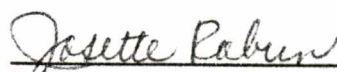


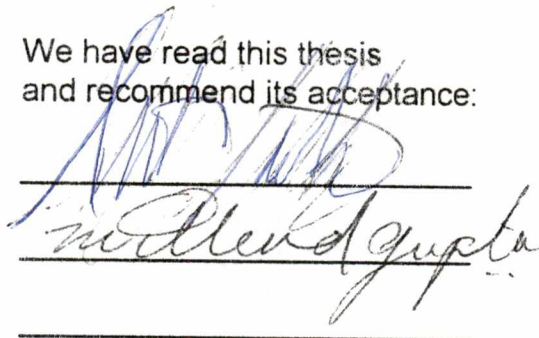
To the Graduate Council:

I am submitting herewith a thesis written by Diana Wilson Morrow entitled "Intergenerational Day Care Facility Design: Adapting Churches to Meet the Needs of Young and Elderly." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master's of Science, with a major in Interior Design.



Dr. Josette Rabun,
Major Professor

We have read this thesis
and recommend its acceptance:



Accepted for the Council:



Associate Vice Chancellor
and Dean of the Graduate School

Intergenerational Day Care Facility Design: Adapting Churches to Meet the Needs of Young and Elderly

A Thesis Presented for the Master's of Science Degree
The University of Tennessee, Knoxville

by

Diana Wilson Morrow
August 1994

Copyright © Diana W. Morrow, 1994
All rights reserved

ACKNOWLEDGMENTS

I would like to thank Dr. Josette Rabun, my major professor, for her guidance and encouragement over the last three years. I would also like to thank Dr. Alton DeLong and Dr. Millend Gupta for their comments and support while serving as committee members. I greatly appreciate my sons, James and Reid, for being patient while their Mom worked, and my husband, Ben for his technical assistance. Buz Morrow, my brother-in-law, assisted with editing the manuscript. Finally, I would like to thank the program directors, staff members, and day care participants at the two case study sites for their cooperation and generous support of this research project.

ABSTRACT

Intergenerational day care (IDC) provides day-time care for elderly adults and young children within the same facility or within proximate facilities.

Proponents of IDC believe it provides mutual benefits for children and older adults and may help counteract age separatism and age bias in our society.

Because IDC is a relatively new type of care, literature describing IDC programs and physical settings is scarce. Day Care centers are frequently located in churches (Clarke-Stewart, 1993), and church buildings are readily adaptable for day care use.

The purpose of this study was to examine, describe, and analyze the physical settings of two existing IDC centers located in churches. The case studies provided a means of identifying design aspects affecting participant well-being and social interaction between young and elderly participants. Emphasis was placed on adult day care design because the elderly and children in the case studies interacted within the adult day care area; the elderly did not visit children in the child care areas. A survey of adult day care participants provided information on how elderly feel about sharing a facility with children.

Recommendations for adapting other churches for IDC were developed.

Literature review included history of child, adult, and intergenerational day care, design for aging, and comparison of child and elderly sensory modalities.

Findings were organized into the following categories: (a) spatial use and organization, (b) room size, (c) lighting, (d) view, (e) acoustics, (f) safety and privacy, and (g) use of outdoor space. Circulation patterns that cause children and elderly to cross paths frequently was found to be a key element in promoting spontaneous interaction between the generations, regardless of distance between adult and child areas. A shared entry into the building did not appear to promote intergenerational social interaction. There is evidence that smaller spaces promote more touching behaviors between elderly and children than do larger spaces. Churches may typically need to make hallways and common areas appear less institutional and make adjustments in lighting to meet the needs of the elderly. View is an important consideration when planning or adapting the adult day care location within a church because watching people and nature is an important activity for the elderly participants. Outdoor areas used by children were found to be underutilized by the adult day care participants, although some elderly expressed a desire to spend time outdoors. Elderly adult participants expressed positive feelings about sharing a facility with children and indicated they were not bothered by children's noise.

TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION	1
1.1 Definition of Intergenerational Day Care	1
1.2 Study Purpose	2
1.3 Study Rationale.....	2
1.4 Limitations and Delimitations	6
1.5 Definition of Terms	7
CHAPTER 2. RESEARCH DESIGN.....	9
2.1 General Method	9
2.2 Site and Population Description	10
2.3 Procedures and Materials	11
CHAPTER 3. LITERATURE REVIEW.....	16
3.1 Overview	16
3.2 Observational Methodology	17
3.3 Church Architecture and Adaptive Use	20
3.4 Child Day Care History.....	22
3.5 Adult Day Care History.....	24
3.6 Intergenerational Day Care History	28
3.7 Effects of Intergenerational Programs.....	29
3.8 Intergenerational Facility Design.....	33
3.9 Comparison of Child and Elderly Sensory Modalities	35
3.10 Day Care Design for the Elderly and Demented	44
3.11 Designing for Children.....	48
CHAPTER 4. FINDINGS	50
4.1 Spatial Use and Organization	50
4.2 Lighting	70
4.3 View	77
4.4 Acoustics.....	80
4.5 Safety and Privacy	82
4.6 Use of Outdoor Space.....	86
4.7 General Observations	86
4.8 Survey Results	89
CHAPTER 5. CONCLUSION	93
5.1 Discussion.....	93
5.2 Design Recommendations	94
5.3 Implications for Further Study	110

LIST OF REFERENCES.....	113
APPENDIXES.....	124
Appendix A: Survey Instrument.....	125
Appendix B: Floor Plans.....	128
Figure 1B. Site A Floor Plan	129
Figure 2B. Site A Floor Plan	129
Figure 3B. Site B Floor Plan	130
Figure 4B. Site A Adult Day Care Floor Plan	131
Figure 5B. Site B Adult Day Care Floor Plan	131
VITA.....	132

LIST OF AND TABLES FIGURES

Table 1. Adult day care population.....	11
Table 2. Adult day care square footage	63
Table 3. Summary of touching behaviors.....	65
Figure 1B. Site A floor plan- Appendix B.....	129
Figure 2B. Site A floor plan- Appendix B.....	129
Figure 3B. Site B floor plan- Appendix B.....	130
Figure 4B. Site A adult day care floor plan- Appendix B	131
Figure 5B. Site B adult day care floor plan- Appendix B	131
Figure 1. Site A circulation	52
Figure 2. Site B circulation	52
Figure 3. Site B interior window	53
Figure 4. Site A hallway	55
Figure 5. Site B hallway	56
Figure 6. Site B hallway use.....	58
Figure 7. Site A building entry foyer	60
Figure 8. Site B adult entry area	68
Figure 9. Site A living room view.....	68
Figure 10. Site B adult area entry	69
Figure 11. Site A spatial arrangement.....	70
Figure 12. Site A reflected ceiling plan.....	72
Figure 13. Site B reflected ceiling plan.....	76
Figure 14. Site B secondary space	77
Figure 15. Site A dining room window.....	78
Figure 16. Use of recliners during child visits.....	83
Figure 17. Site B chairs.....	85
Figure 18. Site B primary space: current ceiling height.....	100
Figure 19. Site B with lowered ceiling	100
Figure 20. Adapting Site A to add privacy.....	102
Figure 21. Adapting Site B to add privacy.....	102

CHAPTER 1. INTRODUCTION

1.1 Definition of Intergenerational Day Care

Intergenerational day care (IDC) provides care for both young children and elderly adults within the same facility or within proximate facilities. This type of care has recently been developed in response to a growing need for quality day care for both children and elderly adults (Gunby, 1993) and in recognition of the mutual benefits that may be derived from intergenerational interaction.

Young children seem to enjoy the affection and attention shown to them by the elderly while the elderly may be cheered by the presence and sound of children. Furthermore, advocates of IDC Centers suggest that IDC programs may counteract the problem of generational separatism in our society by encouraging children to become more sympathetic, understanding, and appreciative of elderly people (Lambert, Dellman-Jenkins, & Fruit, 1990).

Researchers, studying the effects of IDC on the elderly and children and examining issues such as cost effectiveness and program development, have focused primarily on the social and psychological aspects of IDC programs (Wrenn, Merdinger, Parry, & Miller, 1991). Little has been written about IDC physical settings, despite the powerful role that physical environment plays in influencing behaviors and human service program outcomes.

1.2 Study Purpose

The purpose of this study is to examine, describe, and analyze the physical settings of two existing IDC centers located in churches. The goal is to use these case studies to gain information which will be useful in adapting space for new IDC centers in other churches. Although much has been written about design of environments for the elderly and for children, there is a lack of information specifically applicable to designing an IDC center, where the needs of both generations must be addressed within a single environment. When the IDC is located in a church, there may be design problems related to adapting space in that type of building.

This study attempts to identify design factors that affect: (a) the well-being of IDC participants, and (b) the quantity and quality of social interaction between the young and the elderly. The design factors are organized into the following categories: (a) spatial use and organization, (b) room size, (c) lighting, (d) view, (e) acoustics, (f) safety and privacy, and (g) use of outdoor space. Because the goal of the study is to generate useful design information, design recommendations are developed and discussed.

1.3 Study Rationale

This study recognizes churches as a valuable resource in the delivery of child and adult day care services. As the need for day care increases, churches can be expected to be called upon to continue, or perhaps increase their

involvement in providing day care services. Therefore, it is important to learn more about how churches use their buildings for day care, and how future day care centers located in churches can be better designed.

The number of existing day care centers for young children has not met the demand. There are 9 million young children of working mothers in the United States, and only 6 million places for children in licensed day care homes or day care centers. From 1970 to 1993, there was an 80% increase in the number of children in day care. Approximately 40% of the day care centers in the United States are non-profit centers run by churches and community organizations (Clarke-Stewart, 1993).

Demand for adult day care has also increased. According to Edmonson (1990), the number of adult day care centers (ADC's) rose from 18 in 1974 to 1,347 in 1986. Although adult day care shortage does not seem to be as severe as the shortage of child care, experts note that shifts in the percentage of elderly in the United States population can be used to predict an increased demand for adult day care in the future (U.S. Senate Special Committee on Aging, 1991). Regarding locations for ADC's, a large majority of the centers are located in multi-purpose facilities, which include nursing homes, senior centers, and churches (Weissert et al, 1990).

This study views church buildings as favorable locations for future adult and child day care centers for several reasons. First, churches have traditionally provided child care on their premises, and about one third of all churches

currently offer some form of day care (Clarke-Stewart, 1993). Both churches in this study began with child care centers and later added adult day care. After adding adult care programs, the child care staff members coordinated with adult day care staff members to plan intergenerational programs of activity.

A second reason church buildings are favorable locations for all types of day care involves financial economy. It is less expensive for centers to rent or receive donated space from a church and adapt the space for day care than it would be to construct a new building (Friedman, Pile, & Wilson, 1982) or rent commercial property. Volunteers are readily available to help, thus lowering labor costs. Such savings can be used to reduce the cost of care and increase the quality of the day care program.

Another reason for viewing churches as favorable locations for day care is that people may have a sense of trust in leaving a loved one in a day care center operated by their community church. This sense of trust may become increasingly important as media reports of child and elder abuse by caretakers in all types of social service programs cause day care purchasers to be more cautious in selecting services for their dependents.

A final reason churches may be good locations for day care has to do with the actual process of adapting space within a church for day care. This process is called "adaptive use." The National Trust for Historic Preservation (cited in Murtaugh, 1988) defines adaptive use as: "the process of converting a building to a use other than that for which it was designed, e.g., changing a factory into

housing. Such conversions are accomplished with varying alterations to the building." Adaptive use of existing buildings can contribute to our society's economic health by making wise use of architectural resources. Literature indicates that adapting schools, churches, and other types of buildings for multi-use and joint occupancy in providing for a community's needs has become an increasingly popular trend (Allan, 1992; Cantacuzino, 1989; Shopsin, 1989).

In terms of adaptive use, the church building and the day care center are an ideal match because the basic requirements of one fit the basic requirements of the other. Both the church and the day care center need a kitchen, rest rooms, and a series of spaces for various human activities. Therefore, a minimum of alterations may be required to prepare church spaces for day care. Also, churches frequently have unused space on weekdays that can be used by day care programs. Day care programs can successfully share these spaces with church groups who use the space only on Sunday. Furthermore, many churches view day care services as a part of their outreach or mission in the community, allowing day care programs to benefit from lower facility costs and the availability of resources such as volunteer personnel.

However, decisions regarding spatial arrangement and adaptation of church space for an IDC center can be very complex. Interviews with pastors of Methodist churches in Knoxville, Tennessee, in which child care programs are currently operated reveal a common fear that their church might not be "right", or "adequate" for an adult day care program. They also indicate that a lack of

expertise or knowledge concerning how to set up a day care program for elderly adults prevents church leaders from seriously considering such a program in their church. Yet, they perceive adult day care as a needed service in their communities.

Directors of the two church-housed IDC centers that took part in this study said they receive many requests for information from groups wanting to learn how to develop an IDC program. The demand for both child and adult day care has steadily increased over the past two decades and this trend is expected to continue. The fastest growing type of long-term care for the elderly is adult day care (Reifler, 1992).

In summary, this study was generated in recognition of the following: (a) the lack of available day care for children and adults, (b) the general suitability of church buildings as locations for day care, and (c) the informational needs of churches who might consider developing adult day care centers.

1.4 Limitations and Delimitations

At both case study sites the children and elderly get together in the *adult* program areas and the elderly do not go into the children's areas. Therefore, the study is limited to addressing design and adaptation of the *adult* day care spaces but does not address the design of the *children's* areas, except in discussing the relationship between child and adult spaces. It does, however, examine the

social, emotional, and physical needs of children who visit the adult day care areas.

A second limitation is a lack of resources that addresses intergenerational day care. Because the concept is so new, there is little available literature which describes IDC programs, facilities, or the effects of IDC programs upon participants.

A delimitation of the study is that it examines intergenerational day care centers within a 30-mile radius of Knoxville, TN. Two IDC centers were identified within this area, both located in Methodist churches. At both study sites the adult and child spaces are completely separate from one another. However, it is important to note that not all IDC centers are organized in this way. For example, the Stride Rite Center in Boston is a facility designed to promote intergenerational interaction throughout the space by using common areas on a daily basis (Weinburg, 1990).

1.5 Definition of Terms

Acoustics: the science of sound, including its production, transmission and effects (Friedman, Pile & Wilson, 1982).

Adaptive-use: the process of converting a building to a use other than that for which it was designed.

Adult day care: (ADC) a community-based group program designed to meet the needs of functionally impaired adults through an individual plan of care. It is structured and comprehensive, providing health, social, and related support in a protective setting during any part of a day, but less than 24-hour care.

Agnosia: common symptom of cognitively impaired person, characterized by an inability to process sensory information, causing difficulty in recognizing objects.

Alzheimer's disease: a form of intellectual impairment that is one of the most common causes of dementia; causes are unknown, and there is no known cure. (Lindeman, Downing, Corby, & Sanborn, 1991).

Dementia: a medical syndrome characterized by loss of memory, confusion, disorientation, and intellectual functioning (Lindeman, Downing, Corby, & Sanborn, 1991).

Elderly: in most literature and in this study, adults aged 65 and over.

Frail elderly: describes elderly people who have experienced overall physical decline resulting in greater vulnerability to injury, illness, and environmental conditions.

Environment: the circumstances, objects, or condition by which one is surrounded (Webster's New Collegiate Dictionary, 1979). Consists of the following components: (1) social, (2) built, (3) natural, (4) functional, and (5) behavioral (Saarinen, 1976).

Footcandles (fc): a measurement of light; the quantity of light on one square foot of surface area one foot away from light source of one candela.

Intergenerational: in this study, refers to interaction between pre-school aged children and elderly adults.

Lamp: part of a luminaire commonly called "light bulb".

Luminaire: artificial light producing unit consisting of a fixture and lamp.

Perception: the process by which animals gain knowledge about their environment and about themselves in relation to their environment (Gibson & Spelke, 1983).

Reverberation: the prolongation of sound, or the time in seconds required for a sound to decay to inaudibility after the source ceases (Friedman, Pile, & Wilson, 1982).

Wandering: a behavior, symptomatic of cognitively impaired elderly, in which there is an impetus to move without any apparent goal or purpose (Randall, Burkhardt, & Kutcher, 1990).

CHAPTER 2. RESEARCH DESIGN

2.1 General Method

This research took an exploratory and qualitative approach to studying the adaptation of space in churches for intergenerational day care (IDC) facilities.

Case studies, the primary means of data collection, were conducted at two churches where space had been adapted for IDC centers. The case study churches were located in Knoxville (Site A) and Oak Ridge (Site B), Tennessee. Data collection methods for the case studies included observation, videotaping, informal interviews, and a survey of adult day care participants. Before the case studies began, a Form B Application for Review of Human Subjects was submitted and approved.

The case studies provided a means of identifying and describing physical design elements which appeared to affect both the well-being of IDC participants and the social interaction between the young and elderly. After completion of the case studies, design recommendations were developed with the intent that they be applicable to designing IDC child care centers within other churches.

Literature review began several months before the case studies, and continued through all phases of the research. The early part of the review focused on child and adult observation methodology. Other aspects of literature review provided a foundation and conceptual framework for the research. A review of this literature is given in chapter, 3.0.

2.2 Site and Population Description

Site A is a United Methodist church located in Oak Ridge, Tennessee, with a congregation size of 1,100. There is an adult day care program with an average daily attendance of 8 elderly adults, and a half-day child care program serving 98 children who attend either two or three days per week.

Site B is a United Methodist church located in Knoxville, Tennessee, with a 2,500 member congregation. This church has an adult day care program whose average daily attendance is 10, and a full-day child care program for 42 children, ages 3 to 5.

Site A is located in a rural area, while Site B is in an urban area. However, the philosophies and target populations of adult care programs at Site A and B are similar: (a) participants are capable of basic self-care and are ambulatory or semi-ambulatory, (b) care is provided by trained professions who have a background in geriatrics, and (c) the centers provide a program of activities, meals, and socialization opportunities, while allowing families to pursue employment or to have respite from the demands of care giving. Table 1 describes the age and health characteristics of elderly participants at the centers. This data, compiled by directors of Site A and B, describes the adult day care enrollment during the month of February, 1993.

Table 1. Description of the adult day care populations at the two case study sites. Enrollment includes all adults registered in the programs in the month of February, 1993.

ADULT DAY CARE PARTICIPANTS		
February 1993		
	SITE A	SITE B
Average age	79.5	78.9
Gender	Males: 5 Females: 7	Males: 6 Females: 9
Diagnosed with: Dementia (includes Alzheimer's) Chronic Illnesses & Injuries (diabetes, hypertension, angina, arthritis, Parkinson's, hip replacement)	11 12	12 6
Enrollment	12	15

2.3 Procedures and Materials

Case Study Overview

The case studies included two phases: Phase I, a preliminary observation period involving informal visits to the adult day care centers at Site A and B; and Phase II, which employed formal methods of data collection at sites A and B. Phase II also included a survey of the adult day care participants, which sought

direct information from the elderly concerning their feelings about being with the children and their views on the adult day care environment.

Phase I

The goal of Phase I of the case studies was to establish rapport between the researcher and the adult day care participants. Many of the participants had been diagnosed with Alzheimer's disease or other dementing illnesses. Adults with dementia typically experience mood-related problems such as paranoia, irritability, and anxiety (Mace & Rabins, 1991) and may not adjust easily to strangers. The adult day care directors at Site A and B thought the participants would initially react to the researcher's presence with curiosity and possibly suspicion. This phase of the research enabled the researcher to become a familiar face at the two adult day care programs, much like the numerous volunteers who helped regularly in the programs. The child care directors, however, did not think the researcher's presence would be a problem for the children, who seemed to accept new people easily.

Phase I was conducted between July and October, 1992. It included weekly one-hour visits in the adult day care programs at each site. By not taking observation notes or using the video camera in the presence of the participants, the researcher had relaxed and informal visits with the elderly participants. Aspects of the environment which appeared to affect child and adult day care participant well-being or social interaction were identified during this phase.

Phase II

The goal of Phase II was to observe and record information about the IDC settings, activities, and social interactions. A detailed data base compiled during this phase includes the following: (a) anecdotal observation notes, (b) notes from informal staff interviews, (c) photographs and measured drawings of all spaces where intergenerational activities took place, (d) survey results, (e) administrative and operational data collected from program directors, and (f) videotapes and videotape study notes.

Phase II took place from November 3, 1992, through March 1, 1993. The adult and child day care directors cooperated in arranging program schedules that allowed the researcher to be present whenever planned intergenerational activities took place, usually in the morning. Additional observations were made in the late afternoon to observe departure behaviors among the children and elderly and to facilitate observation of spontaneous intergenerational interaction at this time.

In observing social interaction between the young and elderly, two types of interaction were considered: (a) *planned*, which resulted from scheduled activities, and (b) *spontaneous*, or unplanned, which occurred primarily in hallways. Although the study was exploratory rather than experimental, videotape analysis provided a means of quantifying verbal and non-verbal contacts between young and elderly, and of comparing various spaces in relation

to the type of contacts occurring there. Videotapes were especially helpful in studying non-verbal forms of communication among participants.

Videotaping presented a problem. Directors expressed concern that elderly and child participants' behavior might not be "natural" if they were aware of the camera. Various methods of mounting a camera were discussed, and officials at both sites approved a request to wall-mount a camera so that it would be less conspicuous. However, a trial videotaping revealed that both the elderly and the children ignored the tripod-mounted camera whenever the researcher was not standing behind it. During subsequent videotaping, subjects usually seemed unaware of the camera's presence.

Survey

The survey, which asked the elderly how they felt about the children's visits to their area, provided an additional and more direct means of data collection. The survey goal was to learn more about the elderly's preferences such as location and duration of the children's visits, and to get a better understanding of how they perceived being a part of an intergenerational center.

Appendix A contains the survey instrument. It was administered to adult day care participants in February, 1993, during the last two weeks of Phase II. Because of widely varying cognitive levels among participants, staff members helped identify those participants whom they felt could be expected to understand and respond to the survey questions. It was important to identify

elderly participants who could easily respond to survey questions without feeling stressed, threatened, or embarrassed by the task.

The researcher administered the survey individually to 6 subjects at Site A and 5 at Site B. It was done in quiet, comfortable locations within the adult centers. Participant responses could not be overheard by other participants, which assured that participants were not influenced by the responses of their peers.

CHAPTER 3. LITERATURE REVIEW

3.1 Overview

Because the concept of intergenerational day care (IDC) is so new, literature that describes programs and their physical settings is scarce. Furthermore, little research has been done to determine the effect such programs have on participants. A multidisciplinary approach to literature review was considered necessary to the study. Literature review includes the following: (a) methodology for observation of children and the elderly, (b) church architecture and adaptive use of churches, (c) child day care history, (d) adult day care history, (e) intergenerational day care history, (f) effects of intergenerational day care, (g) intergenerational facility design, (h) comparison of child and adult sensory modalities, (i) day care design for the elderly and demented, and (j) design for children.

Literature provided a definition of intergenerational day care and an explanation of the societal forces that have shaped its history. Literature on church architecture and adaptive-use of churches provides a historical perspective on the planning of Christian houses of worship and an understanding of current trends in the use and adaptation of church buildings. Literature was used to examine and compare environmental needs of children and elderly, with particular attention given to auditory, visual, tactile, olfactory, and kinesthetic sensory modalities. This information provided a conceptual

framework for the case studies and resulting design recommendations.

Emphasis was also placed on design for dementia, a diagnosis that applies to a majority of elderly participants in the case studies.

3.2 Observational Methodology

Child Observation and Research

Wasik (1989) provides a historical perspective of child observation methods from 1900 to 1960. Methods evolved sequentially from researchers who used diaries, such as Piaget in the 1930's, to the following more systematic approaches: (a) time sampling, (b) coding behaviors (sampling the occurrence of behavior rather than recording everything), (c) event recording (defining a set of behaviors to be recorded rather than recording events freely), (d) longitudinal studies, and (e) "free" studies, such as the work of Barker in the 1940's and 1950's.

It was not until the 1960's that it occurred to child development researchers to consider the role of the physical environment in child development. Elizabeth Prescott's (1987) research was inspired by the work of Barker, Wright and Gump. Using the concept of behavior-activity settings helped Prescott to see previously unnoticed patterns of behaviors among her subjects and to identify relationships between spatial quality and behavior in her 1967 study on day care centers. Gary Moore (1987) summarizes the areas of child and sociophysical environment that need further empirical research, gives

examples of research, and stresses the importance of behavior setting research that examines the interrelations among behavior, social, program, temporal, and spatial characteristics. According to Weinstein and David (1987), the field of child environment studies lacks progress because few studies simultaneously consider the variables of child, child development, and child environment. As a result, public spaces are not designed with children in mind, and even spaces specifically designed for children often do not consider the developmental needs of the children for whom they are designed.

