



## Theme 2: Old and New: Age and Health in the Built Environment

### Universal Design, Disability and Dementia: Theory and Practice

#### Design Strategies For Falls Proofing The Living Environment.

**Shroyer, JoAnn L. (Texas Tech University, TX), Dickinson, Joan I. (Auburn University, AL), Elias, Jeff (Sanford Center for Aging, NV), Curry, Zane (Texas Tech University, TX), Hutton, Tom (Covenant Health Care Systems, TX), and Cook, Chad (Texas Tech Medical Center, TX).**

Studies show that falls are a serious problem among older adults and are one of the leading causes of death among the elderly (Donald & Bulpitt, 1999). One-third of community-dwelling older adults fall every year (Rawsky, 1998). In 1985, falls accounted for 2.4 million injuries requiring medical attention, 369,000 hospitalization stays of at least one day, 8,920 fatalities and \$7.8 billion dollars in healthcare costs (Bronstein, Brandt, & Woollacott, 1996). These figures are considered conservative because many older adults do not report their fall experiences. Susan Calvert Finn in an unpublished presentation stated, “The risk of dying from hip fractures is more than breast cancer.” The emphasis of the presentation will be on strategies that can be utilized by designers for reducing falls risk in the designed environment for the older adult. The information presented will include information collected from empirical research studies conducted by the researchers that focus on reducing falls risk in the living environment. In addition the research methods utilized for these studies will be discussed. The research strategies and methods included systematic observation in a controlled environment, interviews with the individual who has fallen, and the use of a computerized balance machine utilizing carpeted and non-carpeted surfaces. Both intrinsic (risk factors associated with sedative use, cognitive impairment, dizziness, feet problems, hip weakness, lower extremity range of motion, etc.) and extrinsic (design factors such as floor surfaces, loose rugs, poor lighting and architectural disruptions) factors were considered in the research protocol. Presenter: JoAnn L. Shroyer, (Texas Tech University).

### Informational Potential Map on Wayfinding of Sensory Impaired People.

**MORI, Kazuhiko ( Associate Professor of Spatial Cognition & Behavior, Faculty of Human-Life Science, Osaka City University).**

In this study, we propose the model of Informational Potential Map to evaluate the easiness to breakthrough from the lost in wayfinding of sensory impaired people. Sensory impaired people have difficulties in wayfinding, particularly to breakthrough from the lost in wayfinding. Sensory impaired people could take much less number of informations, such as maps, directional signs than non-handicapped. And also the area sensory impaired people can see (or hear) is limited compared to non-handicapped. We make the computer simulation model of informational potential map that shows visually the area and the degree of number of information in the sensory impaired people’s wayfinding . This informational potential map is simulated with the data of sensible area of each information based on the ability of sensory impaired people. This model makes easy to find problems in the environment that the sensory impaired people has difficulties in wayfinding tasks.

### Analysis Of Scientific Methodology Alterations For Human Behavior Research Studies Regarding The Impact Of Environmental Lighting On Dementia Behaviors Of The Alzheimer’s Type.

**La Garce, Melinda (Southern Illinois University).**

This study discusses alterations made to the methodology for observing Alzheimer’s disease subjects and data analysis techniques of four-month-long pilot studies for the purpose of potentially improving inter-rater reliability among trained observers and providing more data for analysis. This paper also discussed new knowledge discovered in the research findings regarding the effects of designed environmental lighting interventions on the disruptive behaviors of Alzheimer’s disease subjects. Comparisons between findings of the pilot studies and fifteen-month-long studies with the methodology alterations in place were made for 1) inter-rater reliability scores, 2) number of hours ob-

served, 3) frequency of recorded disruptive behaviors common to Alzheimer's disease for each observation period, and 4) average daily frequency of disruptive behaviors for each observation period. Findings indicated an improvement in inter-rater reliability from .70 for the pilot studies to .76 for the fifteen-month-long studies. Significantly more data were available for analysis. Conclusion: analysis of pilot studies methodologies may provide insight into altering scientific methodologies for human behavior research studies.

## **Design For Dementia: Challenges And Lessons Learned for Universal Design.**

**Sanford, Jon (Rehab R&D Center, Atlanta VA, GA), Calkins, Maggie (IDEAS, OH) and Proffitt, Mark (Dorsky Hodgson & Partners, OH).**

Universal design principles have most commonly been applied in connection with physical or sensory impairments, and thus, at least in practice, do not specifically address the needs of individuals with significant cognitive impairments. This paper explores dementia design and examines the extent to which it is congruent with or contradicts universal design. It includes a brief overview of the cognitive changes and behavioral implications that are associated with dementia as well as how and why design affects these behaviors. The basic principles of design for dementia will be discussed and the universal design principles will be examined for their applicability to people with dementia. Although the two sets of design traditions appear similar on the surface, the overlap is much less than might be expected. These differences are important; not to illustrate that universal design is not really universal, but rather to broaden the universal design principles in an effort to make them more universal. Thus, lessons can be learned from dementia design. More importantly, those lessons have been applied to the universal design principles in the form of expanded interpretations, new guidelines, and proposed strategies to broaden their applicability and their relevance to new populations and environments.

## **Design for People with Dementia; Issues and Case Studies**

### **The Role Of Privacy In Encouraging Family Visits To People With Alzheimer's Disease.**

**Chapman, Nancy, Portland State University, OR and Carder, Paula, Kaiser Health Research, OR**

What role does the availability of opportunities for different kinds of privacy play in encouraging family

members to visit their relative with Alzheimer's disease (AD) in long-term care? This study interviewed 26 staff and 22 family members of persons with Alzheimer's disease in 4 different types of long-term care settings: intermediate care, residential care, assisted living, and adult foster homes. 16 examples were chosen; including both integrated and special care models. In addition, a focus group was held with a group of architects to discover how they incorporate family needs centered on privacy of personal possessions, intimacy of communication, and being alone vs. being with others. How these issues are manifested depends on the nature of the visit and the activities engaged in as part of the visit. Public, semi-public, and private spaces all played important roles in family visits. For example, shared rooms posed privacy problems for visitors, but even private rooms were rarely the locus of family visits.

### **Residents' Behavior In Multi-Unit Group Home Environment For People With Dementia: A Case Study Of A Site In The Snowy City, Sapporo Japan.**

**Hayata, Naohiko (Hokkaido University, Japan), Oku, Toshinobu (Hokkaido University, Japan), and Asano, Michiko (Hokkaido University, Japan).**

Recently, many group homes have been built in Japan. However, in most cases their physical environment was not considered. One of the authors engaged in the design of a multi-unit group home for people with dementia in Sapporo, applying E-B concepts. This group home was introduced at the last EDRA conference. For verifying the validity of the concepts, the authors have been investigating the behavior of the residents at the group home, and have checked the relation between their behavior and the physical setting. In this presentation, the authors will show the outcomes of this investigation, including the following: How does the outside environment influence the residents' behavior? What kind of merit can a multi-unit group home bring? How useful are the other concepts for the residents' peaceful lives, e.g., circulation planning easy to be cognized by the residents, common spaces for active and passive participation, and so on?

### **Childhood Memories Of Landscapes As A Restorative Tool In Designing Gardens For Alzheimer's Care Facilities.**

**Turner, Kimberly D. & Ryan, Robert L. (University of Massachusetts, Massachusetts)**

Within the past decade, awareness of Alzheimer's disease has increased due to the rapid rise in the popula-

tion of elderly afflicted with this disease. Researchers have begun to study the effects of the environment on those with Alzheimer's disease, however little research has been done with regards to the outdoor environment. Since childhood memories of landscapes tend to be vivid and inspirational in the lives of adults, this study explores the idea that these memories may play an important role in place attachment and psychological restoration, and should be integrated into the designs of outdoor spaces for this population. Residents and their family members from two Alzheimer's care facilities were interviewed in order to explore their life histories. Elements from childhood memories were then placed within the facilities' gardens and observations of residents' use of the gardens, as well as their general health were made by the researcher, staff and family members. The research results suggest that elements or artifacts from outdoor environments, which are rooted in childhood memories, can have restorative effects upon individual patients. Recommendations include the need to renovate facility gardens according to the needs of the changing resident population.

