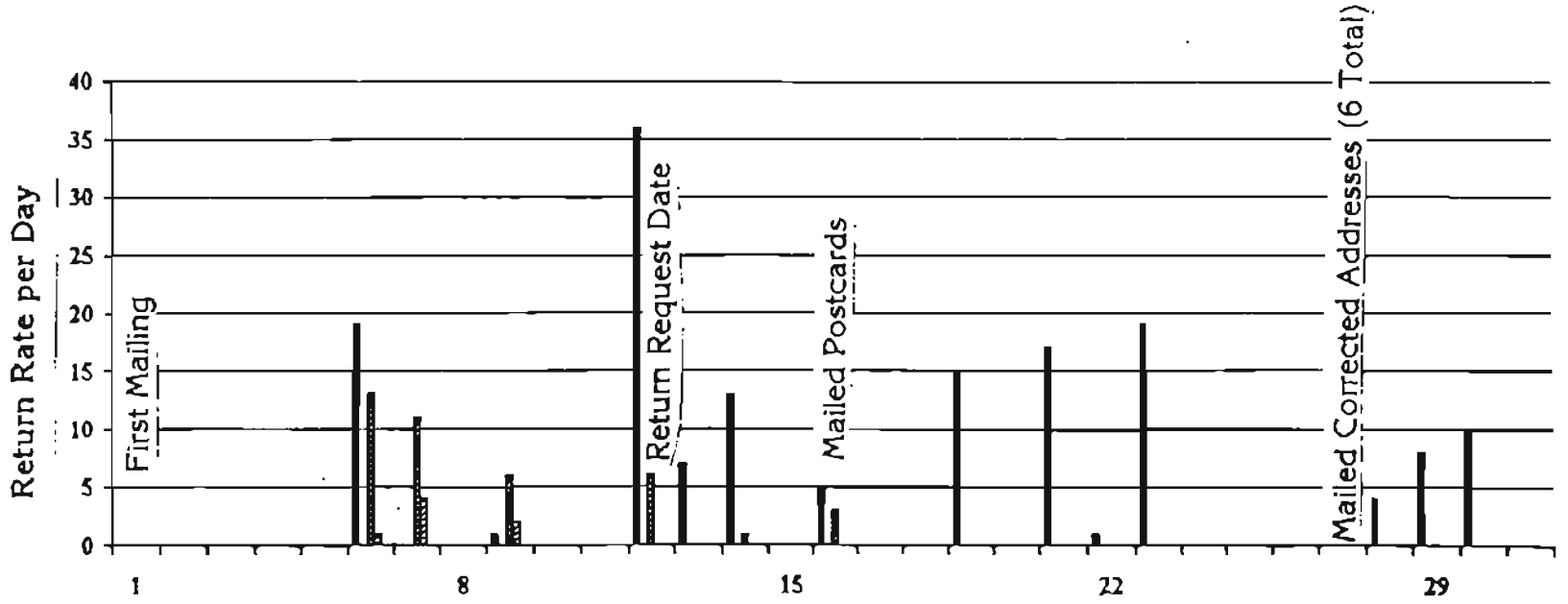

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FIGURE III

Bartlett Survey Mailing
and Return Rate

(page 2 of 2)