Literature on non-verbal communication was useful to this study, particularly in videotape analysis, because much of the communication between the children and elderly was non-verbal. Szasz (1978) illustrates basic body language of children, and Vaughan (1982) examines adult body language.

Observation Methods in Environmental Behavior

Several books provide overviews of the field of environmental behavior (Friedman, Pile & Wilson, 1982; Kaplan & Kaplan, 1982; Saarinen, 1976), which is an interdisciplinary area of research that studies the physical and social settings of people, and which uses a variety of methodology. The literature suggests that it is only through observing and understanding behaviors of people within natural settings that we learn how to design spaces that will support their complex and interrelated physical, social, and psychological needs.

Roger Barker (1955; 1968) developed a method for observing people in natural settings and recording what they *do* rather than what they say they do, and showed the connection between “standing behavior patterns” and their context, which includes places, things, and time. He felt that using interview techniques interfered with what people were doing, thereby creating distortion. Ittelson, Rivlin and Proshansky (1970) used “behavioral mapping” as a way of relating observed behaviors to people's location within a particular setting to learn how the setting is used. In a retrospective discussion of his career in the field of environmental psychology, Proshansky (1990) stresses the importance of observing people in their day-to-day settings and of using a “search-and-learn” method of observing person-environment interactions, which differs from the traditional experimental-laboratory paradigm in psychology. He advocates that researchers become a part of the setting they are studying and that they use a multidisciplinary approach by involving people from other disciplines in the research. He redefines environmental psychology as not just the study of people and their settings, but as the study of the “interactions and relationships between people and their environments.”

In Enclosing Behavior , Robert Bechtel (1977) provides a history of behavioral scientists' efforts to collect objective data that is useful to designers, and outlines a simpler version of Barker's observation methodology. In Patterns of Use, Sandra Howell (1980), who used Bechtel's system of analyzing behavior settings, tells how a facility can be analyzed by observing and recording the

behaviors of its elderly occupants within the space and identifying patterns of use. From these patterns, she generates design guidelines for the various types of spaces within the facility. Because human behavior cannot be predicted intuitively, we cannot design using intuition alone (Deasy, 1990). Therefore, it is imperative that designers take advantage of, and help generate, the growing body of environment-person research in designing effective settings for people.

In an introduction to Spatial Behavior of Older People (Pastalan and Carson, 1970), Edward T. Hall states that the young and old are alike in many ways, and that information contained in the book could be helpful in designing environments for children as well as for the elderly. The book provides a wealth of information on behavioral issues including territoriality, privacy, and spacing of people. Findings were generated through actual observations of behavior in various settings, and using simple methods such as counting certain behaviors occurring within those settings. Particularly applicable to design of adult day care are DeLong's (1970) findings on spatial use and preferences of the elderly.

3.3 Church Architecture and Adaptive Use

All Christian churches have a common origin. Lawrence (1911) describes church architecture evolution from open-air sermons in Old Testament times, to the tabernacle, which was a tent sanctuary, to the temple. Both tabernacle and temple functioned mainly as houses for the Deity, rather than as meeting places for the worshipers. Later, the synagogue was developed to create a place for an

audience, which was the "first expression we have of an audience room for the worship of God. Out of the synagogue came the church."

The early Greeks, Romans, and Egyptians also built temples to honor the deities and house the priests. At the same time, Greeks and Romans built basilicas to provide gathering places for citizens. Basilicas were long halls that served as a dignified place for dispensing the law and other civic purposes, (Jansen, 1986), and from which evolved the pattern for the church (Lawrence, 1911).

During the Middle Ages entire communities typically spent many years building large churches called cathedrals (Jansen, 1986). In contrast to the cathedrals, early churches in this country were simple, utilitarian structures, built for the purpose of having a centralized location for worship. Communities began building larger, more permanent churches as the congregations grew and could afford them. In the early 1900's, churches began to recognize the importance of adding separate Sunday school spaces, either detached from or attached to the "auditorium," or main worship area (Lawrence, 1911).

Literature shows that church sanctuaries have always been specifically designed to meet the ceremonial worship needs of a particular denomination. Subsidiary spaces, however, which provide space for classrooms, meeting rooms, and recreation, tend to follow patterns which are similar among various Christian groups (Clowney & Clowney, 1982; Mills, 1956; Tralle & Merrill, 1921; White, 1988). The design of these support spaces appears to be determined

more by such considerations as site, budget, congregation size, and interest rather than by the particular denomination or religious order.

3.4 Child Day Care History

Literature describing the history of child care in the United States provides important insight for designers of child care centers. Day care designers deal not only with bricks and paint, but with the feelings of the end users, which are affected by cultural views on child care.

The first one hundred years of child care was aimed at helping socially and economically deprived and troubled families, but it was not considered acceptable for "normal" families (Rivlin & Wolfe, 1985). The first day care center was started in 1838 in Boston, for children of seamen's working wives. This center typified the concern shown by wealthy women and charitable organizations toward the working-class immigrants who arrived by the millions between 1815 and 1816 (Clarke-Stewart, 1993).

The depression in the 1930's, during which work programs were created by the Roosevelt administration, and World War II in the 1940's, were events which created widespread need for day care among families who were not poor (Leeper, et al, 1968). The country responded by serving over a million children in day care (Clarke-Stewart, 1993). When the war ended, most of the centers closed and day care again became a service aimed at serving disadvantaged families. However, contrary to expectation, many women continued to work

outside of the home after the war ended. Until the 1960's working women who were not poor enough to use the publicly-funded centers usually arranged for day care with relatives or housekeepers (Clarke-Stewart, Rivlin & Wolfe, 1985).

During the 1950's and 1960's, there was an increased interest in studying the growth and development of children. From the growing awareness of the needs of children came the Head Start Program, started in 1965, which was aimed at providing early intervention for socioeconomically deprived children (Smart & Smart, 1968). The acknowledgment of the importance of early childhood education has given support to the creation of more day care centers, and emphasized the need for quality in child care programs (Rivlin & Wolfe, 1985).

Today, as the trend of mothers working outside the home continues, child care is beginning to be viewed as a service that can be beneficial to both children and to their working parents. As testimony to a growing acceptance of child day care, over 11 million children may be enrolled in some type of day care program by the end of the decade, compared to an estimated 1.2 million children enrolled in day care in 1976 (Moore, 1987). Clarke-Stewart, however, believes widespread ignorance about child care still exists, and outlines changes she believes must occur in the way our society views child care. Rivlin & Wolfe stress the importance of understanding the history of child care, and found, in 1985, that the "most consistent attitude toward day care is that it is a substitute for the

'ideal' form of care by a mother within the nuclear family and that it is the last alternative and appropriate for only the poorest families."

3.5 Adult Day Care History

Literature indicates that adult day care (ADC) is experiencing the same slow public acceptance that child care received decades earlier. As with child care, there seems to be a social stigma connected with leaving an elderly dependent in the care of an institution. According to ADC providers, the public is not well-informed about the existence of ADC centers and their services.

The focus and scope of ADC programs has changed over the years, and researchers believe it will continue to change in response to societal needs (Kaye & Kirwin, 1990; Ohnsorg, 1981; Von Behren, 1989). There is disagreement among authors on some points, such as cost effectiveness of adult day care, and how different types of adult day care should be classified.

The first ADC centers in the U.S. emerged in about 1940. These centers emulated British programs, and were primarily designed in association with an institution such as the Menningers Clinic (Kaye & Kirwin 1990), and Yale Psychiatric Clinic (Von Behrens, 1989). Their purpose was to provide transitional care for elderly patients leaving the institution, and most had a psychiatric focus.

In the 1960's, social workers and others who worked with the elderly and their families began to be aware that ADC could help solve many of the problems faced by these families. Those problems included the need for "respite", or relief

for the caregiver, and the need to provide a meaningful program of activities and support services for elders while caretakers work outside the home (Kaye & Kirwin, 1990).

From the 1970's to the 1980's, there was a large growth in the number of ADC centers. According to Ruth Von Behrens (1989), there were 300 centers in 40 states in 1978. By 1989, the estimate increased to over 2,000 centers in all 50 states. Pegels (1988) notes a similar rapid growth in the number of nursing homes serving the elderly, beginning in the 1960's, largely due to the new availability of funds from Medicare and Medicaid. However, ADC centers had no such government support; their increase was a result of community-based effort to meet the needs of elderly and their families (Kaye & Kirwin, 1990).

Today, this grass-roots support continues, in spite of a lack of coordinated funding. ADC is now recognized as an innovative and effective means of providing part-time care for the elderly, and is considered an important link in the continuum of long-term care (Ohnsorg, 1981; Pegels, 1988; Persily, 1991).

ADC centers can vary widely, based on the competency level of participants, the auspices under which a center is operated, and the level of health support services offered. Some authors identify two broad types of ADC centers: 1.) those which focus on providing health-related services, and 2.) those which meet primarily social needs (Koff, 1988; Pegels, 1988; Weissert, 1976; Weissert et al, 1990). Von Behrens (1989), however, feels these generalizations

are misleading, and that the goals of all ADC centers are consistent, regardless of their focus.

Disagreeing on the cost effectiveness of ADC, some contend that many elder ADC participants would require the higher per diem cost of nursing home care if they were not in day care (Kaye & Kirwin, 1990; Von Behrens, 1984). Stassen & Holahan (1981) suggest that ADC does little to postpone the need for nursing home care, and that it may even increase total costs by adding an intermediate level of skilled care that people might not otherwise use.

There appears to be a growing public acceptance of adult day care, which is perhaps created by necessity. In 60% of today's families, both spouses work outside the home (Creedon, 1988), and surveys of workers indicate as many as 25% have care giving responsibilities for elderly relatives (Sherr, 1989). Furthermore, many of these workers, designated the "sandwich generation", also have child rearing responsibilities. When the elderly adults become unable to care for themselves at home, but do not yet require a nursing home, ADC is a viable alternative (Creedon, 1988). Brody, Saperstein, and Lawton (1989) say that while only a small percentage of elderly use day care, ADC can be a positive, enriching experience for the elder family member and the entire family.

The need for respite services for caretakers has also encouraged acceptance of ADC. Kaye and Kirwin (1990) found that whether or not caregivers are employed outside the home, they seek ADC services to give themselves a break from the demands of care giving. This is increasingly true of families caring

for a mentally impaired elderly adult (Guttman, 1991). Caregiver stress is highest among those caring for mentally impaired elderly (Guttman; Kaye & Kirwin).

Mace and Rabins (1981) clarify this in *The 36-Hour Day*, in which they discuss caring for persons with dementia.

In a national survey (Weissert, et al, 1990), a high level of satisfaction with day care was found among participants and their caregivers, with 82.2 percent of the elderly participants reporting a high level of satisfaction. However, only 74 percent were completely satisfied with noise level, and 69 percent with crowdedness. In Weissert's study, centers served an average of 20 participants per day. Participants were younger, healthier, and more likely to be married than nursing home residents, although most participants were functionally dependent and about one third had mental disorders.

As for the future of ADC, the over-65 age group in our population is increasing. According to the AIA Press (1985), by the year 2000, the population of the U.S. will have increased 3.5 times since 1900, but there will be 11.5 times more people over age 65 than in 1900. In 2030, when the last of the baby boomers reaches 65, the ratio of retirement-age people to working-age people will be 37 per 100, while the current ratio is only about 19 per 100 (United States Dept. of Commerce, 1988). This suggests that now is the time to improve the care delivery system for the elderly, in order to prepare for the changes the "graying of America" will bring.

3.6 Intergenerational Day Care History

The idea of combining adult and child day care programs within the same facility (IDC) appears to have originated in the late 1970's, when some nursing homes provided on-site child care for employees. Markson (1980), expressing support for delivering child care within a nursing home facility, said it can help counteract the elderly's loneliness and isolation in nursing homes.

In an extensive study of all types of intergenerational programs (NASUA, 1984), IDC was described as one type of program that served to unite the young and the elderly. The report, however, focused on programs involving elders and older children, and highly competent elders and young children, rather than programs combining preschool-aged children and frail elderly.

The intergenerational program trend began by putting elders and children together in programs such as Foster Grandparents (Wrenn, Merdinger, Parry, & Miller, 1991) to address problems of increasing alienation among generations. Fewer than 4% of American children live in homes that contain three generations (Clarke-Stewart, 1993). Furthermore, due to increased mobility of families, children often grow up without grandparents nearby. Programs such as Foster Grandparents give children an opportunity to have a meaningful relationship with an older adult. Studies have shown that non-related adults and children can develop bonds that are as strong as those of blood-related individuals (Wrenn, et al). However, it is the *consistent* and *frequent* contact between young children

and elderly that characterizes an *on-site* program such as IDC, and which researchers believe provides the greatest opportunity for close, satisfying relationships. However, on-site programs are still very rare. (Kocarnik & Ponzetti, 1991).

In 1991, the Stride Rite Corporation opened the nation's first corporate-sponsored IDC center (Kantrowitz, 1990; Weinburg, 1990). It was developed in response to an in-house survey in which 25% of the Stride Rite employees were found to have some responsibility for an aging parent, and 13% expected to have this responsibility within a few years.

Generations Together is an organization located at the University of Pittsburgh's Center for Social and Urban Research. It "promotes mutually beneficial interaction between the young and old through community outreach, program development, research, and dissemination." Begun in 1978, it sponsors diverse programs including the Senior Citizen School Volunteer Program, Youth in Service to Elders, and the Intergenerational Community Service Program. This group strongly supports the concept of employment for elders in child care programs (Generations Together, 1992).

3.7 Effects of Intergenerational Programs

While there is little empirical research on the effects of intergenerational day care, numerous authors mention the potential social benefits of intergenerational programs for both the young and elderly. Two of the most

frequently discussed benefits are easing elders' loneliness, and promoting more positive attitudes in the young toward aging and the aged. Kocarnik and Ponzetti (1991), stress the need for further study of the effects and value of intergenerational programs on participants. Although some research has been done concerning attitudes and attitude changes of young and old in intergenerational programs, many questions remain unanswered (NASUA, 1984).

Seefeldt, Jantz, Galper, and Serock (1977) examined attitudes of children toward elderly people by using pictures of a man at four different stages of life. They found that children as young as three have negative and stereotyped views of the elderly. They suggest that schools plan curriculum experiences that counteract such attitudes. A subsequent study (Seefeldt, 1987) attempted to measure change in preschool children's attitudes after visiting a nursing home on a regular basis for one year. While the nursing home and preschool staff felt that the visits were beneficial to both young and elderly, the study found that the children had more negative attitudes *after* the year of visits. The author suggests that caution be used in planning intergenerational programs. Opportunities must be provided to allow the two groups to interact more as equals. Having children entertain or perform for the elderly, for example, may encourage the children to perceive the elderly as passive and helpless. Kocarnik and Ponzetti (1987), however, feel Seefeldt's studies may contain flaws that make the results questionable.

Lambert, Dellman-Jenkins and Fruit (1990) brought day care children and a group of elderly together for a planned program, then compared these children's attitudes towards the elderly with a similar group of children who had not participated in the program. They concluded that regular contact with elderly adults, along with a curriculum designed to provide realistic information about the elderly, had a positive effect on the children's behavior. Most notably, the children were more willing to share with the elderly.

Zandi, Mirle, and Jarvis (1990) examined the attitudes of children towards adults by studying and contrasting responses of a group of American with a group of Indian children. The study indicates that it is the elderly adult's *role* in a particular society that most influences the way they are perceived and treated by children. The Western world tends to view old age as a period of life "without meaningful roles", while in India, the elderly play an important role in transmitting customs, values, and skills. Because elderly continue to have an important role in Indian society, they are held in high esteem. Although both Indian and American children were found to have generally positive attitudes toward elderly adults, when the children were asked to describe elderly people, there were substantial differences between the American and Indian children's responses. The Indian children tended to describe elders in behavioral terms, such as "they can't walk fast", while the American children described elders in more affective terms, such as "they are nice," possibly indicating that Indian children have a better understanding of what elderly people are like, including a realistic view

and acceptance of the frailties of old age. It may be due to the Indian family system which traditionally provides more contact between the young and the elderly.

An earlier study, Hickey and Kalish (1968) looked at development of children's perceptions toward the aged, concluding that the older the adult, the more negative was the child's perception, that negative perceptions of the elderly may begin very early in life, and that negative stereotypes may be internalized by the elderly. A pervasive stereotyping of the elderly by the non-elderly in our society is a serious concern. Sheppard (1990), describes "ageism" as a deep-rooted revulsion toward the physical disintegration that happens to all people around the age of 65. Zandi, Mirle, and Jarvis's study (1990) supports this; 30% of the children in their sample responded negatively toward elderly people, and responded primarily on the basis of physical appearance. Dr. Sheppard suggests that people are beginning to feel antagonism toward the elderly as a group because of the perception that the elderly are affluent, greedy, and taking more than their share of the government dollar, although many elderly live just above the poverty line. Median income of the elderly is about half that of the 25 to 64 age group (U.S. Senate Committee on Aging, 1992). Sheppard's findings are an example of what Ludke (1990) described as a potential competition and bitterness between the generations in an "era of dwindling resources."

Attitudes of the elderly toward children and toward participation in an IDC center have been studied, but there is a lack of empirical research. Seefeldt

(1982) studied elderly adults' attitude toward children and found that some adults had negative feelings toward children's many demands and questions. She found that more actual contact with children produced a more positive view of children.

Participants seem to have a positive view of intergenerational day care. One 71-year-old participant summed up her feelings by saying, "The children give us life" (Kantrowitz, 1990). A 79-year-old participant in an intergenerational program said enthusiastically, "I tell all my friends what they are missing!" (Ludke, 1990). Newman, founder of Generations Together (interviewed in NASUA, 1984), feels many questions must be raised and is particularly concerned that more precise methodology be developed in examining intergenerational attitudes and interactions.

3.8 Intergenerational Facility Design

Literature on intergenerational community and housing issues was examined as a starting point in gathering information applicable to designing intergenerational facilities. Historically, children in this country have not grown up in extended families. Even during colonial times families tended to be nuclear but lived in closer proximity to kin. However, children may have had greater opportunity for contact with grandparents on a daily basis than they have today (Belle, 1989). Greater geographic mobility of today's families decreases opportunity for child and grandparent interaction.

Several studies have examined elderly and young child interaction within homes or communities. Housing studies done by M. Powell Lawton (1970) indicate that elderly adults living in planned housing prefer being with *peers* in age-segregated situations, and that in age-integrated housing there was almost no visiting done between older tenants and children. Yet, Lawton wondered about the enrichment potential of putting the two generations together. Maas (1984) argues that both age-segregated and age-integrated housing are needed to satisfy the diverse needs of the elderly. Garbino (1992) offers support for the concept of multigenerational households. He defines "social density" in a household as "the degree to which an environment contains diversity of roles for children to learn from and for parents to draw upon." Multigenerational households or neighborhoods are more stimulating for children because they are more diverse than settings where children interact with only one adult generation. Barker (1955) found that in settings where there was less separation and distinction of roles among children, adults, and elderly, there was a higher self-esteem among the children.

Despite the general consensus among researchers that intergenerational settings may be beneficial to both young and old participants, only two references to designing an intergenerational setting were found. In the first, Gorfkle (1982) proposes use of a neighborhood center facility ("neighborhood house") that would be designed for all ages, with particular care taken in meeting the physical and emotional needs of children and the elderly. Gorfkle believes

that the current institutional trend of providing services such as day care, nursing homes, senior centers, and teen centers, tends to pull families apart. The neighborhood house is suggested as a means of bringing the generations together. Secondly, Weinberg (1990) describes the design of Stride Rite's intergenerational day care center. Design features include use of adult-sized furniture in the children's spaces and child-sized chairs in the adult spaces, adjustable table heights for wheelchairs, and floors that are raised on one side of normal height tables so children and adults can use the same table. Also, lower shelves of bookcases are reserved for children's books. Although there is intergenerationally shared space, separation and privacy is provided by placement of adult and child spaces in separate wings of the building.

3.9 Comparison of Child and Elderly Sensory Modalities

Literature describing and comparing child and elderly sensory modalities of touch, vision, audition, and olfaction was reviewed. Rebok (1987) describes perception as a "life-span" process that begins at or before birth and continues until death. Rebok uses Gibson and Spelke's (1983) definition of perception, which is "the process by which animals gain knowledge about themselves in relation to the environment."

Touch

The skin senses are correctly called "somesthesia" (Colavita, 1978). The word "touch" is commonly used to express various somesthetic sensations, which include feelings of warmth, cold, light touch, pressure, and vibration.

Comparative studies show that young children and elderly respond similarly to some types of touch, and that for these two groups, human touch may be especially important as compared to other age groups. In a study of pre-school children and elderly who were 61 to 96 years old, both age groups had difficulty in perceiving simultaneous touches on the cheek and hand, while older children and younger adults could more easily perceive the simultaneous touches (Colavita, 1978). The author suggests that the reason for the differences among age groups is the immaturity of the young child's nervous system and losses in nerve sensitivity of the elderly. In The Many Facets of Touch (Brown, 1984), the authors describe the importance of human touch, particularly for babies and elderly, and the role that touch plays in cognitive development. Fanslow (1984) states "...two of the earliest sensory experiences in fetal development, touch and pain, are also the experiences that help us stay in contact with life until life ends." Touch is widely considered essential for human bonding between infants and parents, and touch as a form of communication becomes extremely important to elderly people as other senses may diminish. According to Brown (1984), touch may be "one of the main intersensory

integrators, and one of the main consolidators or cementers of development”.

Warren & Rossano (1991) discuss the relationship between touch and vision, a subject that may be of particular importance in intergenerational design. Hiatt (1980) explains the importance of the tactile environment to the elderly and offers ways to avoid tactile deprivation in institutions.

Colavita (1978) concludes from studies of children and elderly that there is a decreased sensitivity to touch among the elderly. This is due in part to changes in the skin of the older person, and probably due to degenerative changes in sensory nerves. There is no evidence, however, that the skin becomes less sensitive to heat and cold. Due to a higher basal metabolism, children are better able to maintain a constant body temperature than elderly adults, and feel less discomfort when outdoors in hot or cold weather.

Most research on touch has been conducted in laboratory settings rather than in natural settings (Heller & Schiff, 1991). For this reason, little is known about touching behaviors and the role touching plays in learning, communicating, and activities of daily living. Heller and Schiff feel that touching in a natural context needs to be examined in order to bridge the gap between what we know about the mechanics of touching and how people actually use touch. Such knowledge could lead to better design of tools, objects, and materials used in people's physical environments, and to a better understanding of the psychological effects of touching.

Vision

Major differences in visual perception exist between young children and the elderly. Visual acuity, the ability to clearly discriminate forms, is very poor in newborns but rapidly improves and is within adult ranges at 6 months to 1 year (Dworetzky, 1990). According to Earl Print, Education Director of Philips Lighting, a child reaches full accuracy and detail of vision at age three (personal communication, March 18, 1994). Performance in humans begins to decrease at about age 20, with some aspects of vision declining sharply after age 40 (Egan, 1983). Old eyes have an increased sensitivity to glare, decreased ability to adapt to changes in brightness levels, decreased ability to accommodate or focus on near and far objects, and decreased sensitivity to some colors (Birren & Schaie, 1977; Egan; Fozard, 1977; Hughes & Neer, 1981).

Numerous authors describe how to provide appropriate lighting to maximize visual capabilities of the elderly (Davidsen, 1991; Hiatt, 1980b; Kolanowski, 1992; Rutledge, 1987; Tsomides, 1990). According to Earl Print of Philips Lighting (personal communication, March 18, 1994), IES (Illuminating Engineers Society) has recently formed a national committee to explore lighting for the elderly. The committee will collect and disseminate research information and formulate lighting standards for the elderly. There have been few empirical studies conducted on lighting for children, and researchers have not yet studied the effects of lighting on children's cognitive development (Moore, 1987).

Hearing

According to Rebok (1987) hearing shows substantial changes over a life-span, with auditory acuity improving with age until adolescence, and gradually declining after age 30. Selective attention plays a part in both vision and hearing. The child gradually learns to direct his attention to particular things in the environment rather than being distracted by the loudest or brightest stimulus. The ability to attend selectively to important information generally improves throughout adulthood, then declines somewhat during the later years.