### **Changes Of Social Interactions Among People With Dementia In The Relocation From Conventional, Larger Living To Group Smaller Living - A Case Study Of Koho-Heights Nursing Home.**

***Matsubara, Shigeki (Osaka University, Japan), Adachi, Kei (Wakayama University, Japan), and Funahashi, Kunio (Osaka University, Japan).***

The purpose of this study is to evaluate social interactions in environmental relocation from conventional large living unit to group living units for people with dementia. Twenty residents were observed by the behavior tracking method per every fifteen minutes from 9 AM - 8 PM for two days period. The study was conducted in the four periods: before the relocation, immediately after, four months after, and one year after the relocation, respectively. We analyzed on social interactions of conversations. The results are as follows. 1) After the relocation, table and chair setting in group living room made more conversations in various groups among residents. 2) After the relocation, residents tended to spend more time in group living room than in private room in terms of conversations before and after meals. 3) After the relocation, more residents had tendency to converse with others, although only a couple of residents had tendency to converse more with their previous roommates in the former conventional unit. 4) After the relocation, residents had few social interactions with the other unit residents, although they

were often observed to stay at the other living room. 5) After the relocation, many residents had more social interactions with residents in the same group living unit. 6) After the relocation, some residents had more than fifteen successive minutes for conversation in their private rooms.

## **Toward a Wider Construct of 'Health' in the Built Environment**

***Symposium Chair: Ruga, Wayne***

### **EB/GII = EHC.**

***Ruga, Wayne (Harvard University, Massachusetts).***

Now, into the fourth decade of EDRA, it has been firmly and adequately established that environment can influence human behavior. But, why stop with behavior? Why not consider how the environment can influence the entire human condition? The *American Heritage College Dictionary* defines "condition" as "a mode or state of being". In this Working Group, the challenge will be to consider the complete human condition in terms of health, well being, quality of life, satisfaction, work performance, communications, behavior, spiritual attunement, self esteem, relationship, sense of value, and clarity of purpose. Indeed, this is an opportunity to explore the next generation of how environment influences the whole, integrated person - and what it could mean to be a researcher operating in this domain.

### **A Conceptual Framework For Body-Space Relationships: The Nurse And The Hospital Unit.**

***Keddy, Karen (School of Architecture and Urban Planning, University of Wisconsin, Milwaukee).***

The conceptual framework that I propose will better enable theorists, researchers, and participants of research studies to understand how the nurse experiences levels of role-playing through the responses of the interior space of her body as she moves through space on the hemodialysis unit. I have identified three types of *interior space of the body* responses, and three types of *spacio-corporeal construction* settings in the hemodialysis unit. The components of this framework have interconnected relationships with one another. All components of the conceptual framework engages a post-structuralist perspective that acknowledges a fluidity of categories instead of dualisms, multiple instead of single identities and definitions, and overlapping boundaries between one another. A fluid state of the role of the nurse, which I call the *curtain of transformation*, defies the conventional dualistic rendering

of the role of the nurse. This model allows for multiple and diverse body-space experiences and flexibility in identifying spatial settings. The strongest advantage of this conceptual framework is transferability on several levels. A brief introduction to the theoretical linkages of this study will be given, followed by a detailed description of the conceptual framework. In conclusion, three advantages of this conceptual framework for studying the body-space relationship between the professional and their workplace will be discussed.

### **Guidelines For "Healthy" Urban Form: Case Studies Of Downtowns.**

***Kim Joongsub (Lawrence Technological University, MI).***

Deteriorating and unhealthy downtown environments have been among the major concerns of many local residents, design/planning professionals, academics, and government officials throughout the U.S. This research aims to develop guidelines for healthy urban form. A composite set of concepts for healthy urban landscapes was developed from the principles of good urban design. These concepts were used to develop a survey questionnaire to gather information about people's perceptions of healthy urban form as well as to examine two dozen case study towns in Oakland County, Michigan. The case studies represented the downtowns of these cities, consisting of urban parks, vacant sites, parking lots, community gardens, housing, stores, historic properties, government buildings, etc. The information gathered was used to test the concepts and to develop a set of urban design guidelines for healthy downtown landscapes. The goal of the guidelines is to provide opportunities to regain and maintain physical and mental well being through fostering health-giving environments in our downtowns.

### **The Influence Of The Eden Alternative On The Quality Of Life Of Residents In Long Term Care Environments.**

***Alves, Susana (University of Wisconsin, Milwaukee, WI), Cohen, Uriel (University of Wisconsin, Milwaukee, WI), and Cohen, Ruth (Cohen & Associates, Milwaukee, WI).***

Long term care environments were traditionally designed to provide health care. This care philosophy, described as the 'medical model', provided important functions and services, but did not address many of the elderly residents' psychological, social, and cultural needs, resulting in poorer quality of life, contributing to excess disability, discouraging or even preventing residents from exercising their fullest capabilities. One attempt to address the problems of nurs-

ing homes was the Eden Alternative (EA), developed by Dr. William Thomas in 1994. Its main goal is to transform the culture of the environment of long term care settings by addressing three of their main problems - loneliness, helplessness, and boredom. These problems would be addressed by the use of three elements - plants, pets, and children. It is hypothesized that pets and children would provide companionship for the residents. Taking care of, and being responsible for plants and pets would increase residents' autonomy and control. All the elements of the Eden Alternative would increase the level of stimulation, create opportunities for involvement and reduce boredom. Even though the EA has gained much popularity in the US, and was implemented over 200 facilities, little formal research exists about its outcomes. To gain a better understanding of the impact of the EA, this study reviewed the literature related to EA and its various dimensions; conducted interviews with Dr. Thomas and several Eden associates; participated in the training of Eden associates; and conducted case studies - observations of edenized facilities and interviews with their workers and residents. Initial findings indicate that the EA is able to inspire and motivate a large number of followers. The Eden movement is a catalyst for change in facilities. There are variations in the operationalization of the EA. Most information about outcomes is largely anecdotal; and substantial research is needed to find out how, and to what extent EA's human habitat and change of culture affect residents' and families quality of life.

### **Adding The User Into The Design Of The Home In The Digital Age.**

***Symposium Chair: Dewsbury, Guy (SEARCH, The Robert Gordon University, Scotland).***

This symposium will consider the occupant's perspective within the housing design process. The papers reflect on the changing nature of the home from a number of current and future perspectives, centering on the evolution of the care sector's interventions within the home. The psychological, social, and environmental aspects of these interventions are discussed in relation to the current and forthcoming technological/assistive devices that are becoming a feature in the home. The papers provide a forum for the discussion on the promotion of 'independent living' in relation to technology and individuals. The five papers provide complementary perspectives within the field of technological intervention and design for all: Barlow and Dick consider the role of telecare, and the ability to provide remote medical assistance within the fabric of the house. Telecare is increasingly seen as the 'state

of the art' method of providing virtual medicine, yet the focus of this technology is not user orientated, relying more on 'customer focus'. The paper by Burley unpacks the notions of the technological environment as an impetus for new patterns of support. Burley explores the interaction of technology and the home from a current and future perspective. Taylor suggests in his paper that in dealing with frail older people who may also be suffering some mental confusion the safety and reliability of "Smart" homes are paramount. Whatever the objective measure of the risk of "Smart" homes the real question is how do people perceive the risk and do they perceive worthwhile benefits that would offset any objective risk assessment? Venables provides an overview of the current state of the art within the field of technology and the home. This paper considers the logistics and a problem associated with the technology and considers some possible solutions. Dewsbury considers the psychological, social, and environmental impact of the use of technology within the home to assist people with disabilities. A set of guidelines for the use of technology within the home design process is outlined. Participants include: James Barlow (University of Sussex, England), Dick Curry (University of Sussex, England), Robin Burley (Independent Adviser, Edinburgh, Scotland), Bruce Taylor (The Robert Gordon University, Aberdeen Scotland), Tim Venables (University of Sussex, England), Guy Dewsbury (The Robert Gordon University, Aberdeen Scotland).

### **Telecare - User Needs V. Customer Focus.**

***Barlow, James (SPRU, University of Sussex, England), and Curry, Dick (SPRU, University of Sussex, England).***

The paper reports on a research project, which is exploring models for the introduction of 'telecare', the provision of health and social care direct to the home via advanced information and communication technologies. Advocates of telecare promise it will make health and social care more efficient and effective and provide greater customer choice. Potentially telecare can help to support independent living and enhance the quality of face-to-face contact with carers. However, suitable models for its implementation have so far proved elusive. Trials have tended to be small-scale, generally focusing on one particular medical condition. Moreover, the focus has been on improving communications between remote medical staff. There is a need to move from 'business-to-business' - 'B2B' - models which bring together health and social organizations towards 'business-to-consumer' - 'B2C' - telecare services. This has not escaped the interest of major telecoms and IT companies, which see health and social care as a large and growing market. How-

ever, while their involvement is likely to stimulate the development of telecare, notions of 'customer focus' held by these companies may be rather different from those of carers or end-user. The paper outlines possible scenarios for the development of telecare in the UK and explores their implications for meeting user needs.

