



# **PROCEEDINGS OF THE 2010 ANNUAL CONFERENCE OF THE HOUSING EDUCATION AND RESEARCH ASSOCIATION**

**Portland, Oregon  
November 3-6, 2010**

**Katrin B. Anacker  
Editor**

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## American Association of Housing Educators/AAHE

## Housing Education and Research Association/HERA

### Conference Locations and Dates

- 1946 Urbana, Illinois - April 1-4, 1946
- 1948 West Lafayette, Indiana - October 17-19, 1948
- 1957 Urbana, Illinois - October 9-12, 1957
- 1958 Ames, Iowa - October 22-25, 1958
- 1959 Stillwater, Oklahoma - October 7-10, 1959
- 1960 Ithaca, New York - October 12-15, 1960
- 1961 Manhattan, Kansas - October 11-14, 1961
- 1962 Minneapolis, Minnesota - October 18-20, 1962
- 1963 University Park, Pennsylvania - Oct. 30- Nov. 2, 1963
- 1964 East Lansing, Michigan - October 14-17, 1964
- 1965 Columbia, Missouri - November 3-6, 1965
- 1966 **1st AAHE Conference**, Urbana-Champaign, Illinois - October 26-29, 1966
- 1967 **2nd** Lafayette, Indiana - October 11-14, 1967
- 1968 **3rd** Athens, Georgia - October 27-29, 1968
- 1969 **4th** Davis, California - October 15-17, 1969
- 1970 **5th** Lincoln, Nebraska - October 14-16, 1970
- 1971 **6th** Blacksburg, Virginia - October 17-20, 1971
- 1972 **7th** Dallas, Texas - October 10-13, 1972
- 1973 **8th** Madison, Wisconsin - October 10-13, 1973
- 1974 **9th** Boston, Massachusetts - October 29- November 2, 1974
- 1975 **10th** Fort Collins, Colorado - October 7-11, 1975
- 1976 **11th** Columbus, Ohio - October 12-16, 1976
- 1977 **12th** Tucson, Arizona
- 1978 **13th** Minneapolis, Minnesota - October 11, 1978
- 1979 **14th** College Station, Texas - October 16-19, 1979
- 1980 **15th** University Park, Pennsylvania - October 6-8, 1980
- 1981 **16th** San Francisco, California - October 6-10, 1981
- 1982 **17th** Knoxville, Tennessee - August 10-12, 1982
- 1983 **18th** Lincoln, Nebraska - October 4-7, 1983
- 1984 **19th** Washington, D.C. - August 8-10, 1984
- 1985 **20th** Ames, Iowa - October 15-18, 1985
- 1986 **21st** Santa Fe, New Mexico - October 14-17, 1986
- 1987 **22nd** Newport, Rhode Island - November 2-7, 1987
- 1988 **23rd** Corvallis, Oregon - October 11-14, 1988
- 1989 **24th** Greensboro, North Carolina - October 24-27, 1989
- 1990 **25th** Columbia, Missouri - October 16-19, 1990
- 1991 **26th** Durham, New Hampshire - October 15-18, 1991
- 1992 **27th** Winnipeg, Manitoba Canada - September 16-19, 1992
- 1993 **28th** Columbus, Ohio - October 6-9, 1993
- 1994 **29th** Atlanta, Georgia - October 18-21, 1994
- 1995 **30th** Salt Lake City, Utah - October 11-14, 1995
- 1996 **31st** Kansas State University, Manhattan, Kansas - October 16-19, 1996
- 1997 **32nd** New Orleans, Louisiana - October 22-25, 1997
- 1998 **33rd** International Housing Conference, Seoul South Korea - August 5-8, 1998

- 1999 34<sup>th</sup> Orlando, Florida - October 18-23, 1999
- 2000 35<sup>th</sup> Stone Mountain Georgia - November 15-18, 2000
- 2001 35<sup>th</sup> Big Sky, Montana - July 22-July 25, 2001
- 2002 36<sup>th</sup> Minneapolis, Minnesota - October 23-26, 2002
- 2003 **1st HERA Conference** - Washington, DC (held in conjunction with AAFCS) -  
June 28-30, 2003
- 2004 2<sup>nd</sup> Chicago, Illinois - October 20-23, 2004
- 2005 3<sup>rd</sup> Denver, Colorado - October 4-7, 2005
- 2006 4<sup>th</sup> Cornell University, Ithaca, New York - October 8-11, 2006
- 2007 5<sup>th</sup> Charlotte, North Carolina - October 23-26, 2007
- 2008 6<sup>th</sup> Indianapolis, Indiana - October 7-10, 2008
- 2009 7<sup>th</sup> Santa Fe, New Mexico – November 1- 4, 2009
- 2010 8<sup>th</sup> Portland, Oregon – November 3 – 6, 2010

## **Refereed Abstracts – Poster Presentations**

# BLURRING THE BOUNDARIES IN RESIDENTIAL HOUSING: A CASE STUDY OF OUTDOOR ROOMS

Paulette Hebert\*

## Background

The average size of a new single-family home steadily increased in the latter part of the 20<sup>th</sup> century (U.S. Census Bureau, n.d.), and from 1950 to 2003, the average square footage of home per family member increased threefold (Wilson & Boehland, 2005). Some have dubbed “McMansions” the ultimate “American Dream” (Evans-Cowley, 2005), but bigger square footage means more volume to condition (heat and cool) and to illuminate. This trend towards larger residences has been challenged by those who do not believe that bigger is necessarily better. Proponents of more modest housing included Sarah Susanka, whose books *The Not So Big House* (1998), *Creating the Not So Big House* (2002a), and *Not So Big Solutions for Your Home* (2002b) encourage the design and construction of small homes. Susanka promotes housing with minimal footprints that embraces quality design and construction. She also advocates the creation of outdoor views and the optimal use of outdoor spaces for the home.

In 2008, the average size of a new home in the U.S. fell for the first time since 1994. The 2008 average was 2,438 square feet (Knott, 2009). Concurrently, the popularity of backyard living—and especially backyard cooking and entertaining—seemed to be increasing (Hoak, 2009). Further, the distinction between indoor and outdoor spaces was blurred by some homeowners and designers of residential projects, such as Home and Garden Television’s *Take It Outside* (HGTV, 2009).

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\* Paulette Hebert, Ph.D., Professor, Oklahoma State University

## **Purpose and Objectives of the Research**

The main purpose of this presentation is to illustrate the processes of developing outdoor rooms while integrating one of Susanka's small house ideas—"creating shelter around activity"—in a case study. Presentation objectives include illustrating the design and construction processes for outdoor rooms and exploring the challenges and opportunities in the creation of outdoor rooms. Design objectives include enhancing the views to/from the outdoor rooms, providing privacy layers to/from neighbors in a high-density neighborhood, creating a "sense of place" with regional influence, and utilizing sustainable practices based on the Cradle-to-Cradle paradigm (McDonough & Braungart, 2002). Programmatic requirements support environmentally friendly hobbies—gardening, bird-watching, and star gazing—as well as opportunities for relaxing and entertaining. The researcher documents the design and construction process to share the processes with design and housing students and educators. Plans, photographs, initial construction costs, and energy consumption data from the completed project will be shown in the proposed presentation.

## **Methodology**

The researcher performed a precedent study to reveal sustainable design trends that might be applied to this residential, outdoor rooms project (International Dark-Sky Association, n.d.; Susanka, 1988, 2002; U.S. Department of Energy, 2009). The researcher planned, built, and documented the current design and construction project. The following four new outdoor rooms were created for a single-family home in the

Midwest: the Stargazing Patio, the Dining Patio, the Entertaining Patio, and the Spa House. The following three new garden areas were also implemented: the Bird Garden, the Water Rock Garden, and the Vegetable and Flower Garden. Sustainable practices were utilized to condition and illuminate all of these spaces.

The standard design process format (Piotrowski, 2002) was followed: programming, schematic design, design development, contract documents, and contract administration. The design phases of the project occurred over about 18 months during 2007-2008. The project was constructed and installed between August 2008 and April 2009. The educator documented the design and construction project processes and the initial construction costs as a case study for potential use as a module in an existing Environmental Systems course. This course, which is focused on sustainability, introduces lighting, heating, cooling, and ventilation concepts to interior design students.

## **Results**

With their new outdoor rooms completed, the homeowners have increased the total number of activity areas for their home with minimal new construction costs and minimal ongoing energy consumption. Although data analysis is not complete, preliminary findings indicate that the average initial construction cost per square foot for the outdoor rooms in this case study are much lower than that of conventional, conditioned (heated and cooled) interior rooms. This project added 2900 square feet of outdoor activity areas for a total construction cost of approximately \$30.00/square foot. This cost may be compared to the neighborhood's current \$125.00/square foot real

estate prices, which reflect the size of interior rooms only. Each outdoor room in the case study have only two ceiling fans to operate. Therefore, comparable exterior rooms should cost much less to heat and cool annually. Energy savings will be further realized through the use of lighting controls.

### **Conclusions**

The new outdoor rooms in this case study blur the boundary between the interior and exterior of a home. The development of backyards as viable activity areas could extend residential living space without the construction costs and ongoing energy costs normally associated with interior spaces.

### **Implications**

More research about the associated costs and potential benefits of outdoor rooms is needed. The results of this research could greatly influence the design of future residential construction and the performance and cost of home activity spaces.

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# **WORLD WAR II VETERANS' MEMORY DRAWINGS OF HOUSING ON BRITISH AIR BASES**

Paulette R. Hebert, Sylvia Chaney, Jan Johnston, Bridgette Dembowski\*

## **Introduction**

Over half a century ago, the people who would become known as the Greatest Generation were facing a dreadful prospect: an imminent Nazi threat that could not be ignored. The next few years were fraught with heartache and heroism. Undeniably, the landscape of our world was forever altered by the second great World War. As troops mobilized to defend their territories, military bases that were like mobile cities sprang up everywhere. The strategic planning and ardent industry that served the Allies so well in the theater of war also helped them overcome the practicalities of housing thousands of soldiers.

Because Allied forces were exposed not only to the enemy but also to the elements, the military needed low-cost housing that was strong enough to protect its personnel while remaining light enough to ship easily and simple enough to assemble quickly. The English forces were already using lightweight, pre-fabricated Nissan huts (Seabee Museum and Memorial Park, n.d.). Designed for military use in the First World War, these half-cylinder buildings were constructed of corrugated metal panels on steel frames (Chiei & Decker, 2005). The Nissan hut, however, had two major flaws: (1) it

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was difficult to attach the sheet-metal cladding to its frame and (2) it took up too much space in shipping (Thomas, 2003).

The United States' innovation on the housing design was developed and produced at Quonset Point, Rhode Island, during the spring of 1941 (Seabee Museum and Memorial Park, n.d.). The new structure, which became known as the Quonset hut, corrected the issues that were noted in the Nissan hut and also featured interior Masonite® wallboards and a layer of paper insulation. It could be assembled in one day by ten men with no prior training (Chiei & Decker, 2005). Later iterations of the Quonset hut further enhanced the building's strength, safety, portability, and versatility.

### **Procedure**

As part of a larger research endeavor, this study was submitted to the Institutional Review Board (IRB) for use of human subjects and was approved. The 150 attendees at a national WWII Veterans' reunion in the Southwest U.S. were invited to draw, from memory, images of the English barracks where they lived during the war. Participants were provided with black ink pens and plain white 8-1/2 x 11 paper. No time limit was set for drawing. The drawings produced were submitted to a collection box anonymously. Drawings were scanned electronically and researchers visually analyzed the contents of the images and texts for similarities and frequencies of recurring images. A small number of the memory drawing participants also volunteered to be interviewed about their WWII experiences and current housing status, but these interviews are beyond the scope of the current presentation.

## Data

The veteran participants created thirty-seven usable, free-hand drawings to represent their housing during World War II. Most of these attendees had been stationed in England and had lived in Quonset Huts. The average drawing time was about 30 minutes. However, some of the veterans “visited” while they drew, remaining at the drawing “station” for approximately one hour. Each participant produced one to five separate images. In order to maximize ease of participation and preserve anonymity, the drawings were not linked to individual participants or surveys. Therefore, an exact drawing count per participant is not possible.

Only the Quonset hut images are discussed in the current presentation. (See sample images, appended after reference list.) Drawing types varied and included elevations, floor plans, 3D perspectives, and axonometric sketches, as determined by the individual participants. The sketches represent varying levels of drawing skill, accuracy, clarity, and detail. The vast majority of the dwelling unit sketches were simple line drawings, but some were more elaborate, creating visual texture and shade and shadow enhancements. Drawings of both the exteriors and interiors of the huts were produced. Curved roof forms, doors, windows, and other prominent architectural features were indicated by most participants. Various pieces of furniture, furnishings, and equipment were also sketched and noted within the barracks. Labels included “card table,” “one foot-locker per man,” “small coke-burning stove,” and “my bunk”. Further, some participants indicated occupancy levels for the Quonset huts by drawing in a specific number of distinct rectangles arranged in rows and columns to represent

bunks and/or with notes such as “2 crews per hut” and “6 men” labeled on the two sides of the hut or, in larger huts, “36 men double bunks” and “in hut = 36 men.”

Additionally, some of the participants provided contextual labeling and notes for the Quonset huts in either written or graphic formats, some in the form of maps or site plans. Proximal indications, such as “hut one mile from runway” and “to Tibenham Air Base,” were noted by some participants. Other nearby buildings, including “hospital” , “officers’ club”, “mess hall” and “hanger (mine)”, were also indicated on the drawings. Indications of squadrons, groups, and divisions, etc., such as “392<sup>nd</sup> BG (Bomber Group),” “453<sup>rd</sup> Bomb Group,” “734 Bomb Squadron,” “2<sup>nd</sup> Air Division,” and “8<sup>th</sup> USAAF” were also made. A few of the participants signed their names on their drawings.

## **Conclusions**

Even five decades after they lived in the Quonset huts, the participants were able to provide documented memories of WWII housing. No studies were found that examined memory drawings of military housing, although a memory drawing study was found of Kuwaiti women perceptions of the Iraqi invasion (Pepin-Wakefield, 2008). This work fills a gap in the existing military housing literature, providing researchers with new materials for future study and analysis.

## **Implications**

Although historical records accurately document the physical attributes of Quonset huts, the former occupants’ vivid visual recollections can provide unique personal insights into their living quarters during WWII. Due to the advancing age of this

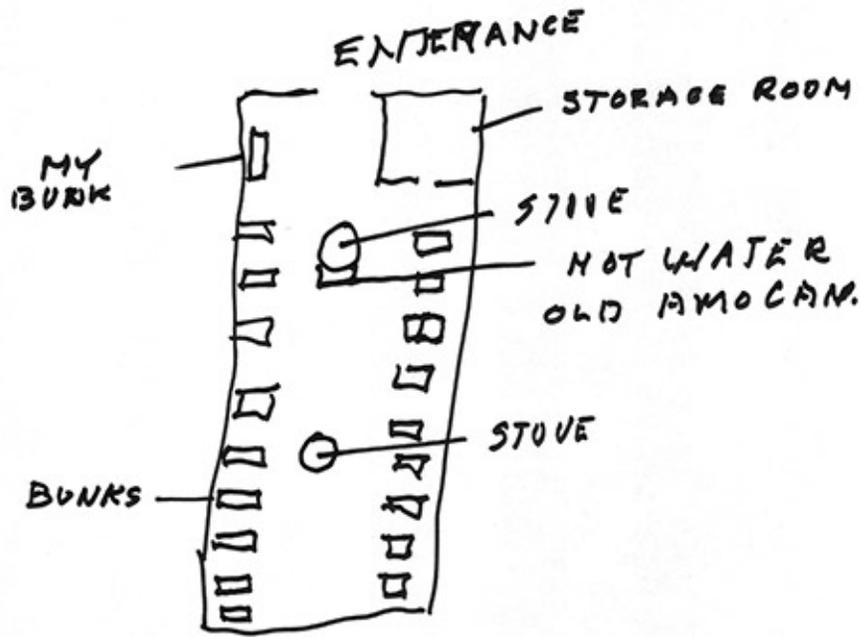
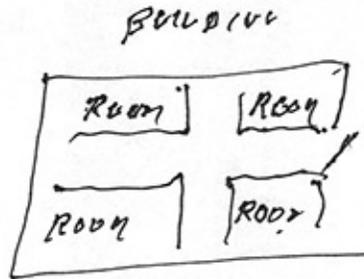
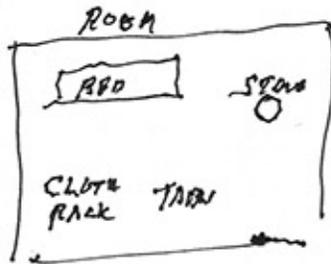
cohort (most of those sampled in the current study were in their 80s or older), future opportunities to capture first-hand memories of WWII Veterans will be limited. The original, free-hand and extemporaneous memory drawings of WWII Veterans' barracks produced in this study comprise a new collection of rich historic images and supporting data.