Sound and noise are the primary aspects of acoustics that must concern an interior designer (Friedman, Pile, & Wilson, 1982). The ability of the elderly to hear the sound of human speech within the space is important, as is the elimination of noise, or unwanted sound, which interferes with the ability to hear human speech. Due to a common condition among the elderly called presbycusis, which is characterized by a decreased sensitivity to high-frequency sounds, elderly people have increased difficulty hearing conversations when there is background noise (Sekuler & Blake, 1987; Tsomides, 1990). An estimated 13% or more of people aged 65 and over have advanced presbycusis (Corso, 1977). Reverberation of sound, which is caused by sounds reflecting off hard surfaces, is a type of signal distortion that also interferes with hearing. Nabelek and Tucker (1991), studying the amount of background noise that people would tolerate, found that young children and elderly adults were very

much alike in their preferences of signal-to-noise ratios. That is, when trying to hear conversation, children and elderly adults showed a similar intolerance for background noises such as babble or music. Earlier studies on the effects of reverberation in rooms (Nabelek & Robinson, 1982; Nabelek, 1983) show that children's ability to hear human speech is much more affected by reverberation in a room than are young and middle-aged adults. The researchers concluded that because children's listening skills are immature, they require a less noisy background.

Good acoustics is important in improving attention and learning in young children (Nabelek, 1983), and in reducing age-related auditory deficits in elderly adults (Calkins, 1977). Moore (1987) summarizes research documenting the negative effects of noise on children. Falconer (1986) reviews research that describes age-related hearing losses and the resulting effects, which include negative social, behavioral, psychological, and cognitive changes in the elderly. Hiatt (1982) suggests that uncontrolled noise produces stress in the elderly. Individual response to noise has a subjective as well as physical aspect. Reaction to noise depends largely on what a person is doing, how much they like or dislike a noise, and the noise level to which they are accustomed (Mayer, 1993).

Serious hearing loss in the elderly is frequently undiagnosed (Falconer, 1986). Hearing losses may occur so gradually that the elderly are themselves unaware of them. A study of nursing home residents with a mean age of 82

found that medical records failed to identify almost half of the elderly residents with moderate to severe hearing loss (Garahan, Waller, Houghton, Tisdale, & Runge, 1992). Only a small percentage of elderly people acquire and use hearing aides (Nabelek, 1991), although hearing aides can improve hearing of people with certain types of hearing losses.

Hall (1966) suggests that auditory perception is culturally influenced, including how people selectively attend to signals and screen out noise. He also discusses J. W. White's (1950) findings that reverberation in a space affects performance of tasks. White found that people read out loud more slowly in a large room which has a slower (therefore longer) reverberation time than in a small room with shorter reverberation time.

Hiatt (1982) states "poorly managed and designed acoustical settings can be as great a barrier to older people as steps are to a wheelchair user."

Christenson (1990) suggests that older people suffering from hearing loss should have control over their TV and music equipment, and that using this equipment occasionally and selectively can increase stimulation and provide a focus for socializing, but warns that if television is used continually it becomes background noise.

Olfaction

While the senses of vision and audition require a physical stimulus, the senses of olfaction (smell) and gustation (taste) require a chemical stimulus. The

sense of smell tends to be viewed as playing a less important role than vision and hearing and we tend to be less aware of it than the other senses (Van Toller, Dodd & Billing, 1985). A person's culture influences the perception of smell, and Americans have a comparatively underdeveloped sense of smell due to concerted efforts to cover up unpleasant odors (Hall, 1966). Hall discusses the negative effect this has upon enjoyment of life. Engen (1989) states that illness, such as viruses, allergies, and upper respiratory infections are the most common causes of loss of sense of smell. Other causes include head trauma and over-exposure to certain chemicals in the work environment.

Van Toller, Dodd and Billing (1985) give an extensive review of research on aging and olfaction, explain the difficulties in measuring subject's sense of smell, and present their own findings on aging and smell. Their research shows that there are ways to combat the general decline of olfaction in the aged, and that this would contribute to the psychological well-being of older people. They recommend providing the elderly with food that smells and tastes stronger, because elderly people often say that eating is one of their few pleasures.

Pegles (1988) feels that the sense of smell can often remain acute in the older person, and it is important to control unpleasant odors in institutional settings. While most researchers agree that aging does produce a general decline in olfaction, there also appear to be health and experiential factors that act independent of age. In some studies, the elderly subjects did better in detecting and identifying smells than the young subjects due to familiarity level

with the stimulus. Elderly perfumers, for example, were found to have good ability to distinguish certain types of smells because they had lifetime practice in doing so. Certain types of medications and medical treatments such as radiation therapy have negative effects on olfaction (Van Toller, Dodd, & Billing, 1985).

Engen (1991) discusses the relationship between memory and olfaction. Memories of certain odors, both pleasant and unpleasant are often formed early in life and can last a lifetime. Smelling a particular odor can trigger very vivid memories of people, places, and events. For this reason, decreased sensitivity to odors can be an important loss for the elderly, who might otherwise enjoy the stimulation derived from odor-induced memories. In outlining problems and solutions associated with dining in nursing home settings, Hiatt (1991) suggests the importance of aiding digestion through food aroma and timing meal service so that aromas don't arrive far in advance of the meals, which may cause restlessness.

Kinesthesia

The kinesthetic sense, which involves an awareness of muscle and joint movement, differs from the senses of touch, vision, olfaction and audition because it does not depend on a particular sensory organ, but on internal reference cues. Receptors in the muscles, joints and ligaments provide information to the brain concerning the position of limbs and allow the coordination of the body in skilled motor functions such as bowling or tennis.

Motor performance decreases with age due to deterioration of muscle tissue and changes in receptor feedback, resulting in reduced coordination of fine muscles, decreased speed of muscle contraction, and reduced strength (Colavita, 1978). Pegels (1988) states that the elderly are less likely to be voluntarily mobile, and it is important that the environment offer incentives to move.

Young children are in the process of developing their muscular strength and coordination. Skilled movements, such as those required in catching a ball or hitting a golf ball, must be practiced (Colavita, 1978). Studies have shown that most kinetic development in children comes from practice occurring in everyday life. Leeper, Dales, Skipper, and Witherspoon (1968) describe a study which compared the ball-catching abilities of a group of young children who had been given several weeks of ball-catching practice to a similar group of children who had not been given practice, and found no significant differences in ability between the groups.

3.10 Day Care Design for the Elderly and Demented

A large body of literature dealing specifically with adult day care facility design has been generated since the early 1980's, drawing extensively from important 1970's research on environmental design for aging. Adult day care settings, like any environment for elderly people, must compensate for normal sensory losses, promote independence (Lawton and Nahemow, 1973), and provide both safety and challenge (Fozard & Popkin, 1978). In addition, there are

special concerns related to the population served by adult day care. The mean national average age of adult day care participants is 72.9 (Von Behren, 1988). All are functionally dependent due to a combination of physical disabilities or chronic illnesses that cause them to require assistance with some daily living activities, and about a third have mental impairments such as Alzheimer's type dementia (Weissert, et al, 1990).

AIA's Design of Aging: An Architect's Guide (1985), organized for ease of reference, presents basic design considerations for aging, including ANSI A117.1 codes which deal with accessibility. Good design for the elderly, states the AIA, will be good design for everyone.

Designing spaces for mentally impaired elderly, while not very different from designing for the elderly in general, requires special attention to aspects of the environment that help decrease confusion, getting lost, forgetting things, and becoming over-stimulated, restless, or anxious. Increased background noise, for example, may encourage wandering and calling out by mentally impaired elderly (Hiatt, 1978). Alzheimer's Day Care: A Basic Guide (Lindeman, Corby, Downing, & Sanborn, 1989), Confronting Alzheimer's Disease (Kalicki, 1987), and Design for Dementia (Calkins, 1988) provide information critical to providing an analysis of day care sites in this study, where the populations included mentally impaired elderly.

Mentally impaired elderly need more structure in the environment while having as much freedom as possible (Mace & Rabins, 1991), which means

keeping the space reliable and simple and keeping the furniture arrangement constant. Although DeLong (1970) found that elderly people generally dislike neat, orderly, uncluttered spaces because they provide less sensory stimulation, mentally impaired elderly may function better and experience less distraction in a more orderly setting (Mace & Rabins).

Aspects of the visual environment are especially important for the elderly. Solid colors on walls and floors are less disturbing than patterns for mentally impaired elderly (Webb 1989). Poor lighting and glare may contribute to mental deterioration, accidents, and reduced mobility and balance (Hiatt, 1982). The quality of lighting for elderly is particularly important because older people tend to spend a great deal of time indoors (Kolanowski, 1992). Kolanowski identifies three variables of light sources that affect behavioral response to light: 1) the intensity, 2) color (spectral power distribution), and 3) temporal pattern of exposure. The use of indirect lighting is recommended for providing the higher level of illumination the elderly need to perform reading and close-work tasks, while eliminating glare. Broad-spectrum lamps, which emit all colors of the electromagnetic spectrum and are similar to sunlight, are recommended. Kolanowsky, in comparing broad spectrum lighting to warm white fluorescent lighting, found that the elderly prefer broad spectrum lighting because it makes them feel more relaxed and it enhances general vision and color perception. Although the amount of exposure to sunlight needed for health is not known, the elderly should be assisted in going outside or into a solarium as a part of their

daily care routine. Literature also links mood disorders to length of exposure to light. Bright light therapy using artificial lighting has shown promising results in improving the mood of persons with seasonal affective disorder. People suffering from this disorder, which is most common in the Northern Hemisphere, experience sadness and depression when days are short.

According to Randall, Burkhardt, and Kutcher (1990), outdoor spaces used by dementia patients must be specifically designed to address their behavioral and cognitive problems. Memory loss and wandering behaviors are typical symptoms. Patients are often restrained from wandering indoors due to staff's fear that they will fall. To accommodate wandering, a looped path in the outdoor area is suggested, rather than a dead end path which contains a decision point. Familiar objects such as a garden bench and common plants may provide a feeling of security. A garden path should be level to accommodate the common symptom of apraxia, which is a tendency to forget how to perform motor skills. The floors of all outdoor areas, such as paths and patios, should be of the same color to address the symptom of agnosia, in which patients perceive contrasts in color value of flooring surfaces as changes in levels. Level changes should be avoided because they are a safety hazard for the elderly and present accessibility problems for the elderly using walkers or wheelchairs. Firm footing should be provided to aid balance because patients may shuffle rather than walk. Benches and chairs encourage sitting and socializing and satisfy a need for privacy. There should be a clear view of the entire area from every point to

decrease confusion and assist in orientation. The authors give specific suggestions for site arrangement, barriers, and plantings, and say that a large area with trees and grass is not necessary in providing an effective outdoor area for elderly with dementia. Hiatt (1980) agrees that outdoor spaces need not be large, and stresses the importance of providing protection from the sun, interesting views, and materials to touch and smell. Bathrooms must be easily accessible. Elevated gardens make gardening activities easier for the elderly. Hiatt also suggest creating a nearby children's play area where the elderly can safely enjoy watching their activities.

3.11 Designing for Children

Zimring and Barnes (1987) state that a few studies done in the 1960's and 1970's examined children's settings, but the past 15 years marks a period of much greater interest. Most research has focused on the effect of settings on cognitive development. Future research needs to examine the effect of settings on children's social and emotional development.

Much research has compared home and day care settings. Elizabeth Prescott (1987) contrasts the sterility of a day care center environment, with its typical child-sized furniture and standardized equipment, to the richness of the home environment. The home setting has a greater variety of furniture, equipment and materials. Children can explore and participate in a wider range of activities, including daily home maintenance and meal preparation. Children

and adults have more prolonged conversations in a home than at a center, and the home offers children areas that are quiet and private. Therefore, Prescott feels that the day care environment needs to be more home-like.

Literature shows that design of outdoor play areas for children has progressed far beyond the idea of a playground as simply a collection of play equipment. Playground expert Leland Shaw (1987) offers guidelines for playgrounds that meet the physical and emotional needs of children. He stresses that playgrounds should provide (1) a sense of place, or ambiance, which makes the playground feel special to the users, (2) a sense of unity, in which all parts are understandable and work together to encourage prolonged interest in playing and encourage use of the entire area, and (3) variety and complexity of spaces, including small defensible spaces (with a single entrance/exit) for privacy.

CHAPTER 4. FINDINGS

4.1 Spatial Use and Organization

Overview: Site A and B

At both sites, the adult and child day care programs occupy separate areas linked by hallways (Figures 1B-3B, Appendix B). Children visit the adult day care area for scheduled activities, but the adults do not spend time in the children's rooms. There are no common spaces used by the children and the elderly on a daily basis. Distance between child and adult areas is 102 feet at Site A and 90 feet at Site B.

Spatial organization of the child care areas are similar at Sites A and B. Children are grouped by age with each age-group occupying an individual Sunday school classroom. Each site also has a gymnasium which is used by the children for active play.

The adult day care participants at both sites use the following types of spaces: (a) a *primary area* used throughout the day for sitting, socializing, dining, and engaging in various individual and group activities, and (b) a *secondary area* used occasionally for crafts, music, and other activities (Figures 4B and 5B, Appendix B). At both sites, a handicapped accessible rest room is located within the adult primary area and another rest room is located in the hallway outside the adult area.

Spatial Arrangement and Circulation

The location of adult and child areas within the buildings at Site A and B and the resulting circulation paths of children and adults strongly influence the level of opportunity for spontaneous interaction between the groups. Because spatial arrangement and circulation patterns are different at Site A and B, the opportunity for spontaneous interaction between generations varies greatly between the centers.

At site A, the circulation paths of the children and adults rarely coincide (Figure 1), and the elderly and children have very little opportunity to interact spontaneously. Here, the circulation paths of the children do not take them to the adult area. Adults sometimes use the hallway for walking, but rarely travel around the corner and down to the children's area. The few intergenerational contacts observed in the hallway were brief but warm and enthusiastic on the part of the elderly; the children generally smiled but appeared to be shy.

Spontaneous interaction took place much more frequently at Site B, where the children travel down a hallway and pass in front of the adult day care area (Figure 2). At Site B, the children use the gymnasium for active play on rainy or very cold days. As children pass through the hallway, adult day care participants can watch them from their living area through a large interior window. The playground can also be viewed from the adult living room or the hallway (Figure 3).

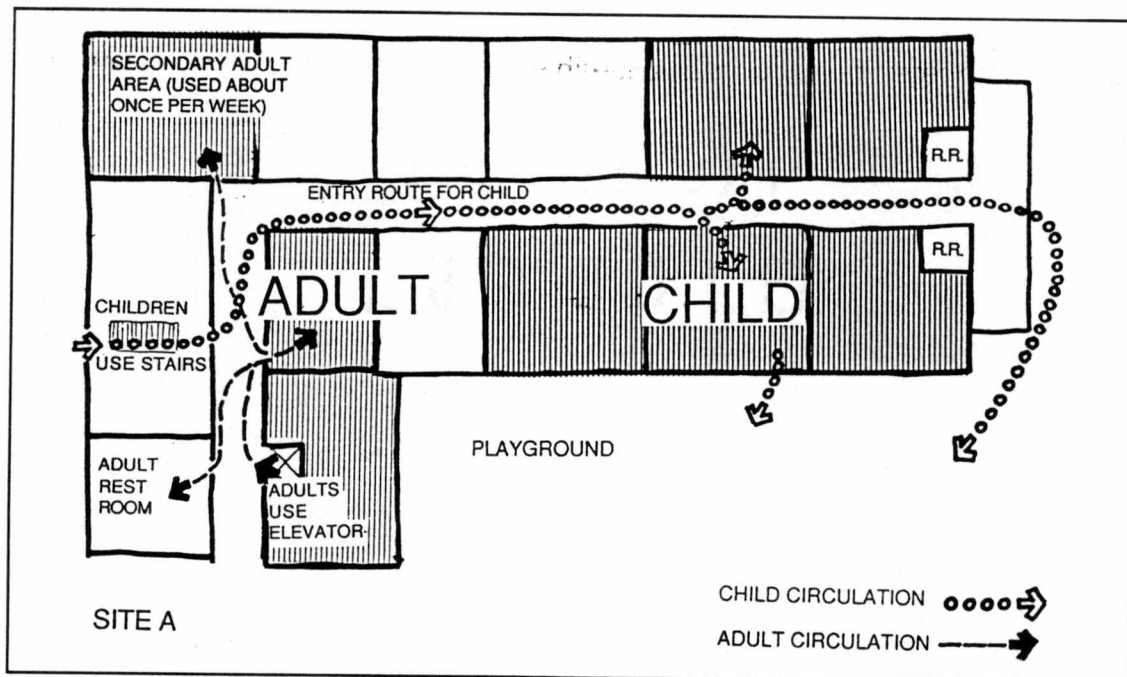


Figure 1. Site A Circulation.

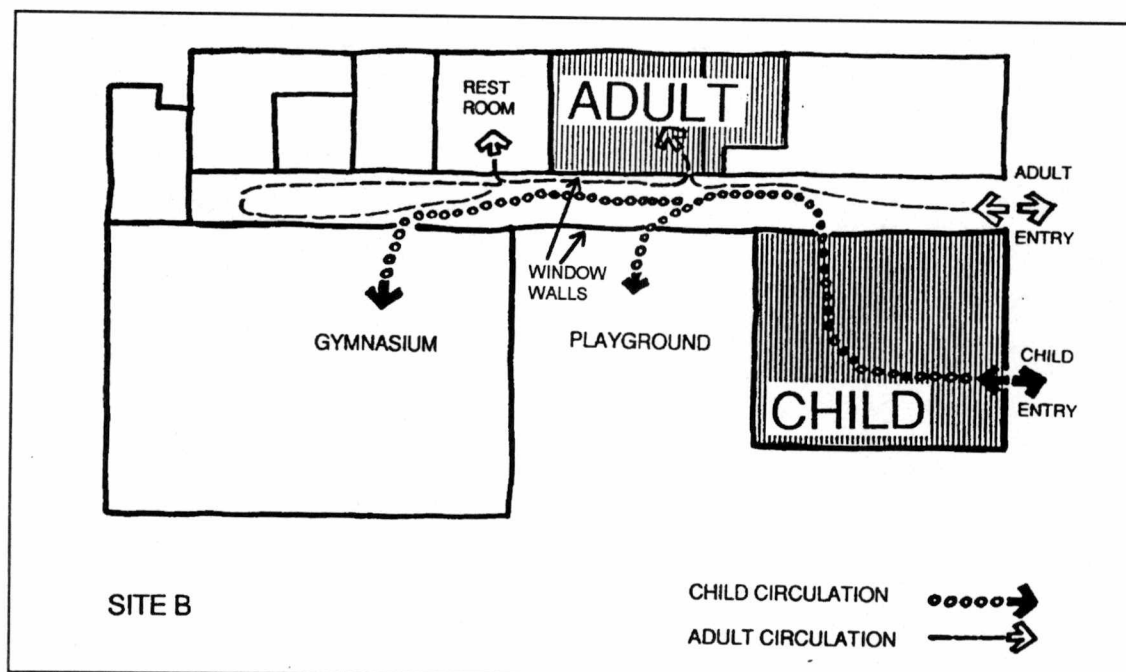


Figure 2. Site B Circulation.

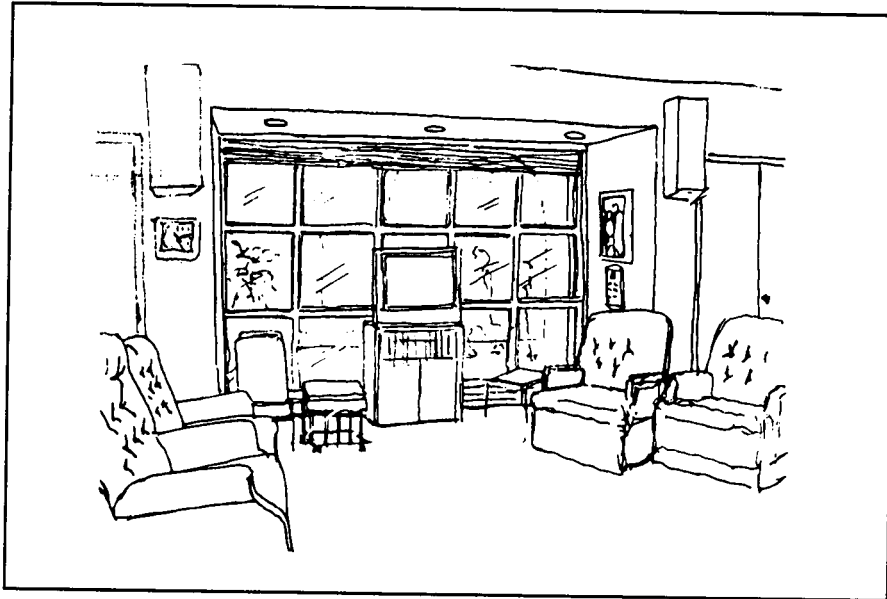


Figure 3. Site B interior window.

At Site B, the children are sometimes very noisy and excited in the hallway, and sometimes more subdued. The children appear to be aware of the adult day care center's presence. As a group of children passes by, a few usually look through the doorway or towards the interior window of the adult area, although not much can be seen through the window from the hallway. When the adults walk in the hallway, closer contact with the children can occur. The children's travel down the hall is slowed by the presence of elderly in the hallways; this slowing was observed both with and without verbal instructions from the teacher. The hallway contacts between children and adults are friendly but usually brief, and the intergenerational communication may be verbal or non-verbal. During one observation, a child stopped to exchange several words with

an elderly adult, but the children and adults most often exchange only smiles or a word of greeting.

Site B children are picked up from the gymnasium by their parents at the end of the day during cold or inclement weather, giving parents an opportunity to have contact with the adult day care participants. The staff reports that some parents stop to visit the elderly, and have extended offers to do chores or run errands for them.

Hallways

The design of hallways adjacent to the adult areas at Site A and Site B influences the way these hallways are used by adult and child day care participants. At site A, the hallway is a dreary place used strictly as a means of getting from one place to another, while the hallway at Site B supports and encourages a variety of activities.

At site A (Figure 4), the 10-foot wide hallway is uninviting and drab, with no windows for natural light, cream-colored composition vinyl flooring, and concrete block walls of a similar color. The overhead fluorescent light fixtures, regularly spaced and mounted on the 10-foot ceilings add to the monotony of the space.

The elderly participants seldom walk in the hallway at Site A, and often become directionally confused when going to the hallway rest room and water fountains, although they are only a few feet from the adult day care entrance.

Way finding, which is an important feature in the design of a facility for the elderly, is made difficult by a lack of visual cues. Literature indicates that the lack of contrast between walls and floors can create visual confusion for the elderly and that a long corridor (100-200 feet) may be perceived as a tunnel (Howell, 1988). Social interaction among the elderly, staff, or others is minimal in this space.

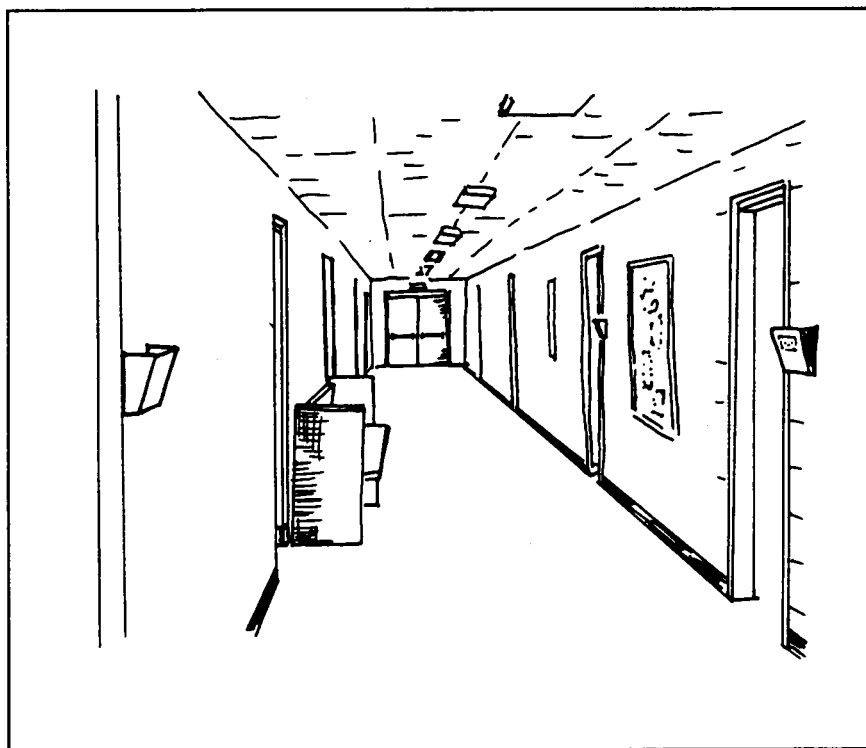


Figure 4. Site A hallway.

The hallway at Site B, however, has features which promote social and physical activity and support way finding (Figure 10). Here, the floors are carpeted in a medium tone of blue-green, and concrete walls are a contrasting off-white color. The hallway is 15 feet wide with a 14-foot ceiling. Lighting is *non-*

uniform throughout the space, with overhead recessed lighting and natural light from large windows and glass doors. Large potted plants are placed near windows. The elderly rarely become directionally confused here; no instances of elderly participants getting lost in the hallway were observed, but staff members say that it does happen occasionally. Additional cues for way finding include auditory cues such as hearing faint sounds of the children playing on the playground or in the gymnasium.