### **How Shall We Grow Old?**

***Burley, Robin (Independent Adviser, Edinburgh, Scotland).***

Traditional approaches to supporting older people and people with disabilities have developed from institutional care in which the person is typecast with a socio-medical label, segregated with others who have the same complaint, and provided with support that focuses on their disabilities. Few community care initiatives have changed this underlying concept of care. The approach is the legacy of the age of steam when older people, those over 50, represented less than a quarter of the population. In the digital age, the average age of the population will soon be 50. This demographic shift will be the driver of change requiring a paradigm shift in patterns of service. The question: How do we care for them? Will become: How are we to grow old? In the digital age, a radically different technological environment can give impetus to new pattern of support. The danger in not making this paradigm shift in patterns of service is that we will simply replace the Victorian institution by a virtual institution. This paper will outline the context for smart home and telecare services to become smarter home helps and digital assistants in an evolving era of person centered support.

### **A Frankenstein Home - Would You Want To Live In One?**

***Taylor, Bruce (SEARCH, The Robert Gordon University, Aberdeen, Scotland).***

Field bus technology has been used in industry for many years to automate manufacturing and process plant. It is now being applied to meet the needs of elderly and disabled people who want to remain in their own homes rather than be cared for in an institution. When dealing with frail older people who may also be suffering some mental confusion the safety and reliability of such systems are paramount. This paper describes the features developed so far to improve the reliability of field bus systems. The reliability of a system decreases as the number of components and interactions between components increases. "Smart" homes for older and disabled people have an inherently rich functionality and hence, potentially, a low

reliability. However, risk assessments and reliability calculations whilst they provide objective measures of risk, they are not accepted by most people. Rational acceptance of risk and human response to risk are frequently contradictory. This paper highlights some of the issues in this dilemma that are relevant to “Smart” homes. Whatever the objective measure of the risk of “Smart” homes the real question is how do people perceive the risk and do they perceive worthwhile benefits that would offset any objective risk assessment?

### **Smart Homes.**

**Venables, Tim (SPRU - Science and Technology Policy Research, University of Sussex, England).**

This paper provides an overview of the current state of the art in smart homes technologies. It reviews the underlying protocols and transmission techniques being developed for the home and illustrates this with examples of prototype developments. The increasing digitization of media and communications has led to a need to enable people to be able to distribute broadband services within the homes. The multitudes of existing networks (telephony, terrestrial television, etc.) are unable to support broadband distribution. Additionally increasing demands on people’s time and increasing expectations of consumer devices leads towards a need for ways to pass command and control information between devices and systems within the home. The coupling of command, control and communication data transmission requirements can be accomplished through the use of the infrastructure of the smart home. This paper will review these requirements and examine how firms are approaching the integration of data streams in the home and how people would interact with such systems. This will be based on research carried out both in Europe and Japan and provide a view on future developments in this area.

### **The Social And Psychological Aspects Of Smart Home Technology Within The Care Sector.**

**Dewsbury, Guy (SEARCH, The Robert Gordon University, Aberdeen, Scotland).**

Smart home technology is being integrated into the care sector where it is used for empowering people with disabilities and older people. This paper examines the utility of smart home technology within this field and explores the effects on the home occupant from a social and psychological perspective. The paper contends that the use of smart home technology necessitates a minimal set of ground rules within its design so that the user is centered within all aspects of its construction and usage. The position of the occupant is reflected in relation to the technology within

the home and aspects of alienation, disempowerment, and the additional stress that can be caused as a result of such installations are considered. The paper outlines the role of smart home technology as a medium for rehabilitation and sustainability for people with physical disabilities or cognitive impairments from a social/psychological perspective and considers the implications of current policy within this domain. The paper contemplates the effect of smart home technology from the providers’ perspective and the increasing pressure to supply quality housing that meets specific individual needs. It develops some initial guidelines for the implementation of this technology within the care sector.

### **Hospital Managers Closely Observed: Some Features of New Technology and Everyday Managerial Work.**

**Karen Clarke, Mark Hartswood, Rob Procter and Mark Rouncefield (CSCW Research Centre, Department of Computing, Lancaster University and Institute for Communicating and Collaborative Systems, Division of Informatics, University of Edinburgh).**

The NHS is experiencing enormous growth in the deployment of information and communications technologies (ICTs). Extensive use of technology serves to ‘reconfigure the organisation’ through its application in data analysis, communication and decision support. This paper reports some preliminary findings from an ethnographic study of hospital information systems in everyday use, documenting precisely how people, systems and enterprises interact and collaborate. Our paper reports on some of the complexities involved in the use of ICTs in everyday managerial work and documents the articulation in practice of the cultural, organisational and technical arrangements through the investigation of the ‘hands on’ work of Hospital Trust management.

### **Reducing Stress Through Design**

#### **Environmental Stress In Women.**

**Ortega-Andeane, Patricia (School of Psychology, UNAM), Mercado, Serafin (School of Psychology, UNAM), Reid, Anne (School of Psychology, UAM), and Estrada, Cesareo (School of Psychology, UNAM).**

Starting from the premise that primary prevention is based on the elimination of hospital environmental factors which could precipitate new problems for the health of patients; in the present study we tried to identify the stress generating factors in patients, who were

waiting to be attended at the physician's surgery. The waiting time in a waiting room of a general hospital in Mexico City was an average of three hours. An Environmental Evaluation Scale for the setting was applied, the Stress Arousal adjective Checklist and a physical measurement of environmental factors, such as temperature, noise, lighting, air speed, humidity and suspended particles in the air. The physiological responses of the subjects: the skin's electrical conductance, peripheral temperature and muscular tension, were also recorded. The sample was of 500 female patients. Results show significant relationships between environmental and historical factors such as waiting time, kind of ailment and the physical measures of environmental factors and the level of arousal, level of stress and the physiological measures. The results are discussed in terms of the good image of the public institution and the overvaluing of the physical aspects of the setting.

### **Restorative Environments: Does Nature Really Matter?**

**Betrabet, Gowri (University of Wisconsin - Milwaukee, WI).**

This paper presents findings from dissertation research that sought a better understanding of how people under stress seek and experience different places and environmental conditions in their everyday coping efforts aimed at achieving restorative outcomes. Integrating theoretical foundations in two research domains (stress and coping, and restorative environments), elementary school teachers' use of places and environmental conditions in restorative coping strategies was documented through seventy-one written responses to a survey questionnaire and detailed in-depth reflections by nine interviewees. Teachers' choices for restorative places include home, nature, city places (e.g., theaters, museums), people places (e.g., restaurants, malls) and church. In these places, teachers used different coping strategies that were aligned on a continuum of 'centering' (inward-directed) and 'prospect-ing' (outward-directed) actions. This paper introduces the context, that is, the constraints under which these places are experienced. It also provides a comparison of how the different places enabled/disabled restorative attempts by the teachers. In doing so, this paper revisits and redefines the role of urban nature as a restorative setting. It concludes by discussing the impact of these findings on the design of urban natural areas, in the context of schools as well as at the city scale.

### **Perceived Restorativeness Of Environmental Settings In Relation To Seasonal Period.**

**Rooijers, Ton (Center for Environmental and Traffic Psychology).**

The extent to which people are able to recover from additional fatigue after a prolonged period of mental effort, depends partly on the nature of the environmental setting. Built and indoor environments are found to be less restorative than natural and outdoor landscape respectively. In addition, as recent research has shown, the perceived restorativeness of natural setting seem to be related to the seasonal period: forest settings being relatively more restorative during the autumn and beach settings being relatively more restorative in the summer and winter. According to the Attention Restoration Theory, the perceived restorativeness of environmental setting depends on four features: being away, fascination, extent, and compatibility. A survey among Dutch adults was carried out to determine in what way the seasonal dependency is related to the four restorativeness factors. Results are discussed.