## References

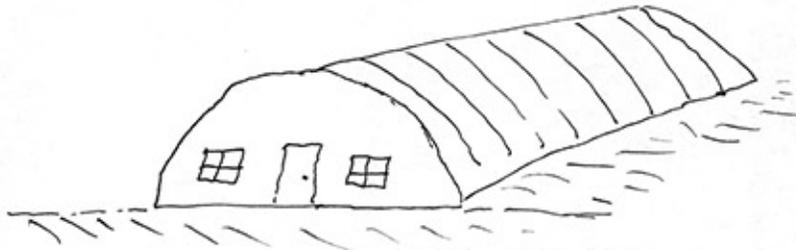
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Appendix: Sample Images

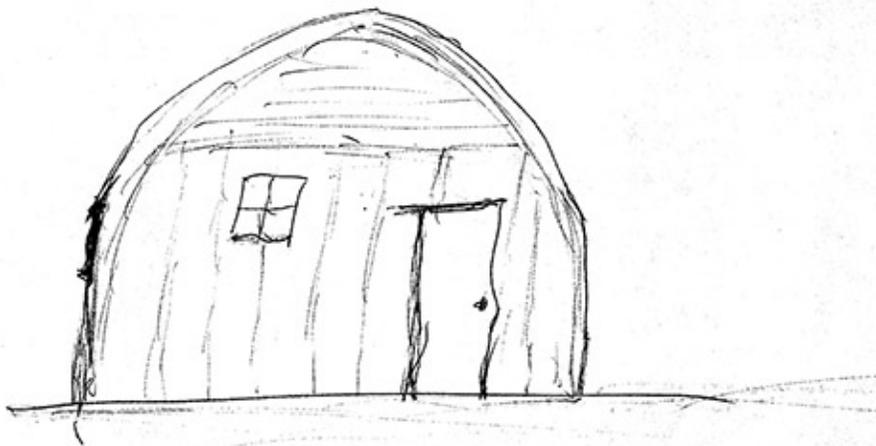
RUSSELL WOJNOWSKI  
464th BG  
STATION - ATTLEBRIDGE, ENGLAND



392nd BG 578039.  
AREA  
WELDING ENG.



Quonset Hut (Steel Sheet Metal)  
For 2 Air Crows (6 Men Each)  
Old Buckenham Airfield



TIBENHAM AIR BASE  
TIVESHAL, ENGLAND  
APD 124

## **KITCHEN DESIGN STRATEGIES TO INCREASE HOME DINING FOR ALL FAMILY MEMBERS**

Arlena Hines, Roberta Null, Joy Potthoff, Sylvia Sullivan, Linda Welch\*

Nowadays, two-thirds of American adults are obese or overweight. Overeating and its lethal companion, under-exercising, are the recognized culprits in this country's rise in obesity rates. As lives grow busier—and waistlines grow larger—a number of nutritionists are calling for Americans to reduce their risk of obesity-related health problems by cooking at home more and eating out less.

Those concerned about the obesity epidemic are battling an entire environment—massive societal change, government policy, and billions of dollars in advertising, all of which influence family eating habits. Advertising, fast-paced living, and convenience foods and treats every time one turns around are keeping us away from healthful eating choices. Americans even eat an average of 30 meals a year in their vehicles, and these meals are most likely purchased at fast food restaurants.

In order to reduce our reliance on fast food, we need to encourage home cooking. To do this, we must make cooking at home an attractive, viable alternative to eating out and develop kitchen design strategies and educational programs to increase home cooking and dining for all family members.

The overriding principles of a user-friendly kitchen design help families to provide a kitchen that supports shared activities, encourages all members in food preparation and planning strategies, and enables team decision-making and delegation of duties.

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Family food preparation activities related to the guidelines from the National Kitchen & Bath Association (NKBA) are selection, preparation, serving, and cleanup. Also, safety is a major factor to consider in a kitchen with multiple cooks (Center for Universal Design, n.d.).

The kitchen design we propose will support all multi-generational family food preparation activities and the enjoyment of family meals. Through collaborative activities, children learn to appreciate the teamwork contributions of older family members and their parents in addition to learning skills that relate to their own future life roles.

Several recent research studies have specifically addressed the needs of older people in kitchen planning. Andes (2004) found that we are not designing well for seniors and that seniors do not know what available supportive design features are appropriate for them. Anders (2005) states that we need to destigmatize supportive kitchen features by creating an attractive appearance, distinguishing between disability features and supportive features. Subsequently, we need to market supportive design features as value-added assets.

Incorporating Universal Design features into kitchen design helps us create spaces that are functional and aesthetically pleasing. Potthoff (2003) developed a set of Universal Design guidelines for kitchens that are supportive of an aging population.

These included:

- 1.) two sinks (one a large two or three bowl that provides for vegetable preparation and the other a small single sink that is possibly located in an island or at the end of a peninsula);

- 2.) counter space at different heights (e.g., 30, 36, and 42 inches);
- 3.) two good-sized, not-too-low ovens into which a 25-pound turkey can fit;
- 4.) non-slip and easy-to-clean floors; and
- 5.) adequate space for multiple cooks to work in the kitchen (i.e., aisles should be at least 44 inches wide).

These same Universal Design guidelines also ensure good wide traffic/circulation paths for efficiency and safety for the “Family of Cooks” kitchen.

In addition to creating a Universally Designed kitchen, the authors/designers describe special features that accommodate the needs of children, parents, and older family members using the kitchen. Some of these features are highlighted in a kitchen plan designed by Sullivan (2005), which incorporates principles of Universal Design and accommodates many people working together in the kitchen. These features are categorized by their work center locations and National Kitchen and Bath Association (NKBA) guidelines. Examples are:

- 1.) lunch/snack prep center – this design element is ideal for children and teens to entertain their friends and serve healthy drinks (e.g., smoothies). This versatile addition to the kitchen can be used as an informal eating area for the family or as a buffet serving area. The bar/counter would be part of an additional food preparation center for the kitchen and would have barstools to seat those eating or preparing food.

The other work centers include:

- 2.) cooking/food prep center
- 3.) clean-up/prep work center

4.) refrigerator/baking center

5.) storage/serving center

6.) planning center

# **AN INTERIOR DESIGN PLAN FOR UNIVERSITY APARTMENTS**

Michelle Schemine, Carla Earhart\*

## **Introduction/Rationale**

Off-campus student housing is now a big business, as enrollment outpaces dorm spaces at universities around the country (Feldman & Feldman, 2005). Today's college student has increased expectations for their housing, and older on-campus sites may have trouble meeting those demands. As a result, many students are moving off-campus as early as their sophomore year.

## **Purpose**

The purpose of this creative project was to propose a redesign for on-campus apartments at Ball State University in Muncie, Indiana, a state-supported university. The existing apartments were opened in phase, with the first being in December of 1959. They were last renovated in the 1980s. The apartment community accommodates upper-level single students with families and faculty and staff of Ball State University. Results from this project can be used by the university to provide a more desirable layout and better materials and finishes in their on-campus apartments. As a result, the apartment community will be more competitive with newer off-campus apartment communities in the area. More students may remain in on-campus apartments if their housing needs are met.

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## **Methodology**

The following steps were taken to complete the project:

- establish client needs by writing a communication log over the duration of the project;
- establish budget and timeline;
- select products (i.e., appliances, faucets, and lights) and finishes (i.e., paint, flooring, and countertops) to meet client needs and budget;
- create a product and finish guide that provides specification information on all of the products and finishes;
- create product and finish boards that display pictures of all of the products and finishes; and
- present findings to the client (i.e., university apartments, and more specifically Anthony Apartments—the former are a part of the Student Housing and Residence Life department at Ball State).

## **Results/Conclusions**

The proposed redesign of these older on-campus apartments showed that the interiors could be updated at a cost of only \$5,000 per unit. A typical redesign for an apartment in the Midwest costs anywhere from \$1,000 and up. The cost depends on how much the community is willing to spend and how much the community wants to redesign. The proposed changes include updates to counter tops, flooring, walls, fixtures, lighting, and appliances. All of the products selected were selected based on their style, warranty, quality, and brand.

The products selected for the redesign of the kitchen include new countertops by Wilsonart, new refrigerators and ovens by GE (both products are energy star products), and new faucets by Kohler. The kitchen floors would also be updated to a wood laminate by Shaw flooring.

The products selected for the redesign of the bathroom include new countertops by Corian, new faucets by Kohler, lights that are available from [www.lampusa.com](http://www.lampusa.com), and ceramic floors by Shaw Flooring.

The living room and bedrooms would receive new carpet in the frieze style from Shaw Flooring and updated paint on the walls. Future residents of the apartments would also have the option of an accent wall in one room and could choose from four colors that would complement the rest of the finishes selected. The accent wall would be repainted by maintenance after a resident moves out or it would remain if the next resident liked the same color. The paint is Valspar that can be purchased at Lowe's Hardware. This poster presentation will show the current state of the apartments and the possibilities for improvements.

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# OPPORTUNITIES FOR ENERGY STAR CERTIFIED MANUFACTURED HOMES

Anne L. Sweaney, Yoko Mimura, Doneshia Starling\*

## Overview of the Study

Two issues motivated this study: first, increasing household energy consumption, and second, housing affordability. Despite tax incentives and greater social acceptance of lifestyles that save utility consumption, many manufactured housing producers do not produce Energy Star certified homes. This lack of production may be a reflection of low demand by homebuyers, despite financial incentives.

We hypothesize that the manufacturers' cost involved in starting to produce Energy Star certified homes outweighs the benefits of making them available to consumers, and that current government incentives are not strong enough to convince manufacturers to make capital investments now for possible tax credits to be given at a later date. Additionally, consumers may overlook long-term financial savings if they are not explicitly made aware of them. If lowering household utility consumption is important for society, then making consumers aware of the financial incentives is important. The situation for Energy Star certified homes might become more favorable as a result of the Home Energy Star Retrofit Act of 2010 (HR 5019), a \$6.6 billion Act by the Department of Energy that was passed by the House of Representatives in May 2010 (House Republican Congress, 2010). It will need to be passed by the Senate and then signed by the President to become a reality.

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This exploratory study compares the total cost of buying and living in Energy Star manufactured homes to otherwise comparable conventional manufactured homes. These costs include upfront and long-term costs. The primary advantage to homebuyers of Energy Star certified homes is financial savings on utility bills. To make Energy Star certified homes an attractive option for consumers, information about savings in utility bills in the long run needs to be made explicit so that more consumers demand such homes (Thaler & Sunstein, 2008). If consumer demand remains low, then manufacturers will not be motivated to produce more of Energy Star certified homes.

### **Background**

The three primary incentives for manufactured home producers to build Energy Star certified homes are market differentiation, cost, and psychology. First, the Environmental Protection Agency and the Department of Energy (2010) list market differentiation and recognition as the first benefit for manufacturers. Second, there may be tax incentives, and recently manufacturers of qualified homes have received a \$1,000 tax credit for each home from the Federal Government (U.S. Environmental Protection Agency, U.S. Department of Energy, 2010). Third, manufacturers of Energy Star certified homes may feel better knowing that they are making a contribution to society by producing affordable housing that helps reduce CO<sub>2</sub> emissions and residents' utility bills. The cost of adding Energy Star certified homes to the production line is the other side of the equation. First, the production plant must be certified, which involves hiring a certifier and designing homes to meet the requirements. Then, producing these

homes requires additional steps, one of which involves periodic evaluations by an accredited certifier (Systems Building Research Alliance, 2010a).

Consumers also have financial and psychological incentives to choose Energy Star certified manufactured homes as opposed to otherwise equivalent conventional manufactured homes. While a typical Energy Star homes costs only about \$700 more than a non-certified home, savings in monthly utility bills could be about 30% (personal communication, 2010). Within a short period, homeowners can see their investment payoff. With the new Home Energy Star Retrofit Act, current manufactured homeowners who meet income criteria can receive up to \$7,500 to replace their home with an Energy Star certified manufactured home. Also, they can receive up to \$2,500 toward destruction or removal of old homes sitting on land where new manufactured homes will be placed (House Republican Congress, 2010).

Furthermore, there are various local programs that provide additional financial incentives through utility companies, for example. States may also offer additional incentives. North Carolina has its own Energy Star program for manufactured homes, which is funded by a federal stimulus package (Systems Building Research Alliance, 2010b). The state provides this funding to homebuyers in an attempt to increase the demand for Energy Star certified manufactured homes. Psychological incentives for consumers include a desire to reduce CO<sub>2</sub> emission from their homes.

In sum, manufacturers have certain financial and social incentives to incorporate Energy Star certified manufactured homes into their inventories; however, few manufacturers are offering such homes. Conversely, homebuyers clearly have

incentives to choose Energy Star certified manufactured homes, yet they lack awareness of the benefits that purchasing such homes would bring.

### **Theoretical Framework**

This study uses a sample of manufactured homes in the market to illustrate inter-temporal financial implications for consumers, comparing cases in which they choose Energy Star homes with cases in which they choose non-Energy Star certified homes. A specific theoretical concept that we use to assess discount rates for consumers who would choose Energy Star homes is present-biased preferences (O'Donoghue & Rabin, 1999). This framework realistically depicts the market challenge that Energy Star certified manufactured homes have experienced. Rational or sophisticated consumers would choose Energy Star certified homes if the long-term cost of owning them would be lower than owning conventional manufactured homes, which could be pre-owned and excessively energy inefficient. However, when the upfront cost of purchasing an Energy Star certified home is higher than that of a non-certified home, naïve consumers tend to operate with quasi-hyperbolic time discounting. They tend to weigh upfront costs much higher than future cost-savings (Frederick, Loewenstein, & O'Donoghue, 2002).

### **Description**

Information for the preliminary stage of this study came from two manufactured home retailers that sell one manufacturer's homes in Georgia. At one retailer, the price range of single section Energy Star certified homes (1,200 ft<sup>2</sup>) ranges from \$29,900 to \$41,000, including delivery and set up fees. This price is \$700 higher than for

conventional homes (personal communication, 2010). Assuming a \$200 monthly utility bill for non-Energy Star homes, the annual utility cost is \$2,400. Assuming 30% savings on the utility bill for Energy Star homes, homeowners could save \$720 per year on their utility bills. Within a year of living in an Energy Star certified home, the return on investment exceeds the initial investment. This example shows that naïve consumers who choose conventional homes because they are \$700 less do not look even 12 months ahead. The saving described here does not account for inflation, nor does it include any governmental rebates or promotions from local utility companies.

### **Implications**

Due to recent legislation, consumers have a unique opportunity to purchase energy efficient housing. Energy Star manufactured homes are now available; however, consumers need to be aware of this affordable option, since not all retailers offer it. By purchasing Energy Star certified homes, families and consumers can enjoy long-term benefits.

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## **Refereed Abstracts – Oral Presentations**

# **FUTURE HOUSING PLANS OF OLDER RESIDENTS IN RURAL TENNESSEE AREAS: FOCUSING ON OLDER ADULTS AGED 80 AND OLDER**

Mira Ahn\*

## **Introduction**

Older residents in rural areas often lack the resources necessary for decent, affordable housing along with special services in the fields of housing, healthcare, and transportation as compared to non-rural residents (Cynthia, 2005; Joint Center for Housing Studies, 2010). Regardless of poor housing conditions, most rural elderly want to age in place, meaning they prefer to stay in their current homes as long as possible (Norris-Baker & Scheidt, 1994). Aging in place is the most desirable option if the current home environment can meet the increasing needs of older people as they age. However, for very old people living in poor housing in rural areas, this preference might cause more problems than it would for older residents in non-rural areas.

The purpose of this study is to investigate the future housing plans of people aged 80 and older in rural areas in Tennessee by comparing them to the plans of their younger counterparts.

## **Methods**

The sample of this study consists of adults aged 65 years and older living in their current homes in northwest Tennessee areas that are considered more rural areas than

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other areas in Tennessee.<sup>1</sup> Data were collected by a questionnaire distributed to 13 senior centers<sup>2</sup> in northwest Tennessee in 2008. Seven hundred and thirty-five questionnaires were distributed. One hundred and thirty surveys were mailed to individuals by directors of the centers and 605 surveys were placed at the centers to allow seniors interested in the survey to participate. The response rate was 37%, with 268 eligible, completed questionnaires. The four major characteristics used for this study were (a) demographics, (b) health, (c) housing, and (d) future housing plans. Chi-square tests were used to compare frequencies of two groups with a confidence level of  $p < .05$  for statistical significance.

## Results

In order to investigate the future housing plans of adults aged 80 and over, the respondents' ages were categorized as two groups: under 80 years old ( $n=174$ ) and 80 years old and over ( $n=94$ ). For analyses, these two groups were compared using chi-square tests.

The majority of the respondents from the older group (73.3%) had an annual income of less than \$20,000; 66% ( $n=62$ ) were homeowners and 11% of the older group lived with their children ( $n=10$ ). Regarding housing conditions, 66% of the older group lived in single-family, detached homes ( $n=62$ ), 34% of those respondents' houses

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<sup>1</sup> According to the U.S. Census Bureau (2002), rural areas are defined based on population density and all territory outside of Census Bureau-defined urbanized and urban clusters. Thus, rural areas have population densities as high as 999 persons per square mile or as low as one person per square mile. Based on the population data, the author considered nine rural counties in northwest Tennessee for this study.

<sup>2</sup> Most of the counties have one senior center, but some of the bigger counties have more than one.

were built before 1960 ( $n=32$ ), and 11% of the older group reported that they had lived in their current homes for over 50 years ( $n=10$ ).

Not surprisingly, chi-square tests indicated significant differences in health conditions between the two groups. Approximately 37% of the older group and 15% of the younger group reported that they had had falling experiences:  $\chi (1, N=252) = 16.124, p=0.00$ . Almost 30% of the older group and 10% of the younger group reported their health conditions as poor or very poor:  $\chi (1, N=255) = 15.656, p=0.04$ .

Also, the current environmental adaptations and future housing plans of the two groups were compared. The majority of both groups agreed or strongly agreed to age in place. With 77% of the older group and 82% of the younger group planning to age in place, there was no statistically significant difference between the two groups. However, when it came to moving plans, the chi-square test indicated that there was a significant difference between the two groups. Seventy nine percent of the older group and 56% of the younger group reported that they had made plans to move:  $\chi (1, N=103) = 5.704, p=0.17$ .

Regarding environmental adaptation behaviors, including home modification, repairs, or renovation, both groups showed similar responses without statistical significance. Almost 19% of the older group and 15% of the younger group had adapted their home environment, whereas 56% of the older group and 69% of the younger group had considered it. Almost 82% of the older group and 78% of the younger group reported that they would continue to live without any changes in their homes (see Table 1).