Figure 5. Site B hallway.

As an example of Site B hallway use, one elderly man takes short walks in the hallway several times a day. When the children are outside, he taps loudly on a window of the glass wall overlooking the playground to get their attention and then waves at them.

The elderly at Site B also use the space as a "front porch". The staff often brings two or three chairs into the hallway in the late afternoon and the elderly sit next to the large windows (Figure 6), providing an *unobstructed* view of the playground. The elderly watch the children playing, experience the change of seasons, and feel the warmth of the afternoon sun. For some of the people of this generation, it may bring back pleasant memories of their own front porches. On warm days, the day care children spend the last hour of the day on the playground, remaining there until parents arrive. At this time, individual or small groups of children sometimes go inside to visit with the elderly in the hallway. With the elderly comfortably seated in chairs, there appears to be a greater potential for more prolonged and qualitatively different interactions with the children than those that occur when the elderly are walking in the hallway. When seated, an elderly person is closer to eye level with a child, which is more conducive to communication. The seated elderly person is also less likely to fear having a child bump them and cause them to lose their balance. Literature indicates falling is a serious problem for the elderly, although elderly surveyed in this study denied that they worry about children causing them to fall.

As a final example of observations made in Site B's hallway, two elderly woman sat in the hallway near the glass doors watching children playing on the playground. A three-year-old girl saw the women and came into the hallway. The

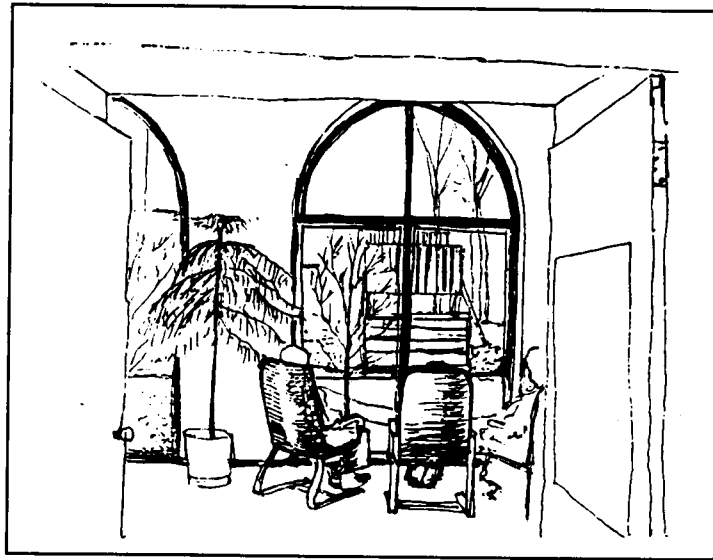


Figure 6. Site B hallway use.

child reached out and offered the toy she was carrying to one of the women. The woman smiled and said clearly and enthusiastically, "Oh, that's nice!" The remarkable aspect of this exchange is that the woman had not been observed to speak a single word during numerous other observations in other locations in the center, including several observations with individual or small groups of children.

Other similar incidents of elder and child interactions in the Site B hallway suggest that it is perhaps not only the physical setting, but also the time of day that affects social behaviors among children and elderly at this site. The late afternoon appears to provide an enhanced opportunity for the elderly to interact on a one-on-one basis with children. Children may be calmer at this time, and fewer people are present in the adult and child areas, since many children and elderly have already departed for the day.

Entryways

At Site A, children and elderly use a *common* entry into the building. The entry is on the main level. An elevator (used by elderly) and stairs (used by children) provide access to the day care areas on the ground floor. Site B has *separate* entries for children and elderly. Here, the programs are also located on the same level, but because the building is stepped, a short flight of stairs is located between the adult and child spaces (Figures 1B-3B, Appendix B).

Little interaction between children and elderly occurred in the common entry foyer at Site A (Figure 7). The lack of interaction may be partly due to a low incidence of common arrival times between the children and adults. Also, the children seemed to be focused on the task of separating from their parents. A third possibility is that the space is perceived as being impersonal. There is nothing about the space that connects it to either the children or the elderly, such as art work or photographs. It is a dull and colorless space. The space contains two apparently unused wooden benches and lacks visual points of interest to encourage people to stop and linger. The arriving elderly go straight to the elevator to reach their program area downstairs, while children and parents go to the stairs to reach the children's area.

However, the entry foyer may not have always been so lifeless. The adult day care center was previously located in a space adjacent to the entry foyer (see Figure 1B, Appendix B). A few months prior to this study, the adult program

was moved downstairs into a slightly larger space. Participants who remember the former location say they liked the old location better because it was more lively and exciting. The other advantage of this former location was that as children arrived and departed they could see the elderly in their space, giving the children greater familiarity with the elderly on an informal basis. This also gave children an opportunity to connect the elderly with a particular space, and within a particular context, rather than only seeing them as strangers passing through the foyer.

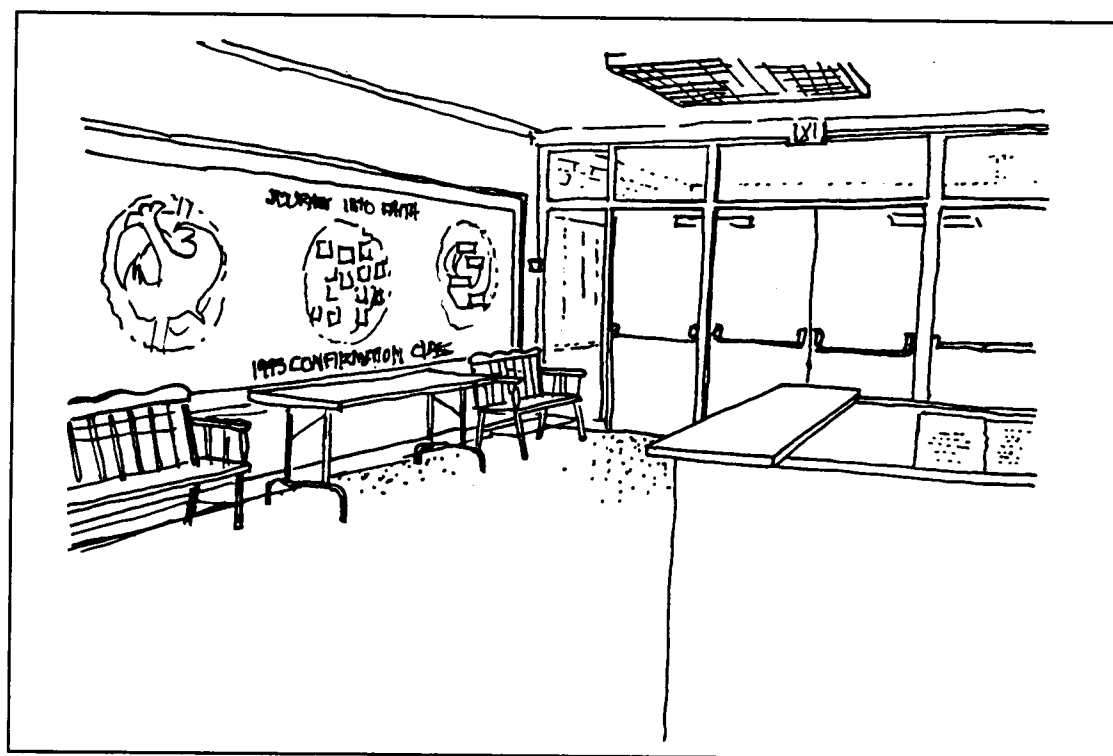


Figure 7. Site A building entry foyer.

Programmatic Aspects of Space Use

Planned interaction between children and the elderly occurs in either the primary adult day care areas or in the secondary multi-use spaces at both Site A and B. However, program planning methods of staff members differ at the two sites. Site A brings larger groups of children into the adult area and plans more frequent intergenerational activities than does Site B staff.

At Site A, where 98 children attend either two or three mornings a week, the staff tries to have each of the 8 groups of children visit the adult area at least once a month. The visits may be very brief, such as when the children parade through the adult area wearing Halloween costumes, or lengthy, as when there is storytelling, music, or an art activity. Groups of children who are identified as interacting especially well with the elderly visit the elderly area more often, but no more than twice a month.

Site B, however, brings only a few children from a *single* group of full-day children into the adult area, with the exception of one or two larger events each year when an entire group of children visits. Therefore, adults at Site B have a greater opportunity to get to know the individual children who visit. Here, the elderly and their caregivers know the children by name, while the adults and caregivers at Site A are less likely to know the names of the children.

Given these programmatic differences, interactions between the elderly and children at Site B might be expected to be friendlier, warmer, and involve

more touching and verbal communication due to a higher level of familiarity with the children. However, interactions between children and elderly are equally verbal and friendly at the two centers, while there is a distinctly *lower* level of *physical contact between young and old at Site B.*

Room Sizes at Site A and B

Table 2 summarizes the room sizes of the adult day care spaces at Site A and B . Overall size of primary areas at Site A and B are similar, as are the sizes of functional areas (dining, living room, etc.), and the square feet per person.

However, the spatial *scale* of the adult primary areas differs dramatically between the sites. Site A consists of two adjacent rooms which are comparatively small and have eight-foot ceilings. Site B has a large open-spaced arrangement with a high double-pitched ceiling. At site A, where the primary area is small, the multi-purpose room is comparatively large. The opposite combination exists at Site B, which has a small multi-purpose space adjacent to its large primary area.

Social Interaction and Room Size

At both sites, more touching behaviors between children and elderly occurred when intergenerational groups used the smaller of the two adult spaces than when that same group participated in the same activity in a larger space. This became clear when the videotapes were studied. During observation, other

Table 2. Square footage summary of adult day care spaces at Site A and B.

AREA	SITE A	SITE B
PRIMARY AREA	Arranged in two separate rooms	Single room; furniture divides space
Overall size	1,040	1,147
Breakdown: Living room Dining Administrative Storage/circulation/rest room Exercise area	483 546-entire room (221-eating area) (48 located within dining area) (277 located within dining area) N.A.	396 286 66 159 240
SECONDARY AREA	Single room 37 feet from primary area 550	Single room adjacent to primary area 420
TOTAL SQUARE FOOTAGE Primary + Secondary Areas	1,586	1,567
SQUARE FEET PER PARTICIPANT (Overall square footage divided by Feb. 1993 enrollment) Enrollment: 12 at A; 15 at B	132 s.f./person	104 s.f./person

types of verbal and non-verbal communication made *all* the intergenerational sessions appear to be warm and friendly.

Hiatt (1980a) suggests that human touch may be "significantly more important to the very young and the very old than are statements and words." Therefore, videotape analysis looked carefully at touch as a form of communication. Table 3 summarizes the observational data which suggest that frequency of touching behavior at both sites was influenced by room size.

Descriptions of the observation are as follows: At Site A the elderly and a group of three-year-olds participated in three art activities; sessions were at least two weeks apart; two sessions took place in the dining area of the adult space (364 sq. ft.), and one in the secondary area (550 sq. ft.). A high degree of lap-sitting, patting, and touching of hands occurred throughout both sessions in the dining area. In the larger multi-purpose room, although there was a similar level of verbal interaction, there was no lap-sitting or hugging; there was hand touching that appeared to be more accidental than deliberate between the children and adults, and there was shoulder-rubbing caused by chairs crowded around the table.

At Site B the elderly and a small group of four-year-olds participated in 20-minute exercise sessions, in which children and adults were all seated. Four sessions took place in the adult day care's primary area (1147 sq. ft.) and one session took place in the secondary area (420 sq. ft.). There was no physical

Table 3 . Summary of touching behaviors.

Site	Activity	Relative Room Size	Area/square footage	Behaviors
A	Art Project	Larger	Secondary area/550 s.f.	No lap sitting or hugging; accidental hand touching; shoulder rubbing.
A	Art Project	Smaller	Dining Room in primary space/(<u>visible</u> part only) 364 s.f.	Two children sat on adult lap; several incidents of hugging & patting hand or shoulder.
B	Group Exercising	Larger	Exercise area in primary space/(includes <u>visible</u> area only) approx. 1,000 s.f.	No physical contact.
B	Group Exercising	Smaller	Secondary area/ 420 s.f.	Two adults patted children (head/shoulder); one child hugged adult's leg.

contact between children and adults during four sessions in the larger area; in the smaller room, two adults patted children on the head or shoulder, and one child hugged an adult's leg.

At Site A, more touching occurred in the most familiar and frequently used space (the dining area), while at Site B it occurred in the *least* familiar (the secondary space). Spacing of seating was similar throughout the observations, as was arrangement of furniture.

At both sites, differences in quantity of touching occurred when both the *number of participants* and the *type of activities* were held constant, helping to eliminate the question of group size or activity influence. This suggests that some attribute or attributes of the rooms influenced the differing amounts of touching, with size of rooms being the most obvious.

As previously stated, the overall scale of the two sites differs greatly. Site B can be characterized as large and less home-like in scale than Site A, where spaces are smaller and more intimate. When touching behaviors are compared *between* the two centers, Site A appears to be more conducive to touching as a form of communication between young and old. Further analysis of the sessions described above shows that at each site there was a similar number of elderly and child *verbal* responses in both rooms at each center. Comparison of the quality of verbal responses at the sites was difficult because the activities were different; art activities done at Site A probably promoted more verbal "helping" responses from elderly participants, while the exercise sessions at Site B did not.

Entry Into Adult Areas

The entry foyers into the primary adult areas at Site A and B are arranged differently and function differently. They appear to influence the behavior of both participants and visitors.

At Site A the foyer is small and enclosed, and must be passed through before the dining and living room areas are visible (Figure 8). When a staff person is seated at the desk, visitors generally pause after passing through the foyer. If no one is at the desk, visitors continue a few steps more to the doorway of the living area or into the dining area. At Site A the living room seating is all oriented towards the doorway, causing the adults to be extremely vigilant about people coming to this doorway. When a visitor arrives at the doorway, they are only a few feet from participants (Figure 9).

At Site B (Figure 10), where the foyer is off-set from the living room area, participants are not vigilant about visitors entering the space. Also, because the entire room is visible to visitors entering the foyer area from the hallway, visitors tend to pause in the entry to seek permission from a staff member to come farther into the space. This foyer arrangement places a visitor at a considerable distance from participants when the visitor is paused in the foyer area.

In summary, the arrangement at Site B appears to protect the participants and staff from visitor intrusion by providing a psychological barrier. Unexpected visitors are less likely to intrude, and participants don't have to visually "protect" their territory. The foyer at Site A, however, does not appear to provide participants with as great a sense of privacy and security.

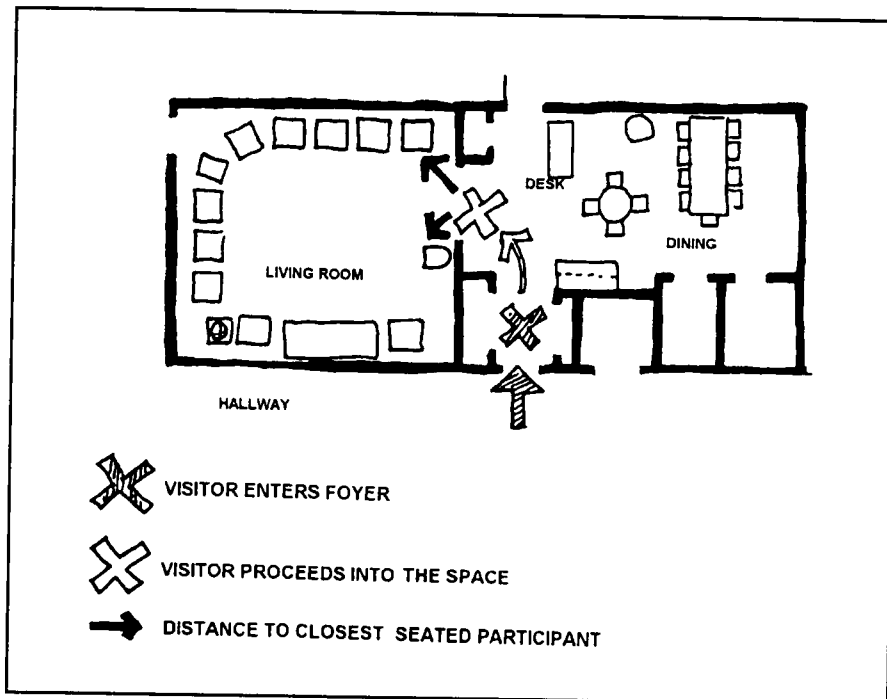


Figure 8. Site A adult entry area.

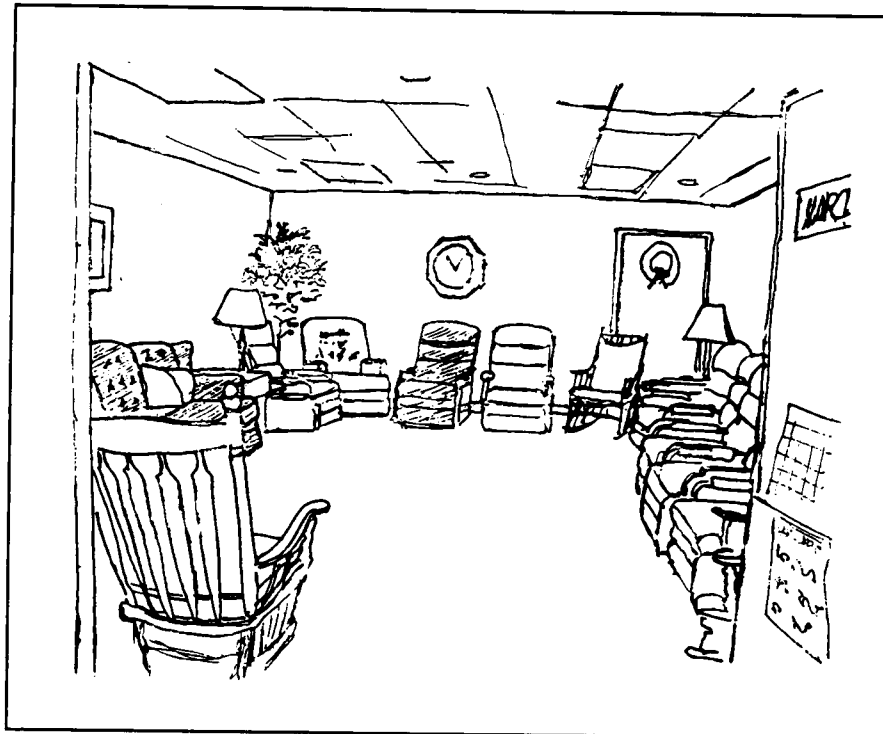


Figure 9. Site A living room view.

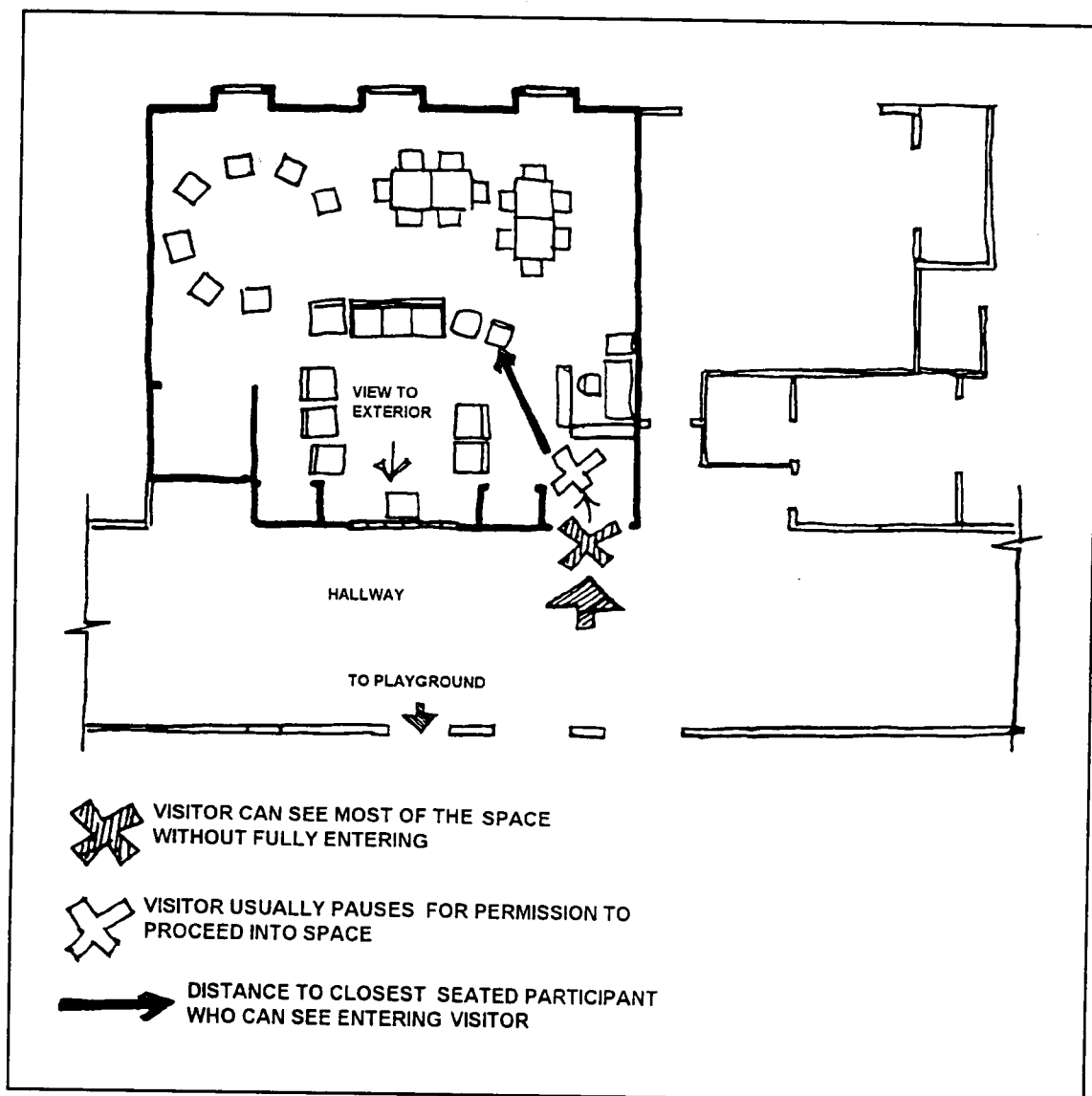


Figure 10. Site B adult area entry.

Home-like Arrangement

There is an aspect of space arrangement at Site A that probably resembles most participants' homes, where the view of each space is framed by its doorway. While areas are somewhat open to each other, walls provide a high degree of separation (Figure 11). In an open-spaced arrangement such as Site

B's, this home-like feature doesn't exist; functional areas are defined and separated by furniture placement (Figure 5B, Appendix B).

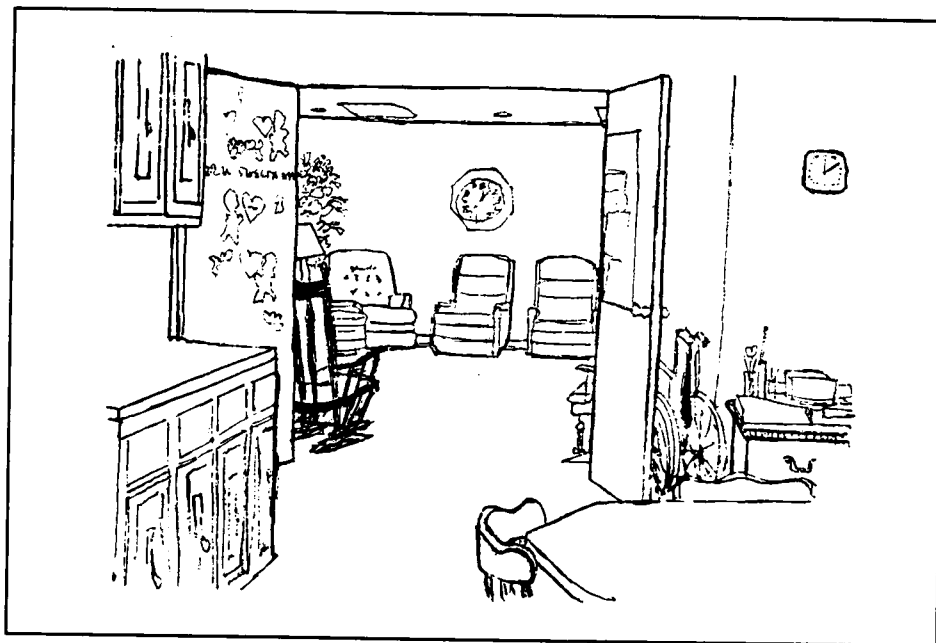


Figure 11. Site A spatial arrangement.