### **Environmental Evaluation And Burnout In Stressful Situation.**

**Ortega-Andeane, Patricia (School of Psychology, UNAM), Mercado, Serafin (School of Psychology, UNAM), Reid, Anne (School of Psychology, UAM), and Estrada, Cesareo (School of Psychology, UNAM).**

The Burnout Syndrome has been widely studied among healthcare personnel in several industrialized countries; however, if we transfer these findings and the solutions from developed nations to a country in the process of development, we will find them probably inadequate, as they are surely context specific, mainly due to the idiosyncrasy of society, culture and environmental factors. In order to understand the influence of physical-environmental conditions upon personnel burnout, in this paper we present the results of a study carried out in the tocosurgical unit of a general hospital for women. We applied an Environmental Evaluation Scale, the Burnout Inventory and the physical measurement of milieu conditions, such as room temperature, noise level, lighting, airspeed, humidity and suspended particles in the air. Results show, related to the inadequate characteristics of the environment in the different service areas, the low valuation of the milieu by the medical and nursing personnel and its influence on burnout, depersonalization and personal performance. Results are discussed in terms of the impoverishment of the environment, the high demand for medical attention, the development of personal

stress and the high level of motivation, due to the role of ‘social benefactor’.

### **Christopher Alexander’s Pattern language Revisited: An Experiment In Reading Architecture.**

Intentionally designed as a therapeutic instrument, the Vidar Clinic near Stockholm, Sweden, is the subject of a study aimed at describing specific key architectural elements and qualities. The architect of the clinic was able to create an extraordinary milieu of care, which, together with the clinic’s adjacent outdoor spaces imparts a distinct sense of protection and nurture for the life and well being of patients and staff. Based on research which included repeated site visits, participant observation, interviews and review of relevant literature, this paper offers an interpretation of how the architectural order of the hospital complex, the layout and shape of interior spaces, and the attention to building details support the patients in their healing process. Adapting Christopher Alexander’s pattern language approach from a design oriented to an analytical tool, this paper explores a way to understand qualities in an existing architectural setting. Ranging from site design to building details, individual patterns demonstrate how care for the patients and staff can be expressed architecturally at all levels of scale. It is suggested that the pattern language format is a useful tool for examining and communicating the unique qualities of existing environments.

### **Cancer, Healing and Design of Restorative Environments.**

*Symposium Chair, Cooper Marcus, Clare, (University of California, Berkeley). Moderator, McCormick, Molly Ph.D. (College of Architecture, Texas A&M University).*

Environmental design researchers and designers who have known cancer intimately in their lives as survivors of family members will discuss challenges in cancer center design. While objective evaluations of cancer centers are essential, this symposium takes a slightly different tack. Do designers and design researchers who have experienced cancer themselves have particular insights into how cancer centers might be better designed for healing? Which themes and insights from the speakers’ experiences with illness have shaped their later research and design? Are some criteria for healing so well established that future designs for cancer environments must include them? We also extend the topic to include a glimpse of the future of restorative environments-Dr. Chang-Shan Huang’s master plan for a continuing-care retirement commu-

nity in China. What do experience, research, continuing-care, and cross-cultural issues contribute to design for future restorative environments in China and in the West? In Part 1, speakers touched by cancer will tell their experiences and evaluate the cancer centers and healing places they came to know so well. These speakers will also show how their experiences with acute illness influenced and in some cases redirected their subsequent work in healthcare research and design for healing.

### **The Significance of the Physical Environment during Cancer Treatment.**

*Cooper Marcus, Clare (University of California, Berkeley).*

I will reflect on the pros and cons - from the patient’s perspective - of physical environment of two hospitals where I was treated for cancer. In one of these a garden became a significant healing ally. Working with a hypno-therapist I also used healing imagery which focused on the wild landscape, flora, and fauna of the Scottish island of Iona, the most restorative environment I know. During my treatment, a publisher approached me to write/edit a book on healing gardens, and his professional work on healthcare landscapes also became part of my journey to recovery. The book completed, I am now conducting preliminary research with cancer survivors on the role of nature in their healing and their recommendations for the design of gardens in cancer centers.

### **Environment-Behavior Issues for Cancer Patients and their Caregivers.**

*Anthony, Kathryn H. (School of Architecture, University of Illinois, Champaign, Urbana).*

Evaluating cancer treatment centers, both from the viewpoints of the patients and their caregivers, is long overdue. In a paper presentation at EDRA 1999, “Our Medical Odyssey: An environmental-Behavior Critique of Cancer Treatment Centers,” I discussed my personal experiences caring for my husband, Barry Riccio, a history professor at Eastern Illinois University, and a long-time friend of EDRA. My presentation at EDRA 2001 builds upon that earlier work. For over seven years, Barry and I desperately sought to control this devastating illness.. Since he was first diagnosed with leiomyosarcoma in 1993, he had seven surgeries, several rounds of chemotherapy and radiation, antiangiogenesis, and about 400 blood transfusions. Our quest for treatment included five states and scores of doctors, nurses, and medical staff. Sadly, Barry died in January 2001 at age 46. We tell our tale in a book entitled *Running for Our Lives: The Odys-*

*sey of Our Battle with Cancer* (forthcoming in 2001). This presentation gives an overview of issues we faced and environments we encountered throughout our long journey. It also analyses our unique perspectives as cancer patients and caregivers.

### **Birth of a Healing Garden.**

***Chamberlin, Ann (Artist and Professor, Art Institute of California, San Francisco).***

When I was being treated for breast cancer, two things were on my mind: How could I deal with this illness? How could the cancer center that I had to return to repeatedly become less frightening, and more of an environment conducive to healing? The Healing Garden at UCSF Cancer Center was born out of those two concerns. Stories and storytelling became an important way to deal with the illness. As part of a support group I became aware of how shared stories could help people rechart their lives in the face of serious illness. These stories became a source of inspiration to me, and a focal point in the design of the healing garden. I initiated a project of inscribing stories onto tiles that line the hallway leading into the Cancer Center. The unused courtyard in the middle of the Cancer Center became a center for gardening, tile making, and celebrations within the Cancer Center. With invaluable help from my surgeon, fellow cancer survivors, and master gardener and designer Katsy Swan, we completed its transformation by redesigning the courtyard as a healing garden.

### **Design for Healing: How insights from Experience Illuminate the Design of Healing Environments.**

***Shepley, Mardelle McCuskey (College of Architecture, Texas A&M University).***

What types of environmental issues are raised by young designers who have survived cancer or have lost a close family member to the disease? This session will include a literature review and summarize the author's experience with two students, one of whom was a cancer survivor and later completed his design education, and the other of whom lost his brother to cancer while in design school. The presentation will review the designers' documentation of their experiences as summarized in their final research projects. The paper will compare issues raised by non-designer-survivors and designer-survivors, with the intention of improving information-gathering techniques for programmers and designers during the development of design guidelines.

### **Impact of Service Model on Cancer Center Design: POEs Compare Interdisciplinary to Traditional Practice Models.**

***Williams, Karol R. (Facilities Planning, Design and Construction, University of Pennsylvania Health System, and Drexel University, Philadelphia, PA).***

From 1995 to 1999, the University of Pennsylvania Health System embarked upon two projects concerning cancer care: the Hematology/Oncology Clinical Practice Suite and the Rena Rowan Breast Center. The Hematology/Oncology Practice Suite delivers care as a traditional, single-specialty practice model, while the Rowan Breast Center provides an interdisciplinary group-practice model integrated with a patient-centered complementary-care approach. For the traditional-practice design, physicians, nurses, and in-house facility planners provided input to the architectural design team. For the interdisciplinary center, focus groups of patients, physicians, staff, and in-house facility planners all contributed to the design. Occupied since 1998 and 2000 respectively, these two environments invite evaluation. How effective are the two environments in terms of patient and family comfort and support? Are the needs and efficiencies of the physicians and staff being met? Post-occupancy evaluations (POEs) will compare and contrast the effects of different service delivery philosophies on cancer center design.

### **A Research-Based, Culturally Appropriate, and Site-Specific Approach to Healthy Retirement Community Design: A Case Study in China.**

***Chang-Shan Huang, Ph.D. (Department of Landscape Architecture and Urban Planning, Center for Health Systems & Design, College of Architecture, Texas A&M University).***

As China's population is aging rapidly and the demand for higher quality living environments for elderly people continues to rise, a concept of institutionalized elderly living arrangements that was developed in western countries is becoming of interest to Chinese government and developers. This paper presents a case study of a newly planned model continuing-care retirement community underway in Dalian City, Lianoning Province, the People's Republic of China. The project was carried out as an academic practice project by a team consisting of both American and Chinese scholars and professional landscape architects. The multimedia presentation will introduce the project background, design approach and process, related academic research, specific cultural and site issues, and the design concept. The presentation will address the impact of cultural differences and specific site condi-

tions on the design for retirement communities and the importance of academic research as a base for design practice. The goal of this presentation is to strengthen the links between academic research and professional practice in the field of community design, and to promote culturally appropriate and ecologically sound approaches to design. In the panel discussion, Dr. Huang will answer questions related to Chinese cancer patients and cancer care in China.