**Table 1. Comparison of Future Housing Plans and Environmental Adaptation of Older Adults**

	Older group (aged 80 and over) (%)	Younger group (aged under 80 years) (%)
Aging in place (Agree/ strongly agree)	77.3%	81.6%
Moving plans in future * (Yes)	78.6%	55.7%
Home modification/ Home repairs/ Renovation (Yes)	18.5 %	14.5 %
Consideration of Home modification/ Home repairs/ Renovation (Yes)	55.6%	68.5 %
Continue to live without any changes (Yes)	81.8%	77.6%

\* Difference is significant at the 0.05 level.

### **Conclusions and Discussions**

The majority of the group aged 80 and older (77%) showed a preference for aging in place. However, the potential problem related to this preference is that most of them responded that they had not adapted their home environments and would

continue to live in their current homes without any changes even though more from the older group reported falling experiences at home as compared to the younger group.

A significant finding is that although most of the older group showed a preference for aging in place, more of them had plans to move in the future than younger respondents. These results imply the complicated relationship between the recognition of current home environments and the future needs of home environment as the older group ages.

It should be noted, though, that older people's strong desire to age in place might not accurately represent their desired future housing plans. In many cases, staying in their current homes might be their only option as a result of poverty (Fitchen, 1991) or because of a lack of information about other housing options (Cynthia, 2005). Providing more affordable alternative housing and community-based social services in rural areas will be needed to support the successful aging in place of very old residents in rural areas.

The results from this study cannot be generalized for the entire elderly, rural population, mainly because the sample for this study was not random. However, this study is expected to provide a better understanding of how very old persons aged 80 years and older in rural areas perceive their current and future home environments when considering future housing plans.

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## MONITORING AND EDUCATING FOR SUSTAINABLE WEATHERIZATION

Jorge H. Atilas, Mandi C. Blochberger, Pamela R. Turner\*

The U.S. Department of Energy (DOE) defines the Weatherization Assistance Program (WAP) as a program that “enables low-income families to permanently reduce their energy bills by making their homes more energy efficient” (U.S. Department of Energy, 2010, p. 1). Starting in 1976, WAP has helped over 6.4 million low-income households reduce annual energy bills by an average of \$437 per year (U.S. Department of Energy, 2010). Advances in weatherization have moved from covering windows with plastic sheeting to permanent, cost-effective measures. The focus is now a whole-house approach, referred to as “Weatherization Plus” (Millennium Committee Strategy Report, 1999). This treats the house as one energy-consuming unit and employs more diagnostic testing (energy audits) before implementing energy conservation measures.

In 2009, the American Recovery and Reinvestment Act (ARRA) expanded WAP by \$5 billion with two primary goals: increase the number of homes weatherized to one million homes per year (an additional 590,000 homes) and generate energy-related employment during the recession. To accomplish this, low-income thresholds were increased from 150% to 200% of the federal poverty income guidelines, and average WAP expenditures per home increased from \$2,500 to \$6,500 (U.S. Department of Energy, 2009). In 2009, an Extension housing specialist along with 12 Extension energy educators and 12 field monitors at The University of Georgia secured an ARRA grant

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from the state energy agency to monitor weatherization and provide consumer energy education. The Extension proposal competed with a pool of eight renowned energy-related businesses around the nation. There are several reasons why Extension was selected for this program:

1. Extension has an existing, unbiased, research-based delivery structure in almost every county.
2. It has over ten years of experience delivering energy curricula, low-literacy publications, and exhibits to low-income audiences and five years experience working with community action agencies implementing WAP.
3. It has proven capacity to evaluate outcomes, with experience in evaluating energy conservation and literacy.
4. The Extension proposal included a sustainable component—consumer energy education. This ensures that WAP beneficiaries learn both how the improvements will help them before the weatherization takes place and how to further reduce energy costs by making behavioral changes.
5. There is a Human Sciences holistic approach. Programs and services include improving the indoor environment, conserving water, maintenance, nutrition, relationships, and financial management.

Since the award, the grant has been renewed and will continue through 2012.

Extension created 24 new jobs in weatherization monitoring and energy education and two jobs in program compliance/accounting. The Extension staffing structure for this program includes:

- a) Extension field monitors trained on weatherization, building science, energy, and related topics to ensure proper weatherization improvements. Field monitors also educate the weatherization agency's field inspectors and crews on the latest technological and construction practices in weatherization. A field monitor shared his experience in an urban county where the median family income is \$71,884 and the average monthly utility bill in 2008 was \$114 (HUD, 2010; EIA, 2010):

There were 4 dependents living in the home and total household income was well under \$40,000.00. This home was less than 1,100 square feet and their monthly utility bills were costing them more than \$480.00 per month. ... [After weatherization] our efforts will reduce this homeowner's monthly utility expenses to less than \$180.00 per month. Ultimately, helping them stay in their home and keeping their power on (which was already running a month past-due). The homeowners could not express their gratitude enough. (p. 2)

- b) County-based Extension educators monitoring weatherization agencies for WAP compliance (i.e., wages, inspections forms, energy assessments). Educators educate WAP recipients. Knowledge gains among recipients were measured using a retrospective post-test. Table 1 summarizes responses ( $n=212$ ) indicating that WAP recipients gained "a lot" of knowledge from the Extension education.

**Table 1. Knowledge Gained from Consumer Energy Workshop**

Question	Knowledge Gained			Question	Knowledge Gained		
	Nothing	A Little	A Lot		Nothing	A Little	A Lot
Before this class I knew what needs to be done to weatherize my house.	26.4%	55.4%	20.1%	After this class I know what needs to be done to weatherize my house.	3.3%	19.2%	77.5%
Before this class I knew how to dispose of broken CFL light bulbs.	67.1%	26.2%	6.7%	After this class I know how to dispose of broken CFL light bulbs.	10.1%	12.3%	77.7%
Before this class I knew what I need to do to apply for weatherization.	48.5%	35.7%	15.8%	After this class I know what I need to do to apply for weatherization.	4.7%	15.1%	80.2%
Before this class I knew what I need to do to prepare my home for weatherization.	39.1%	48.5%	12.4%	After this class I know what I need to do to prepare my home for weatherization.	6.7%	19.7%	73.6%
Before this class I knew how temperature settings affect my utility bill.	19.9%	44.9%	35.2%	After this class I know how temperature settings affect my utility bill.	3.3%	22.8%	73.9%
Before this class I knew how to check the gasket seal on my refrigerator.	58.5%	27.4%	14.0%	After this class I know how to check the gasket seal on my refrigerator.	20.7%	12.1%	67.2%
Before this class I knew how to recognize hypothermia.	44.2%	38.1%	17.7%	After this class I know how to recognize hypothermia.	25.2%	13.6%	60.5%

Longer term impact analyses will follow to assess actual energy savings for the recipients after weatherization.

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# **DETERMINING THE EFFECTS OF UNIVERSITY CAPITAL IMPROVEMENT PROJECTS ON STUDENT RESIDENTIAL SATISFACTION**

Andrew Carswell\*

## **Introduction**

Recently, there has been an emphasis on improving the residential housing stock within America's college campuses (Supinie, 2008). While other sectors of the housing industry languish, there are signs from industry trade sources that the student housing sector has the potential to thrive over the next several years (Campus Housing Solutions, 2008; Texas Construction, 2009). Meanwhile, there is evidence that colleges and universities are using such housing as recruitment tools for prospective students (Supinie, 2008). Part of that recruitment effort includes undergoing capital improvement projects on American campuses in an effort to modernize residential environments.

The literature on student housing and satisfaction is sparse. Holahan and Wilcox (1978) reported on residential satisfaction of dormitory living and the effect that building density plays on social connections. The authors found that residents in high-rise dormitories were less satisfied than residents in low-rise student housing, and that residents of high-rise dormitories had less social contact than residents in low-rise dormitories. Research suggests that the design of the built environment has a profound influence on one's mental health (Evans, 2003), which certainly has a tie-in with one's overall satisfaction. Such general research on residential satisfaction certainly has applications within the student housing environment.

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## Data Analysis

This research addresses four research questions. They are:

1. Does student residential satisfaction increase after a capital expenditure project?
2. Does the specific type of project alter the effect on residential satisfaction?
3. Does the amount of the expenditure make a difference in the students' level of satisfaction?
4. Do any gains in residential satisfaction through capital improvement projects fade over time?

Two data sources were used for this research. The first concerned the residential satisfaction assessment data provided by Educational Benchmarking Inc., a private firm that surveys college populations on several aspects of the university experience. Several aspects of the residential experience are included within the survey, which includes several dozen questions, such as the students' feelings toward room and floor environment, services provided, and safety and security. Assessment data were collected from the period 2001 to 2008. There were 29,865 resident survey responses from the University of Georgia residential community for the eight-year period. The other data, which covered the detailed capital expenditures that occurred at the university from 2001 to 2008, was provided by the university's Physical Plant Division. Overall, there are 1,080 records of capital expenditures throughout the university during this time frame affecting dormitory environments. These expenditures range in scope from basic maintenance operations of less than \$100 to major capital improvement campaigns exceeding \$10 million.

## Results

From the student satisfaction survey, the three questions analyzed were: 1) “Were you satisfied living in the residence hall?”; 2) “Did the residence hall fulfill expectations?”; and 3) “Would you recommend this residence hall to others?” The responses to these survey questions were provided on a 7-point Likert scale ranging from negative (1) to positive (7). Assuming satisfaction is measured in linear fashion, the answers to questions 1 and 2 were significantly different and positive (at the 5% tolerance level) for those who lived in buildings affected by a renovation when compared with those who had no renovations. Question 3 also elicited a slightly more favorable response from those who experienced a renovation within their dormitory, but the difference was not significant.

When comparing same-building satisfaction differences pre- and post-renovation for six of the residential buildings, there were significant positive differences (at 5% significance) in responses to question 2 for residents of two of the six buildings. There was also a greater difference in post-renovation recommendations to friends (significant at 1%) in two of the six buildings surveyed. Concerning overall satisfaction with the residence hall experience, only one of the six buildings surveyed showed a significant difference in satisfaction levels. Unexpectedly, the difference was negative, in that post-renovation satisfaction levels lagged behind pre-renovation figures. Because this particular building was one of the most recently renovated dormitories on campus, the results may reflect the lack of completion of the project. When examining the difference in satisfaction levels beyond simply the year after the renovation was completed, the students still display a significantly positive difference in responding favorably to the

residential experience fulfilling his or her expectations. Meanwhile, the correlation between satisfaction levels and actual amount of expenditure outlays toward maintenance shows a surprisingly negative association between the two variables (significant at the 5% tolerance level).

### **Conclusions and Discussion**

In addition to the above questions, there are questions about how improvements within the built environment improve students' quality of life, an aspect that goes beyond the simple issue of residential satisfaction. This has been covered in traditional research linking the built environment and its effects on the quality of residents' experience (Parry-Jones, 1990; Sirgy & Cornwell, 2002). Practitioners within university housing departments may be interested in this research for reasons beyond simple competition. Having satisfactory housing experiences can translate into better academic performance records, which can ultimately translate into greater earning opportunities. Such a connection with academic performance has already been explored in previous literature (Aitken, 1982), but is a logical extension of this type of research.

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# INTENTIONS OF NURSING HOME ENTRY AMONG THE ELDERLY IN JEJU, KOREA

Young-eun Choi, Ann Ziebarth, Eunju Hwang, Seung-hahn Koh\*

## Introduction

This study uses Andersen's Behavioral Model (Andersen and Newman, 1973) to examine the factors affecting nursing home (NH) entries of the elderly in Jeju, Korea. In an increasingly aging population, long-term care (LTC) services for either home care or institutional care are needed, especially for the oldest old populations. The oldest old populations tend to be functionally dependent and, thus, need more skilled services; however, home caregivers face the burden of LTC needs as well.

Jeju Province, a subtropical island off the southern tip of the Korean peninsula, is characterized by an agricultural economy and an increasingly aging population. Jeju Province, which has the highest percentage of the oldest old population, is called "the island of longevity."<sup>3</sup> In order to maintain this reputation, institutional care services, such as NH, can provide intense services for the frail, elderly population<sup>4</sup>. Compared to the relatively high elderly population, however, few NH are available in Jeju<sup>5</sup>. Rural

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<sup>3</sup> The province has the higher percentage of the oldest old population in Korea. In 2006, the percentage of the older population (65+) in Jeju was 10.7%, which was 1.2% higher than the average percentage at the national level. Moreover, the percentage of the oldest old (85+) was even greater, at 8.74% of the population compared to 6.06% at the national level (Korea National Statistical Office, 2007).

<sup>4</sup> Korean elderly welfare policy identifies long term care services as informal and formal care services. Informal services represent services provided by the family or relatives. Formal services are comprised of institutional care services and community care services, including in-home care provided by skilled people (Lee, 2009).

<sup>5</sup> There is an extreme shortage of nursing homes, with only 149 non-profit nursing homes and 84 for-profit nursing homes available in Korea; five non-profit and one for-profit exist in Jeju (Ministry for Health and Welfare, 2006a).

residents tend to maintain strict cultural norms in terms of filial obligations. These filial obligations emphasize adult children's responsibilities for elderly care, which is predominantly focused on the eldest son (Liu & Tinker, 2003). Also, rural areas have a higher proportion of elderly household heads and more nuclear families (Kwon, 1999)<sup>6</sup>. The elderly living alone will increase LTC needs, and the needs are becoming a greater challenge in rural areas.

Even though placing parents in NH often results in feelings of guilt for adult children, NH is an alternative source for LTC support, physically, emotionally, and economically. According to recent studies, when the elderly enter NH, it lessens the burden on their children (Kim, 2001; Lee, 2008). NH care is also more cost effective than home care (Kim & Yang, 2005). Thus, this study will help care services providers and policy makers conceptualize NH care needs in Jeju.

### **Conceptual Model**

In order to examine the predictable factors related to service needs of the elderly, Anderson's Behavioral Model, which has been used to explain the utilization of health services, was used. This model has been widely used for LTC needs of the elderly, focusing on NH (Black, et al., 1999; Borrayo, et al., 2002; Lee, 2009; Liu & Tinker, 2001; Taylor, et al., 2005). This research also used the behavioral model to examine the elderly with the core set of predisposing, enabling, and need factors (see Figure 1).

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<sup>6</sup> In Korea, the proportion of elderly living alone increased from 16.1% in 2000 to 17.9% in 2005; in Jeju the number of elderly was roughly one third higher (24.3%) than the national population in 2005 (Ministry for Health and Welfare, 2006b).

## Data and Methods

Data were obtained from the Jeju Development Institute in 2008 to examine the quality of life of the elderly (85+) in Jeju with face-to-face surveys using a structured questionnaire. The sampling was designed in three ways: first, the 20 villages (*ri*)<sup>7</sup> in Jeju Province that had a high number of elderly residents (85+) within each village were selected as candidates; second, the elderly residents (85+) within the 20 villages were identified; and lastly, a random sample of residents was selected. Of the total 359 in the sample, ten cases were eliminated due to missing data. Thus, the final size of the sample was 349. Logistic regression was used with SPSS version 16.0 for Windows. Logistic regression indicates the independent variables as the log odds of being in a one-point increase in the dependent variable. The dependent variable was whether an elderly person had an intention to move into NH. The independent variables were categorical and mostly dichotomous. The results were reported as odds ratios (OR). A 95 % confidence interval (CI) was used to estimate the influential factors (see Table 1).

## Results and Conclusion

This study aimed to examine the predictive factors of NH entry of the elderly in Jeju. Our findings were significantly associated with predisposing variables, including living arrangements and knowledge of services (see Table 2). The positive effects on the intention to move into NH were thinking of death, knowledge of institutional care services, and sum of IADLs (Instrumental Activities of Daily Living). The negative

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<sup>7</sup> South Korea has eight provinces (*do*), one special autonomous province (*Jeju*), six metropolitan cities (*gwangyeoksi*), and one special city (*Seoul*). These are divided into cities (*si*), counties (*gun*), districts (*gu*), towns (*eup*), townships (*myeon*), neighborhoods (*dong*) and villages (*ri*). Jeju Province is divided into 19 neighborhoods (some of them are called as villages), four towns, and three townships (Wikipedia, 2010).

effects were living arrangements (alone, a spouse, and children), knowledge of community care services, tenure, future caring (for themselves and from children), and no health insurance.<sup>8</sup> Health status was not found to be a significant factor. The expectation that care giving would be provided by children was found to be the most significant factor, negatively impacting intentions to enter NH. Jeju elderly residents still retain the traditional norms in regards to living arrangement and future care expectations to be met by one's children. Considering the high number of aging populations in Jeju, however, the NH perception of the elderly themselves, as well as their family members and neighbors, needs to change. Therefore, the perceptions of NH users and the types of NH care services will be helpful in future studies.