4.2 Lighting

Lighting problems were identified in the adult day care centers at both sites. However, none of the elderly participants were observed to complain about the lighting. Staff at both adult centers, while understanding the problems, did not seem to feel they were a pressing concern.

Lighting is an important consideration in IDC centers because appropriate lighting can help the elderly make the best use of vision that has deteriorated as a normal part of aging. Although children are distracted by light that is too bright (Leeper, Dales, Skipper, & Witherspoon, 1968), literature indicates that they are

much less affected by illumination levels and glare conditions than are the elderly.

Site A Lighting

Problems identified which might negatively affect elderly vision were: (a) direct glare from overly bright luminaires in living room and dining area, (b) illumination in the secondary area inadequate for tasks for the elderly, and (c) poor choice of lamp color in fluorescent luminaires. White ceilings and pale walls increase the apparent brightness in all the areas. Light level readings were taken with a color and cosine-corrected meter held 30 inches above the floor. Readings were taken in several locations within a room and averaged to obtain an average footcandle level for the spaces.

New lighting was installed in the ceilings of the primary adult day care area before the program moved into this space. The living room has ceiling mounted fluorescent luminaires and recessed incandescent luminaires with reflector lamps. The dining room has recessed fluorescent luminaires and three windows. Figure 12 is a reflected ceiling plan which shows fixture arrangement in the primary adult areas.

Wall switches in the living area allow users to choose between two levels of illumination for the fluorescent luminaires, and the recessed incandescent luminaires can be dimmed. Two table lamps provide additional task light in the living room. Unfortunately, the two-level system for the fluorescent luminaires is

useless at the higher level, in which all four lamps in each luminaire are turned on, as opposed to only two lamps per luminaire for the lower level. According to staff members, the higher setting is never used because the elderly object to this

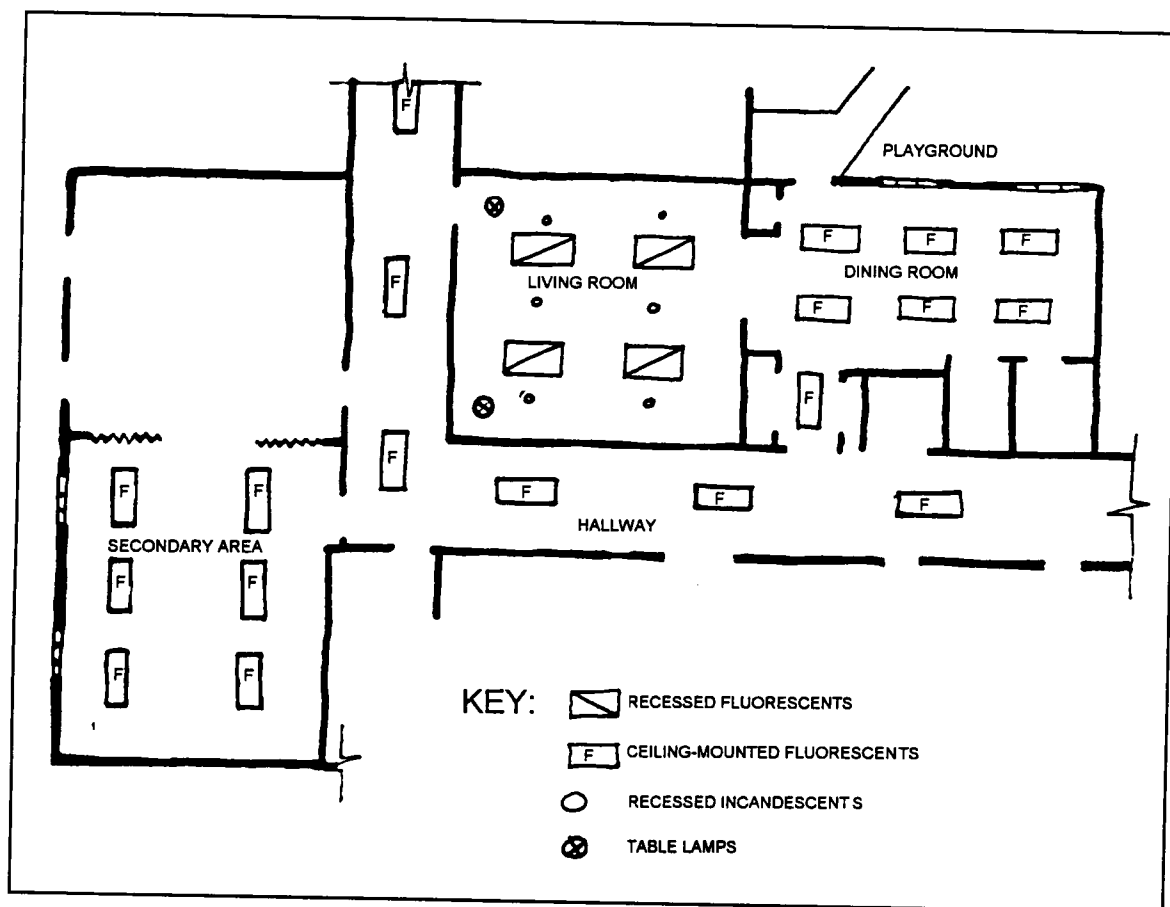


Figure 12. Site A reflected ceiling plan.

setting, which is intolerably bright. The dimmable recessed luminaires, however, work well in providing a low level of illumination in the living room during afternoon rest periods. During this time, the fluorescent lights are turned off and the recessed lights provide a soft, restful ambient light.

The living room lighting system addresses the need of the elderly for a higher illumination level for *tasks*, but may be slightly too bright to provide comfort for *non-task* activities, such as sitting, resting, and socializing. The average footcandle reading in the living area with fluorescent lights *switched to the lower level*, and with *recessed lights turned off* is 70-90 fc. These illuminations are high when compared to IES recommended light levels (Kaufman, 1981), and illumination levels recommended by Tsomides (1991) for people over age 65, which is 30 to 70 fc for general lighting and higher for tasks. However, even more troublesome than the high general illumination level in the living room is the high brightness of the *individual* fixtures. This is a problem because the elderly are more sensitive to glare conditions than younger people, and these fixtures are potential sources of direct glare.

The dining area has an average of 90-100 fc with lights turned on during a sunny day. Although this is also bright compared to recommended levels, lighting in this area is well-suited to the function of the space because it is primarily a task area. Because of the competing natural light, the artificial light sources appear less bright in this area. However, the fixture brightness may, as in the living room, present a problem of direct glare for the elderly users. In the dining room, direct glare from afternoon sunlight is controlled with mini-blinds and curtains. Reflected glare from the tabletop is minimal because a tablecloth with a matte finish and medium color value is used.

The lighting in the secondary area, which contains three windows with curtains, is less bright than in the primary area, because it has not been changed for the adult day care program. Illumination levels in this room averaged 60 fc on a sunny day, which is similar to illumination levels in the child spaces. This level is adequate for general lighting for the elderly, but is below the recommended task lighting level for the elderly. Curtains usually remain drawn to block direct sunlight in this room.

The type of lamp used in the fluorescent ceiling luminaires throughout the adult spaces is a "cool white" fluorescent. Unfiltered photographs of the spaces at Site A clearly show that the cool white fluorescents cast a greenish-yellow light. Cool white fluorescent lamps render the chromatic aspects of the environment poorly, which heightens the elderly's problem of color perception (Hughes & Neer, 1981). Rutledge (1987) recommends using a "warm-white" fluorescent lamp for the elderly because the elderly tend to prefer warm illumination and because warm light sources enhance skin tones. Al Meredith, a G.E. representative (personal communication, April, 1994), recommends *deluxe warm white* fluorescents for good color rendering of skin tones and the physical environment.

Site B Lighting

Lighting problems in the primary and secondary areas at Site B are (a) direct glare from recessed luminaires in the high sloped ceilings, (b) glare from windows, and (c) lack of flexibility of the lighting system. Figure 13 is a reflected ceiling plan.

In the primary area, high-pressure sodium lamps in the recessed ceiling fixtures are too bright. From several seating positions they create direct glare that the young staff members feel is distracting. For elderly eyes, this glare is possibly disabling. An additional problem is that when the lamps are turned off for an afternoon rest period they require a 15-minute re-strike time, leaving the area too dark, since there are no other artificial light sources. Also, the light fixtures are not designed for use in sloped ceilings, causing light to be directed sideways and across the room rather than straight down. With no light sources other than the recessed ceiling luminaires, and no dimming capabilities, this system cannot adequately meet both ambient and task needs. There are no floor outlets to facilitate the use of table lamps in this large open-spaced area.

Natural light helps create a soothing environment for demented elderly (Lindeman, Downing, Corby, & Sanborn, 1991), but there is too little control of natural light at Site B. In the primary area, large windows create bright spots on walls and create glare on the TV screen. Although the TV is used only occasionally, this glare is annoying when the TV is on or off. While an effort has

been made to control light from the upper windows, the lower windows lack any means of control. Circular wooden discs that fit into the upper windows can be inserted by a maintenance person using a long hooked pole when the room must be darkened for viewing slides or videos, but this is impractical for daily use.

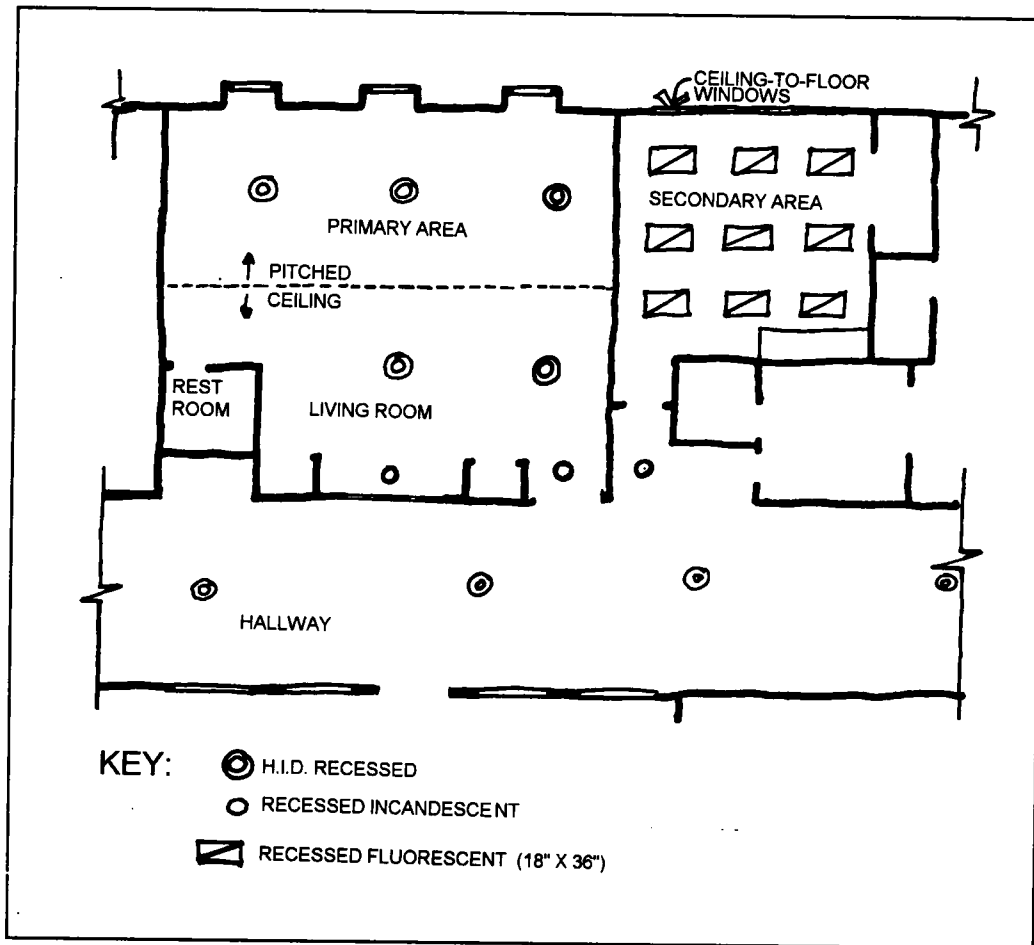


Figure 13. Site B reflected ceiling plan.

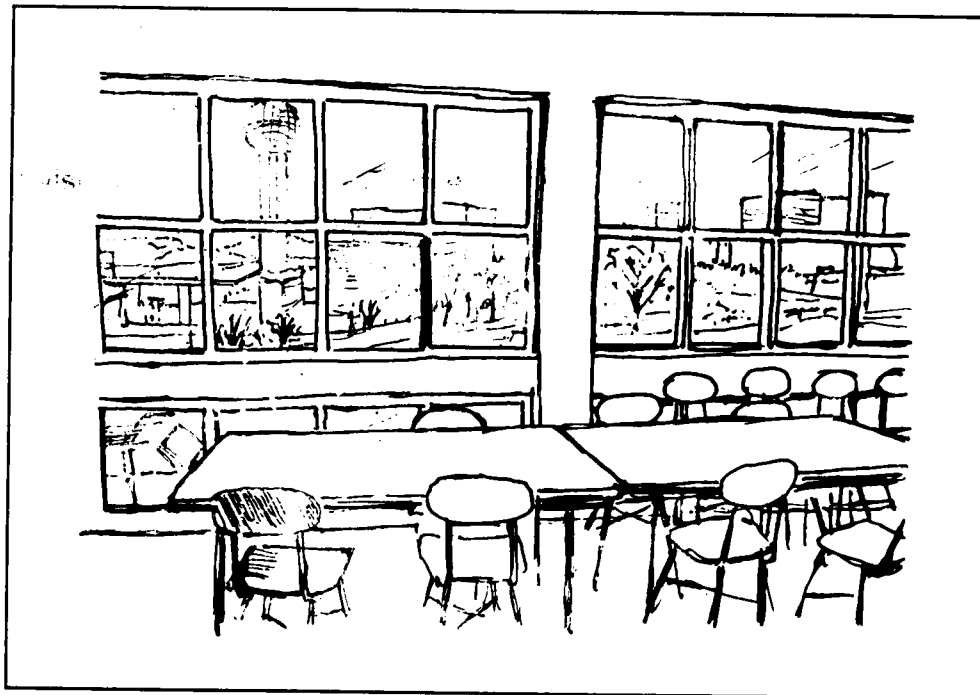


Figure 14. Site B secondary space.

The secondary space contains a large, almost wall-sized window with no window covering to control the light. Because of glare from the light-colored table, the elderly must sit with their backs or sides to the window to avoid disabling reflected glare from the table (Figure 14). Although this room, which faces North East, does not get direct sunlight, it receives a great deal of light because there is no roof overhang to shield the large window area.

4.3 View

At Site A, the elderly have three windows in their dining area, but they are too high to see anything but sky, tree tops, and the top of one of the children's climbing structures (Figure 15). The elderly sometimes stand near the windows

to look out upon the playground. Those elderly who are not healthy or mobile enough to stand next to the window *never* have a view. Elderly people at Site A are thus deprived of one of their favorite activities (Howell, 1980), which is sitting and watching out a window. Lawton (1970) defines "empathetic participation" as the tendency among older people to replace active participation with observation.

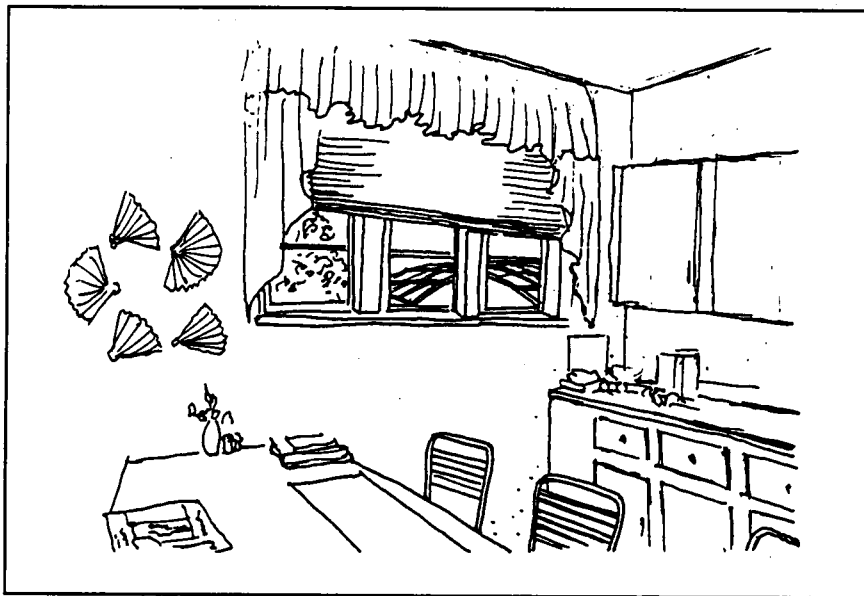


Figure 15. Site A dining room window.

There are no windows in the Site A living area. Therefore, as previously stated, the entrance into the room becomes the view for participants seated in the room (Figure 9). The participants are much more vigilant about people appearing at this entrance than participants at Site B, which has interesting views and an off-set entry.

At Site B, there are sweeping views of the city of Knoxville from the secondary area, although no elderly participants were observed looking at them

for more than a few seconds, possibly due to the glare conditions mentioned previously. Also, this room is only used for planned group activities, with little discretionary time for looking out a window. However, the primary area has a large interior window that appears to be the major focal point in the living room space (Figure 3). Through this window, participants can see the hallway and across the hallway to the playground. Some participants stated that they make it a point to sit where they can watch the children on the playground. Mini-blinds are used by staff to control the view but are usually kept open. However, much of the view is obstructed by the position of the TV, which sits directly in front of the window, and by the blinds, even when open. The primary area also has windows, but the view of the city can only be seen from a standing position.

Another problem produced by windows that are too high is illustrated by an observation at Site A. Two cognitively impaired female participants, seated in the dining room, became very agitated when they saw children at the top of a piece of climbing equipment (Figure 15). The women appeared anxious and screamed, "Look at those children! What are they doing? They're going to fall!" With their view being limited to the top of the climber, the women were unable to correctly assess the children's situation. The adults became calmer after being told that the children are on a climber, are very good at climbing, and that there is soft sand on the ground in case of a fall. It is possible that the adults would not have grown so alarmed had they seen how easily the children negotiated the lower parts of the climber. Given a view of the entire climber, they might have

been better able to judge its height. This incident suggests that mentally impaired adults may need *more contextual information* in order to evaluate and process visual stimuli, and that a more complete window view of human activities is desirable. Lindeman, Downing, Corby, and Sanborn (1991) recommend large windows with views for their possible effect in decreasing agitation in demented ADC participants, but caution against windows that provide a view of the parking lot, which may upset participants because they think it is time to go home.

4.4 Acoustics

Evaluation of the acoustic environment at Site A and B was based on how well the elderly participants could hear human speech, and to what degree noise interfered with this. At both sites, noise from outside is minimal due to the buildings' concrete block construction and isolation from the street. Mechanical noises within the buildings also do not seem to present a problem. The adult day care areas at both sites are separated from the children's area so that noise from the children's areas, which can be particularly loud during transition periods and unstructured play periods within the children's rooms, are not bothersome to the elderly.

At site A, noise from the children's area can be heard when the children are in the hallway and on their way to the playground, but the elderly indicated they are not disturbed by this short-term noise. At Site B, where the children pass in front of the adult center on their way to the gym, the noise level can be

high, but is of short duration. Adults showed no signs of annoyance with this, and those responding to the survey said they were not bothered by noise from the children and did not desire that there be less noise. At both sites, the typical elderly adult response to this type of noise produced by the children was to listen and smile, or to ignore it altogether. It appears that child-produced noise outside of the adult day care space is not a particular concern to the elderly, which may be due to the infrequency and short duration of the noise.

Noise *within* the elderly's space was a problem at Site B, where the high ceiling and large expanses of gypsum board wall and ceiling surfaces and glass surfaces of the many windows increase reverberation, making speech unintelligible to many of the participants. The staff is aware of this problem and has hung a quilt on the wall to absorb some of the sound. The staff feels that music playing softly in the background improves the acoustics by making this large room seem "less dead." The staff also feels the music is relaxing for the elderly and removes some of the pressure to have to talk all the time. There is white noise in the space created by a constantly gurgling fish tank. The television is seldom turned on, except to watch the news or special events. During one session when the television was turned on, a participant whispered to the researcher, "I don't know why they turn the thing on. You can't hear a thing!"

Noise within the primary area at Site A was not a problem. Noise was also not a problem within the secondary areas at either site.

4.5 Safety and Privacy

Observations at both centers indicate that the adult day care staff members are keenly aware of safety and are very observant and protective towards the participants. During this study, no adult participants were observed to lose their balance, fall, or have any type of accident, although staff at Site A reported that one participant lost her balance, fell, and broke a hip while walking across the living room.

At both sites, the elderly are usually seated before the visiting children arrive, reducing the chance that fast-moving children or increased crowding might promote accidents. The elderly seem to prefer this, as there appears to be much less movement of elderly during child visits. That is, there is less getting up from chairs, walking around, and wandering in the halls when children are visiting.

Large recliners appear to provide a safe and comfortable means of seating for the elderly during intergenerational visits (Figure 16). They also offer the elderly and children a range of social choices. For example, at Site A, when children came into the living room the elderly used verbal and physical signals to let individual children know when it was acceptable to come close enough to lean on the chair, and then to make closer physical contact with the adults, such

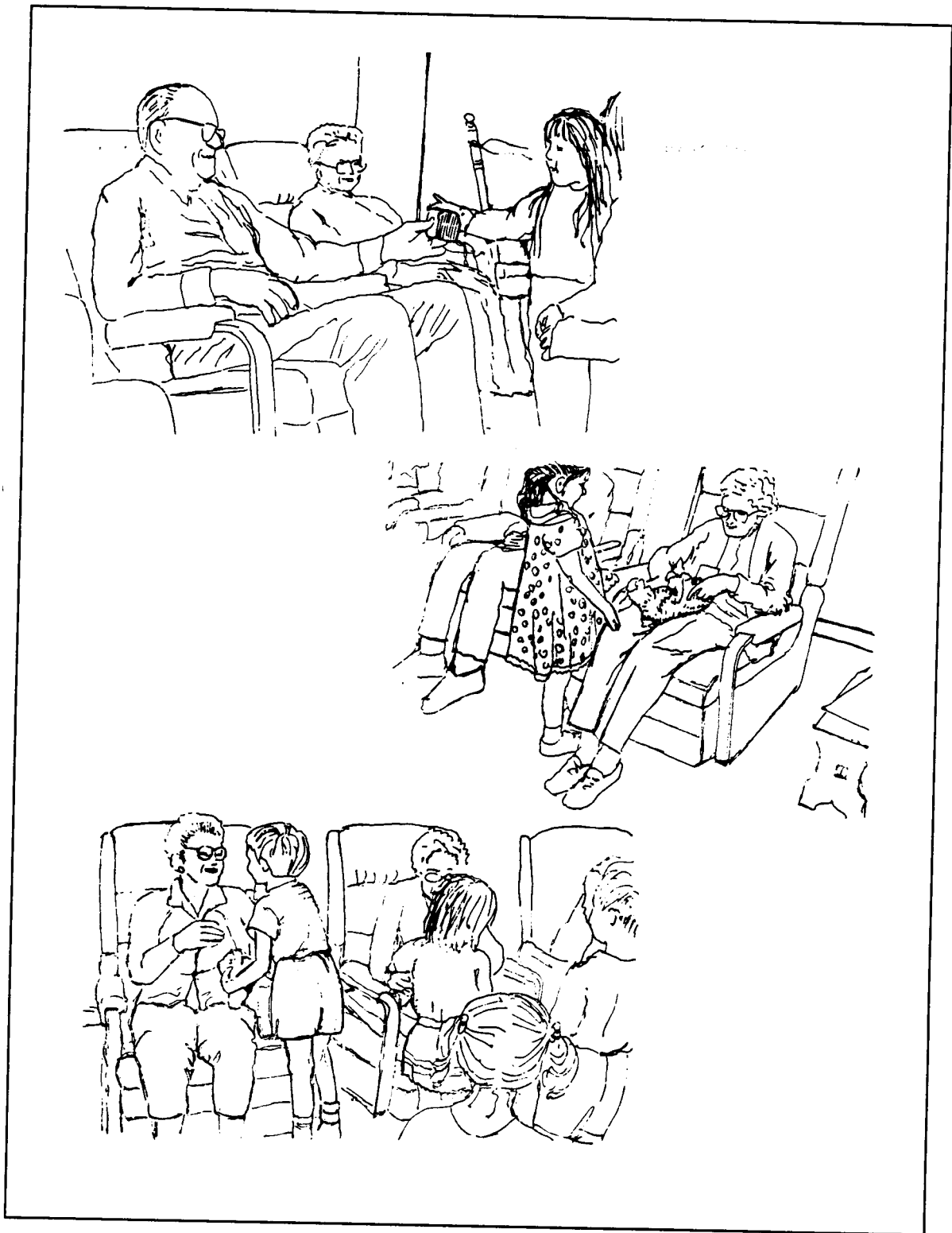


Figure 16. Use of recliners during child visits.

as climbing up to sit on a lap. Adults who preferred to avoid being approached by the children merely sat back and did not use welcoming hand gestures. The children had a similar choice to stand back and have a conversation or to get closer.