## **Planning And Utilizing Space In Neighborhoods For Children's Inclusive Play.**

**Working Group Chairs: Ashley, Brian (free-lance consultant, Stockholm, Sweden) and Siebenaller, Robert, (SSOE Studios, OH).**

In increasingly urbanized environments how do we protect outdoor space for children, including those who are handicapped, to meet their own needs for free expression and independence? Evidence of the need will be presented and risks and obstacles to modern provision examined. A case study of the Swedish park-playground will be used to illustrate one useful model with potential for development. How do different cultures and different social environments affect both the problem and the possible solutions? Is this also a problem for less urbanized communities or for societies under development? How can the possible solutions be presented to achieve higher priority in the political and economic consideration of decisions of community planning and provision? Participation in the working group by all interested in or involved with these questions is invited to present their own experience, research or case studies and advance their own suggested solutions.

## **Sensory Integration In Early Childhood Environments.**

**Siebenaller, Robert (SSOE Studios, OH).**

How do you design or renovate developmentally appropriate environments for young children? Are our licensing laws and building codes an adequate basis for determining what is developmentally appropriate? Why do we rely on abstract concepts when our children are developing a concrete awareness of their world? Learn how to use our five senses to intuit a concrete understanding of our environments. Discover how to use the primitive gifts of hearing, seeing, tasting, smelling and touching to give form to our modern world and nurture the environments being designed and used by our young children. Discussion will focus on memories of childhood and the role of the senses

in those memories. Drawing exercises will be used to record those sensory experiences. A final exercise will be developed as a way of recording the life of the senses in a familiar environment. Discussion will follow with summary thoughts focusing on how the senses impacted the behavior and health of the human spirit.

## **Perception Of Children Safety At The Streets Of Single-Family Homes As A Function Of Street Layout.**

**Al-Homoud, Majd S. (Jordan University of Science and Technology, Irbid, Jordan).**

Over time safety of children playing around their homes formed a main source of worry for parents, since the street in front of the house is the traditional playing area for children. Hierarchies of spaces that are created by the street layout affect natural surveillance, zones of influence, and territorial controls, and therefore, children's safety. The target population was located at the city of Amman, Jordan; year 2000. The suggested hypothesis that perception of children safety at the streets of single-family homes is associated with street layout was tested at a setting using random sampling. The total sample size was 51 single-family householders from the Housing of Jordan Army Officers housing complex. The data was collected through face-to-face interviews with one of the parents of each household using a structured questionnaire. The results of the study demonstrated that the shape of the street is the most affecting predictor perception of children safety at streets of single-family homes.

## **Toronto's Dilemma: Does Concern For Safety Violate The Right To Play?**

**Sivakumaran, Shan (University of Wisconsin-Milwaukee, WI).**

Play is a significant part of a child's social, emotional, cognitive, and physical development. Recognizing the important role of play in child development, the United Nations Convention on the Rights of the Child emphasizes play as a fundamental right of all children. The physical environment plays a vital role in fulfilling this right by providing the play settings for children's activities. Thus, parks and playgrounds have become an integral part of a child's development. As a result of new safety standards for play equipment in daycare playgrounds, the Toronto District School Board has inspected and removed play equipment from 170 of its 364 elementary schools this summer. This has resulted in many children being deprived of play facilities and has left the parents enraged. While the school board officials defend the action as a necessary

safety measure, the critics argue it is a monumental waste of taxpayers' money, especially after learning that it cost \$700,000 to remove the equipment and will cost \$27.5 million to replace them. By reviewing literature, this paper critically examines both sides of this issue to determine whether the "new ideas" have ensured children's safety in play or has violated the children's right to play.

### **Identification Of And Design Guidelines For The Play Preferences Of Children Who Have Disabilities.**

***Stark, Susan (Washington University School of Medicine, St. Louis, MO).***

The purpose of this study was to explore playground experiences that are perceived to be the most fun according to children with disabilities ages 8-11. Participants for this study were children between the ages of 8 and 11 years who attended a school exclusively for children who have a variety of neurobehavioral and/or physiological impairments. Twenty-one children were recruited for the study by their teachers and agreed to participate in an activity that focused on playgrounds. Data collected included the children's drawings and their narrative comments about their drawings. Five themes that related to the play experiences in which children wished to participate were identified using the constant comparison method. These themes can be described as 1) access to experiences, 2) participation in group activities, 3) opportunities for children with different abilities, 4) imaginative play and 5) sensory rich experiences. Each theme is presented with descriptions of the children's play goals. The children's drawings are provided to illustrate each theme. The themes are discussed with regard to current literature on play spaces for children who have disabilities and current theoretical models. The themes are also translated into a design guide to assist playground designers.

### **Cognition And Connection In Spaces For Children With Asperger's Syndrome.**

***Leigh, Katharine (The University of Oklahoma, OK), Robinson, Mary Beth (The University of Oklahoma, OK), and Friar, Erin (The University of Oklahoma, OK).***

Two aspects of Asperger's affect physical interface with the learning environment: visual thinking and sensory sensitivity. These children and adults demonstrated the use of mental picturing through the translation of action(s) into sequential pictures to serve as mental reminders. Designers of the built environment also 'picture' space. How can this visualization of the built environment be explored through the eyes and

minds of children and adults with Asperger's Syndrome to study the ways in which these individuals perceive their surroundings and picture it in terms of visual imagery and the physical interface of the individual as affected by light, noise, and visual clutter? How can children with Asperger's, who require socialization opportunities filter out environmental interferences impairing their ability to function in the classroom? How can their environment surround them with positive sensory interaction? This research investigates the environmental interface required for individuals with Asperger's to succeed specifically in the learning environment through the application and integration of environmental controls within a learning pod. This prototype 'environment' provides for tangible evaluation by users, parents, teachers, and professionals in design and special education.

### **Environmental Effects On Preschool Children's Development Of Competency.**

***Maxwell, Lorraine E. (Cornell University, NY).***

This study examines the role of the physical environment of both the home and childcare centers in preschool children's development of competency. The researcher is interested in both actual competency and children's perception of competency. Competency, part of a larger construct of self-esteem, is a sense of being able to initiate and complete an action. Certain physical characteristics of childcare centers are thought to be related to children's sense of competency and their ability to initiate and complete an action. These characteristics include: control, privacy, complexity, exploration, safety, place identity, legibility, and restoration. As part of this research a measure was developed to assess childcare classrooms on these characteristics. The home environment was measured using Wachs' Physical Environmental Inventory. Children's perceived competency was measured using Harter and Pike's Pictorial Scale of Perceived Competence and Social Acceptance. Actual competence was assessed using McCathy's Scales of Children's Abilities. This research seeks to develop a model of how the interaction between home and daycare settings effects young children's development of competency. It also seeks to empirically test daycare center physical characteristics that are believed to be related to competency.

## **Designing The School Environment: Getting It Right Inside And Out.**

***Symposium Chairs: Ward Thompson, Catharine (Edinburgh college of Art/Heriot-Watt University) and Aspinall, Peter (Heriot-Watt University).***

These presentations draw on recent and ongoing research projects that have explored the indoor and outdoor primary school environment. They present innovative research techniques and original findings, as well as an analysis of the effectiveness of such methodology. The results have serious implications for the way the school environment is designed and managed in Scotland, in North America, and in the international context. Participants include: Roy Webb (Heriot-Watt University, Edinburgh), Brian Robertson (Heriot-Watt University, Edinburgh), Peter Aspinall (Heriot-Watt University, Edinburgh), David MacKenzie (Heriot-Watt University, Edinburgh), Sharon Airey (Heriot-Watt University, Edinburgh), Nilda Cosco (North Carolina State University, NC), Robin Moore (North Carolina State University, NC), and Catharine Ward Thompson (Heriot-Watt University, Edinburgh). Institutional (schools), built environment, empirical, case study, children/youth.