### **Acknowledgements**

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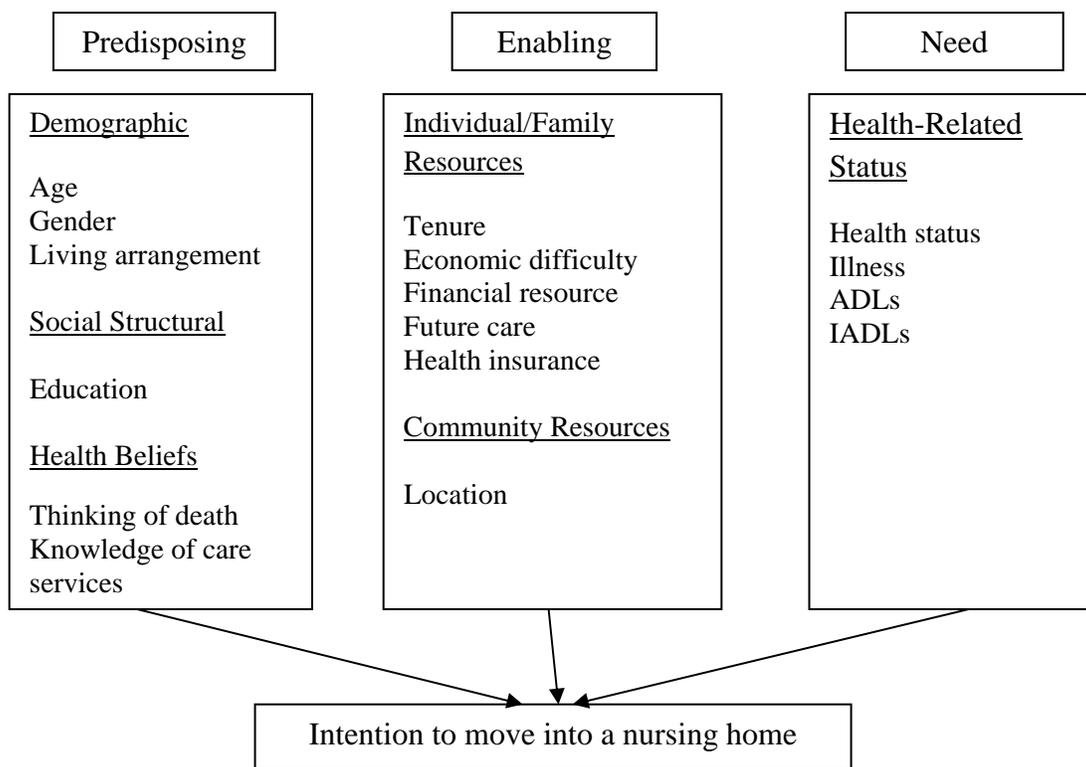
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<sup>8</sup> According to Statistics Korea (2008), 93.1 percent of Koreans has health insurance.

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**Figure 1. Model of Intentions to Move into a Nursing Home**

**Table 1. Characteristic by Anderson Health Services Behavior Model (n=349)**

Variables	% Coded 1(n)	Coding schema
Dependent		
Intention to move	28.1(98)	1 if yes, 0 no
Independent		
<i>Predisposing</i>		
Age	65.0 (227)	1 if 85-89 yrs old , 0 over 90 yrs old
Gender	72.2 (252)	1 if female, 0 male
Living arrangement	47.0 (164)	1 if yes, 0 otherwise
alone		
with a spouse	22.9 (80)	1 if yes, 0 otherwise
with children	23.5 (82)	1 if yes, 0 otherwise
Education	23.2 (81)	1 if school, 0 no school
Thinking of death	76.2 (266)	1 if yes, 0 no
Knowledge of community care services	23.5 (82)	1 if aware, 0 no
Knowledge of institutional care services	92.8 (324)	1 if aware, 0 no
<i>Enabling</i>		
Tenure	63.6 (222)	1 if own, 0 otherwise
Economic difficulty	3.35 (1.12)*	5 scales; 1 never difficult – 5 very difficult
Financial resource	28.9 (101)	1 if yes, 0 otherwise
From children		
From government	45.3 (158)	1 if yes, 0 otherwise
Future care	25.8 (90)	1 if yes, 0 otherwise
For themselves		
From children	54.7 (191)	1 if yes, 0 otherwise
Health insurance	63.3 (221)	1 if have, 0 no
Location	84.5 (295)	1 if suburban & others, 0 urban
<i>Need</i>		
Health status	3.67 (0.99)*	5 scales; 1 very good – 5 very bad
Illness	81.4 (284)	1 if yes, 0 no
Sum of ADLs	3.85 (1.61)*	5 items with 0 – 5 (6) scale
Sum of IADLs	4.29 (1.87)*	6 items with 0 – 6 (7) scale

\* Mean (SD)

**Table 2. Logistic regression analysis (n=349)**

Predictor	B	S.E.	OR(sig.)	95% C.I.
<i>Predisposing</i>				
Age	.383	.313	1.466	.794 – 2.708
Gender	.558	.445	1.746	.731 – 4.174
Living arrangement				
alone	-1.822	.710	.162**	.040 – .650
with a spouse	-2.459	.776	.086**	.019 – .392
with children	-2.622	.767	.073**	.016 – .327
Education	.292	.495	1.338	.507 – 3.533
Thinking of death	.765	.381	2.149**	1.019 – 4.532
Knowledge of community care services	-.926	.394	.396**	.183 – .858
Knowledge of institutional care services	1.114	.625	3.047*	.895 – 10.372
<i>Enabling</i>				
Tenure	-.622	.347	.537*	.272 – 1.060
Economic difficulty	-.031	.156	.970	.714 – 1.318
Financial resource				
From children	.447	.459	1.564	.637 – 3.842
From government	.388	.377	1.475	.704 – 3.087
Future Care				
For themselves	-1.088	.436	.337**	.143 – .793
From children	-1.712	.435	.180***	.077 – .423
Health insurance	-.693	.301	.500**	.277 – .902
Location	-.281	.407	.755	.340 – 1.676
<i>Need</i>				
Health status	-.173	.183	.841	.588 – 1.204
Illness	.453	.488	1.572	.604 – 4.092
Sum of ADLs	.141	.115	1.151	.918 – 1.442
Sum of IADLs	.376	.103	1.456**	1.189 – 1.784

\* p<.10, \*\* p<.05, \*\*\*p<.001

## HOUSING URBANISM: THE PEDAGOGY OF CONTEMPORARY HOUSING IN AN ARCHITECTURE CURRICULUM.

Judith K. De Jong, Clare Lyster\*

What instructional strategies are best employed to help students design housing for contemporary urban living? *Housing Urbanism*, a graduate design studio conducted at the University of Illinois at Chicago's School of Architecture in 2008, posits that the research and design of new housing morphologies must first and foremost produce a productive discussion of the city. This means that housing must be explored as a generator, rather than the result, of a broader urban paradigm.

There cannot be a discussion of urbanism without contemplating where and how people live in the city. By 2030, 60% of the world's population—4.9 billion people—will live in cities (United Nations Population Division, 2010). In 1950, only 29%—737 million people—lived in cities (United Nations Population Division, 2010). Some cities are faced with the need to house a rapidly increasing population, as in Mumbai, whose population in 2020 is projected to be 28.5 million, 60% of which will live in unofficial, typically substandard housing (Parasuraman, 2007). Other cities are facing housing crises of a different nature, such as Las Vegas, which has minimal resources—in particular water—to host its rapid increase in residential development (Huber & Stern, 2008). This has led not only to limited affordability, but also to the question of whether there should be building in Las Vegas at all. The cities of Philadelphia and Detroit are grappling with a significant exodus of residential populations, leaving large areas of vacant and often

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substandard housing. In Chicago, the overall metropolitan population outpaces the city population. While the City of Chicago experienced a population decline of 1.55%, or 44,748 people, between 2000 and 2009, suburban Kendall County saw an increase of 92.1%, or 50,258 people, in the same period, leading to massive new housing subdivisions on the periphery (Perry & Mackun, 2001; U.S. Bureau of the Census, 2009). In the end, what is common to every one of these examples is a fundamental relationship between housing and patterns of urbanization.

Historically, “(a)rchitecture in general and housing in particular was seen as a means to fundamentally transform the city and, therefore society” (Schafer & Reeser, 2002, p. 6). This was evident in a series of urban plans for the 20<sup>th</sup> century that deployed housing as the basis for urban planning and, more importantly, as a means to imagine new ways to live in the city. Le Corbusier’s unbuilt *Ville Contemporaine* (1922), *Plan Voisin* (1925), and *Radiant City* (1932) all proposed a vertical, dense city of cruciform towers with residential systems called “unites” as a solution to overcrowded urban slums that characterized most large industrial cities like Paris at the time (Fishman, 1977). These plans directly contrasted with the horizontal, low-rise, more dispersed model that was also considered, significant examples of which include Ebenezer Howard’s *Garden City at Letchworth* (1904) (Howard, 2009) and Frank Lloyd Wright’s unbuilt *Broadacre City* (1932) (Fishman, 1977). Significant post-World War II models include Archizoom’s “No Stop City” (Branzi, 2006) and Archigram’s “Plug in City” (Cook, 1999), both of which considered housing as a central part of the emerging communication infrastructure of the 1960s in that they aligned a nomadic urban model with a new way of collective living.

More recently, however, architecture has abdicated its role in deploying housing as a planning mechanism. More than any other space or building type, housing enacts social and cultural ideologies not possible in other buildings, yet housing has lost its historical role as an ideological container or at least a means to demonstrate alternative forms of collective living. Within the discipline, the academy and the profession's avant-garde have refrained from tackling housing as a collective project in a serious, witty, or utopian manner. This proposal argues that rather than teach housing solely through the design of individual units, we prioritize instructional strategies to frame it as a broader infrastructural proposal. Only then we can recuperate housing as part of a critical discussion on urbanism.

The studio *Housing Urbanism* was thus motivated by one question: How can housing generate new forms of urbanism in the contemporary American city? Thirty two graduate architecture students were asked to conceptualize urban proposals that deploy housing as the mechanism to imagine new narratives for the 21<sup>st</sup> century city. Working in teams of three, students investigated the impact of a minimum population increase of 100,000 new residents in Chicago over the next five years. The eleven resultant urban proposals conceived housing as a mechanism to densify transportation cores, reuse ageing infrastructure, colonize post-industrial sites, speculate on regional urbanism, shrink the footprint of the city, generate a healthy city, and/or equalize the ratio of public space throughout the urban area. Students then individually “zoomed in” on a specific moment of their urban concept and focused on the design of new multi-unit housing morphology at the scale of an average city block. At this close scale, the studio encouraged strategies that provided increased densities in downtown areas and

addressed new domestic collectives that are emerging globally, such as multi-generational communities, work-live scenarios, and an aging population. The aim of the studio was to produce plausible strategies that suggest new ways to live in the city at both the urban and architectural scales.

The studio's design brief<sup>9</sup> was augmented with urban research in the form of maps and diagrams that describe relevant demographic data and density statistics in the ten most populous American cities. GIS maps were also used to identify real estate that would support the design propositions, such as vacant parcels near transit hubs. Moreover, the studio commenced with extensive research of historic and contemporary case study housing projects from around the world (Mateo, 2008; French, 2008). Projects were selected for study not only for their architectural importance, but also for the significance of their urban impact, such as projects with very high densities, typologies that supported innovative public programming initiatives, and projects that addressed infrastructural issues.

We propose to present selected design projects from the studio, framed within a larger theoretical discussion of housing and urbanism.

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<sup>9</sup> A design brief in an architectural studio describes the conceptual framework and methodology of the proposed design project as well as the specific constraints that must be considered, such as zoning requirements, types and size of spaces required, etc.

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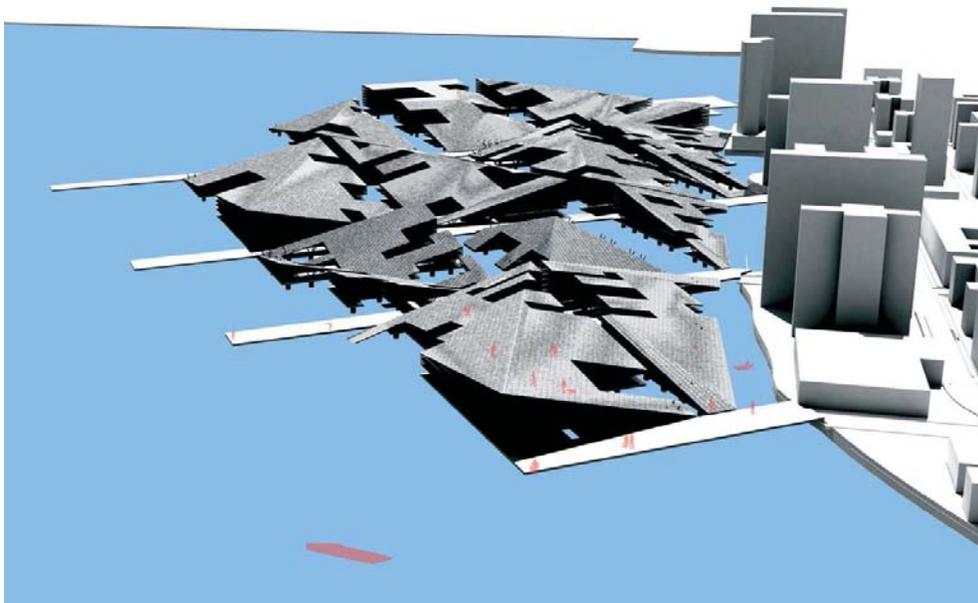
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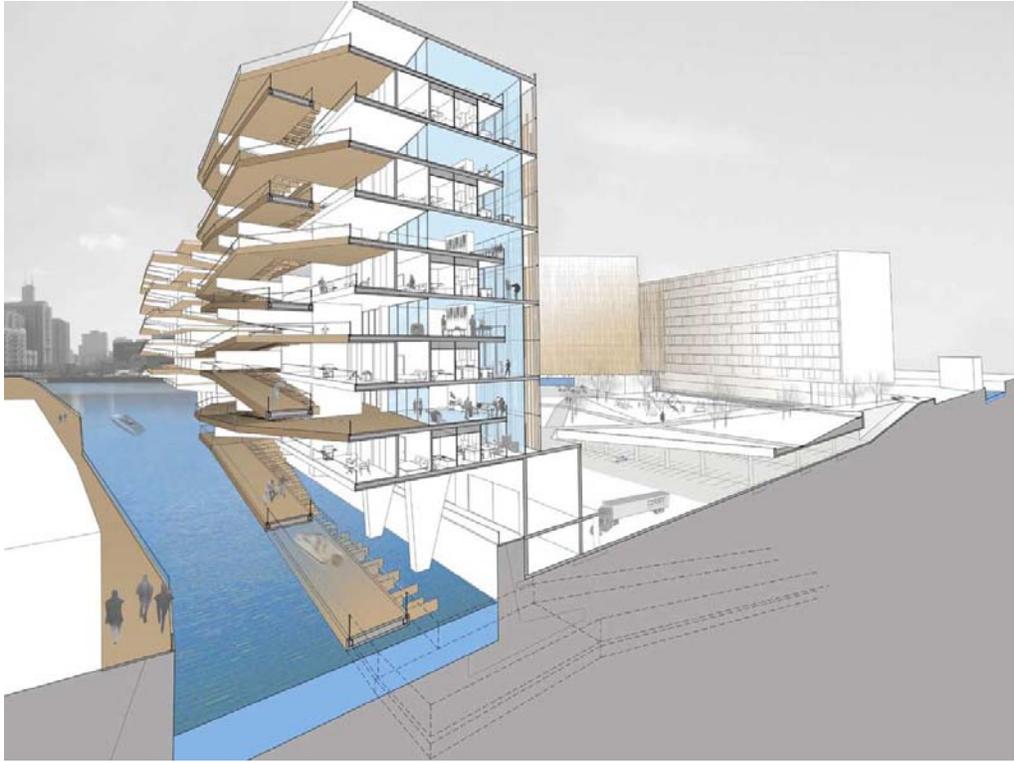
**Appendix: Selected Images from the Design Studio.**



**Figure 1. Hydro City**



**Figure 2. Linear City**



**Figure 3. Post-Industrial City**



**Figure 4. Interior City**

## EXPLORING THE UTILIZATION AND OUTCOMES OF THE 502 MUTUAL SELF-HELP PROGRAM BY LOW INCOME FAMILIES IN RURAL UTAH

Lucy M. Delgadillo\*

Prospective low-income buyers interested in living in rural areas may qualify for rural loans through the U.S. Department of Agriculture (USDA). One of these rural loans is the Section 502 program, which targets low-income families, and the 502 Mutual Self-Help Program (MSHP), which specifically targets very low-income families. The 502 Program and the MSHP are the only direct federal lending mortgage programs (i.e., USDA originates and services the loans) that offer subsidized interest rate loans based on applicants' incomes.

The invitation to participate in this study was sent to five nonprofits. MSHP is not disseminated through the U.S. Department of Agriculture, but through non-profit organizations that are in charge of recruiting and selecting potential homebuyers. This study focuses on the utilization of USDA 502 MSHP by the two non-profit organizations in Utah that agreed to participate, namely the Neighborhood Nonprofit Housing Corporation (NNHC) and Color Country Community Housing (CCCH). 150 participants obtained a rural loan through these organizations from 2004 to 2009. Contrary to much of the rest of the nation, Utah was not affected by the housing crisis until late 2008.

The two objectives reported in this abstract are (1) to identify general demographics of the participants and (2) to identify what factors best explained variance in the overall satisfaction with home quality and neighborhood.

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## **Characteristics of the Mutual Self Help Program (MSHP)**

Groups of families unable to obtain housing through conventional methods because of limited income may construct their homes by participating in an MSHP project. Participating families perform approximately 65% of the construction labor on each other's homes under qualified supervision that is provided by a licensed builder associated with the nonprofit. The savings from reduction of labor costs allow eligible families to own homes. Normally, self-help groups range from six to twelve families that are put together by a nonprofit organization. Each household in the group contributes between 30 to 35 hours per week to building while maintaining its employment and other obligations. Participants learn construction skills, such as titling, painting, flooring, framing, plastering, texturing, and landscaping that will also allow them to make repairs in the future (USDA Rural Development, n.d.).

The most comprehensive, recent examination of the Section 502 Self Help Program was undertaken by the USDA's Economic Research Service (ERS) in 1998 (Wallace, 2000). The ERS study analyzed the demographics of 3,027 Section 502 borrowers who obtained loans between 1994 and 1998. Typical Section 502 borrowers were under 40, had children, earned low or modest incomes, lived in homes that were better than their previous residences, and were satisfied with their current homes, neighborhoods, and the program. Most believed that without assistance from the program, they would have been unable to afford a comparable home for at least two years and possibly never.