At Site B, interactions between children and elderly took place in the exercise area in the primary space where elderly sit in large chairs, and in the secondary activity space, where everyone sits at tables or in a circle of large chairs. While the large chairs (Figure 17) used for exercising and dining are safe, comfortable, and easier for the elderly to rise from, they don't provide the range of social choices that the recliners do. "Sled" legs allow these chairs to slide easily across carpeting when they need rearranging.

Because of spatial arrangements at both study sites, the elderly cannot gain privacy except by selecting a chair in a more isolated location or by putting a lounge chair in a fully reclined position. Both behaviors were observed, but were infrequent. It is possible that privacy is not a pressing concern to most participants because a majority attend the center less than five days per week. Also, participants appear to be socially oriented rather than withdrawn from people, and this may be prerequisite to their being willing to attend the program. Only one person at the two sites appeared to be somewhat disinterested in the children's visits. However, that person also made an effort to set himself apart from his peers in other ways, such as by bringing his lunch from home and eating in a chair apart from the group. He seemed satisfied with this situation,

and still very socially involved with staff and peers when he chose to be. During some children's visits in the living room, he separated himself from the activity by continuing to read.

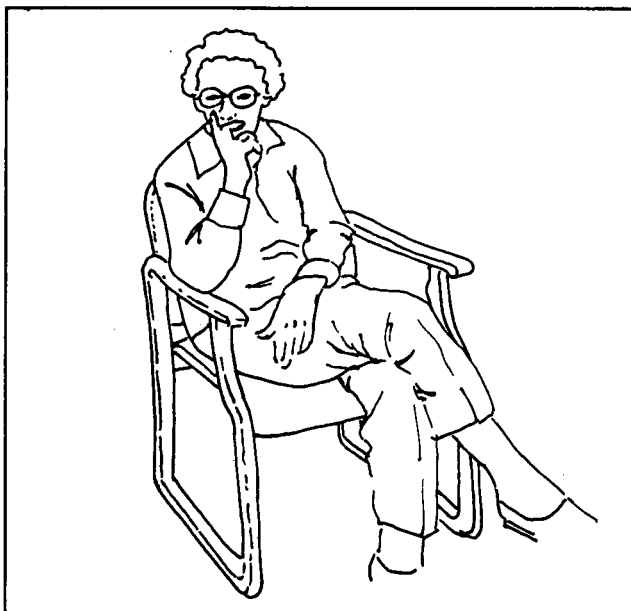


Figure 17. Site B chairs.

There were several instances of elderly participants indicating they were not in the mood for visiting with children on a particular day because they didn't feel well, although they normally enjoy the children. However, they did not complain to the staff, and they participated in the visits.

Most, but not all of the elderly at Site A and B choose to occupy particular chairs in the living room. Everyone seems to be aware of chair "ownership," and there appears to be little conflict over chairs. Staff, however, reported incidents in which participants have been agitated and verbally combative when someone

sat in their chair. According to Saarinen (1976), studies have shown that chair ownership is a type of territoriality prevalent in institutions for the elderly, and is a means of marking and defending a small space to preserve an individual's privacy. Also, ownership of a space relieves the stress of having to be around other people with whom the individual may not be compatible.

4.6 Use of Outdoor Space

At both sites, the U-shaped buildings surround a courtyard used as playground for the day care children. No adults were observed to use this outdoor area, although literature stresses the importance of exercise and contact with nature for the elderly.

The adult day care staff at site A has considered adding a screened patio. It would be located off the dining room, where there is an exterior door leading to the playground.

4.7 General Observations

Welcoming Children to Adult Area

Many children entering the adult areas at both sites were initially timid, regardless of the number of times they had visited. Videotapes at both sites show that with most children there is a latency period of about one to four minutes before the children will move away from the teacher or adult who has

brought them and begin responding to the elderly either verbally or non-verbally without shyness. Some children take much longer.

One observation was very different from the others. There was zero latency time: no hesitation at the door, no glancing back at the teacher, no shyness. The difference appeared to be caused by a teddy bear one of the adult participants had brought to the center and left on the sofa. Three children at Site B saw the bear immediately upon entering the adult space and, obviously delighted, they all ran to pick it up. In less than a minute, the children appeared relaxed and ready to participate in an activity with the adults. This suggests that objects with which children can identify have a welcoming effect, and the use of such objects or "props", may help young children feel more comfortable about leaving their classroom to visit in the adult area.

Kitchen Location

Kitchens at both centers are located near the adult day care areas. This adjacency is convenient for cooking and baking activities in which the children and elderly participate. Also, literature suggests that when kitchens are in close proximity to the adult areas, the elderly's appetite and digestion may be aided by food aroma.

Children's Use of Space in the Adult Area

Preschool teachers are aware of, and therefore avoid "dead space" when arranging their classrooms. This is a type of open space that invites running and wrestling (Prescott, 1987). This type of behavior occurs when children are not engaged in a constructive activity, get bored, and become disorganized and wild. None of the spaces at Site A appeared to contain "dead space", but this type of behavior was observed after exercise sessions at Site B. This occurred when the children were not taken back to their room immediately after the exercise session, and they began to roll around on the floor within the circle of adult chairs. Some of the adults appeared annoyed by the children's behavior. It took a couple of minutes to get the situation under control and get the children to put their shoes on. This might have been avoided by taking the children immediately after the activity to a smaller area within the room to put on shoes.

Before the arrival of children at Site B for exercise sessions with the elderly, child-sized chairs were carefully spaced within the circle of adult chairs. Children coming into the adult area found the adults already seated and the children had their choice of chairs. Their choices were recorded to see if they would select a chair that was close to (12"-14") or far from (24") an adult chair. The first child to arrive within the circle of chairs had the broadest range of choices. In all three observations where this was noted, children having first choice selected seats having the *greatest* separation from adult chairs. The

spacing differences were only a few inches, but children were observed making deliberate choices which appeared to be based on chair spacing. Chairs were all alike and their orientation to the room varied, based on where they were placed within the circle.

For the Site B exercise sessions, other types of seating besides chairs were tried, including making squares on the floor with masking tape and using 12" x 18" rug samples between the adult chairs. The non-chair options did not work as well. Seated in chairs, children were less likely to respond to the dead space by staying seated, and appeared better able to maintain interest in the exercise activity.

4.8 Survey Results

Personal interviews with eleven adult day care subjects at the two sites resulted in only three being able to respond to all questions. The other subjects either (1) had difficulty with or were totally unable to answer questions pertaining to time, (2) did not have an opinion on some questions, or (3) didn't understand some questions. Several became restless, tired, and distracted, which suggests the survey may be too long. However, all subjects were able to answer most of the questions. At Site A, there were two male and four female respondents; at Site B, two male and three female. The following are the questions and responses:

1. *How do you feel about visiting with the children?*
 - All but one person said they liked being with the children.
 - Site B male: "I'd just as soon they didn't come."
 - Site A male: "I like it when we *do* something, not just sit and look at each other."
 - Site B female: "I like watching them walk by." (response was positive, but did not address the question of being with children.)
2. / 3. *How many children should visit each time?. Do you prefer 2-3 children, or several visiting?*
 - Participants at Site A, where larger groups (10-12) actually visit, tended to say they like larger groups of children
 - At Site B, where 2-5 children usually visit, but there is daily visual contact with large groups of children, the elderly said any size was acceptable. Two (including the male who said he would just as soon they not come) said they would prefer groups of several children.
4. *Would you rather watch or do something with the children?*
 - Site A: all adults said "do something." One female participant said "both."
 - Site B: three prefer to only watch; two prefer to do things with the children, one of whom said she always sits where she can watch them on the playground.
5. *What activities do you enjoy doing with the children?*
 - Site A: "Singing", "crafts", "I think planned activities are better working at tables. Teachers keep children under control better. Kids love to draw. Teachers make them mind." Three participants said "everything" or "anything".
 - Site B: "Show them objects and toys," "exercises." Three participants did not answer, one of whom said "I don't remember."
6. *How much time should be spent with the children when doing the following activities? (Art, exercising, informal visits, parties, programs)*
 - Participants at both sites had difficulty with this question, and several said "I don't know."
 - Site A (two responded): one male suggested 30 minutes for exercise, 30 minutes for art, and 15 minutes for parties and programs; a female suggested 15 to 30 minutes but no more."
 - Site B (one response): one male said "15 minutes" for exercise.

7. a. *Do children make noise in the building?*, b. *Does noise bother you?*, c. *Would you like the children to be quieter in the hallway?*. d. *Other comments?*

- No one at either site felt the children made too much noise or said they are bothered by their noise. Three acknowledged that the children do make noise.
- Two (one at each center) said they like hearing sounds children make, one of whom said "I like hearing the racket." Another said, "Let 'em rip."

8. *In which room would you choose to be with the children?*

- Site A: The four who answered all prefer the smaller primary area (3 liked living room, 1 liked dining room) rather than the larger secondary space (multi-purpose room).
- Site B: Two of five responded; they prefer the living room and exercise area in the primary space.
- At both sites, preferences matched the space where the most visits actually take place.

9. *How long do you like the children to stay when they visit? Four choices given, ranging from very short (15 min.), to long (45 min. to 1 hour).*

- Low response rate from all to this question.
- Site A: two people answered question. One prefers very short visits; one feels long visits are acceptable.
- Site B: Four of six responded. Three prefer short time, one said "depends on what we are doing. Sometimes we don't have enough time with the children."

10. *How do you feel about going outside on the playground?*

- Site A: Four responses were "We don't go outside," "I think we should go outside," "I have a bum knee and can't go outside. I'm afraid I'll fall. I prefer to do my walking at home," and "It would be nice." One person did not answer.
- Site B: Three said they would like to go outside, one said "no", and one did not answer.

11. *Would you like to go outside when the children are there?*

- At both sites there was an almost equal amount of yes and no responses.
- Those saying "no" felt the children are too rowdy.

12. *Have you ever been concerned that a child would accidentally hurt you or make you fall? If so, how do you protect yourself?*

- All answered "no," and did not elaborate.

13. *Would you be just as happy in a place where there are no children?*

- Site A: All said they would not be as happy.
- Site B: All but one said they would not be as happy.

14. *Other comments (unsolicited responses):*

- Site B participant said she recognizes particular children on the playground.
- Site B male said he doesn't look out (windows) much, but likes to watch children on the playground.
- Another Site B male: "the children show off sometimes. I don't like that."
- Site A Female: "I didn't have children of my own. It was a disappointment. I love children."

CHAPTER 5. CONCLUSION

5.1 Discussion

The two churches in this study demonstrate different approaches to adaptation of space for intergenerational day care, and each appears to have both positive and negative design elements. By examining the elements of the sites, assessing the impact of these elements upon participants, and relating this information to day care design literature, conclusions can be drawn concerning adapting space for intergenerational day care in churches. These conclusions are listed in this chapter as design recommendations.

Child and elderly day care participants appear to have many shared needs. For example, it is important for both young and elderly that day care centers be home-like, rather than institutional. An institutional setting is characterized by sensorial blandness and offers little opportunity for making choices. Both generations approach their surroundings in a multi-sensory way: children tend to employ all their senses as they explore their world, while elderly tend to make greater use of certain sensory channels when other channels become less effective for gaining information. Such qualities as good acoustics and stimulating textures, smells, and views are important to day care participants of all ages. A day care center is, above all, a home-away-from-home and should be physically comfortable and psychologically comforting.

5.2 Design Recommendations

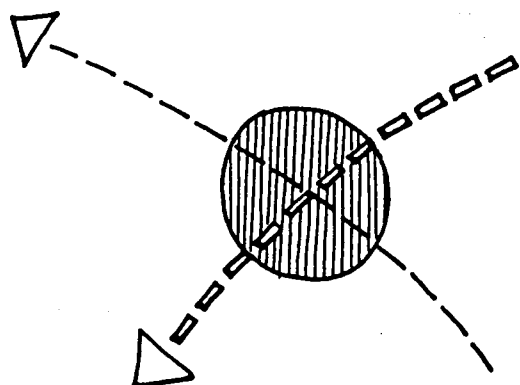
1. Location of child and adult areas:

One of the first decisions to be made when adapting space within a church for intergenerational day care is the location of the child and adult areas. The two study sites, like the Stride Rite Center cited in the literature, provide separation between adult and child areas to ensure privacy and quiet for both groups. Because the distance between the adult and child areas at the two study sites is so similar, the effects of distance between adult and child areas could not be compared. However, elderly participants at both sites indicate that they are not bothered by noise made by children outside the adult program area, and that in many cases they even enjoy hearing the sounds of children. Therefore, it seems feasible that both areas could be located in a single wing or area of a building, and would not necessarily require the level of separation used at the two study sites.

2. Circulation Patterns:

This study showed the importance of creating circulation patterns that provide opportunities for spontaneous intergenerational contact. The value of spontaneous as compared to planned interaction is in providing both elderly and young participants with a choice and sense of control. This is particularly important for the elderly who may feel an increasing lack of freedom and control over their lives. Each participant can choose to interact at whatever level they

desire. The key to promoting spontaneous interaction appears to be *circulation patterns that allow young and elderly participants' paths to cross on a frequent basis*. Social intersections created by circulation patterns are important in providing social opportunities, sensory stimulation, and in motivating the elderly to move around in the space. Elderly participants do not want to be isolated in a remote wing of a building, but prefer to be where they can see and hear the activities of others.



INTERSECTING PATHWAYS:
INCREASED SENSORY STIMULATION
AND SOCIAL OPPORTUNITY

Site B created social intersections by bringing the children past the entrance to the adult day care area. This was especially effective due to the interior window that allows the elderly to watch, as well as hear, the children as they pass in the hallway. The elderly have the choice of watching or going into the hall for closer contact with the children, and they expressed pleasure with this arrangement.

3. Shared Intergenerational Entry:

Having a shared entry into the building does not appear to encourage intergenerational interaction. However, it is possible that an inviting and personalized entry space, with comfortable seating, might encourage people to spend more time in the space. Locating an adult day care space close to the entry foyer would be a way to give the elderly more stimulation and social opportunities

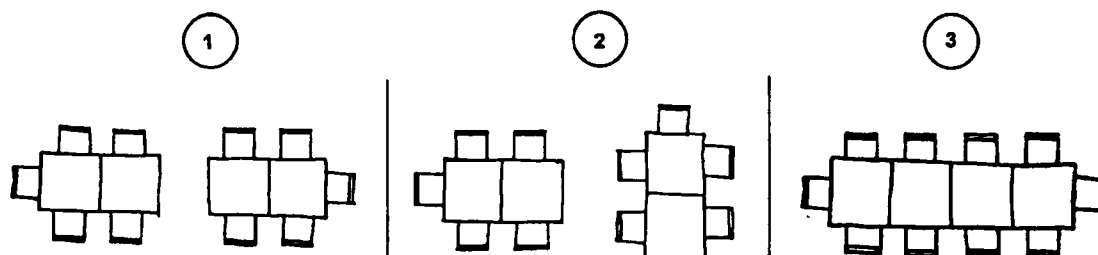
4. Spatial Arrangement of Adult Program Area:

The two study sites are very similar in total square footage and in the size of living and dining areas. However, Site A has individual rooms while Site B uses a single open space with areas defined by furniture arrangement. It seems possible that both approaches can provide a supportive environment for elderly participants, although each has advantages and disadvantages.

The advantage of Site A's approach is that the spaces seem more home-like and cozy and the acoustics of the smaller spaces is better. The disadvantage is that the space lacks flexibility. There is little opportunity to rearrange furniture to accommodate different types of activities, and participants have few choices in terms of seating and movement within the space.

The advantage of Site B's single open space is visibility and flexibility. Here, the participants can see everything that goes on in the program space and appear to feel freer, or are perhaps more motivated, to move around. Furniture is

often rearranged to accommodate particular activities, and there is room for an exercise area. Imperative to the success of an open-spaced arrangement is that the furniture be arranged to give a definite sense of individual spaces within the larger room. This allows an arrangement of functional spaces such as living and dining areas that resembles those found in homes. Furniture can be used as “walls” (a table placed behind a sofa, shelving units, or the backs of recliners), providing a sense of separation. Establishing a static location for the main areas (living and dining) may be beneficial to cognitively impaired individuals. However, small adjustments in furniture arrangements made for particular activities appears to be accepted by participants and may even be stimulating. For example, at Site B, the configuration of the 36” dining tables was changed several times during the study. The staff reported that arrangements 1 and 2 appear to promote more conversation among participants at mealtime than does arrangement 3. Arrangement 3 is preferred by staff for group art and cooking activities.



5. Adult Day Care Room Sizes:

At both study sites, observations suggest that the amount of touching between the young and elderly during planned intergenerational activities is influenced by the room size, although other factors such as density of objects and people may be critical. Looking at space size alone, more touching takes place in the smaller of two rooms at both sites, and more touching takes place at Site A, where the spaces are smaller scaled than at Site B.

The elderly at Site A, which plans more frequent activities involving a large number of children, don't get to know individual children as well as the elderly at Site B, where the group of children is smaller and the same children come each time. The greater warmth and physical affection between elderly and children seen at Site A suggests that the physical space may be exerting a greater influence than frequency of intergenerational visits and level of opportunity for elderly to develop an acquaintance with individual children.

In studying institutionalized elderly, DeLong (1970) found that smaller, cluttered spaces were preferred by the elderly, while large, open spaces were disliked. He suggests that smaller spaces are better suited to using peripheral vision, which tends to remain keener than foveal vision as people age, and a small room more readily accommodates use of tactile perception, which becomes more important as visual and auditory abilities diminish. The elderly

also prefer the acoustic qualities of a small room rather than a large room, a preference which is shared by young children (Nabelek, 1982).

The least amount of touching behaviors between the young and elderly were observed in the primary area at Site B, which is a large, open space with a high ceiling. Alexander, Ishikawa, and Silverstein (1977) suggest that ceiling height influences social interaction. They theorize that a high ceiling makes people feel farther apart than they actually are. Since it is believed that the elderly's social distances are closer together than younger adult's (DeLong, 1970), then the combination of large, open space and high ceiling creates an unsuitable space for elderly people. This type of space should be avoided when selecting a space for the adult day care program. If it must be used, the ceiling height should be altered. Lowering a part of Site B's primary area ceiling would change the scale of the space, improve the acoustics, and make the space feel more home-like and intimate (Figures 18 & 19). Cantacuzino (1989) suggests using a suspended ceiling when bringing down the height of a space.

6. Privacy for Elderly Participants:

DeLong (1970) explains the importance of providing spaces for institutionalized elderly that will support various levels of social involvement. He identifies three types of spaces (Private, Semi-private: Semi-social, and Public). DeLong found that the elderly must perceive that all three types of spaces exist, or the functions of the spaces will change. For example, in the absence of a

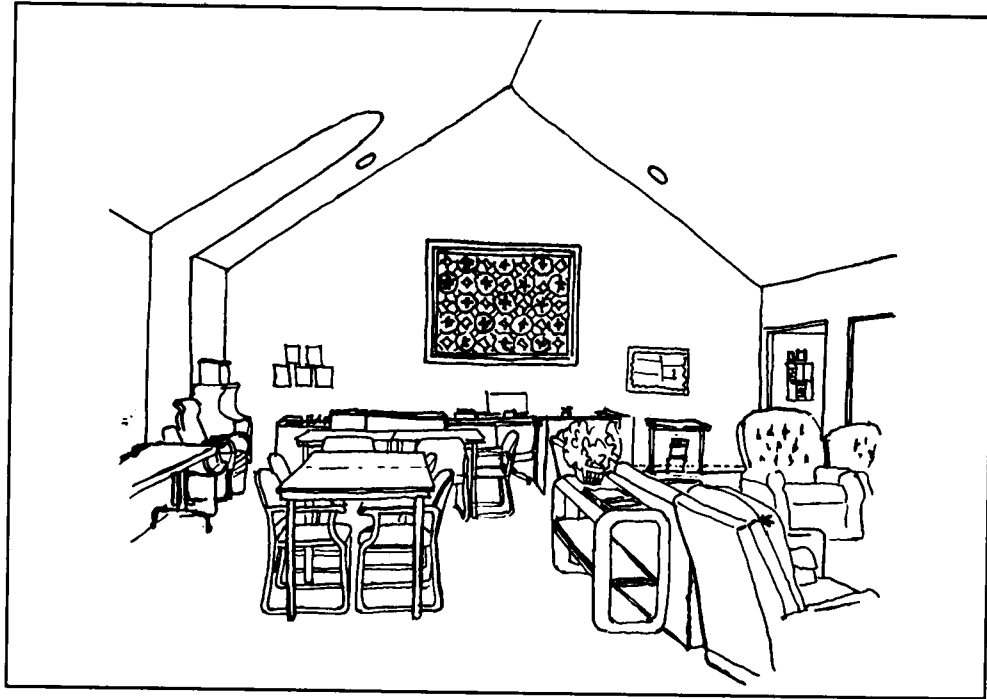


Figure 18. Site B primary space: current ceiling height.

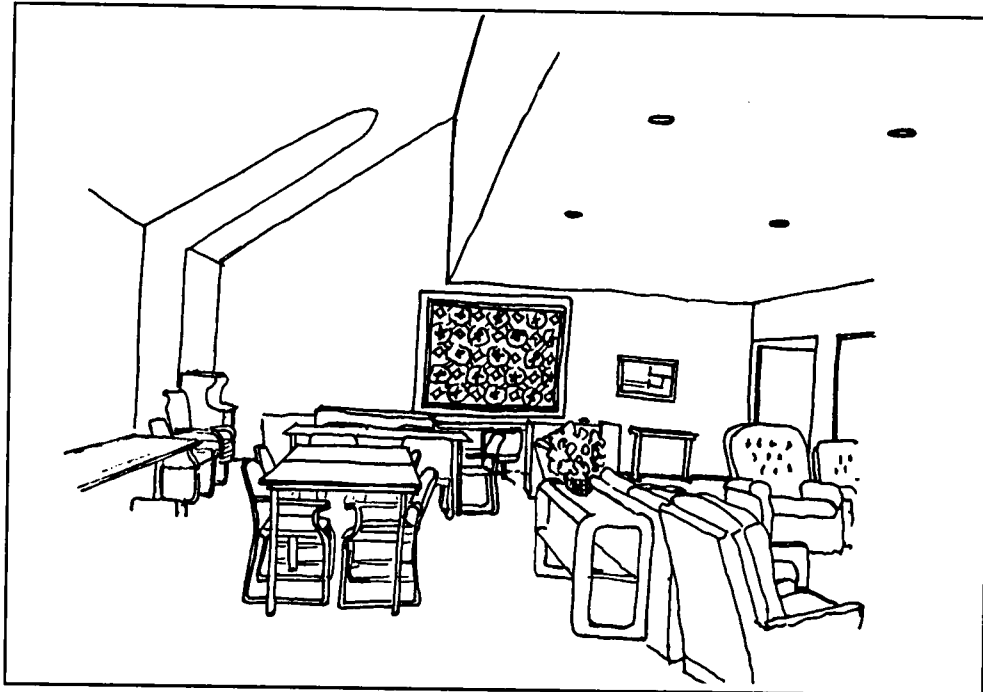


Figure 19. Site B with lowered ceiling.

private space, the elderly may isolate themselves and aggressively defend a personal territory within a public space, such as a corridor, while elderly provided with a private space tend to be more social and less territorial.

The privacy needs of elderly who live in residential care facilities may differ from adults who spend several hours in a day care center and then go home. However, privacy is a basic need for all people and it must be addressed in adult day care centers. If DeLong's spatial-behavior concept is applied to an adult day care setting, the living/dining areas, where the elderly spend most of their time, could be classified as social areas (Semi-private: Semi-social) and the hallways as public areas. Neither of the study sites offers a private area. It is possible that the addition of a small seating area away from the main living area would provide privacy and a choice of participation levels. This is especially needed at site A, where there is no escape from being with the group and having to participate in all activities. A small adjoining space, visible to the larger space, would provide this without completely isolating a participant from the group.