## **Projective Approaches To Designing Playgrounds.**

***Ward Thompson, Catharine (Heriot-Watt University, Edinburgh).***

The paper presents research with children (as well as their teachers) using projective techniques to draw out their desires and needs in relation to design of their school playgrounds. The two principle methods used are based on Personal Construct Psychology and Ecoanalysis. In an initial phase, the eliciting of personal constructs allows the holistic experience of landscape that may be held at a pre- or sub-conscious level to be explored. Elements of these constructs can then be articulated, using a projection location task for the way people experience and construe the regions around their own body, to inform the way they interact and engage with the space around them. It gives insight to the meaning of spatial layouts that can assist in the structural ordering of space. Results of work to date confirm the importance for children of activity-based behavior settings and for natural elements as the integrating core of their play environment.

## **Luminous Environment Effects Upon The Visual Performance Of Children In Classrooms.**

***Webb, Roy (Heriot-Watt University, Edinburgh), Robertson, Brian (Heriot-Watt University, Edinburgh), and Aspinall, Peter (Heriot-Watt University, Edinburgh).***

The visual environment within seven primary schools, representing a cross-section of building types and ages from the 1890s to the late 1990s in Scotland, was investigated. An extensive survey of the visual environment was carried out as well as an assessment of the visual performance of the pupils in each classroom setting. A questionnaire survey was used to obtain the views of teachers on their own classroom environment. The survey revealed that large variations in lighting quantity and quality occur between schools. A link between the visual performance of pupils and prevailing visual environmental conditions was clearly indicated. The teachers identified two main environmental factors as being significant, the acoustics and lighting provision within the classroom. Teachers were concerned that the physical environment in the classroom appeared to affect both pupil performance and their behavior. It can also be concluded that the impact of poor lighting conditions is likely to be considerably greater for those pupils with a sensory impairment.

## **Can You Hear Me? The Effects Of Classroom Acoustics On Pupils And Teachers.**

***MacKenzie, David (Heriot-Watt University, Edinburgh), and Airey, Sharon (Heriot-Watt University, Edinburgh).***

As part of an intensive research project investigating the acoustics of classrooms, the adverse effect of poor acoustics upon teachers and pupils was investigated. 70 primary school classrooms were used. Objective measurements of the background noise level, reverberation time and speech intelligibility (speech transmission index and percentage loss of consonants) were undertaken in both empty and occupied classrooms. A novel subjective listening test was devised to determine how much speech primary school pupils could understand in a typical classroom environment, before and after acoustical treatment was applied to the room. Results indicated that in many classrooms noise levels were excessive, reverberation times too long, speech intelligibility exceeded recommended values and children performed less well when working in a noisy environment. Improving the acoustic environment can improve the pupils' listening ability, comprehension, and possibly long term school performance. Teacher questionnaires were distributed to determine the effect of the physical classroom envi-

ronment upon the teachers' health and well being. A significant link was found between poor acoustics and teacher ill health.

### **Design For Natural Learning.**

**Cosco, Nilda (North Carolina State University, NC) and Moore, Robin (North Carolina State University, NC).**

What is the impact of the designed outdoor environment on the health development of children? This paper draws on: a) the theory of play and the "holding environment" (Winnicott); b) sensory integration (Ayers); c) recent empirical research on outdoor early childhood environments in Sweden and Norway; d) the results of an analysis of "incident reports" before and after the renovation of the outdoor environments at a child development center and a primary school in North Carolina; and a variety of sources demonstrating the health effects on children of designed outdoor settings. The emerging field of ecopsychology will be discussed as the unifying framework for action research integrating design, nature, and child development. Implications for provision and design of children's outdoor environments will be discussed.

### **The State Of Post-Occupancy Evaluation In The Practice Of Educational Design.**

**Lackney, Jeffery (University of Wisconsin - Madison).**

Over the past decade thousands of new school buildings and renovations have been planned, designed and constructed in the U.S. Of these only a small fraction will ever be evaluated against the educational needs of students and teachers. This paper reflects on the state of post-occupancy evaluation (POE) in the practice of educational facility design in the U.S. by analyzing the results of thirty-three entries in the School Construction News and Design Share Awards 2000 program. This program, openly invited submissions while encouraging, but not requiring a post-occupancy evaluation be conducted on a newly designed and occupied facility. One of the objectives of the program is to encourage and publicize nationally the value of conducting POEs. Three POEs received honor, merit and citation awards, Davidson Elementary School in Davidson, North Carolina, Central Tree Middle School in Rutland, Massachusetts, and Indian Trail Elementary School in Canal Winchester, Ohio. The paper provides a description and a comparative analysis of the methods used in each POE, a summary of jury comments, and recommendations for the refinement of the awards program in promoting the POE.

## **Opportunities And Constraints In Children's Participation In Community Improvements.**

**Symposium Chair: Horelli, Liisa (Helsinki University of Technology, Finland).**

Participation, which is recognized as one of the three Ps - provision, protection, participation - of the UN Convention on the Rights of the Child, makes children's claims and ideas publicly visible. Because children's suggestions may threaten the status quo, there is often resistance against giving children real influence in the amelioration of their communities. The aim of the symposium is to present and discuss the results from case studies on children's participation in community improvements in both Old and New Worlds as well as in the Third world countries. Louise Chawla presents the final results of the contemporary revival of Growing Up in Cities, first conducted by Kevin Lynch two decades ago (*Community Quality from Children's Perspectives: Research Synthesis and Review*). This project, which has involved low-income 10 through 15 year olds in the assessment and design of their community environments, has taken place in eight nations in the developed and developing world. The presentation will focus on a set of indicators of children's sense of well-being or alienation in their communities, which are compared to a review of other research that assesses low-income urban communities from children's perspectives. Liisa Horelli will discuss a recent experiment in local and regional development in Finland in which strategies and methods, borrowed from gender mainstreaming, have been successfully applied in the involvement of young people (*In Search of Strategies and Methods for Involving Children and Young People in Local and Regional Development*). A set of methodological package is demonstrated and discussed in terms of varying situational and contextual demands in European countries. Patsy Eubanks Owens will focus on the lessons learned from an experiment with specific youth participation methods in the design of a visionary community park in California (*Learning from Youth: Their Vision for a Community Park*). A video from the project will highlight the teens' responses to the project. The core questions in the discussion will deal both with the content and the process of participation: Are there environmental characteristics (or indicators) that children and young people share across cultures and "worlds" and how do these vary from those of adults? What strategies and methods are applicable in the promotion of children's participation and how do these methods differ from those applied with adult participation? Par-

ticipants include: Louise Chawla (Kentucky State University, KY), Liisa Horelli (Helsinki University of Technology), and Patsy Eubanks Owens (University of California, Davis).

### **Community Quality From Children's Perspectives: Research Syntheses And Review.** **Chawla, Louise (Kentucky State University, KY).**

This presentation considers the meaning of poverty and well-being from the perspective of low-income urban children. It is based on the contemporary revival of Growing Up in Cities, a project which involves low-income 10 through 15 year olds in the assessment and design of their community environments, which was featured in an invited plenary at EDRA 1999. This presentation reviews final project results in eight nations in the developed and developing world, including Norway and Poland in the "Old World". The project results are synthesized in a set of indicators of children's sense of well-being or alienation in their communities; and these indicators are compared to a review of other research that assesses low-income urban communities from children's perspectives. The sociophysical nature of these indicators is noted: the importance of places that afford children positive experiences with peers and adults. These results are contrasted with conventional adult-designed indicators of environmental quality for children, and the implications are discussed in terms of child-centered definitions of poverty and the integration of children into participatory processes of community development and poverty reduction.

### **In Search Of Strategies And Methods For Involving Children And Young People In Local And Regional Development.**

**Horelli, Liisa (Helsinki University of Technology, Finland).**

A series of case studies have been conducted during the past years, in several European countries, on children's involvement in neighborhood improvement. The young participants keep demonstrating that they are both able to criticize their environments and to produce new ideas for implementation. Nevertheless, young people's participation has not become part of an accepted child policy, nor a praxis of European planning systems. In the most recent participation projects, in the Finnish North Karelia, new strategies and enabling techniques, borrowed from gender mainstreaming, have been applied for involving young people in local and regional development. This has started a process in which new partnerships between young people and adults have been formed and sup-

ported by the regional councils. The aim of the paper is to discuss the appropriateness of the strategies and applied techniques in the light of the case studies.