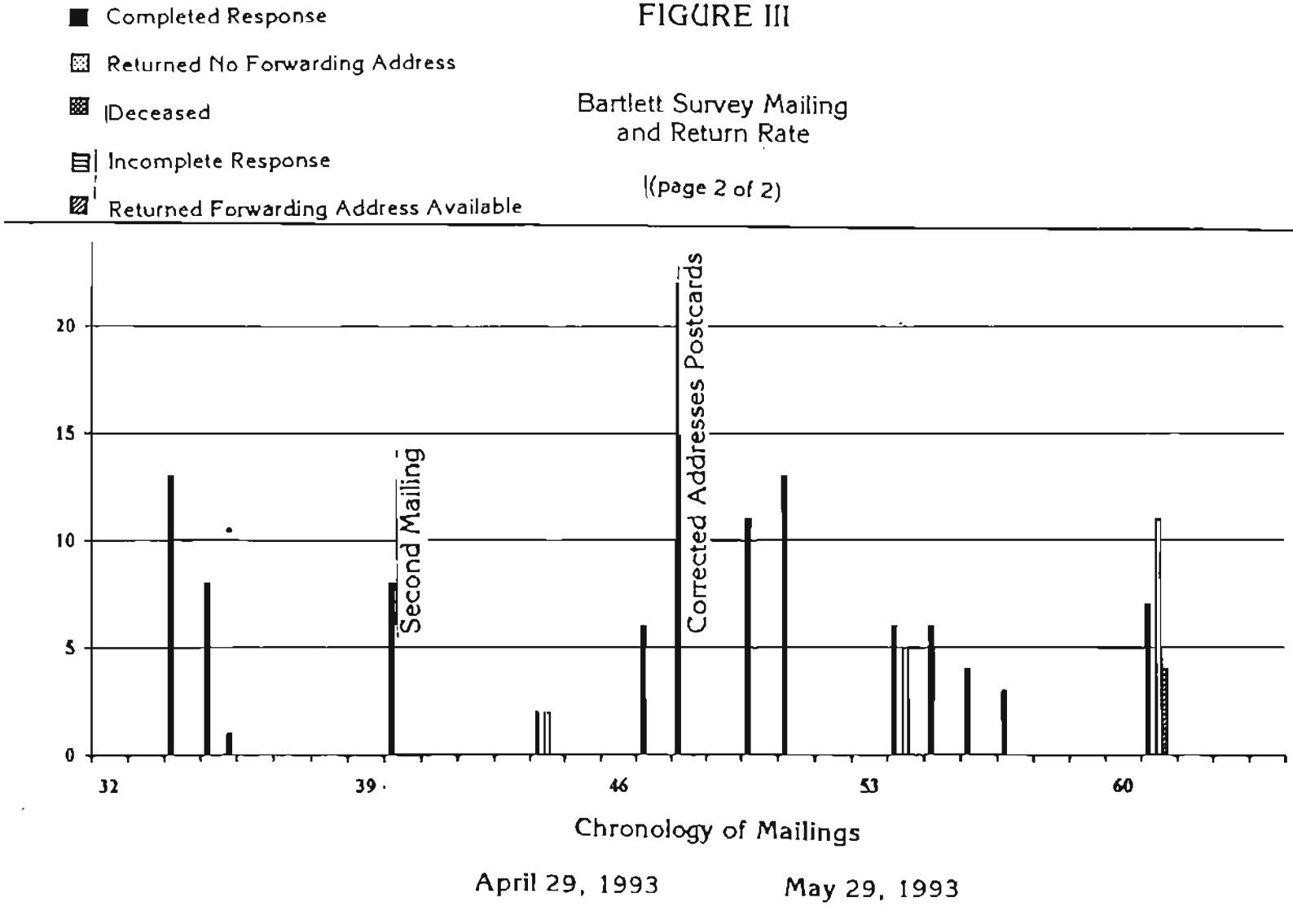

FIGURE IV

Stillwater Random Survey Mailing
and Return Rate

(page 1 of 2)