At Site B, participants can move to another part of the room when seeking privacy, but aside from the living room, there is no comfortable place to sit and read or be alone. Figures 20 and 21 show how adjoining spaces could be used to provide a small "break-away" seating area. At Site B, this area also capitalizes on an excellent view of the city.

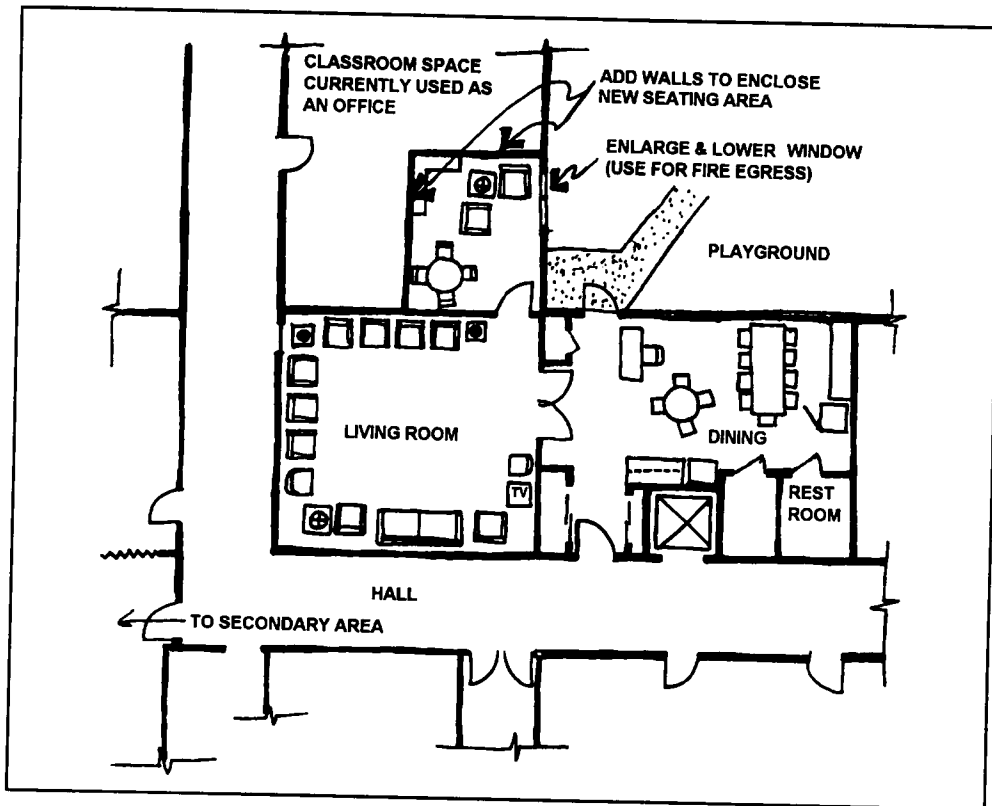


Figure 20. Adapting Site A to add privacy.

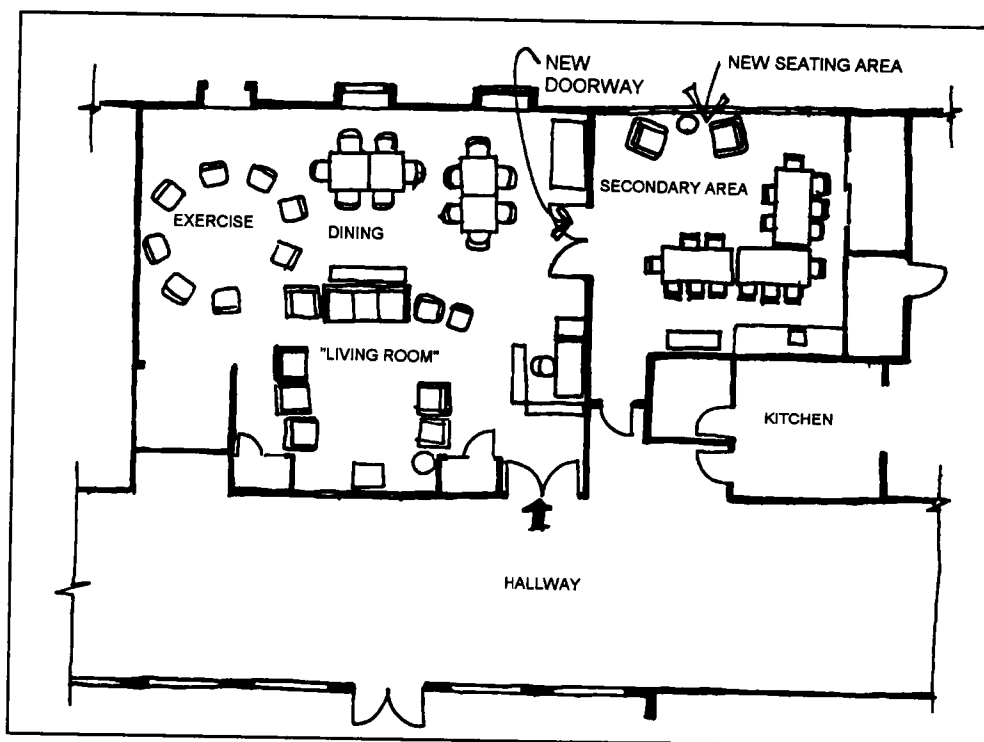


Figure 21. Adapting Site B to add privacy.

7. Hallway Design:

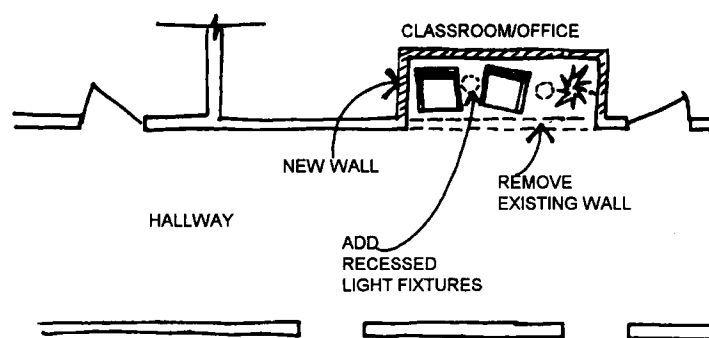
Hallways are important spaces in an intergenerational day care center because the elderly use them for exercise and because they are potential intergenerational social spaces. This suggests that churches need to view hallways as extensions of the actual program spaces, and can meet participant's needs by modifying long, monotonous hallways to make them more inviting and functional.

Visually and cognitively impaired elderly require a contrast in value between the color of the floor and walls. For these elderly, walking in hallways with low contrast between walls and floors may be difficult because they may not be able to distinguish between the wall and floor planes. This problem can be addressed inexpensively by adding a contrasting baseboard when painting walls or changing flooring material is not feasible. Ideally, if the walls are pale, then the flooring should be a medium value.

Way finding cues in hallways are helpful to cognitively impaired adults (Koff, 1988). Changes in color, texture, and decorative features of the walls can act as way finding cues. Hiatt (1980d), explaining the importance of providing for way finding, states that the fear of getting lost is one of the causes of inactivity in the elderly. She suggests that an interesting and varied environment is needed, rather than one system of landmarks or cues. For financial reasons, churches may be limited to non-structural modifications in hallways. The hallway at Site A

could be made more interesting by varying the lighting, adding a waist-high wall trim or handrail with a textured wall covering above the rail, and painting the door frames different colors. Site A's hallway contains uncomfortable church pews in which no one sits. These could be replaced by chairs or two-person benches with sturdy arms and padded seats. The water fountains could be painted a bright, non-institutional color.

Placement of objects such as seating and display units in hallways is determined by fire code and corridor width. Where furniture cannot be placed in hallways, it may be worthwhile to break the monotony of long hallways by creating recessed areas (niches) for display units and seating. A niche can be built by moving a small portion of the hallway wall into an adjoining space. A niche can be built by moving a small portion of the hallway wall into an adjoining space.



8. Kitchen Location:

Locating the day care programs near a kitchen is desirable. Both child and adult groups enjoy cooking activities, and convenient access to the kitchen makes it easier for the staff to plan and conduct these activities. For example,

cookies made in the adult or child program area have to be taken to the kitchen to bake. Having the kitchen near the program areas also allows participants to enjoy the cooking aromas, which is especially helpful in enhancing the elderly's appetite.

9. Lighting:

Churches will probably need to make changes in lighting of spaces to be used by the elderly. These changes will have to be carefully planned to meet the elderly's need for a higher level of task lighting while considering their greater susceptibility to glare.

If there are existing recessed or ceiling-mounted fluorescent fixtures, these could be used, but should be retrofitted with deluxe warm white fluorescent lamps. This type of lamp has a tri-phosphorous coating and produces a warm, broad spectrum light preferred by elderly. It also renders colors better than the daylight fluorescent lamps commonly used in fluorescent fixtures of large facilities. To avoid causing direct glare, these lamps should not be too bright. Then, to provide for the higher level of illumination needed for performing tasks such as reading and crafts, recessed incandescent fixtures on a dimmer can be added to supplement the fluorescent lighting. A dimmer switch for the recessed incandescent fixtures provides a means of changing the lighting levels to accommodate a variety of activities, including resting.

Table lamps make a room seem warmer and more home-like, and should be a part of the lighting plan. Lamps that switch on by simply touching the base of the lamp would be easy for the elderly to control.

Sunlight must be controlled with window shades, blinds, or draperies to eliminate glare and unwanted heat. Table tops that have a matte finish and a medium color value reduce the possibility of reflected glare.

10. View:

Literature points out the value of providing a view of the natural world for people of all ages and stresses the importance of views for the elderly. Sitting and looking out a window appears to be a satisfying activity for the elderly, and may be helpful in decreasing agitation in cognitively impaired elderly. In selecting space for day care, churches should consider the need to provide an interesting view of both natural surroundings and people. Churches may need to consider enlarging a window or group of windows in order to provide a view. For example, enlarging the high windows at Site A would provide a seated view of the playground from the dining room (Figure 15).

11. View and Adult Area Entry:

An interior window, such as the one at Site B, is an effective way to provide a stimulating view for participants (Figure 3). This window appears to provide a focal point for participants seated in the living area. The living area at Site A has no windows, which results in the room's doorway opening becoming

the "view" for adults seated in this space. This appears to increase the amount of attention given to people entering and leaving the space, and which in turn may reduce the amount of privacy enjoyed by the participants.

The location of the entryway to the adult space at Site B (Figure 10) allows a person to enter the room and be less noticed than in the Site A entry (Figure 8). Because Site B's entryway is set aside yet visible from the living area, participants appear to be less vigilant about people coming and going through the doorway. Although the living room is arranged within a large open-spaced room, it seems to provide a sense of privacy and security for the adult participants.

12. Acoustics:

Both young children and elderly adults are more affected by noise than other age groups. Background noise interferes with young and elderly day care participant's ability to understand voices and may be distracting and stressful.

Adaptations to improve the acoustics of church spaces used for day care are particularly needed in large rooms and rooms with many hard surfaces. This can be accomplished by adding sound-absorbing materials such as acoustic wall covering, carpeting for floors, fabric wall hangings, and fabric window coverings. For wall coverings, acoustic wall fabric or wall carpet can be applied. Regular floor carpeting should not be used on walls, as it will not meet fire codes.

Carpeting for floors should be installed; loose carpeting or throw rugs present a tripping hazard.

Literature suggests that soft background music may interfere with the elderly's ability to hear conversations. The staff at Site B uses background music as a way of coping with their large, open space. They feel the music helps, in a sense, to fill the space and make it feel less dead. Lowering the ceiling in a portion of this space, as suggested previously, would improve the acoustics of the space. If a ceiling cannot be lowered, Koff (1988) suggests hanging decorative acoustic baffles from a high ceiling to reduce reverberation.

13. Safety:

Although no accidents were observed during the study as a result of active children and frail elderly being together, safety is a concern. The survey, observations, and discussions with staff indicate that the elderly are not generally aware of safety hazards or their own physical limitations. Therefore, safety must be considered in planning, arranging, and conducting the adult day care program.

Having the elderly seated before children arrive for visits seems to be a good practice. At Site B, where children participate in exercise sessions with the elderly, having a child-sized chair in place for each arriving child appeared to help children understand that they were to sit in one place rather than run around. When the exercise sessions ended, the "dead space" formed by the

large circle of chairs was an irresistible invitation for some of the children to wrestle on the floor. This behavior was annoying and potentially dangerous. Keeping the visits short (about 15 to 20 minutes) helped to eliminate this problem.

Although hand rails are not used at either of the study sites, hand rails on hallway walls might enhance the elderly's safety, especially when hallways are shared by elderly and young children. Handrails should be mounted at three feet, six inches for ambulant users and should be flat on top for resting the forearm, and have finger recesses on the sides and be narrow enough to be gripped (Koff, 1988). Tsomides (1990) recommends that handrails be 1.5 inches in diameter with a 2 inch hand clearance between wall and rail.

14. Intergenerational Props

Some of the most successful intergenerational sessions observed during this study involved the use of props. For example, at Site A adult day care staff invited the children to visit and bring a teddy bear. The children introduced their bears to the elderly, creating a tactile and verbal experience enjoyed by both generations. At Site B, a memorable experience was a doll show presented by a staff member to the female child and adult participants. Participants sat at a table (children and adults were alternated) and were able to handle each doll as it was shown.

Using props such toys or art materials with which both generations are familiar and find meaningful seems to be an especially good way to help participants relax and communicate with one another. This idea could be extended to keeping some special toys in the adult center, or making a scrapbook or bulletin board with children's photographs and art work to welcome visiting children.

5.3 Implications for Further Study

The question of proximity between the child and adult areas in intergenerational programs needs to be examined further. Future studies might examine other programs where child and adult areas are adjacent to each other, and where there are provisions for more spontaneous interaction between the generations, to see how participants feel about this arrangement. How successful is the use of a common space for children and elderly? Should child-sized furniture be used in a common area, or should children be expected to adapt to adult furniture as they do at home?

Planning of outdoor areas for the elderly in day care programs needs to be addressed. This study supports findings in the literature that elderly in day care programs and other institutional facilities have few opportunities for outdoor exercise. Survey results from this study indicate that most elderly are interested in going outside, but many are resigned to not going outside, or have some fears about going outside. Literature indicates that it would be feasible to plan an

outdoor area that would serve as both playground for children and an outdoor area for adults, although the two groups might not use this area at the same time. There are common elements, such as looped pathways, recommended for outdoor areas for both children and elderly adults. At both study sites, the adult day care center is well-located for easy access to the outdoor area. This should be a consideration in planning adult day care in churches.

This study raised the question of how many children should ideally visit the elderly in an intergenerational day care program. At both sites, elderly who were surveyed tended to say they prefer the number of children who actually visit in their program. The general impression from this study is that the larger groups (8 to 12) which typically visit at Site A, worked best because they provided greater opportunity for the adults to have one-on-one conversations with children. When smaller groups of children visit there is a tendency for the children to be on display and the center of attention, rather than the children having satisfying interaction with the elderly. It might be helpful to study and compare the effect of different sizes of child groups on intergenerational interaction at other centers so spaces could be planned and arranged to accommodate the child group size that seems most effective.

Other areas that require further study involve crowding, personal space and room size in intergenerational day care. Literature indicates that we still know little about crowding and whether crowding is caused by the number of people in a space ("social crowding"), or the size of the space ("spatial

crowding") (McClelland, 1982). While McClelland believes that it is the number of people in a given space that causes feelings of crowding under normal conditions, it may be that the elderly are more affected by room size, or "spatial density", where there is less space for a given amount of people. Future research is needed to determine the size of rooms that best promote interaction between children and elderly, and the type of spacing both adults and children prefer when interacting.

Research should also examine how differences in populations of elderly and children may affect intergenerational social interaction. For example, do people in an urban setting interact differently than those from a rural setting? Do children who participate in a full-day program interact differently with the elderly than children who are in a part-day (nursery school) program?

In conclusion, further study of settings used by the elderly and young children is important because these groups are the least able to change or control their environment, but are the most affected by them. The elderly may quietly accept negative aspects of their environment because they don't want to appear complaining, or because they prefer not to acknowledge or call attention to their physical impairments. Because the elderly and children may be unaware of their own needs, or unable to verbalize them, researchers must study care settings and develop strategies for providing environments that are physically and psychologically supportive.

LIST OF REFERENCES

LIST OF REFERENCES

- AIA (American Institute of Architects) Press (1985). Design for aging: An architect's guide. Washington D.C.: The AIA Press.
- Alexander, Christopher, Ishikawa, Sara, & Silverstein, Murray (1977). A pattern language. New York: Oxford University Press.
- Allan, John (1992) Footballers and toddlers under one roof. The Architect's Journal, 196(14), 44-49.
- Altman, Irwin & Christensen, Kathleen (Eds.) (1990). Environment and behavior studies: Emergence of intellectual traditions. Human Behavior and Environment; Advances in Theory and Research, Vol. 11. New York: Plenum Press.
- Barker, Roger G. & Wright, Herbert F. (1955). Midwest and its children. Evanston, Ill.: Row, Peterson and Company.
- Barker, Roger G. (1968). Ecological psychology. Palo Alto, CA: Stanford University Press.
- Bechtel, Robert B. (1977). Enclosing behavior. Environmental Research and Development Foundation, Tucson, Arizona. Stroudsburg, PA: Dowden, Hutchinson & Ross.
- Belle, Deborah (Ed.) (1989). Children's social networks and social supports. N.Y.: John Wiley & Sons.
- Birren, J.E. & Schaie, K.W. (Eds.) (1977). Handbook of the psychology of aging. New York: Van Nostrand Reinhold.
- Black, John W. (1950). The effect of room characteristics upon vocal intensity and rate. Journal of the Acoustical Society of America, 22, March, 174-176. In E.T. Hall, The hidden dimension, 44. Garden City, New York: Doubleday & Company, Inc., 44.
- Bower, T. G. R. (1977). The perceptual world of the child. Cambridge: Harvard University Press.

- Brody, E. M., Saperstein, A. R., & Lawton, M. P. (1989). A multi-service respite program for caregivers of Alzheimer's patients. Journal of Gerontological Social Work, 14(1/2), 41.
- Brown, Catherine Caldwell (Ed.) (1984). The many facets of touch. Chaired by Kathryn F. Bernard & T. Berry Brazelton. Johnson & Johnson Baby Products Company pediatric round table series; 10.
- Calkins, Margaret P. (1988). Design for dementia: Planning environments for the elderly and confused. Owings Mills, MD: National Health Publishing.
- Cantacuzino, Sherban (1989). Re-architecture. New York: Abbeville Press.
- Christenson, Margaret A. & Taira, Ellen (Ed.) (1990). Aging in the designed environment. Binghamton, NY: The Haworth Press.
- Clarke-Stewart, Alison (1993). Daycare (rev. ed.). Cambridge: Harvard University Press.
- Clowney, Paul & Clowney, Tessa (1982). Exploring churches. Grand Rapids: William B. Eerdmans Publishing Company.
- Colavita, Francis B. (1978). Sensory changes in the elderly. Springfield, Ill: Charles C. Thomas.
- Corso, John F. (1977). Auditory Perception and Communication. In J. E. Birren & K.W. Schaie (Eds.), Handbook of the psychology of aging (pp. 535-553). New York: Van Nostrand Reinhold.
- Creedon, M. (1988). The corporate response to the working caregiver. Aging, 358, 16-19.
- Davidson, Judith (1991). Lighting for the aging eye. Interior Design, February, 134-135.
- Deasy, C. M. & Lasswell, T. E. (1990). Designing places for people: A handbook on human behavior for architects, designers, and facility managers. New York: Whitney Library of Design.
- DeLong, Alton J. (1970). The micro-spatial structure of the older person: Some implications of planning the social and spatial environment. In L.A. Pastalan & D. H. Carson (Ed.), Spatial behavior of older people (pp. 68-87). Ann Arbor:

The University of Michigan and Wayne State University, Institute of Gerontology.

Dworetzky, John (1990). Introduction to child development. (rev. ed.) St. Paul, MN: West Publishing Co.

Edmondson, Brad (1990). Where's the day care? American Demographics, 12(7), July, 17-19.

Egan, M. David (1990). Concepts in architectural lighting. New York: McGraw-Hill, Inc.

Engen, Trygg (1991). Odor sensation and memory. New York: Praeger Publishers.

Faloner, Judith (1986). Aging and hearing. Physical and Occupational Therapy in Geriatrics, 4(2), Winter 1985/86, 3-20.

Fanslow, Cathleen A. (1987). Touch and the elderly. In Catherine Caldwell Brown (Ed.), The many facets of touch. Johnson & Johnson Baby Products Company pediatric round table series; 10.

Fozard, James L. (1981). Person-environment relationships in adulthood: Implications for human factors engineering. Human Factors, 23(1), 7-27.

Fozard, J. & Popkins, S. (1978). Optimizing adult development: ends and means of an applied psychology of aging. American Psychologist, 33, 975-989.

Friedman, Arnold; Pile, John F., & Wilson, Forrest (1982). Interior design. (rev. ed.) New York: Elsevier Publishing Co.

Garahan, M. B., Waller, J. A., Houghton, M., Tisdale, W. A., & Runge (1992). Hearing loss prevalence and management in nursing home residents. Journal of the American Geriatrics Society, 40(2), Feb., 130-134.

Garbarino, James (1992). Children and families in the social environment. (rev. ed.) New York: Walter de Gruyter, Inc.

Generations Together (1992). Ongoing programs. Generations Together Exchange. Pittsburgh: University of Pittsburgh's Center for Social and Urban Research, Issue 7, Winter, 6.

- Gibson, E. J., & Spelke, E. S. (1983). The development of perception. In J.H. Flavell & E.M. Markman (Eds.), Handbook of child psychology: Vol 3, Cognitive development (pp. 1-96). New York: Wiley.
- Gorfkle, Rosalie A. (1982). A new concept for a neighborhood house. Interior Design Educator's Council Journal of Interior Design Education and Research, 8(2), 33-37.
- Gunby, Phil (1993). Adult day centers vital, many more needed. JAMA, The Journal of the American Medical Association, 269(18), 23.
- Guttman, Rosalie A. (1991). Adult day care for alzheimer's patients: Impact on family caregivers. New York: Garland Publishing.
- Hall, Edward T. (1966). The hidden dimension. (1969 ed.) Garden City, NY: Anchor Books.
- Hall, Edward T. (1970). Introduction, In L. A. Pastalan & D. H. Carson (Eds.), Spatial behavior of older people. Ann Arbor: The University of Michigan and Wayne State University, Institute of Gerontology.
- Heller, Morton A. & Schiff, William (Eds.) (1991). Psychology of touch. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Inc.
- Hiatt, Lorraine G. (1978). Architecture for the aged: design for living. Inland Architect, Nov./Dec., 6-18.
- Hiatt, Lorraine G. (1980a). Touchy about touching? Nursing Homes, Nov./Dec., 42-46.
- Hiatt, Lorraine G. (1980b). Is poor light dimming the sight of nursing home patients? Nursing Homes, Sept./Oct., 32-41.
- Hiatt, Lorraine G. (1980c). Moving outside and making it a meaningful experience. Nursing Homes, May/June, 34-39.
- Hiatt, Lorraine G (1980d). Disorientation is more than a state of mind. Nursing Homes, 29(4), 30-36.
- Hiatt, Lorraine G. (1982). The importance of the physical environment. Nursing Homes, 31(4), Sept./Oct., 2-10.

- Hiatt, Lorraine G. (1991). Nursing home renovation designed for reform. Boston: Butterworth Architecture.
- Hickey, T. & Kalish, R. (1968). Young people's perceptions of adults. Journal of Gerontology, 23, 215-220.
- Howell, Sandra C. (1980). Designing for aging: Patterns of use. Cambridge: The MIT Press.
- Hughes, Philip C. & Neer, Robert M. (1981). Lighting for the elderly: A psychobiological approach to lighting. Human Factors, 23(1), 65-85.
- Ittelson, W. H., Rivlin, L. G., & Proshansky, H. M. (1970). The use of behavior maps in environmental psychology. In H. M. Proshansky, W. H. Ittelson, & L. G. Rivlin (Eds.), Environmental psychology: Man and his physical setting (pp. 658-668) New York: Holt, Rinehart & Winston.
- Jansen, H. W. (1986). History of art (rev. ed.). New York: Harry N. Abrams.
- Kalicki, Anne C. (1987). Confronting Alzheimer's disease. Owings Mills, MD: Rynd Communications and American Association of Homes for the Aging.
- Kantrowitz, B. & Picker, L. (1990). Day care: Bridging the generation gap. Newsweek, July 16, 52.
- Kaplan, Stephen & Kaplan, Rachel (1982). Humanscape: Environments for people. Ann Arbor, MI: Ulrich's Books.
- Kaufman, (Ed.) (1981) IES lighting handbook, application volume. In Egan (1990), Concepts in Architectural Lighting (pp.122-123). New York: McGraw-Hill, Inc.
- Kaye, L. W. & Kirwin, P. M. (1990). Adult day care services for the elderly and their families: Lessons from the Pennsylvania experience. Journal of Gerontological Social Work, 15(3/4), 167-183.
- Kocarnik, R., & Ponzetti, J. (1991). The advantages and challenges of intergenerational programs in long term care facilities. Journal of Gerontological Social Work, 16(1-2), 97, 107.
- Kolanowski, Ann M. (1990). Restlessness in the elderly; the effect of artificial lighting. Nursing Research, 39(3), May-June 1990, 181-183.