### **Learning From Youth: Their Vision For A Community Park.**

**Eubanks Owens, Patsy (University of California, Davis, CA).**

The Visionary Landscape was a conceptual project designed to allow teenagers to develop their visionary design for a city park. The project had several purposes: to understand what was important to teenagers in a park, to investigate youth participation methods, and to provide university students with first-hand experience working with youth. This presentation discusses the ideas generated by the teens, the participatory process, and lessons learned. A video of the project highlights the teens' responses to the project. Teenagers generated ideas of their ideal park and then constructed a scaled-representation of their design during a four hour Saturday afternoon workshop. The meeting began with discussions about parks (what are they, who uses them, what should be there, what should it look like) and was followed by the development of two designs. Reconciliation of the two schemes into one plan was difficult. Most teens from one group left the meeting; those remaining incorporated some of the more radical ideas into the other plan. The teens then constructed a scaled representation of their landscape in the city's "Central Park". The scaled model stayed in the park for the rest of the weekend. The teens' reflections on their participation in the project include surprise that they enjoyed themselves and that they would like to participate in similar events in the future. Participants were proud of their effort and brought parents by later to see it. The participants also learned that designing a park is complicated and that many more issues have to be addressed than they had realized previously. The university students learned the difficulties of gaining participation for an imaginary project, the importance of alternative agendas, and the complexity of participatory efforts. They also discussed the difficulty of setting a meeting agenda that will direct the discussion without prejudicing the outcome.

### **Preschool Children's Special Places To Regulate Social Interaction At School.**

**Schiavo, R. Steven (Psychology, Wellesley College, MA).**

Preschool children (N=59, ages 3.6 - 5.9 years) identified places at their school where they could find solitude ("be alone without anyone bothering you") and intimacy ("be with a best friend without anyone join-

ing you”). Places could be inside the classroom or outside on the playground. Their teachers rated the nominated places for effectiveness in obtaining these goals. Children also nominated places as personal territory (“belong just to you, no one else”). Children showed relative consensus on places for solitude and intimacy. More (86%) nominated places for intimacy than solitude (64%). The more effective places for these goals were characterized by environmental features or by situational norms (e.g., rules regarding number of occupants). Fewest children nominated personal territories (46%) and these places were primarily ones which allowed temporary control over others’ access, not permanent ownership. The relationship between places nominated for these functions and “favorite places” is also examined. Gender differences were found in nominating places for solitude and intimacy and in the characteristics of the nominated places. Few age differences were found. These data indicate that young children can differentiate the functions that physical places can serve to regulate social interactions.

### **Intergenerational Preferences Between Youth And Elderly: Public Outdoor Settings That Promote Well-Being.**

**Layne, Michael (North Carolina State University, NC).**

Segregation of the population into life cycle stages and the related decrease in the active participation of all generations in young people’s lives continues to undermine their self-esteem and cripple their capacity to care. Just as a reduction in intergenerational interaction has led to isolation, an increase in contact between generations would lead to more enriching opportunities to share knowledge, skills, and affection. Given the fact that public outdoor settings could provide interactive opportunities, the purpose of this pilot study was to examine the relationship between outdoor settings and the perception construct, well-being, for both youth and elderly. Using photographic simulations, a preference survey was conducted with 27 elderly and 24 design students. The results point to variations in light, contiguous buildings, prospect and refuge, adjacency to open space, multiple-use and group/paired meeting opportunities as being required for creating settings that would be mutually supportive. In addition, natural settings, open spaces, lack of appropriate seating, water, circulation pathways, limited overhead cover, non-maintained areas, and inaccessible settings should be avoided. Since current research indicates that intergenerational interaction is important to the well-being of both elderly and youth, the results of this age-comparative study could help to improve the

design of public outdoor spaces.

### **Playful Outdoor Environments: Design For Young Children.**

**Workshop Chair: Ward Thompson, Catharine (Edinburgh college of Art/Heriot-Watt University).**

**Cosco, Nilda (North Carolina State University, NC), Eubanks Owens, Patsy (University of California, CA), Maxwell, Lorraine (Cornell University) and Moore, Robin (North Carolina State University, NC)**

This is a workshop/working group involving a discussion of design techniques that engage with children’s desires and needs and site visits to examples of environmentally appropriate design for primary and preschool aged children. What are the methods that have been used to engage children in the design process? How effective are the environments as educational and playful places? How effectively do they engage with the natural environment? Which elements have been most successful in a Scottish social, cultural, and physical context? Presenters will include Patsy Eubanks Owens (University of California) who will open the session with a discussion of different techniques for engaging children/youth in design decision-making, Simon Lewis (Director of Grounds for Learning), Alan Rees (IPA Scotland), and a representative from ‘Play Scotland’, as well as local leaders of children’s day nurseries and summer play schemes.

### **The Pedagogy, Design and Use of ‘Smart Classrooms’.**

**Workshop Chairs: Danny Mittleman, Rich Wener, Craig Zimring. Discussant: Gary Gumpert**

Many post secondary educational institutions have developed, or are in the process of developing classrooms that involved the use of information technology. These rooms, often called “smart classrooms,” may include such technologies as internet connections - to the instructor’s podium and/or to the student desks, projection systems for showing digital displays (such as internet pages or Power Point presentations), and document cameras, for displaying printed information. Some also include distance learning facilities, such as video feeds from cable or satellite. As these rooms proliferate, it is reasonable to ask basic environment-behaviour questions about their design and use. These rooms are very costly, in terms of the money required to purchase technology, but also in the time and effort required of university faculty and staff to design and maintain these rooms, as well as to train instructors and students in their use. Yet, it is the case more often

than not that the underlying pedagogy involved in their use has not been well thought through. Often, the design process is limited, and these rooms appear to be standard classrooms with the technology added-on. Clearly, a more systematic attempt to study the purpose and philosophy underlying these spaces, and empirical studies to understand their use or misuse is warranted. This presentation will attempt to discuss these issues with the goals of invoking an exchange that helps to set forth a research agenda for studying these spaces. The three co-chairs will present a series of case studies of 'smart classrooms' that were conducted cooperatively and with the same procedures and instruments, on three university campus in the east, south and midwest. The results of these case studies will be presented both for their data, findings, and insights, but also to create a common information base to evoke discussion of design and pedagogical issues. Professors Mittleman, Wener, and Zimring will introduce the topic and present the case studies, limiting presentation to a total of 40 minutes. Gary Gumpert will then serve as a discussant (for a maximum of 15 minutes) to highlight critical findings and issues. The remainder of the session will be used in an open forum with the panel and audience.

## **Theme 2 Posters Gerontology and Health**

### **Transforming A Historic Care Setting For The Aged: Research-Based Design.**

**Verderber, Stephen F. (School of Architecture, Tulane University, New Orleans, LA).**

A case study is presented on the reconfiguration of a portion of a 195-year-old long-term care environment, and the challenge of doing so with an in-place, aged residential population. A research-based design process is recounted, guided by the environmental support-autonomy dialectic put forth by M.P. Lawton. A historic facility, complete with its archaic open wards, is examined from the standpoint of maximizing ways in which the inherently pressing conditions posed to the individual by this condition can be ameliorated. The results of a post occupancy evaluation of this care setting are translated into a compendium of design guidelines and subsequently translated into architectural design. The recommendations are presented, as are inherent risks, and opportunities, both from the standpoint of the well being of residents, their families, and staff involvement, as well as the need to reaffirm the viability of the historic facility. The case study functions as an example of how a balance is achievable between the dictates and limitations of a historic

care setting and the provision of state of the art care to each resident.

### **Elderly Persons With Dementia In Korean Long-term Care Settings.**

**Oh, Eunjin, Jun-Myung Research Institute on Aging & Environment, South Korea**

The environment of elderly people with dementia needs special attention to accommodate their behavioral problems. The purpose of this study was obtaining knowledge about the relationship between the therapeutic quality of architectural environment and behaviors of elderly persons with dementia in long-term care settings. In this study, research hypothesis was made as follows. The long-term care settings, designed to have therapeutic quality, have positive effect on reducing the problematic behaviors of elderly persons with dementia. Independent Variable for this study was the architectural environment of elderly persons with dementia in long-term care settings. Dependant Variable was the problematic behaviors of elderly persons with dementia in long-term care settings. Intervening Variables considered in this study include demographic factors, life-history factors, psychological factors, health factors, caregiver factor and program factors. In this study, four different facilities and their 109 residents with dementia were studied. Quality of those settings were measured by PEAP (Professional Environment Assessment Protocol by Weisman et al. (1998) and DEAP (Dementia Environment Assessment Procedure), which were developed for this study. Problematic behaviors observed in this study were forgetfulness, orientational capabilities in time, place and person, physical and verbal violence, eating non-edible, denying foods, overeating, wandering, sleep disturbances, urinary and bowel incontinence, inappropriate sexual behavior. The results indicate that purpose-built facility with therapeutic quality for dementia elderly has significant positive effects on reducing problematic behaviors of residents.