Of the sample studied by the USDA ERS in 1998, 230 respondents (7.7 percent) participated in a 502 MSHP. Among these 230 participants, self-help borrowers were

more likely to be married couples with children (59%) and between the ages of 30 and 49 (69%). The largest race/ethnic group was Hispanics (45%), and participants primarily resided in the West (32.6%). Over 98% of self-help borrowers were first-time homeowners; almost 70% said that their housing cost either declined or stayed the same. On average, self-help borrowers earned 16.4% on their equity, twice the return (7.8%) than other 502 borrowers (Wallace, 2000).

### **Methodology and Procedures**

About 150 mail surveys were sent to 502 MSHP participants from January to July 2009. The list of participants was provided by the non-profit organizations. The response rate was 35% ( $n=52$ ). Descriptive statistics were collected on demographics of 502 MSHP borrowers (age, marital status, number of children, race/ethnicity, borrower's education) and on characteristics of the homes, including number of bedrooms, number of bathrooms, characteristics of current housing as compared to prior, monthly house payment, loan amount, and estimated equity. Questions were also asked about home building experience and the loan process experience with the agency. Data was analyzed using descriptive, correlation, and stepwise regression equation. Table 1 provides a list of dependent and independent variables.

**Table 1. Dependent and Independent Variables for Regression Equations**

Dependent Variable (Likert scale 1-10)	Independent Variables (Likert scale 1-10)
Overall satisfaction with the home	<ol style="list-style-type: none"> <li>1. Exterior appearance of your home</li> <li>2. Home construction quality</li> <li>3. Home size compared to your needs</li> </ol>
Overall satisfaction with the neighborhood	<ol style="list-style-type: none"> <li>1. Satisfaction with schools</li> <li>2. Public services</li> <li>3. Convenience</li> <li>4. Safety/security</li> <li>5. Appearance</li> </ol>

### Results

In Utah’s sample, Self Help borrowers are more likely to be married (90%), with 75% of families having three or less children and one family having eight children. All the participants reported being White, with an average age of 30 and a mode of 28 (*SD*= 11; range= 23-52). Over 98% of MSHP borrowers were first-time homeowners; 44.2% were college graduates and 86.5% reported they live in a better quality home than the previous one. More than 50% estimated that they already have between \$10-40K in equity; 94% have mortgage loans for less than \$200,000 and 96% have built their home in the last five years (2004-2009). About 65% reported that the cost of housing is about the same or lower. The most common mortgage payment was between \$500 and \$600 for Principal, Interest, Taxes, and Insurance (PITI). Only one participant reported a mortgage payment higher than \$800 (PITI). Most of the homes have four bedrooms (range 3-5) and two bathrooms (1.5-3).

The most significant factor associated with recommending the MSHP to others was having a good interaction with the non-profit staff ( $r = .67$   $p < .05$ ). Regarding the overall satisfaction with the house, exterior appearance of the home explained 53% of the variance. The statistically significant variables that explained 77% of variance in

overall satisfaction with the neighborhood were public services of the neighborhood and appearance (Table 2 and 3). Participants reported that without assistance from the program, they would have been unable to afford a comparable home for at least two years.

**Table 2. Stepwise Regression on Overall Satisfaction With the Home (DV)**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	3.370	.720		4.680	.000
Satisfaction exterior	.617	.083	.726	7.467	.000

Note:  $R^2 = .527$

**Table 3. Stepwise Regression on Overall Satisfaction with Neighborhood (DV)**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	1.954	.538		3.631	.001
Satisfaction neighborhood appearance	.607	.086	.682	7.069	.000
Satisfaction services community	.211	.081	.253	2.617	.012

Note:  $R^2 = .775$

## **Discussion and Conclusion**

In conclusion, the most significant difference between the MSHP national sample and Utah's sample was that the group that benefited the most in Utah was White while the group that benefited the most in the national sample was Hispanic. This is not surprising, though, because the sample is a good representation of the state (92.3% of Utah's population is White). Participants in Utah cared about the appearances of their homes; this feature superseded even the size of the home. As expected, the safety and appearance of the neighborhood also seemed to be important factors. Positive experience in the interaction with staff members is statistically significant for recommending the program to others. In summary, several responses from the Utah sample mirrored the findings of the national sample conducted in 1998.

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**THE POWER OF THE MEDIA:  
APARTMENT INDUSTRY TERMINOLOGY IN ONLINE NEWS ARTICLES**

Carla Earhart, Danny Spindler\*

**Introduction**

A recent article links many problems in the U.S. today to members of society's overwhelming desire to be homeowners. In "8 Reasons We Need Renters," Karen Aho states:

The bias against renters has been growing ever since homeowners crossed into the majority in the 1950s. And where has it gotten us? We have a mortgage/financial crisis, clogged highways, abandoned houses, tax-strapped cities and working families now homeless and in need of affordable rental housing. (Aho, 2009, p.1)

Aho (2009) further states that communities need apartments to reduce urban sprawl and provide flexibility so that workers can move closer to jobs instead of being tied down by home ownership. However, renters in the U.S. are not afforded the same social status as homeowners, and government policies that favor homeowners only reinforce the perception that home ownership is more desirable.

It is well known that mass media has a powerful influence on society (Bryant and Oliver, 2009). Ladd (1972) suggested long ago that housing norms are reinforced by mass media through more favorable portrayals of homeowners in movies, TV, and magazines. Much research has been conducted on a variety of media topics, including the media's influence on elections, violence, and health behaviors, but research on the media's influence apartment living is scarce.

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Problems exist when media outlets use terminology that may have negative connotations. According to training materials of the National Apartment Association (NAA, 2009), the following terminology is preferred in elevating the public perception of renters and apartment dwellers:

- *apartment home* instead of *apartment unit*;
- *apartment community* instead of *apartment complex*;
- *resident* rather than *tenant*; and
- *community manager* rather than *landlord*.

### **Research Purpose/Objectives**

Because the media can have such a powerful influence on public perception, this exploratory study seeks to better understand the treatment of renters and apartment dwellers in the news media. Specifically, the research examined the use of NAA's preferred terminology in online news reports.

### **Methodology/Procedures**

Using the *Google News* search engine in May 2010, the key word *apartment* was entered and resulted in 37,200 hits. Twenty acceptable articles were selected for further study. Articles rejected included obituaries, editorials, professional press releases, advertisements, or repeats of stories already accepted for the study.

Articles retained for the study included news articles from a variety of geographic locations, representing local, regional, and national news outlets. Ranging in length from 43 words to 1,273 words, most articles were in the 100- to 200-word range. Shorter

articles tended to be “breaking news” regarding a fire, crime, or other problem that had occurred at an apartment community ( $n=16$ ). The larger articles were “human interest” feature articles related to the apartment search of individuals and families ( $n=4$ ).

The title and body of the articles (5,746 words total) were examined for the following categories of apartment industry terminology:

- individual space (i.e., *apartment home*, *apartment unit*, *residence*, etc.)
- collective space (i.e., *apartment community*, *apartment complex*, *residences*, *property*, etc.)
- individual/collective dwellers (i.e., *resident(s)*, *occupant(s)*, *tenant(s)*, etc.)
- staff/owner (i.e., *community manager*, *property manager*, *landlord*, etc.)

## Results

In the 20 news articles, a total of 60 references were made to the individual apartment spaces, with five different terms used. The single word *apartment* was used most often ( $n=39$ ), followed by the terms *home* ( $n=11$ ) and *unit* ( $n=6$ ). In three instances, the individual space was referred to by its unit type (*studio* or *one-bedroom*) and as a *residence* in one instance. None of the articles used the complete phrase *apartment home*.

When referring to the collective space, five different terms were used a total of 79 times. Overwhelmingly, the total space was simply referred to as a piece of real estate by using terms like *building*, *structure*, or *property* ( $n=49$ ). However, other terms used included *complex* ( $n=9$ ) and *apartments* ( $n=9$ ). The news articles also referred to the

collective space by the proper name *apartment community* ( $n=11$ ). Although the term *community* was not used in any of the articles, the term *project* was used once.

Twenty-five references using five different terms were made to those living in the apartments. *Resident* was the most popular term ( $n=11$ ), with *tenant* and *people* each being mentioned six times. The terms *renter* and *occupant* were each used only once.

Apartment staff were mentioned only four times in the 20 articles, with three different terms being used: *manager* ( $n=2$ ), *resident manager* ( $n=1$ ), and *rental agent* ( $n=1$ ). None of the articles used the term *landlord* or *community manager*.

## Conclusions

In some ways it was surprising and even refreshing to see that the online news media is using some of the terminology recommended by the National Apartment Association. The terms *apartment* and *home* were used more often than *unit* when referring to individual living spaces. However, the complete phrase *apartment home* is still preferred by the apartment industry. Similarly, the term *resident* was used more often than the term *tenant*, and the term *landlord* was not found in any of the online news articles.

Nevertheless, improvements are needed in the media's vocabulary when referring to collective space. Terms such as *complex*, *project*, *building*, *structure*, and *property* do little to elevate public opinion of apartments as desirable housing options.

## **Implications**

Because little research has been done on the effect of media on people's perceptions of apartments, more research is needed. Additional studies should have a much larger sample size, and they should use additional media outlets, including print, television, and radio. Further research could also compare the use of apartment-related terminology between the various media outlets.

In this study, the names of specific apartment communities were used 11 times in the 20 articles—five times when referring to a negative incident (fire, murder, or rape). Anecdotally, it seems that the names of specific single-family neighborhoods are rarely used in such incident reports. This is another area where further study is needed to determine whether such differences truly exist.

It is doubtful that the media has a purposeful bias against apartments as a housing option. Instead, it is likely that it is simply not educated about the benefits of apartment living and the preferred terminology. Educational programs directed toward the media are needed to rectify the situation, with the ultimate goal of apartments being more positively presented and, therefore, becoming more socially acceptable.

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# **CONTINUING CARE RETIREMENT COMMUNITY HOUSING ALTERNATIVES: DILEMMAS AND TRADE-OFFS FACED BY AGING HOUSEHOLDS**

Karl H. Flaming\*

## **Introduction**

Housing choices present trade-offs and dilemmas to the elderly that require them to carefully examine their own resources and needs in order to make the best possible housing choices for late life. Choices involve assessing the financial risks, benefits, and amenities of facilities offered by elderly retirement communities as opposed to remaining in and maintaining one's own home. "For most people, it is a daunting task" (Bertsch, 2005, p. 241).

The overall purpose of this study is to examine late-life housing options offered by Continuing Care Retirement Communities (CCRCs) in the Denver area. The first task was to establish and identify the entry costs, financial stability, and type of housing, amenities, and services offered by these CCRCs. Eight CCRCs are located in Colorado, of which four are in the Denver MSA: Vi (formerly Hyatt Classic), Covenant Village, Holly Creek, and Windcrest. The second task was to make recommendations for further research. What follows is a brief discussion of the study methods, the implications of key observations resulting from the study, and suggestions for continued research.

## **Methods**

Participant observation was the methodology used in this study, and the role of the observer was that of a potential buyer who was responding to the marketing

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programs of CCRCs. The observer (author) has conducted housing research for most of his career and is in the “young elderly” age category (Ages 65-75), which is targeted by CCRC marketing (Lauricella, 2010).

Babbie states that participant observation is more than data collection, it also is a way of generating and testing theory. It is a way to “...make sense out of an ongoing process that cannot be predicted in advance—making initial observations, developing tentative general conclusions that suggest particular types of further observations, making those observations and thereby revising your conclusions, and so forth” (Babbie, 2007, p. 286). Babbie’s characterization of participant observation summarizes the approach of this study. In addition, the interpretation of observations was informed by Giele and Elder (1998) in particular, who discuss life course research strategies and methods.

In accordance with IRB review, the study was limited to information that would normally be provided as part of the marketing process of Denver area CCRCs. As a potential consumer, en’tree (i.e., access) was a natural process. A number of elderly retirement housing options were observed, but this abstract focuses on what has been learned about the four Denver CCRCs.

There is a substantial literature that describes the history of CCRCs and how they are distinct from other types of senior housing (e.g., Cassel, 1993). First, all CCRCs provide a continuum of housing, from independent living through assisted living, memory support, and skilled nursing. A second characteristic is that a large entry fee, which is returned in full or in part when the resident departs, is required and can range from about \$100,000 to more than a million dollars. Finally, the CCRC enters into a “Life

Care Contract” with the resident, which guarantees life-long care to the resident even if his/her resources are depleted. Life-care contracts do vary, and these differences define the three types of CCRCs in the Denver area, referred to as Types A, B, and C. Only Type A CCRCs cover all services, including assisted care, memory support, and skilled nursing through the entry fee and monthly assessments. Types B and C also have entry fees and monthly assessments, but they are lower than for Type A, and both charge additionally for long term care, memory support, and assisted living. Type B does not charge for most non-health services, such as recreation and transportation. Type C requires fees for most services on an as-needed basis. In the case of Denver, Vi is Type A, Holly Creek and Covenant Village are both Type B, and Windcrest is Type C.

Initially, a major part of the observation process was to attend marketing sessions that CCRCs routinely offer. These sessions are advertised in local papers. They are usually a luncheon at which initial information is presented by the sales personnel and a tour of the complex and model apartments is given. The emphasis is on such amenities as dining, recreational facilities, social activities, transportation, and health care. During this process, current residents are available to answer questions about the community. This is followed by one-on-one interviews with a sales representative.

The selection of the CCRCs for study was purposive in that these projects are located in the community where the observer intends to remain. The Denver CCRCs appear to be fairly comparable to CCRCs in other parts of the country. Windcrest, Vi, and Covenant Village are part of national systems of CCRCs, while Holly Creek is part

of a local system. In all three of the national cases, Chicago CCRCs that were comparable to their Denver counterparts were visited by the observer.

### **Observations and Implications**

All four Denver CCRCs were very appealing and had a wide array of apartment choices, social activities, resort-style ambiances, etc. Nevertheless, there are differences between the four, which illustrates the complexities of the choices available to the consumer. These were observed and are discussed in this section of the paper.

**Observation 1:** Entrance fee policies differ among the four Denver CCRCs.

Specifically, Windcrest promises to return 100% of the entrance fee when the resident leaves. Vi has two plans, one of which returns 100% of the fee while the other returns 50%. Covenant Village also has several options, one of which returns a declining amount over time while another requires a small entry fee but with a substantially higher monthly assessment. Holly Creek returns 90% of the fee.

Human agency theory focuses on the active pursuit of personal goals, which purportedly influence decision-making regarding significant life choices (Giele & Elder, 1998). In the case of the entrance fee, if one's goal is to leave a financial legacy for one's children, then it would be important that the entrance fee be refunded. If, on the other hand, the goal is to not be a financial or care-giving burden to children or other relatives and friends in late life, then the refund might not be as important. CCRC marketing generally assumes that residents are more interested in the refund of the fee,

which reflects the first goal, but Vi and Covenant Village illustrate that there are differences of which the consumer must be aware.

**Observation 2:** Two important differences in physical structure were observed between the Denver CCRCs. First, three of the four (Windcrest is the exception) include cottages (individual homes) in addition to a high-rise apartment complex. Second, in two of the CCRCs (Holly Creek and Windcrest), the care facilities (skilled nursing, assisted living, and memory care) are physically part of the main high-rise apartment complex while in the other two (Covenant Village and Vi), these facilities are in a different building. It is noted that, at present, Windcrest has not yet started building the health care facility.

The implications of these structural differences are informed by the research of Sugihara and Evans (2000) regarding the significance of proximity to activity centers in CCRCs. Their research indicated that residents who are closer to activity centers like the recreation center experienced more interaction and social networking than those whose apartments were more distant. Living in housing separate from the main high rise where social activities are located may inhibit participation with residents of the high-rise apartment complex. Similarly, where the nursing section is not physically part of the high-rise complex, interaction between patients and residents may be inhibited.

**Observation 3:** Other differences reflect variations between the size of the four CCRC populations. The populations range in size from less than 200 to more than 500. It is not surprising that the larger the population, the more activities were available and the more people were seen in the public areas during the day. In the smallest CCRCs, there were

times when almost no one was observed in the common areas. The larger populations listed more subgroups around special interests and activities.

**Observation 4:** Two of the four CCRCs (Covenant Village and Holly Creek) are sponsored by religious organizations, and this influence is reflected in their activities and facilities. For example, Covenant Village has a chapel and a choir. Holly Creek, which is also sponsored by a local Christian organization, emphasizes religious themes in the marketing sessions but in a somewhat more ecumenical manner. It has a theatre room in which religious services are held. In Windcrest and Vi, religious activities are included in the list of activities listed on the calendar of events, but they are not as central.

**Observation 5:** There is a difference in the age of the four Denver CCRCs. Covenant Village opened more than ten years ago. Holly Creek is the second oldest and recently completed its health care wing. Vi began construction around 2007 and the entire complex was completed in 2009. Windcrest, which also began construction in 2007, is the largest of the four Denver CCRCs, but because of the financial difficulties of the previous owner, Erickson, the health care wing, which will include skilled nursing, assisted living, and memory care, has not yet been built.

**Observation 6:** Finally, the single most significant issue concerns the financial viability/stability of CCRCs. Erickson, which recently declared bankruptcy, built Windcrest. It is important to consider that the life care contract is only as good as the

financial viability of the CCRC. Sales personnel in all of the CCRCs indicated that a high occupancy rate is needed in order for the financial model to work. Covenant Village and Holly Creek are at or above this rate. Vi, at the time of this writing, is still short of it. Windcrest currently reports a high occupancy rate, but it has yet to complete the health care wing of the complex. Lauricella (2010) argues that the financial crisis of 2008 has had a severe impact on the CCRC industry. At least in the Denver area, the older CCRCs appear to have been less negatively affected by the 2008 financial crisis than the newer CCRCs. This has implications for new developments of CCRCs in the future.