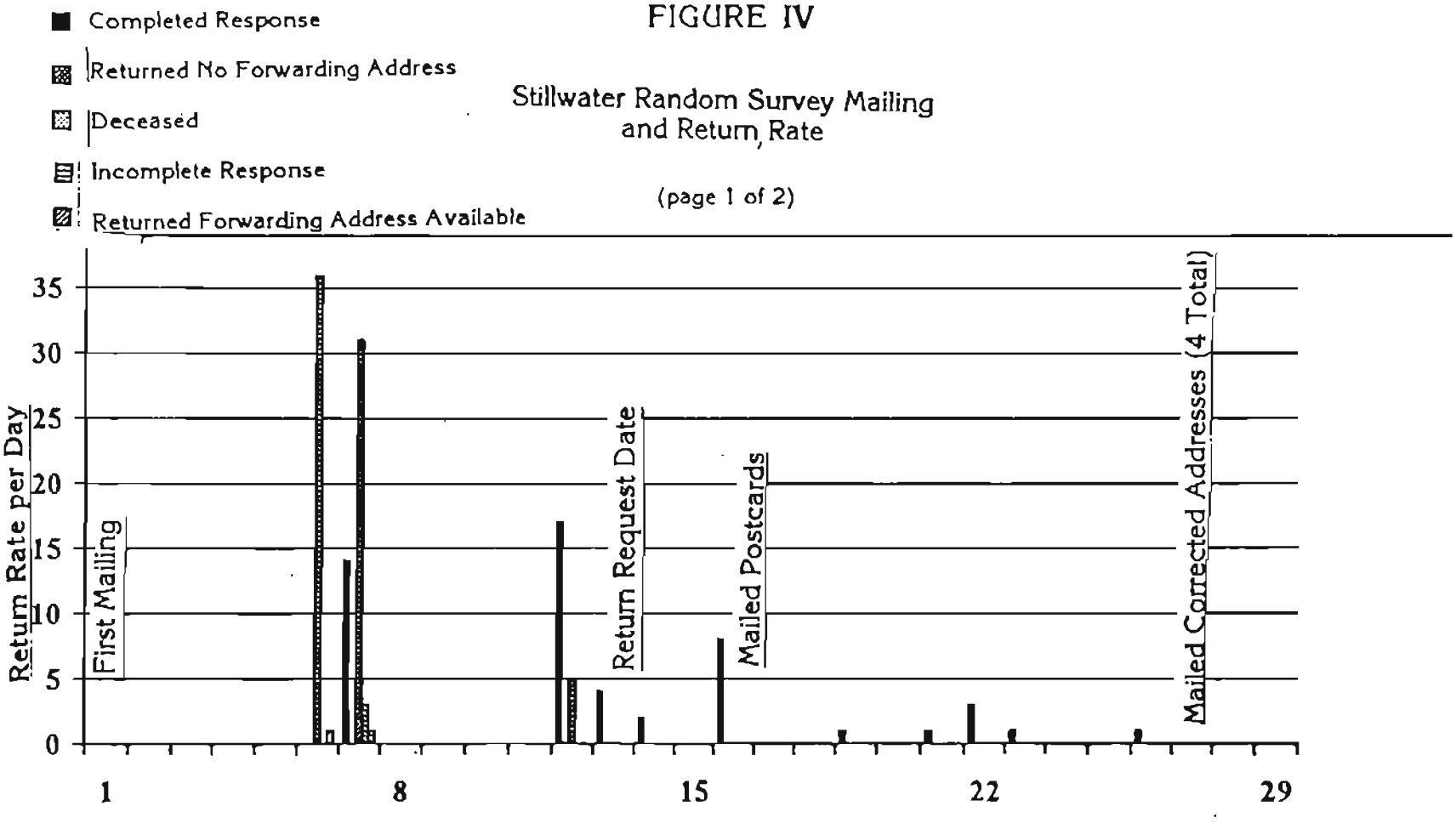

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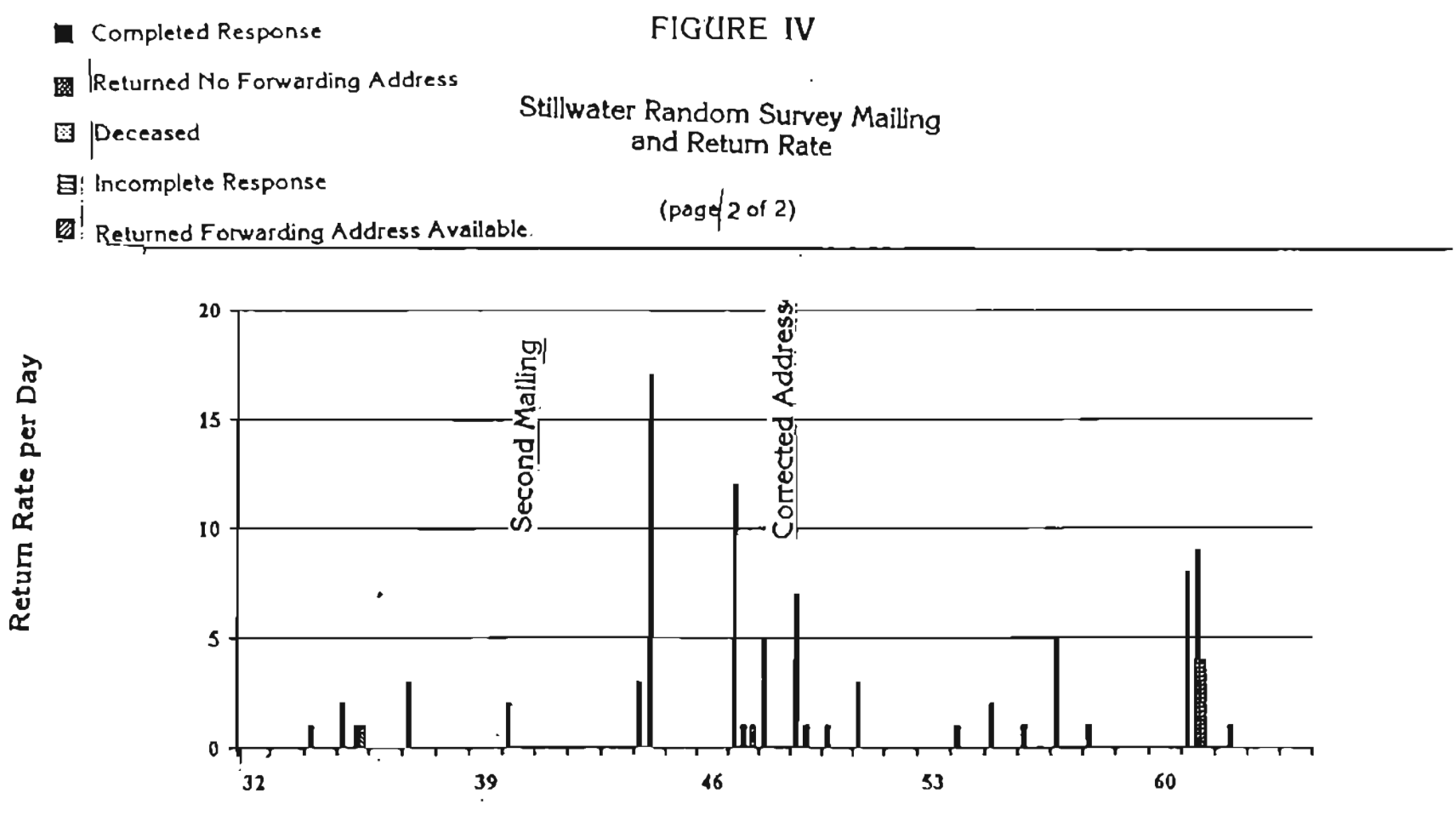
FIGURE IV

Stillwater Random Survey Mailing and Return Rate

(page 2 of 2)



VITA

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