- Koff, Theodore (1988). New approaches to health care for an aging population. San Fransisco: Jossey-Bass Inc.
- Kritchevsky, S. & Prescott, Elizabeth (1977). Planning environments for young children: Outdoor space. Washington, D.C.: National Association for the Education of Young Children.
- Lambert, D., Dellman-Jenkins, M., Fruit, D. (1990). Planning for contact between the generations: An affective approach. The Gerontologist, 30(4), 553-556.
- Lawrence, Marion (1911). Housing the Sunday school. Boston: The Pilgrim Press.
- Lawton, M. Powell (1970). Ecology and aging. In Leon A. Pastalan and Daniel H. Carson (Eds.), Spatial behavior in older people (pp.41- 68), Ann Arbor: The University of Michigan.
- Lawton, M. P. & Nahemow, L. (1977). Ecology and the aging proces. In M. P. Lawton and C. Eisdorfer (Eds.), The psychology of adult development and aging (pp. 619-674). Washington, D.C.: American Psychological Association.
- Leeper, S. H., Dales, R. J., Skipper, D. S., & Witherspoon, R. L. (1968). Good schools for young children: A guide for working with three-, four-, and five-year-old children (second edition). London: The Macmillan Company,
- Lindeman, D., Downing, R., Corby, N., & Sanborn, B. (1991). Alzheimer's day care: A basic guide. New York: Hemisphere Publishing.
- Ludke, M. (1990). Getting young and old together. Time, April 16, 64.
- Mace, Nancy L. & Rabins, Peter V. (1991). The 36-hour day. Baltimore: The Johns Hopkins Press.
- Maas, Henry S. (1989). People and contexts: Social development from birth to old age. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Markson, E. (1980). Institutionalization: Sin, cure, or sinecure for the impaired elderly. In E. Markson & G. Batra (Eds.). Public policies for an aging population. Lexington, MA: Lexington Books.
- Mayer, Barbara (1993). Mind, not body, can tune out noise. AP special features. The Knoxville News Sentinel, Feb. 11, B2.

- McClelland, Lou (1982). Crowding and territoriality. In S. Kaplan & R. Kaplan (1982), Humanscape: Environments for people (pp. 202-224). Ann Arbor, MI: Ulrich's Books.
- Mills, Edward D. (1956). The modern church. New York: Frederick A. Praeger.
- Moore, Gary (1987). The physical environment and cognitive development in child care centers. In Carol Simon Weinstein and Thomas G. David (Eds.), Spaces for children: The built environment and child development (pp. 41-71). New York: Plenum Press.
- Murtaugh, William J. (1988). The history and theory of preservation in America. Pittstown, NJ: The Main Street Press.
- Nabelek, Anna K. (1983). Noise as a public health problem. Proceedings of the Fourth International Congress, 1, 501-511, Giovanni Rossi, M.D. (Ed.).
- Nabelek, A. K. & Robinson, P. K. (1982). Monaural and binaural speech perception in reverberation for listeners of various ages. Journal of Acoustical Society of America, 71, 1242-1248.
- Nabelek, Anna K. & Tucker, Frances K. (1991). Toleration of background noise: Relationship with patterns of hearing aid use by elderly persons. Journal of Speech and Hearing Research, 34, June, 679-685.
- NASUA, National Association of State Units on Aging (1984). Intergenerational programs: a synthesis of findings, research, and demonstration projects. Washington, D. C.: NASUA. Administration on Aging grant no. 90-AM-0057.
- O'Connor, Brian P., Davidson, Heather, & Gifford, Robert (1991). Window view, social exposure and nursing home adaptation. Canadian Journal on Aging, 19(3), Fall, 216-223.
- Ohnsorg, D. W. (1981). Burgeoning day care movement prolongs independent living. Perspective on Aging, X(1), 18-20.
- Pegels, C. (1988). Health care and the older citizen: Economic, demographic, and financial aspects. Rockville, MD: Aspen Publishers, Inc.
- Persily, N.(Ed.)(1991). Eldercare: Positioning your hospital for the future. American Hospital Publishing, Inc.

- Prescott, Elizabeth (1987). Environment as organizer in child-care settings. In Carol Simon Weinstein and Thomas G. David (Eds.), Spaces for children: The built environment and child development (pp. 41-71). New York: Plenum Press.
- Proshansky, Harold M. (1990). The pursuit of understanding: An intellectual history. In I. Altman & K. Christensen (Eds.), Environment and behavior studies: Emergence of intellectual traditions (pp. 9-29). New York: City University of New York.
- Randall, Pricilla, Burkhardt, Sandra, & Kutcher, Joan (1990). Exterior space for patients with Alzheimer's disease and related disorders. The American Journal of Alzheimer's Care and Related Disorders & Research, July/August, 31- 37.
- Rebok, George W. (1987). Life-span cognitive development. New York: Rinehart and Winston.
- Reifler, Burton V. (1992). Making something good out of something bad. Respite Report, Spring, 3.
- Rivlin, L. & Wolfe, M. (1985). Institutional settings in children's lives. New York: John Wiley & Sons.
- Rivlin, Robert & Gravelle, Karen (1984). Deciphering the senses: The expanding world of human perception. New York: Simon and Schuster.
- Rutledge, J. Page (1987). Lighting as an environmental tool for the elderly. Contemporary LTC, August, 42-44.
- Saarinen, Thomas F. (1976). Environmental planning: Perception and behavior. Prospect Heights, Ill: Waveland Press.
- Seefeldt, C., Jantz, R., Galper, A., Serock, K. (1977). Using pictures to explore children's attitudes toward the elderly. The Gerontologist, 17(6), 506-512.
- Seefeldt, C. (1982). How elders view children. Children Today, 11(2), 16-21.
- Seefeldt, C. (1987). The effects of preschoolers' visits to a nursing home. The Gerontologist, 27(2), 228-232.
- Sekuler, Robert & Blake, Randolph (1987). Sensory underload. Psychology Today, Dec., 48-53.

- Shaw, Leland (1987). Designing playgrounds for able and disabled children. In C. Weinstein & Thomas G. David (eds.) Spaces for children: The built environment and child development (pp. 309-318). New York, Plenum Press.
- Sheppard, H.L.(1990). Damaging stereotypes about aging are taking hold: How to counter them? Perspective on Aging, Jan./Feb., 4-8.
- Sherr, L. (1989). Balancing the responsibilities of worklife and family life. Perspective on Aging, XVIII(6), 16-18.
- Shopsin, William C. (1989) Restoring old buildings for contemporary uses. New York: Whitney Library of Design.
- Smart, M. S. & Smart, R. C. (1967). Children: Development and relationships. New York: The Macmillan Company.
- Stassen, M. & Holahan, J. (1981). Long-term care demonstration projects: A review of recent evaluations. Washington, D. C.: The Urban Institute, 230.
- Szasz, Suzanne (1978). The body language of children. New York: Norton.
- Tralle, H. E. & Merrill, G.E. (1921), Planning church buildings. Philadelphia: The Judson Press.
- Tsomides, Constantine L. (1990). Facility design with the elderly in mind. Journal of Ambulatory Care Management, 13(2), 59-67.
- U.S. Dept. of Commerce, Bureau of the Census, (1988). "Who's helping out?" Current Population Reports. Household Economic Studies. Series P-70, no.13, Oct.
- U.S. Senate Special Committee on Aging (1991). Aging America: Trends and projections. Washington, D. C.: in association with AARP and the Federal Council on Aging.
- Van Toller, C., Dodd, G. H., Billing, Anne (1985). Aging and the sense of smell. Springfield. Ill: Charles C. Thomas.
- Vaughan, Bruce L. (1982). Body talk: Understanding the secret language of the body. Allen, Texas: Argus Communications.

- Von Behren, R. (1989). Adult day care: A decade of growth. Perspective on Aging, XVIII(4), 14-18.
- Warren, D. H. & Rossano, M. J. (1991). Intermodality relations: Vision and touch. In Morton A. Heller & William Schiff (Eds.), Psychology of Touch. Hillsdale, NY: Lawrence Erlbaum Associates.
- Wasik, B. H. (1989). The systematic observation of children: Rediscovery and advances. Behavioral Assessment, 11, 201-217.
- Webb, Linda Cook (1989). Planning and managing adult day care: Pathways to success. Owings Mills, MD: National Health Publishing in cooperation with the National Council on Aging and The National Institute on Adult Day Care.
- Weissert, W.G.(1976). Two models of geriatric day care: Findings from a comparative study. Gerontologist, 16(5), 420-27.
- Weissert, W.G., Elston, J.M., Bolda, E.J., Zelman,W.N., Mutran, E., Mangum, A. B. (1990). Adult day care: Findings from a national survey. Baltimore: The Johns Hopkins University Press.
- Weinburg, Hedy (1990). Caring for elders and kids in the workplace. Denver, CO, Senior Edition USA, XVIII(7).
- White, James F. & White, Susan J. (1988). Church architecture: Building and renovating for Christian worship. Nashville: Abingdon Press.
- Wrenn, R. M., Merdinger, J., Parry, J., & Miller, D. (1991) The elderly and the young: a cooperative endeavor. Journal of Gerontological Social Work, 17(1/2), 93-103.
- Zandi, T., Mirle, J., Jarvis, P. (1990). Children's attitudes toward elderly individuals: a comparison of two ethnic groups. Aging and Human Development, 30(3), 161-174.
- Zimring, Craig & Barnes, Richard D. (1987). Children's environments: Implications for design and research. In C. Weinstein & Thomas G. David (eds.), Spaces for children: The built environment and child development (pp.309-318). New York, Plenum Press.

APPENDIXES

APPENDIX A
ADULT DAY CARE PARTICIPANT SURVEY FORM

ADULT DAY CARE PARTICIPANT SURVEY FORM

Subject (Initials only) _____ Date/Time: _____ Site: A _____ B _____

Statement to subject: "I would like to spend a few minutes with you to talk to you about the young children that we spend time with here. I would like to ask you some questions and find out how you feel about being with the children."

1. In general, what are your feelings about visiting with the day care/preschool children?

2. How many children do you think should come to visit each time?

3. Which do you prefer:
- a. One child visiting at a time _____
 - b. Two or three children visiting at a time _____
 - c. Several children visiting at a time _____

4. Would you rather watch the children play, or do something with the children? _____

5. When the children have visited, is there an activity you have especially enjoyed doing with them? (For example: art activities, exercising, parties, informal visits from children, some type of entertainment or program that you watch with the children, such as a storyteller.)

6. How much time do you think should be spent with the children when doing the following activities?

Art activity	_____ minutes
Exercising (Site B only)	_____ minutes
Informal visits from children	_____ minutes
Parties	_____ minutes
Programs	_____ minutes

7. a. Do the children sometimes make noise in the building? _____

b. Does the noise bother you? _____

c. Would you like the children to be quieter in the hallway? _____

d. Other comments: _____

Adult Day Care Survey Form page 2

Subject (Initials only) _____ Date/Time: _____ Site: A _____ B _____

8. If you could choose a room in which to visit or do an activity with the children, which room would it be? Why? _____

9. In general, how long do you like the children to stay when they visit?

- a. Very short time (less than 15 minutes) _____
- b. Somewhat short (15 minutes to 30 minutes) _____
- c. Somewhat longer (30 to 45 minutes) _____
- d. Long time (45 to 60 minutes) _____

10. How do you feel about going outside on the playground? _____

11. Would you care to go outside when the children are there? Yes _____ No _____

Other responses: _____

12. Have you ever been concerned that the children would accidentally hurt you or cause you to lose your balance and fall? If so, how do you protect yourself, or make yourself feel safe?

13. Would you be just as happy in a place where there were no children? Yes _____ No _____

Other responses: _____

14. Other comments: _____

**APPENDIX B
FLOOR PLANS**

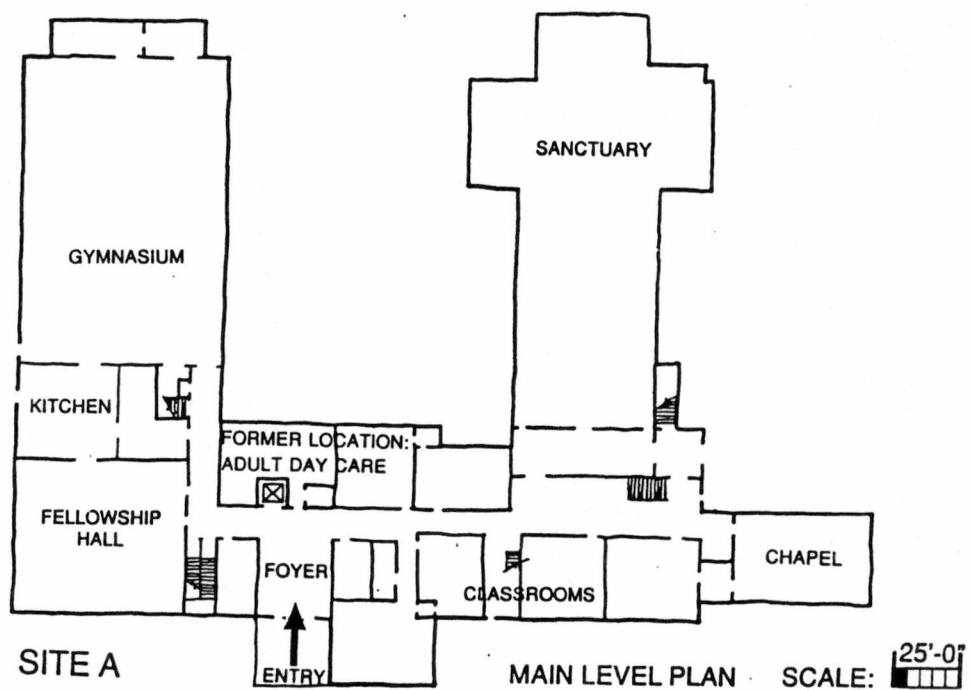


Figure 1B. Site A floor plan

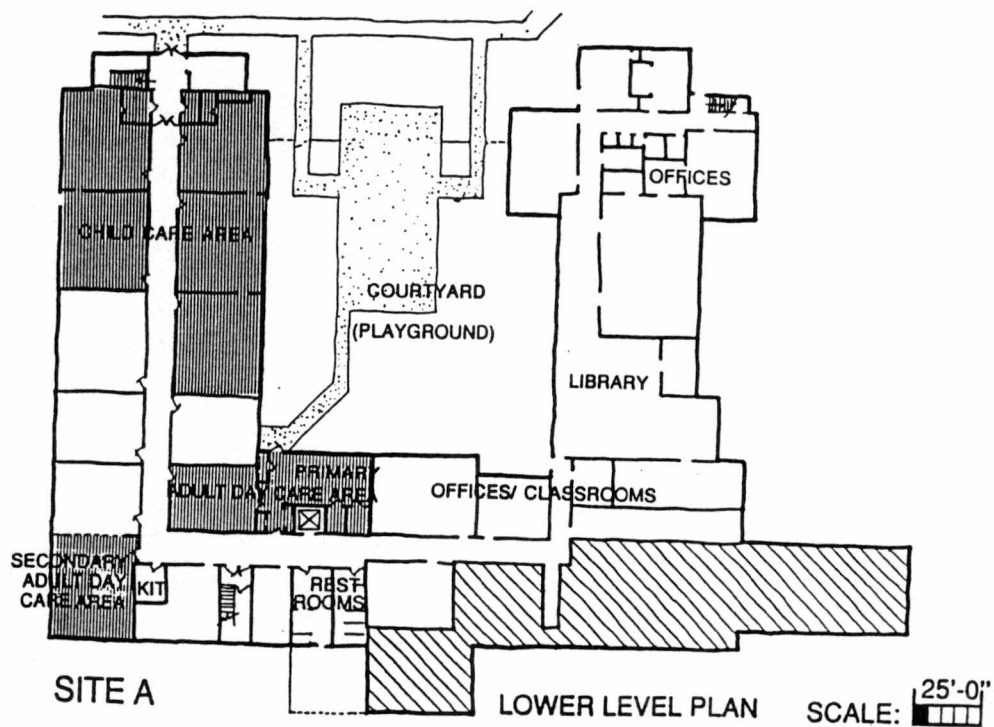
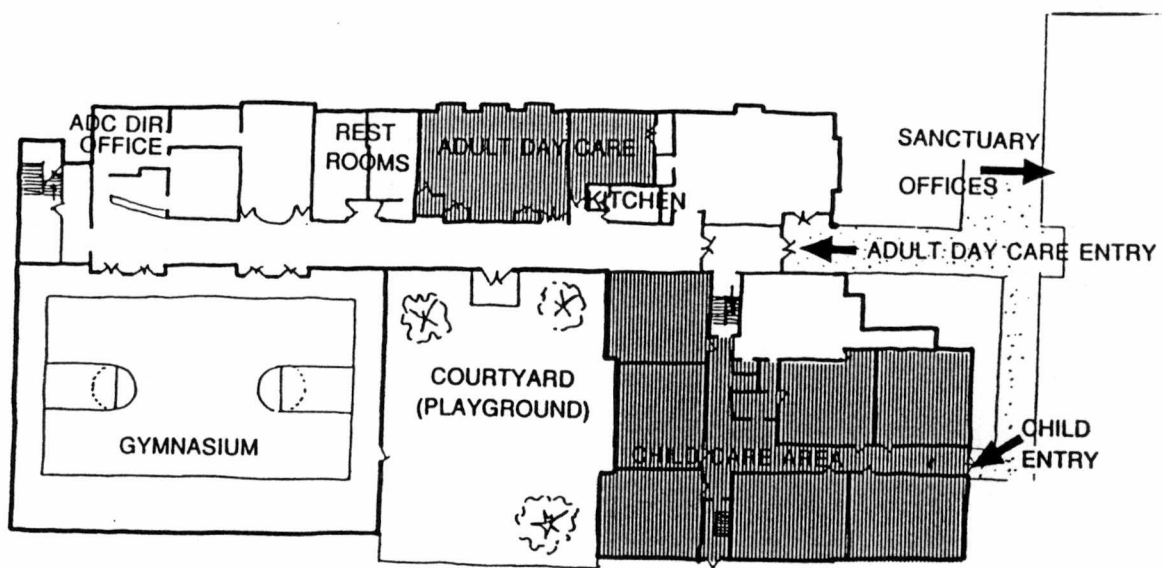


Figure 2B. Site A floor plan



SCALE: 25'-0"

SITE B
MAIN LEVEL

(SHOWS ONLY THE AREAS
CONTAINING ADULT AND CHILD
DAYCARE)

Figure 3B. Site B floor plan

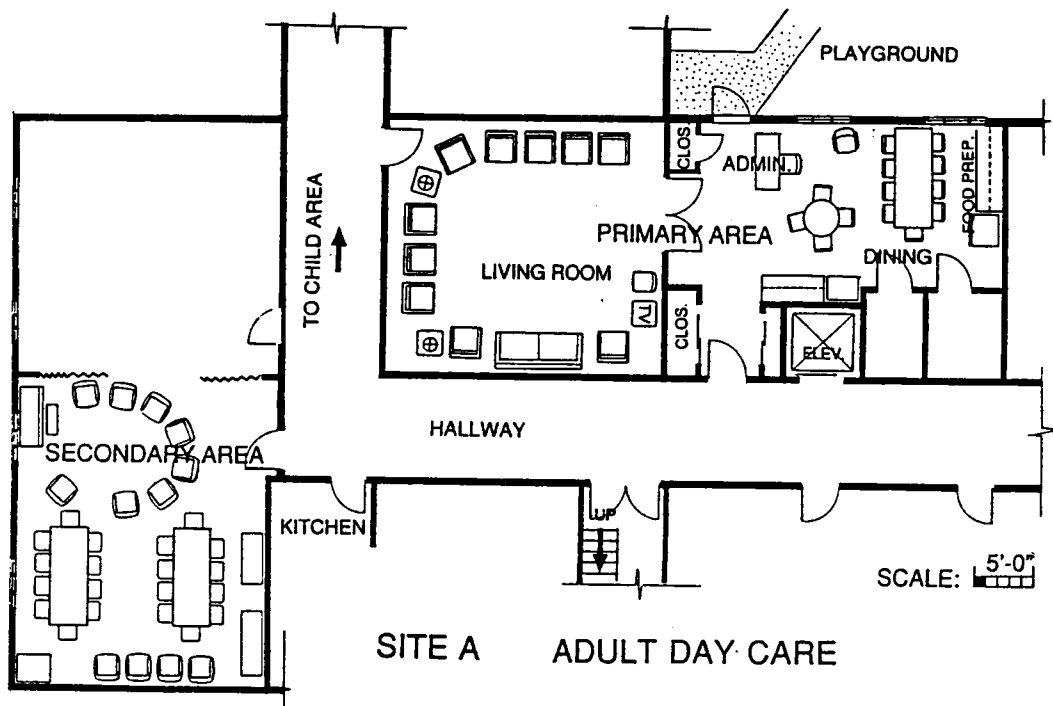


Figure 4B. Site A adult day care floor plan

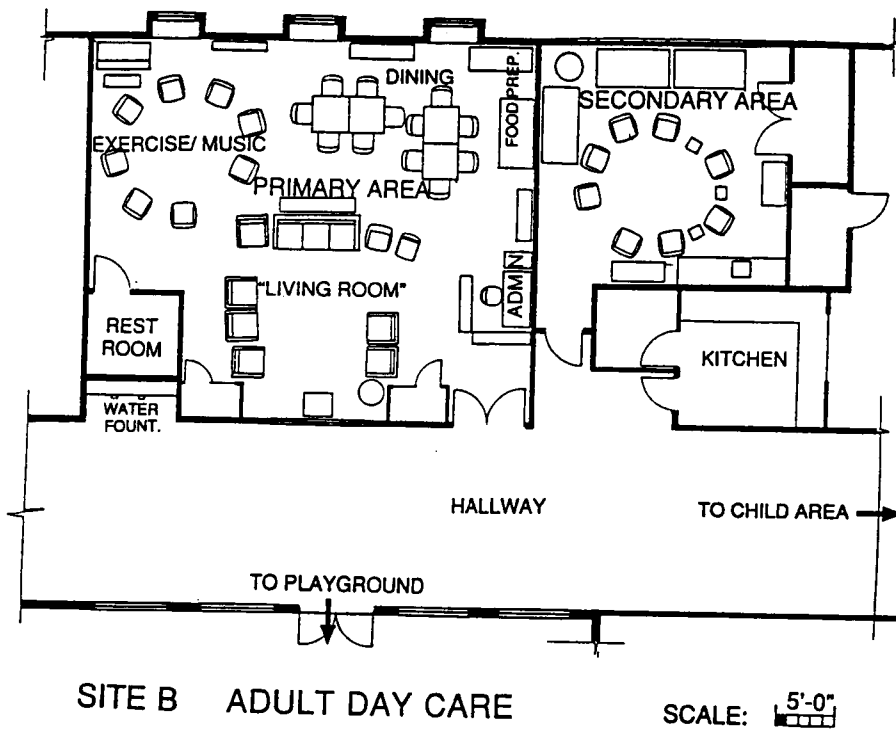


Figure 5B. Site B adult day care floor plan

VITA

Diana Wilson Morrow was born March 5, 1949, in San Antonio Texas and received a B.S. degree in Child Development from the University of Texas at Austin in 1972. She held teaching and directing positions in the child care field for fifteen years. As director of the child development program at Woods Memorial Presbyterian Church in Severna Park, MD, from 1976 to 1979, she had an opportunity to observe one of the country's first adult day care centers, which was also located in the church.

After moving with her family from Columbia, MD, in 1987, Ms. Morrow enrolled in the undergraduate Interior Design Program at the University of Tennessee in Knoxville, and in 1989 began the graduate program in Interior Design. Her focus has been historic preservation, with special interest in adaptive use. She was awarded the Master's degree in August, 1994.

While at the University of Tennessee, Ms. Morrow was a graduate teaching associate, recipient of two Chancellor's Citations, served as President of the UTK chapter of Kappa Omicron Nu, and a member of the Student Chapters of the American Society of Interior Designers and the Illuminating Engineers Society. She is a life member of Phi Kappa Phi and allied member of the American Society of Interior Designers.