### **Conclusions**

Perhaps the most obvious long term concerns have to do with the costs of managing health as one grows older. Link, for example, states that the "...management of health, like so many other aspects of modern life has become extremely complex" (Link, et. al, 2008, p. 74). CCRCs offer a range of facilities and amenities that allow residents to age in place, beginning with independent living and extending through assisted living, memory support, and long term health care. Assessing the costs and benefits of living in a CCRC rather than remaining in one's own home is complicated and requires additional research.

The next stage in this study will be guided by the following questions. First, what are the options available to a proactive elderly person who cannot remain at home and either cannot afford to live in a CCRC or is not willing to risk loss of the entrance fee? Several new elderly communities that offer independent living, memory care, and assisted living are now on the market in Denver that do not require an entrance fee and

do not offer a life care contract or skilled nursing. These housing options need to be studied and will be the focus in the next stage of this study.

Second, what are the perceptions about and knowledge of housing options for the elderly who still remain in their homes but may need alternative retirement housing options such as CCRCs in the future? Wilson (2007) reports that very few elderly are aware of CCRCs, and research is needed to gain a better assessment of how knowledgeable the elderly are about the available types of housing that could enhance their ability to manage health, social, and financial wellbeing in late life. A review of life course research (e.g., Clausen, 1998; Scott & Alwin, 1998) suggests the value of case studies of current and prospective CCRC residents that feature their life histories and their future expectations of housing.

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## **GRADUATES OF RESIDENTIAL PROPERTY MANAGEMENT PROGRAMS:**

### **WHAT INFLUENCES THEIR CAREERS?**

Rosemary Carucci Goss, Christine Buchanan\*

#### **Introduction**

The United States is experiencing a decrease in homeownership rates as a result of the housing crisis, the recession, more stringent lending policies for homebuyers, and high foreclosure rates (Sugrue, 2010). In addition, there is pent-up demand from the echo boomer population (18-34 year olds), who usually rent but are currently more likely to live with their parents until the economy improves (Obrinsky, 2010). Moreover, *State of the Nation's Housing 2010* (Joint Center for Housing Studies, 2010) reports an increase in renters among minority households and baby boomers. All of these factors suggest an increase in the demand for apartments. Along with this increase in demand, there will be an increased need for well-trained property management professionals. Retaining existing talent and finding new professionals are the top two priorities for most real estate firms today according to CEL & Associates (Lee, 2008).

#### **Literature Review**

The management of residential real estate has evolved from the manager who focused only on collecting the rent to someone who is responsible for the economic viability of the asset (Goss & Campbell, 2008). According to Lee (2008), finding and retaining the best talent in an industry with employee turnover rates around 30 percent

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is the key to long-term success. Based on employee satisfaction surveys conducted by CEL & Associates, the top three employee complaints are compensation that is too low, too much paperwork, and lack of training/career development progress. Kaye and Jordan-Evans (1999) found that respondents from various careers listed the reasons why they stayed where they were working as 1) an opportunity for career growth, learning, and development; 2) exciting work and challenge; and 3) meaningful work or making a difference. Fair pay and benefits was number 11 on the list. Carswell and Phillips (2008) suggest that there is much to be gained by longitudinally tracking the career progress of graduates who have committed to the profession by choosing a curriculum that focuses on residential property management.

Longitudinal data from a study conducted at Virginia Tech in 2002 using an almost identical survey will be compared to this study. The purpose of this presentation, however, is to examine why graduates of one university-based residential property management program have either remained in the industry or chosen to leave it. In addition, factors contributing to their success are explored.

### **Methodology**

A survey (which was revised slightly from the one used in 2002) was mailed to all of the 451 graduates (from 1987 to 2009) of the Residential Property Management option in the Department of Apparel, Housing, and Resource Management at Virginia Tech. The data collection, which occurred between February and May 2010, followed a four-contact procedure. First, the survey and a letter offering a \$100 gift card drawing as an incentive to return the survey were mailed to each graduate. About a week later, an

email was sent from the alumni office to remind alumni to complete the survey. This was followed by a thank you/reminder post card, and finally a replacement survey was mailed to those who had not responded. The survey began by determining whether the recipient had never been, was previously, or was currently employed in a property management-related field. If the recipient had never been employed in a property management-related field, the recipient was asked what influenced his/her career choice decision. If the recipient was not currently employed in a property management-related field, the recipient was asked three questions pertaining to the factors that influenced him/her to leave. If the recipient was currently employed in a property management-related field, 21 questions were asked. The questions asked about career advancement and barriers to entry, what kept the recipient in the industry and at his/her current company, and the scope of the recipient's responsibilities. Of the 451 surveys, 20 were not delivered due to bad addresses and 208 surveys were completed, resulting in a total response rate of 48.3%.

## **Findings**

Almost 90% ( $n=208$ ) of the respondents accepted employment in the property management industry upon graduation, and of those, 59% ( $n=186$ ) are currently employed in the industry. Of those that are currently in the industry, 57% were male and 43% were female, with 53% making \$65,000 or less and 12% making over \$125,000. This variation in pay probably resulted from a variety of factors, including length of time in career, scope of responsibilities, and geographic location. Chi-square analysis revealed no significant difference in male and female earnings. Those currently

employed in the industry cited their level of formal education (37%) and having a mentor (21%) as the two factors that contributed most to their professional development. When asked why they had remained in the industry, the reasons cited were an opportunity for career growth, learning and development (26%), meaningful work, making a difference and a contribution (12%), job security (10%) and fair pay and benefits (8.3%).

The major reasons cited for leaving the industry were personal/family reasons (18%), poor pay and benefits (12%), lack of meaningful work, making a difference and a contribution (12%). Half of those who left the industry left by the third year of employment, and chi-square analysis revealed the only significant factor for leaving was for personal and family reasons.

### **Conclusions and Implications**

A large number of graduates cited their level of formal education as the most important factor in their professional development, which is great news for university-based residential property management programs. These statistics could be useful in seeking development monies from the property management industry and related trade associations.

Respondents who remained in the industry cited reasons similar to research findings from Kaye and Jordan-Evans (1999) for why they stayed. However, pay as a factor for remaining in the industry was higher than in the Kaye and Jordan-Evans' research. Lee (2008) found that real estate professionals most often complained about their pay. The findings of this research study need to be evaluated further, since 12% of those who left the property management industry cited pay as the most significant

reason for leaving and 8% of those who stayed cited it as a reason for staying. Further examination of the data as it relates to such respondent characteristics as scope of responsibility and time in career might yield valuable information for companies as they evaluate pay as a factor in talent retention—especially for graduates of university-based property management programs.

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# THE RELATIONSHIP BETWEEN HOUSING COST BURDEN AND HEALTH STATUS IN OLDER ADULTS IN THE UNITED STATES

Leslie E. Green-Pimentel\*

## Introduction

A relationship exists between health and financial strain, but the direction of the relationship remains in question (Jacoby, 2002; Krause, 1997; Lyons & Yilmazer, 2005; Meer, Miller, & Rosen, 2003). Many individuals accumulate assets to finance consumption in retirement. Home equity, often the largest form of wealth held by Americans, can be used for consumption in older age. Older homeowners can access equity through a second mortgage<sup>10</sup>; however, the responsibility of repayment could become stressful during a time when income is typically reduced and certain expenses, such as health care, typically increase. Two schools of thought exist on older mortgagees in the United States. First, mortgage debt could contribute to poor health (Cairney & Boyle, 2004; Nettleton & Burrows, 1998, 2000). Second, mortgage debt may be the result of poor health (Kim & Lyons, 2008).

Objectives of this study concern homeowners age 65 and older and are intended to 1) create a housing finance profile of mortgagees, 2) compare the health of homeowners with and without mortgages, and 3) examine the dual relationship between housing cost burden and self-reported health among mortgagees. The dual relationship

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<sup>10</sup> Older homeowners may also be eligible to access home equity through a Reverse Mortgage. Such a mortgage does not require monthly repayment. However, this study is primarily concerned with older homeowners who carry a mortgage requiring monthly repayment. Additionally, information regarding Reverse Mortgages is not found in the Health and Retirement Study data used for this research.

has two parts: the relationship between housing cost burden and the probability of having good health and the relationship between good health and housing cost burden.

## **Methodology**

The 2004 and 2006 waves of the Health and Retirement Study (HRS) were used for this study. The HRS, a national data set of adults age 50 and older, is ideal for this study because of its large sample size and comprehensive data on finances and health. The HRS does not consist of a simple random sample but rather a clustered and stratified sample, thus sample weights were used in the analyses to adjust for unequal probability of selection and allow the results to be viewed as nationally representative of the population being studied<sup>11</sup>. The sample for research questions 1, 3, and 4 totaled 1,197 (3.8 million weighted) homeowners age 65 and older reporting a mortgage payment in 2004. The sample for research question 2 totaled 6,728 (22.5 million weighted) homeowners, with or without a mortgage, age 65 and older.

### *Variables.*

Two dependent variables were used in this study, self-reported health status and housing cost burden (HCB); each comes from the 2006 wave of the HRS. Health categories consisted of excellent, very good, good, fair, or poor. This variable was dichotomized to equal “1” for excellent, very good, or good health and to equal “0” for fair or poor health. HCB was created by dividing monthly mortgage payment in 2006 by monthly income in 2006. HCB, a continuous variable, ranges from 0 to 1. The

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<sup>11</sup> The HRS contains two types of weights: household level and individual level. This study examines individual level data, thus making the use of individual level weights appropriate. The statistical analysis used to answer research questions 3 and 4 does not have a sample design weight command. Thus, only research questions 1 and 2 were weighted to account for the complex and clustered sample design of the HRS.

independent variables, all from the 2004 wave, include race/ethnicity, marital and employment status, education, gender, age, level of assets and consumer debt, health insurance, and whether the home was ever modified for accessibility. Additional 2004 variables used only for research question one were present value of the home, net value of the home, and level of mortgage debt and HCB. All were continuous variables inflated to 2006 dollars.

### *Models*

The following models are used to address research questions 3 and 4 and thus satisfy the third objective of the study:

#### *Model 1.*

$$\begin{aligned} \text{Pr}[\text{Health Status}_{t1} = 1] = & F(\beta_1\text{HCB}_{t1} + \beta_2\text{Level of Assets}_{t0} + \beta_3\text{Level of Consumer Debt}_{t0} \\ & + \beta_4\text{Hispanic}_{t0} + \beta_5\text{Black}_{t0} + \beta_6\text{OtherRace}_{t0} + \beta_7\text{Divorced/Separated} + \beta_8\text{Widowed}_{t0} + \\ & \beta_9\text{Employed}_{t0} + \beta_{10}\text{HighSchoolGraduate}_{t0} + \beta_{11}\text{SomeCollege}_{t0} + \beta_{12}\text{Female}_{t0} + \beta_{13}\text{Age}_{t0} + \\ & \beta_{14}\text{HomeModifiedForAccessibility}_{t0} + \beta_{15}\text{Medicare}_{t0} + \beta_{16}\text{Medicaid}_{t0} + \\ & \beta_{17}\text{PrivateHealthInsurance}_{t0} + \beta_{18}\text{ChampusVAHealthInsurance}_{t0} + u_{t1}) \end{aligned}$$

#### *Model 2.*

$$\begin{aligned} \text{HCB}_{t1} = & \alpha_0 + \alpha_1\text{HealthStatus}_{t1} + \alpha_2\text{Level of Assets}_{t0} + \alpha_3\text{Level of Consumer Debt}_{t0} + \\ & \alpha_4\text{Hispanic}_{t0} + \alpha_5\text{Black}_{t0} + \alpha_6\text{OtherRace}_{t0} + \alpha_7\text{Divorced/Separated} + \alpha_8\text{Widowed}_{t0} + \\ & \alpha_9\text{Employed}_{t0} + \alpha_{10}\text{HighSchoolGraduate}_{t0} + \alpha_{11}\text{SomeCollege}_{t0} + \alpha_{12}\text{Female}_{t0} + \alpha_{13}\text{Age}_{t0} \\ & + \alpha_{14}\text{HomeModifiedForAccessibility}_{t0} + \alpha_{15}\text{Medicare}_{t0} + \alpha_{16}\text{Medicaid}_{t0} + \\ & \alpha_{17}\text{PrivateHealthInsurance}_{t0} + \alpha_{18}\text{ChampusVAHealthInsurance}_{t0} + \varepsilon_{t1} \end{aligned}$$

### *Research Questions.*

- 1- What is the housing finance profile of mortgagees age 65 and older in the United States?
- 2- Does the mean self-reported health status of individuals age 65 and older with a mortgage differ significantly from those in the same age group who own their homes without a mortgage?
- 3- What is the relationship between housing cost burden and the probability of having good health among mortgagees age 65 and older in the United States?
- 4- What is the relationship between good health and the housing cost burden among mortgagees age 65 and older in the United States?

### *Statistical Analysis*

Descriptive statistics were used to answer question 1 and a t-test for two independent samples was used for question 2. A two-stage probit least squares model (2SPLS) as outlined by Keshk (2003) was used for questions 3 and 4; it includes instrumental variables for each model<sup>12</sup>. Finding valid instruments is difficult, thus the analysis of the 2SPLS is only as good as the instruments. The instrument for Model 1 is lump sum dollar amount received between 2004 and 2006, a continuous variable measured in 2006 dollars. The instrument for Model 2 is the frequency of physical activity in 2004, coded as “1” if respondent engaged in moderate activity at all during the month and “0” if respondent hardly ever or never engaged in moderate activity during the month. Prior to analyzing the research questions, the data were examined for

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<sup>12</sup> An Instrumental variable is used to isolate the part of the endogenous independent variable that is not correlated with unmeasured determinants of the dependent variable. The instrument is used in the first stage of the two-stage regression procedure. Models 1 and 2 present the relationship between HCB and Health Status prior to the implementation of the instrument and, thus, the two-stage procedure. For detailed information regarding Instrumental Variable Regression and general two-stage procedures, please see Stock and Watson (2007) as well as Wright (1928).

influential outliers and multicollinearity. Observations containing influential outliers were removed and no colinearity problems exist in the final model.

## **Results**

### *Question 1*

What is the housing finance profile of mortgagees age 65 and older in the United States? The median home value for the sample was \$186,765, and median equity was \$107,790. Total mortgage debt ranged from \$427 to \$1,067,231. The median HCB reported for this sample in 2004 and 2006 was 15.78% and 17.14%, respectively.

### *Question 2*

Does the mean self-reported health status of individuals age 65 and older with a mortgage differ from that of those in the same age group who own their homes without a mortgage? The health of mortgagees is statistically significantly lower than the mean health of owners without a mortgage.

### *Question 3*

What is the relationship between housing cost burden and the probability of having good health among mortgagees age 65 and older in the United States? HCB in 2006 is not significantly associated with the probability of reporting good health in 2006. However, education, assets, and whether or not the respondent participated in regular physical activity are significantly positively related to the probability of reporting good health.

#### *Question 4*

What is the relationship between good health and the housing cost burden among mortgagees age 65 and older in the United States? Self-reported health in 2006 is not significantly related to HCB in 2006. However, a significant negative relationship with HCB exists for those reporting being employed and having Champus/VA or private sector health insurance. A significant positive relationship exists for those reporting a minority race/ethnicity and for those reporting being separated or divorced and widowed.

#### **Conclusion**

If, as this study indicates, there are no health consequences to having mortgage debt in older age, there surely are financial consequences. If plans for wealth accumulation and withdrawal rates do not account for mortgage payments, as appropriate, individuals may be underfunded at retirement. One limitation of this study is the validity of the instruments, which may have biased the results. Future research could include state-level instruments instead of individual-level instruments, as they may have greater validity. This study used data from 2004 and 2006; future research could examine this population after the fall of the United States housing market that occurred in late 2006.

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**SUSTAINABLE LIGHTING PRODUCTS IN SINGLE-FAMILY RESIDENTIAL  
EXTERIORS AND LANDSCAPES: A PILOT STUDY QUERYING HOMEBUILDERS  
REGARDING AWARENESS, CLIENTS' INFLUENCE, AND ADOPTION BEHAVIOR**

Paulette Hebert, Mihyun Kang\*

**Background**

While many would agree that sustainability is desirable, and claims of “environmentally friendly” products abound, exterior illumination still accounts for a very large amount of the total energy consumption of the United States. One source estimates “wasted outdoor lighting... at 17,400 gigawatt-hours a year. At an average of \$.10 per kilowatt-hour, the cost is \$1.74 billion a year” (International Dark-Sky Association [IDA], 2008, p. 4). Meant to mitigate this problem, “ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy (DOE) helping us all save money and protect the environment through energy efficient products and practices” (U.S. Department of Energy, n.d., p. 1). The use of ENERGY STAR-approved outdoor fixtures, which “meet strict energy efficiency guidelines set by the EPA and U.S. Department of Energy” (U.S. Department of Energy, n.d., p. 4), is encouraged. For those unable or unwilling to change their lighting fixtures, ubiquitous reminders, such as the article “Change a Bulb, Change the World, Save Some Green” (Trattner, n.d.), have urged the replacement of incandescent lamps with compact fluorescents (CFLs).

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Recently, ENERGY STAR began qualifying “a new kind of light”: Light Emitting Diodes (LEDs), which are solid-state light sources that use even less energy than CFLs (U.S. Department of Energy, 2009a). Recent developments are increasing the viability and affordability of LEDs for residential use. However, because the qualifying process has only just begun, very few ENERGY STAR-approved LED fixtures are available (U.S. Department of Energy, 2009b).