### **The Effect Of Physical Living Environments On The Quality Of Life Fro Koreans With Disabilities**

**Chang, Yunjung (Yonsei University, Korea), and Lee, Yeunsook (Yonsei University, Korea).**

Previous studies for Koreans with disabilities not only limited to social policy or rehabilitation services, but also neglected people's needs for improving their quality of life. This study thus assessed the extent to which physical living environments affect the quality of life for Koreans with disabilities. Survey questionnaires were given to 1,200 disabled (960 physical; 140 hear-

ing; 100 visual disabilities) through the proportionate stratified cluster random sampling procedure. By conducting careful comparisons among personal systems (self-esteem, self-confidence, and self-consciousness) and physical living environments (home circumstance, neighborhood, and public facilities), the findings indicated that both personal systems and physical environments were the most likely to affect quality of life for people with disabilities, while the degree to which social systems (social policy, societal attitudes, and social supports) influenced their quality of life was statistically insignificant. The quality of life among the respondents was generally found to be acceptable. However, it was very dependent on the extent to which physical living environments, particularly both social facilitation and accessibility, provide them. Also, disabled people's expectation of improvement in physical living environments was relatively high. People with visual disabilities cited improvement in physical living environments more often than people with hearing disabilities. The results of this study can be utilized to justify the importance of physical living environments in quality of life for Koreans with disabilities.

### **Nighttime Noise And Sleep Disturbance In Nursing Homes.**

**Ahuja, KA (GTRI), Funk, R (GTRI), Griffiths, C (Emory University), Schnelle J (UCLA), and Ouslander, J (Emory University).**

Noise is a common source of sleep disturbance for nursing home residents and has implications for their health, well-being, and satisfaction with care. Sleep status, assessed with wrist actigraphy, and A-weighted noise levels (1 minute Leq) at participants' bedsides were monitored in 2 nursing homes from 7PM to 7AM for a total of 195 person-nights. The lowest noise levels at the subjects' bedsides, for all night each subject was monitored, ranged from 29.8 (+/- .9) to 55.9 (+/- 1.3) dBA. The highest noise levels at the subjects' bedsides, for all nights each subject was monitored, ranged from 63.6 (+/- 1.7) to 78.7 (+/- 3.5) dBA. Noises exceeding 90 dBA were recorded on some nights at some subjects' bedsides. When subjects were grouped by place of residence, the facilities were notably different in terms of the lowest average bedside noise levels (35.9 +/- .2 vs. 50.3 +/- 3/1), although there was no difference between facilities in their highest average bedside noise levels (70.3 +/- 6/3 vs 69.5 +/- 3.6). Awakenings (after at least 10 minutes of seep) were observed coincident with even small increases in noise level (>3dBA). Sources of noise and implications for environmental interventions will be discussed.

### **Design Of An Outdoor Health Care Environment: Enriching The Therapeutic Experience.**

**Burcher, Lise (California Polytechnic State University, San Luis Obispo, CA).**

Design project serves as a model demonstrating the integration of research addressing the needs of specialized populations with the application of this to the detailed physical design resolution of an outdoor therapeutic environment within a hospital setting. The project design resulted from an extensive process developed with the objective of engaging participants to address specific areas identified as being deficient in previous research documentation. Specifically, the process challenges the assessment of risk-management in traditional decision-making processes within health care institutions for specialized populations. The process engages health care providers, therapeutic specialists and health administrators with a focus on experiential engagement to create a detailed design program for an outdoor environment providing opportunities for both passive restoration and therapeutic program delivery. Both the program and detailed design development were evolved within the collective group process, as will be the ongoing site management and continuing design evolution following the project installation. The project illustrates physical form and experiential opportunities that reflect information gained through interviews, accepted theories, case study examination and original research. The design is for a quarter acre controlled space within a hospital environment at a veterans care facility for residents experiencing moderate to advanced forms of dementia, their families and hospital staff. The project, situated in a northern setting, demonstrates the application of physical design criteria as evolved from research and process findings with the major objective of increasing opportunities for experiential engagement of residents while balancing the need for appropriate risk management.

### **A Community Center For Seniors.**

**Kalymun, Mary (University of Rhode Island, RI).**

The purpose of this presentation is to illustrate the integration of environmental gerontology research and practice into the design of a community based facility for elders who gather on a daily basis for services and activities. The Center is located in a rural setting and is designed with building materials that are germane to the area. This structure represents a one story 10,000 square foot building divided into two zones. Upon entry to the facility, a spacious atrium serves as a reception area that opens to locations for dining, recreation,

medical services, physical exercise, and a café with computers. A second zone provides office space for administrative and related services. It includes a conference room, meeting room for local associations, and space for senior volunteer services. Examples of environmental supports for participating elders are: the use of a dramatic central landmark upon entry into the atrium; a surrounding mezzanine level to facilitate the display of items that reinforce a sense of belonging; access to all desired locations, minimal distance to destination points; circular travel routes; bringing the outdoors indoors through vegetation and abundant natural light; a color palette that takes into account changes in visual acuity; and variety in the selection of ergonomically appropriate residential furnishings.

### **The Healing Garden: Using Evaluation-Based Design.**

***Bedard, Mary (University of California, Davis, CA).***

While we often think of healing gardens as part of a medical milieu, healing the rest of a community is still a problem being explored. Additionally, while we sometimes think of public participation as merely a politically necessary obstacle to projects, design benefits enormously from this time-consuming process. This collaborative project sought to integrate the needs of several stakeholders into a functional landscape design, while using an ongoing evaluative framework to inform the process. Data was collected through workshops, questionnaires, and interviews, providing information not only on user preferences, but also on how the garden was intended to function and how to best design it to function as desired. The two main stakeholders wanted to create a place for physical, spiritual, and environmental restoration. The resulting design was a collaborative effort, and a successful plan for a neighborhood restorative garden. The evaluative process, while guiding the initial design, also provided a series of checklists that will enable the stakeholders to continue to monitor the project, from fiscal tracking to baseline health data for future research.

## **Theme 2 Posters: Children**

### **The Effect Of Newly Built Elementary School For Open Education On Children.**

***Yoon, Hyegyung (Sangmyung University, Seoul, Korea), and Lee, Yeunsook (Yonsei University, Seoul, Korea).***

The purpose of this study is to examine how the pleasant environment affect the children's environmental perception/assessment, mood and attitude in the long-

term perspective. From this perspective, this study focused on the tree aspects: 1) children's environmental perception and assessment by grade and gender as time past, 2) children's mood and attitude by grade and sex as time past and 3) the difference in the assessments of the experimental group and the control group. This study is based on a field experiment that was conducted in two different types of experimental designs. Pre-test-posttest extended experimental design to measure any changes in the experimental group, and posttest only control group experimental design to select a control group so as to compare the results with the experimental group. The treatment was moving into a newly built M school. For research method, this research adopted a self-administered questionnaire survey. The survey was conducted among 1,401 elementary school children in the capital area from May 30th 1997 to February 17 1998, and a total of 2,815 data were collected. The major findings of the research were as follows: 1) It was found that children, in general, evaluated the newly built school environment more highly and positively. However, if they adapt themselves to the new environment over time, short-term impacts appeared right after moving were not continued as they were over the long period of time, but changed into various movements like up and down or down and up according to the conditions of children's objective and subjective characteristics. 2) The effect of changed physical environment significantly differed by sex (boy and girl). 3) The experimental group of M school children was found to have different results in all aspects.

### **The Meaning And Perception Of School Buildings.**

***Pasalar, Celen (North Carolina State University, NC).***

This study explores how people interpret and perceive the physical environment. It also demonstrates how specific meanings are attached to buildings and how these meanings influence people's judgments. The focus of this research is school buildings since few research studies have concentrated on issues related to imageability and symbolic meaning. The survey included eight photographic images representing different architectural styles of school buildings, a semantic differential rating scale, and questions related to familiarity, friendliness, and appropriateness for future education systems. The sample group consisted of students from the School of Education. Results were analyzed by using descriptive statistics. Preferred school building images were described as dynamic, complex, attractive, interesting. Disliked images were static, common, boring, simple, and unattractive. In general, high-tech and post-modern school building

images, which were not very familiar, were considered more appropriate for providing a variety of spaces to accommodate different programs and facilities than traditional school building types. All subjects disliked modern school buildings. Results from this empirical study in environmental perception can be influential in expanding the people's vision of building images beyond their everyday experiences with school buildings.