Paradoxically, homeowners’ concern for home security, their demand for backyard entertainment, and even design professionals’ recommendations have continued to spur the illumination of home properties (International Dark-Sky Association, n.d. b; Moyer, 2005). New phrases have found their way into industry literature. *Light pollution* is defined as light that is “directed upward to the sky or reflected... that interferes with astronomical observations or appreciation of the night sky” (Rea, 2000, p. 10-5). *Lighting curfews* mandate automatic extinguishment of lights at certain hours (IDA, n.d. b). *Light trespass* describes unwanted illumination that has encroached onto others’ properties or shone through bedroom windows (Obtrusive Light Subcommittee, 2000a). *Lighting ordinances* are rules intending to curb light levels and glare (International Dark-Sky Association, n.d. c).

The International Dark-Sky Association (IDA) is an organization whose mission is embraced by amateur and professional astronomers, environmentalists, and the U.S. National Parks (IYA 2009, n.d.; National Park Service, 2007). This organization endorses and promotes “dark-sky friendly” fixtures, which have the Fixture Seal of Approval (FSA) for use in commercial and residential applications (International Dark-Sky Association, n.d. a; International Dark-Sky Association, n.d. d; International Dark-

Sky Association, n.d. e). These approved fixtures do a better job of directing the light they give off so less energy is wasted as light pollution.

The illumination of the exteriors and landscapes of many single-family homes is designed and/or installed by non-design professionals, homebuilders, and/or their clients, as evidenced by the abundance of do-it-yourself literature (Donovan, 2006). Previous research investigating homebuilders' awareness of sustainable lighting, homebuilders' clients' influence towards the adoption of sustainable practices, or actual adoption behaviors of homebuilders regarding sustainable exterior and landscape lighting was not found.

### **Purpose**

As part of a larger research project, the purpose of this pilot study was to test a new survey instrument and to gather preliminary data towards the investigation of homebuilders' involvement with sustainable lighting for exteriors and landscapes. The objectives of the study were to determine homebuilders' awareness, clients' influence, and adoption behavior.

### **Methodology**

While attending a comprehensive energy conference sponsored by their local utility company in April 2008, homebuilders in the Midwest were invited to participate in a research study. This convenience sample had been previously identified by the utility company as having successfully constructed ENERGY STAR homes. A series of questions was developed to determine awareness, clients' influence, and adoption

behavior of each respondent. Descriptive statistics were employed to analyze the data gathered.

## Results

The response rate was 100% of those attending the seminar ( $n=17$ ). The majority (88%,  $n=15$ ) of the respondents indicated that they had attended college, and almost half (47%,  $n=8$ ) had a bachelor's degree. A minority (12%,  $n=2$ ) reported continuing education courses on lighting in the previous two years. Almost half of the respondents (47%,  $n=8$ ) had been homebuilders for more than fifteen years. Most of the respondents (82%,  $n=14$ ) were members of a builder organization.

To ascertain client influence relevant to sustainable lighting, subjects were asked how important they believed certain topics were to their clients. Almost half (47%,  $n=8$ ) believed that sustainability was important to their clients. The majority (65%,  $n=11$ ) believed energy efficiency was important to their clients.

Subjects were questioned regarding their familiarity with relevant terminology. The majority (65%,  $n=11$ ) were familiar with the phrase "light pollution", but less than half (41%,  $n=7$ ) were familiar with "light trespass". The majority (76%,  $n=13$ ) were not familiar with "lighting curfew". Furthermore, 88% ( $n=15$ ) indicated that they had not heard of the IDA. None of the respondents had installed IDA-certified fixtures. Over three fourths (76%,  $n=13$ ) reported being unaware of any applicable lighting ordinances.

Although only 18% ( $n=3$ ) of the homebuilders had received requests for exterior incandescent lights in the previous year, 29% ( $n=5$ ) had installed them. Only 18% ( $n=3$ )

had requests for compact fluorescents, but 24% ( $n=4$ ) had installed them. None had requests for LED lights, but 12% ( $n=2$ ) had installed them.

In the previous two years, most respondents (71%,  $n=12$ ) had installed lighting controls in residential projects. Photocells, for example, were installed by 59% ( $n=10$ ) and time clocks were installed by 24% ( $n=4$ ).

### **Conclusions**

While most of the homebuilders and their clients were aware of sustainable practices and products, the majority had not implemented the most sustainable practices and products over the time period studied.

### **Implications**

Residential exterior and landscape lighting may be an overlooked area in the education of homebuilders towards sustainability. Educational opportunities for homebuilders to pursue sustainable practices in exterior and landscape lighting are needed. Determining the reasons why homebuilders are motivated to apply sustainable products would provide direction to promote sustainable practice.

### **Limitations**

This study had limited participants, with its sample skewed towards male homebuilders in the Midwest.

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## HEALTHY CARIBBEAN HOME

Caryl Johnson, Dara Cooper, Dale Morton\*

The Caribbean region of the world has a unique housing situation. In order to better meet the needs of the people of the Caribbean, the Cooperative Extension Service, University of the Virgin Islands, St. Thomas Campus saw a need to produce the booklet *Help Yourself to a Healthy Caribbean Home*. This booklet was developed from the *Help Yourself to a Healthy Home* booklet that is used in various states on the mainland U.S. (Alabama Cooperative Extension System, n.d.). The United States Virgin Islands is made up of three main islands that are located in the Caribbean about 1,200 miles southeast of Miami, Florida. The *Healthy Caribbean Home* booklet will better meet the needs of the local population throughout the Caribbean region.

This presentation will discuss how the *Healthy Caribbean Home* booklet was developed and the considerations that were made to make it a useful educational booklet for the Caribbean. Much of the information that is found in the *Help Yourself to a Healthy Home* booklet does not apply to the Caribbean region and has not been field tested on an extension audience. However, the *Help Yourself to a Healthy Home* booklet has been used by the Caribbean extension staff with their audiences. The Caribbean audiences appreciate the information in the *Help Yourself to a Healthy Home* booklet that is used on the mainland, but their feedback was that much of the information does not apply to the Caribbean region. This is what motivated the

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Cooperative Extension staff to revise the booklet. It is hoped that this booklet will be shared with other educational institutions throughout the Caribbean, not just the United States Virgin Islands.

The purpose of *Healthy Caribbean Home* is three-fold. The first purpose is to provide information about the best way to protect families from accidents and illness in and around the home. Many accidents and illness could be prevented if clients were educated about safety within the home. The second purpose is to provide historical information about housing in the Caribbean. Much of the history about the traditional historical architecture is being lost, and the addition of the historical architecture section to the booklet will provide information that hopefully will give the extension audience a better appreciation for historical architecture. The younger generation is not always aware of the unique cultural aspects of the historical architecture that is found in the Caribbean. The third purpose of this booklet is to look into the future and discuss sustainable energy as provided through solar electricity (photovoltaic), solar hot water systems, and fluorescent and LED lighting. The cost of energy in the Caribbean, and especially the cost of electricity, is very high.

The focus of the first part of the original booklet is on indoor air quality that can lead to illness. A major source of drinking water and water used in the home in the Caribbean comes from cisterns. Thus, changes were made in this section to make reference to cistern water rather than well water. Cistern water is rain water that is collected on the roof of a home. Water runs from the roof into a gutter system that is connected to a cistern. Most cisterns are constructed out of cement and located underneath the structure, where they usually form part of the support system for the rest

of the house. A figure of the components of a cistern and how the system works was added to the booklet.

Also, important information about cistern water was added to the booklet. This information includes: (1) testing the cistern water; (2) keeping the cistern away from animal pens, manure, pet waste, septic systems, dumps, and places where chemicals are stored; and (3) checking the cistern for cracks or leaks. It is recommended that the cistern water be purified by either boiling it before using it for drinking or adding three to five ounces of fluid bleach to every 1,000 gallons.

As most of the Caribbean does not need to produce heat, information on wood burning stoves, furnaces, fireplaces, flues and chimneys, and space heaters was omitted. Also, information on radon, a gas that emanates from the ground, basements, humidifiers, and carbon monoxide was removed, as these terms do not apply to the islands.

Another addition to the *Help Yourself to a Healthy Caribbean Home* booklet was information on Caribbean historical architecture as found in the United States Virgin Islands. The authors felt that there was a need to preserve knowledge of traditional architecture that has been an important part of the Caribbean culture. In this section of the booklet, information is presented on architectural styles as related to the various cultures that settled in the United States Virgin Islands, which was formerly the Danish West Indies. Color photos and informational text about historical architecture have been added to the booklet to show the various cultural influences. The first dwellings that were constructed by the Arawak (Taino) and Carib Native Indians are cited in the booklet. Most of these structures were made of palm branches or light poles and woven

branches. The West African cultural influences can be seen in wattle and daub construction and the use of the gallery or the porch. The European cultural influences included in the book are the Danish townhouses, the traditional French vernacular cottages as found on St. Thomas, and the Victorian architecture of the English on St. Croix. The Spanish cultural influences are seen in the use of wrought-iron details, ceramic tile floors, arches in corridors, and the use of Spanish walling or tabby, a cement-like mixture of sea shells, lime, water, and sand (Brown, 1981; Gjessing & MacLean, 1987; Gosner, 1971; Island Resource Center; Jackson, 1990; Johnson, 1995; Sessin et al., 1985).

The Danes had a major influence on planning in the towns Christiansted and Frederiksted on the island of St. Croix. Narrow step-streets found throughout the town of Charlotte Amalie were designed by the Danes and built by individuals from West Africa. These step-streets are unique to the island of St. Thomas.

The third major change to the development of the *Help Yourself to a Healthy Caribbean Home* booklet was the addition of a section entitled “Going Green for Homes”. The public needs more educational information and awareness about sustainable home energy and energy saving types of equipment, such as lighting. Information is also presented on solar hot water systems that could be installed in a home, including direct systems and indirect circulation systems (active solar) and integral collector-storage passive system and thermosyphon (passive solar). A short paragraph explains the photovoltaic (PV) or solar cells that can be installed in a home.

*Help Yourself to a Healthy Caribbean Home* will be a powerful education tool that can be used throughout this region of the world.

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# INTEGRATING GIS AS A PLANNING TOOL IN THE PEDAGOGY OF THE ARCHITECTURAL RESEARCH STUDIO

Azza Kamal\*

## Architectural Studio Pedagogy

In the pedagogy of architecture education, the studio is an American adaptation of the atelier-based training practiced at the Ecole des Beaux-Arts in 19th Century Paris (Chafee, 1977). The studio provides what Kuhn (1998) calls a model driven by design as a discipline. The functional and the structural aspects merge with the social and the technical ones, resulting in what Kuhn emphasized as a complexity of both the procedures in and the contents of the architecture studio. As he puts it,

[The] characteristics of the architecture studio include: project-based work on complex and open-ended problems, very rapid iteration of design solutions, frequent formal and informal critique, consideration of a heterogeneous range of issues, the use of precedent and thinking about the whole, the creative use of constraints, and the central importance of design media (Kuhn, 2001, p. 349).

Adding to this complexity, different components can be integrated into architecture studio instruction, such as digital fabrication and research. The latter has been adapted by different schools and is now regarded as a major constituent of studio activity. The structure of research is anchored in a set of clear goals pursued through appropriate methodology and a documentation of all activities that are overseen by discipline-related expertise (Diamond, 2002). In this manner, design decisions, reviews of current practice, and regular critiques are altered by in-depth investigation of the design problem, the review of the literature, the acquisition of empirical data, and

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publishing outcomes. The University of Montreal/Canada established a model for such a studio format with a history and theory research theme in architecture education by devoting its curriculum to heritage conservation research wherein both technical and historical modes are integrated (Chodikoff, 2004). Another model was set by Hinson (2007) in a research-driven design-build studio at Auburn University, where faculty and students expanded their goals beyond student learning outcomes and addressed questions much broader than the scale of the single building and with significance beyond the single client.

The challenge of these models was denoted in the review of the symposium of the Royal Institute for British Architects (RIBA) *Reflections on Practice*, in which Short (2008) underlined the limitations of research in architectural studios. Research is limited because architecture has almost no capacity for speculative design research and urgently needs support from the similarly besieged academic research sector. Both research sectors need resources and research-trained instructors.

### **Local Case Study**

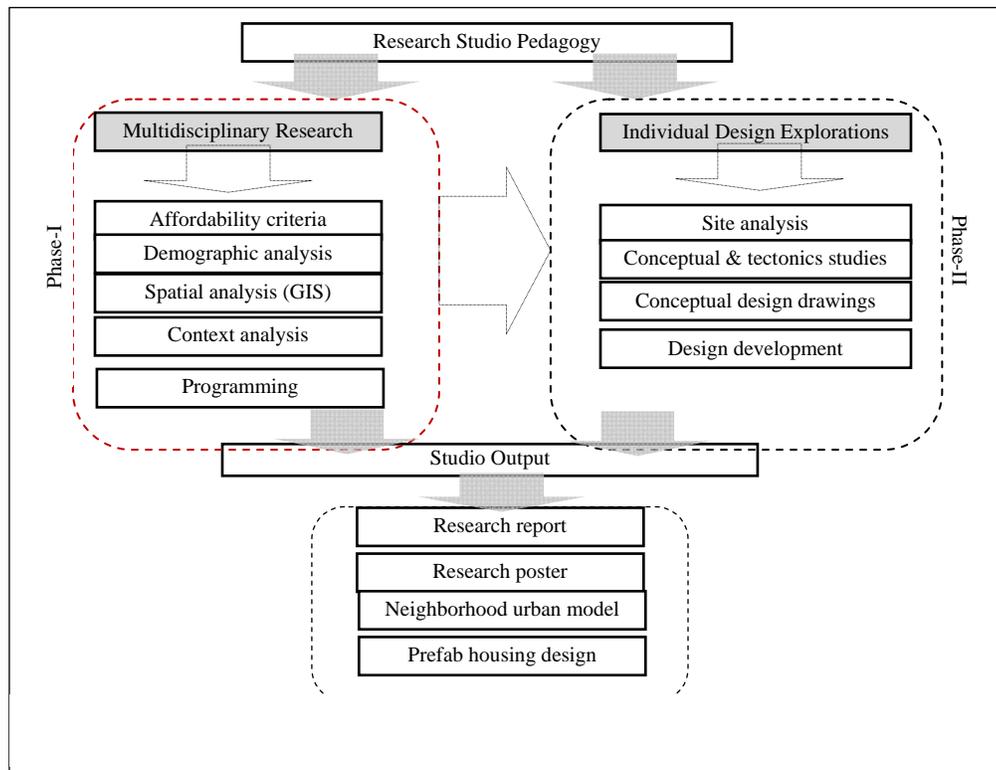
Considering these factors, this paper discusses the premise of an undergraduate research studio and explores the process of utilizing GIS as a planning tool in architecture studio pedagogy. More specifically, GIS was utilized for analyses of housing and demographic data in San Antonio, Texas—a city characterized by 58.7 percent Hispanics (U.S. Census Bureau, 2000)—in order to identify areas with low-income Hispanic households. A design strategy for housing a selected low-income Hispanic population was developed. The instructors imposed prefab owner-occupied units as prototype in order to approach affordability as a solution to the housing problem

of low-income households. Students made affordable designs by incorporating low-cost and recycled construction materials, whereby housing cost was reduced. They also decreased the overall cost by referring to the affordability index of the Center for Neighborhood Technology [CNT] (2010), which regards the combined cost of housing and transportation as the fundamental influences on housing affordability. Thus, students cut households' spending on transportation by identifying sites located within walking distance to bus stops and commercial areas.

### **Studio Premise**

The studio, which included 14 undergraduate students, pursued a multidisciplinary pedagogical approach to incorporating GIS as a planning tool in the research studio in architecture departments. The studio prompted students to acquire real-world data from both the US Census shapefiles (U.S. Census, 2000) and empirical analysis of housing form in selected neighborhoods. The outcomes of this analysis were assigned the key source in identifying different sites inhabited by a mostly low-income Hispanic population. Studio assignments required the use of prefab and recycled materials in designing low-cost housing units and, at the same time, the integration of day lighting, rainwater harvesting systems, cross ventilation, and renewable energy. Research assignments required researching sustainable features and materials and were followed by design tasks completed by individual students. Both in design and research work, students experienced frequent interactions with their teammates and others, including the two studio instructors, two local practicing architects, and two external faculty reviewers. Studio activity concluded with the development of design

proposals for single-family, owner-occupied housing units with attached rental studio apartments to generate income for the low-income homeowners. Figure 1 shows the contents of both phases: multidisciplinary research and individual design explorations.



**Figure 1. Structure of the Research Studio Pedagogy**

**Source: Author**

### **Multidisciplinary Research**

In the seven-week research phase, a number of guiding principles were imposed by instructors, including organizing work teams of four to five students each and requiring a number of criteria for site selection, including low land value and land occupation by a majority (50% or more) low-income Hispanic population. In the teams,

students' skills were improved particularly due to their peer-to-peer interactive collaboration, which triggered critical thinking and facilitation skills. The collaboration also enhanced students' effective participation skills, explained in Fruchter's study on teamwork education (2001), with collaborative efforts in researching local sustainable materials and investigating site and neighborhood features. Throughout this process, students utilized GIS software ArcView 9.3 (Environmental Systems Research Institute [ESRI], 2009) to look into a set of different criteria for site selection. Identifying three to four lots that met these criteria, students followed their selection by inspecting the condition of onsite structures for possible renovation and by locating nearby public utilities, including power lines, sewage ditches, and potable water lines. Each team then chose a site to be the location of their individual design proposal.

Instructors also required that the forms generated in the design proposals had to adhere to the neighborhood housing forms in which each chosen site was located, hence stressing urban uniformity. Each team embarked on a documentation of morphological elements of neighborhood housing adjoining their selected sites in order to incorporate these elements into their renovation and design tasks. This was undertaken by photographing housing fronts and using content analysis to code and classify morphological elements, including height, roof finishing material, roof form, location of front door, availability and location of porch, and colors. Content analysis was then used to generate analytical graphs and pie charts comparing the percentage of each element with other elements (e.g., see Ball & Smith, 1992).

## **Design Process**

While investigating neighborhood housing form was a pivotal process that influenced how students understood the milieu of their sites, the design process did not start until the strengths and weaknesses of each site were verified. These included the view from the site to its surrounding, the price of existing abandoned structures (estimated by Bexar County's appraisal office), and the ease of accessibility, which were all facets that affected the overall cost of the proposed design and, consequently, enhanced or decreased its affordability. The design process was then carried out by individual students over eight weeks. They emphasized the tectonic studies of the proposed designs and constructed a series of small-scale models. Following the assessment of these models by peer-to-peer and instructor evaluations, each student decided on one model to further develop into a conceptual design proposal for a renovated, owner-occupied house and an attached yet small rental unit. The design development drawings were then submitted for a final review and evaluation.

## **Interdisciplinary and Group Work**

Face-to-face interaction with instructors and practicing architects during weekly critiques and six research and design reviews improved students' organizational skills and augmented their ability to formulate planning data from the US Census shapefiles. Asynchronous collaboration in which instructors provided both GIS lab sessions and Web-based data in order to identify neighborhood selection criteria also improved interactive engagement in discussions and brainstorming outside the lab and studio hours. Other skills were also emphasized by prompting students to gain hands-on

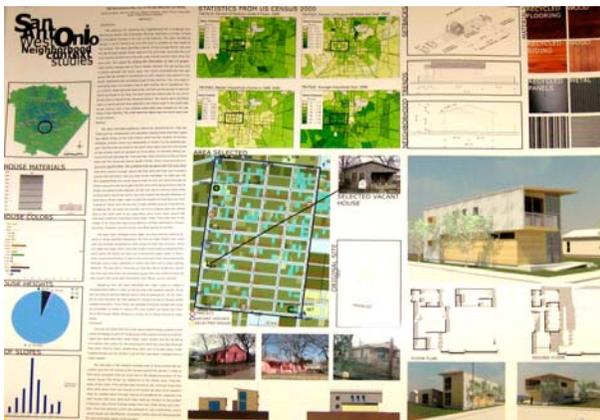
experiences by documenting housing forms during the field visits, during which students applied such planning and social science research methodologies as data and image-based analyses. The downside of such empirical practice took place not onsite, but during the coding and analysis of data using spreadsheets. Due to some students' lack of experience with spreadsheet processing, the coding and analysis was to some extent a chaotic and disorganized activity. To address this, instructors held short tutoring meetings during the regular desk critique with students needing advancement in their skills for spreadsheet application. Each group was then assigned to document the research in an instructive poster (Figure 2), a process which sharpened their graphical and presentation skills.

### **Individual Explorations**

A one-week programming preparation transitioned the research process to a design exploration and stimulated students' innovation and creativity, which led to conceptual design explorations. This also yielded an array of conceptual analog models and improved students' understanding of tectonic studies, an example of which is shown in Figure 3. However, a lack of integration of contextual morphological elements in the tectonic models was a manifestation of students' preference for incorporating new elements instead of contextual ones. Figure 4 shows the integration of computer technology used to transform the models into digital drawings, which, in turn, equipped students with experience in comprehensive design practice.

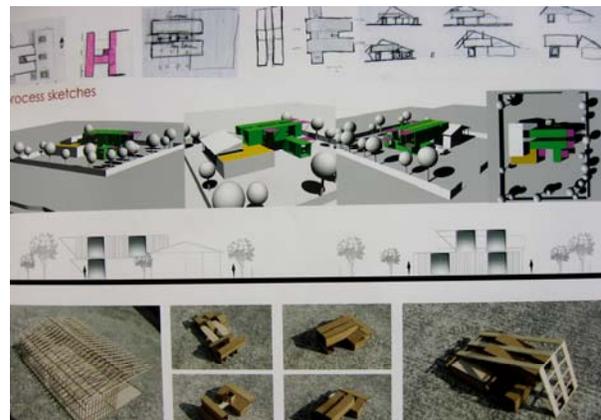
## Conclusions

In line with Kuhn's investigation of a project-based pedagogical model in the curriculum (Kuhn, 2001), this paper stressed the significance of a multidisciplinary module in undergraduate design projects. While integrating a multidisciplinary research model imposed logic in design decisions and reduced the subjectivity of project evaluation, there was an intensive need for face-to-face, supporting tutorials and web-posted handouts. Both were time consuming and, thus, impacted studio time. However, these sessions and web-posted handouts were crucial due to the complexity and variety of disciplines that students had to deal with in their design projects. In addition, the productivity of research groups was influenced by the format and mechanism of each group. An advisory role by the studio instructors was subsequently necessary in order to help students acquire the expected skills. Therefore, the multidisciplinary research studio could be integrated as a design studio module to prompt students to acquire knowledge from multiple fields, such as planning and social science. This knowledge could then be integrated into the process of design thinking, therefore resulting in a comprehensive and pragmatic design solution for real-world problems.



**Figure 2. Poster Presented by Group 1**

**Source: Author**



**Figure 3. Tectonic Studies by Gabriel**

**Olmos**

**Source: Author**



**Figure 4. Design Development of the Proposed Prefab House by David**

**Gonzalez**

**Source: Author**

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# RESIDENTIAL TECHNOLOGY FOR ELDERLY AMERICANS AND KOREANS AGING AT HOME

Suk-Kyung Kim, Mira Ahn\*

## Introduction

Elderly people's desires and needs for technology in their homes have been explored primarily for those who are already physically impaired (Becker et al., 2005). However, recent studies have examined the technological desires and needs of healthy elderly people (e.g. Ahn & Goss, 2006; Melenhorst et al., 2006; McCreddie & Tinker, 2005). Findings from these recent studies emphasize the increasing technological desires and needs of the elderly and their willingness to learn or accept them (Rogers et al., 2002; Ahn & Goss, 2006; Kim et al., 2009). In particular, persons aging at home show positive attitudes toward residential technology (Kim et al., 2009). These studies suggest that greater consideration of the incorporation of residential technology can improve quality of life and support aging at home (e.g., Ahn & Goss, 2006; Kim et al., 2009).

This paper focuses on residential technology and elderly people's opinions of it. Residential technology is any type of system or appliance in individual homes or residential properties that assists in daily life. Residential technology ranges from small handheld devices to complicated multifunctional systems (Kim et al., 2009). Alternative terms include smart home technology (Laberg, 2005) or intelligent systems (Korea National Housing Corporation, 2001).

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The primary questions for this study were: 1) What kinds of residential technology have been introduced thus far?; and 2) How much do elderly people need them? These initial questions produced two different studies in two different cultural contexts. The authors of this paper each initially conducted and published studies independent of one another. The first study was “Relationships Between the Desire to Age in Place and Attitudes Toward Residential Technology,” published in *Housing and Society* 33(1) by Ahn and Goss (2006). Next, the study “High-tech Amenities for the Elderly: The Technological Assistance Needs of Elderly Koreans Aging at Home” was published in the *Journal of Housing for the Elderly* 23(3) by Kim et al. (2009). The differences in opinion and attitude in the articles, along with common findings, represented meaningful contributions to gerontechnology, and the authors decided to combine and reanalyze their findings in this study.

### **Purpose**

This paper aims to 1) explore the residential technology needs of the elderly and their opinions thereof in both the U.S. and Korea, 2) analyze commonalities and differences in needs and opinions, and 3) discuss current and future directions for residential technology plans based on the results.

## **Limitations**

As mentioned above, this paper analyzed two data sets collected through two different studies. The target populations, opinion measurement scales, and types of residential technology included in the survey are not identical. However, the results cover significant information on residential technology and elderly people's opinions that housing researchers need to know.

## **Research Methods**

### *Elderly Americans' Attitudes Towards Residential Technology*

To explore elderly people's attitudes in the United States, residential technology was divided into five categories according to use: 1) safety and security, 2) comfort, 3) entertainment, 4) home management, and 5) communication. Residential technology was additionally cross-categorized as survival technology, basic technology, and high technology, according to the degree of function and rate of adoption. A total of 25 residential technologies (including products and services) were included in the opinion survey.

Data were collected with a web-based questionnaire delivered via email to subjects on a preexisting Virginia Tech alumni listserv. The data collection was completed in February 2004. Based on the general borderline age of senior housing (U.S. Department of Housing and Urban Development, 2004), this study targeted subjects aged 55 or older by distributing the online survey to alumni aged 55 and older. The sample size was 9,789 and a total of 1,546 responses were obtained, making the response rate 15.8 percent. Of the total respondents, 97.8% were Caucasian, 90%

were married, and 91.7% were male. Only 8% of the respondents were female and 2% were non-white. Approximately 95% of the respondents reported their health condition as excellent or good. 60.6% had a post-bachelor's degrees. This higher educational attainment was due to the purposive sampling (the subjects were linked to a university listserv).

The acceptance level of residential technology by elderly people was investigated. An acceptance variable was created by summing 25 questions asking about respondents' perceptions and experiences regarding technology products and services.

Answering options were made based on Rogers' (1995) innovation-decision process that consists of a series of actions and choices over time through which an individual evaluates a new idea and decides whether or not to incorporate the innovation into an ongoing process. The answer choices in this study were 1 = not familiar with this product or service; 2 = heard, seen, or read about it; 3 = interested in/tried looking for information; 4 = considered purchasing; 5 = purchased; and 6 = purchased but do not use or rarely use. The fifth and the sixth options were coded 5. A higher score means that respondents were at a later stage of the innovation-decision process. The total mean of acceptance of residential technology products or services was 74.2 (out of 125).

Data were analyzed with the help of ANOVA to assess differences in acceptance dependent upon age, employment status, health condition, marital status, education, and income. Results showed that younger males with higher educational attainment had higher acceptance scores in residential technology than other respondents in this sample. Generally, elderly participants showed high acceptance levels in regards to

entertainment systems, such as CD/ DVD players, satellite TV, and home theater systems. Communication systems were more highly accepted than safety and security systems. Table 1 below shows the categories and residential technology products or services applied in homes and elderly Americans' purchase rates. This rate includes the percentage of survey participants who gave answer options 5 or 6. The table excludes the three technological systems that had a purchase rate of 1.0 percent. These were video-phone at entrance (0.7), wireless health-monitoring products (0.5), and video-recognition door opener (0.2). These products have since become more prevalent, but they were not highly accepted in the study.

**Table 1. Residential Technology Products or Services for Elderly Americans and Purchase Rate**

Categories	Survival Technology (%)	Basic Technology (%)	High Technology (%)
Personal and Home Management			
Safety and Security			Burglar alarm (32.1) Gas leak detector alarm (21.0) Personal health remote diagnostic product (4.0) Flood alarm (3.3) Emergency alert products (3.1)
Comfort	Microwave oven (98.0)	Electric toothbrush (58.6) Remote garage door opener (69.8) Laptop computer (47.9)	PDAs (26.7) Remote controls for temperature or humidity (19.9) Remote controls for turning on/off lighting & dimming lamps (15.6) Remote controls for home appliance (1.6) Remote controls for raising/lowering shutters(1.3)
Communication		Cellular phone (87.8) Fax machine(52.2)	Video phone(1.1)
Entertainment	CD player (96.1) VHS player (92.9)	DVD player (73.8)	Satellite TV (26.9) Home theater system (18.2)

Note 1: The table is a revised version of Table 5 in *Housing and Society*, 33(1), p. 99

Note 2: Products or services with an acceptance rate of less than 1% are not included in this table.

### *Elderly Koreans' Attitudes Towards Residential Technology*

The Korean study was initiated in 2000 and first identified available systems for the elderly. The research team visited six sites to observe senior housing developments with residential technology systems: 1) the Integer Millennium House in England, a world-renowned site that incorporates various residential technology systems; 2) an apartment complex in France; 3) an experimental house in France by the Legrand Company where advanced technology and home appliances are used; 4) a model house designed by the Rosemalen Company in the Netherlands; 5) the NAIS Plaza showroom in the Netherlands; and 6) the Home Information Infrastructure House in Japan. All of the types of technological systems within the six sites were catalogued and new system names were added whenever they were observed.

Next, a list of residential technology systems from a review of the literature and site visits was compiled. The systems were categorized based on function. Ten technology experts from the Korean National Housing Corporation and Seoul Commtech, Inc. reviewed each list and the categories and confirmed their justification and functional capabilities for elderly people. Later, one senior apartment complex planned by Helpy Elkander (of the Korean National Housing Corporation) in Nuenen, the Netherlands was visited to investigate a working example of senior housing with advanced residential technology systems. The final list of the systems included 24 items under six categories, as shown in Table 2 below.

**Table 2. Technological Systems for Elderly Koreans (Mean Values)**

Categories	Names of Systems & Needs	Categories	Names of Systems & Needs
Safety & Security (4.33)	Elevator safety (4.69)	Indoor Environment Control (4.05)	Heating control (4.45)
	Emergency alarm (4.62)		Automatic lighting (4.31)
	Fire & gas detecting (4.53)		Air conditioner control (4.16)
	Invasion & robbery Prevention (4.40)		One-button lighting on/off (3.93)
	CCTV monitoring (4.38)		Dimming control (3.90)
	Unit gate control (4.31)		Automatic curtain & blind (3.55)
	Building gate control (4.22)		
	Integrated key (3.36)		
Housekeeping Assistance (3.85)	Cleaning (4.00)	Health (4.02)	Central water purification (4.22)
	Automatic garbage collecting (3.81)		Intelligent bathtub with water temperature control (3.81)
	Automatic water (3.74)		
Internet-based Services (3.88)	Remote meter reading (3.98)	Automatic Control (3.82)	Out-of-house remote control (4.38)
	Communication (3.78)		Indoor remote control (3.72)
			Speech recognition (3.36)

Note 1: Scale: 1.Very unnecessary, 2.Unnecessary, 3.Neutral, 4.Necessary, 5.Very necessary

Note 2: For information on the detailed functions and characteristics of the systems, please refer to Kim, Lee, & Yim (2009), pp. 212-213.

Currently, “silver colleges” are popular in Korea. They are similar to senior centers in the U.S. They provide educational programs and social interaction opportunities for elderly people residing in adjacent areas. Participants in this study were chosen from

one silver college located in the Mokdong area in the City of Seoul, Korea. This area is a representative middle-income district, and the participants were thus considered to have average levels of educational attainment and economic status for the country. The subject setting had 80 seniors who were asked to participate (without incentives). From July 18 to August 14 in 2000, a total of 60 people participated voluntarily (response rate: 75 percent). Their ages ranged from 56 to 80 years, with a total mean of 64.9 years.

Interviews and a standardized questionnaire investigated participants' needs and opinions on technological systems in their residential environments. Staff members of the silver college assisted in data collection to gain clearer responses from participants. This study explored the necessity of the 24 systems with regard to independent living at home. The necessity level was measured by a 5-point Likert-type scale, with 1 being "very unnecessary" and 5 being "very necessary".

Each system was described and an accompanying picture was shown in the interview in case participants were not have been familiar with them. For example, the necessity of an elevator system was assessed by asking, "How much do you need an alarm or reporting system that sends signals to the maintenance office or the police when problems or accidents happen in your building elevators?"

Among the 60 participants, 24% were men and 76% were women. All of them were high school educated or higher. Approximately 90% owned their homes and 70.7% lived in high-rise condominiums, 17.2% in single-family houses, and 12.1% in other types. All participants were married and some of them lived with their children's families. The mean number of family members living with participants was 2.9. Most of the

participants did not have severe physical problems in reading and understanding. All had independent mobility. Their knowledge and experience with computers varied.

The analysis tested necessity levels by demographic variables such as gender, age, and educational attainment. Only gender was verified as an explanatory variable. Mean values were obtained to examine the level of necessity. Overall mean values of elderly participants' necessity levels were higher than the neutral value (3.0), which means that their necessity levels for technological systems to assist home living are positive. Among the six categories, systems in the safety and security category were most strongly needed ( $m = 4.69$ ). The second most needed was the indoor environment system category ( $m = 4.05$ ), whereas the automatic control system category ( $m = 3.82$ ) and the internet-based service system category ( $m = 3.88$ ) were less needed. The analysis of mean differences between per-system category need and overall need for technological systems revealed that the safety and security system category was most important to participants. Their need for the automatic control system category were significantly lower than their overall needs for the six categories. The necessity levels of the 24 systems are presented in Table 2 above.

## **Discussion and Conclusion**

This paper reviewed two data sets investigating elderly people's opinions about residential technology in the U.S. and Korea. The details of the residential technology employed in the two studies were different. Technology products or services included in the U.S. survey were more product-oriented (e.g., remote garage door opener, burglar alarm) than the systems (e.g., indoor environment system) used for the Korean study.

For example, the DVD players or PDAs found in the U.S. study are products, while the cleaning system in the Korean study is a complicated system integrating dust collectors in individual units, an entire building garbage collector located in the building basement, and garbage transit to a central collector located at the corner of the neighborhood. However, several residential technologies overlapped between the studies, specifically safety and security systems, various remote control systems, and communication systems.

Several differences in elderly people's opinions were found. Elderly Koreans showed a higher desire for safety and security systems—more so than any other type of system. This shows their preference for improved safety from crime and unwanted accidents as well as more rapid responses when an undesirable situation occurs. By contrast, elderly Americans highlighted the importance of safety and security systems less. They rated entertainment systems higher. These differences seem to reflect different housing situations. Most Korean participants were living in high-rise condominiums located in the Seoul metropolitan area, while most American participants were living in single-family detached houses in small towns or rural areas around Blacksburg, Virginia.

Despite differences in needs or acceptance levels, there were also commonalities in the two studies. The elderly in both Korea and the U.S. were very willing to incorporate technology products or services into their homes. Many strongly desired to own (for Koreans) or expressed a strong interest in purchasing (for Americans) new technological systems, which in both cases means that they are willing to pay for residential technology. The positive opinions of the elderly about the capacity

of technology to improve the quality of their daily life indicates the need to focus on these technologies, especially for those who own their homes and wish to continue to age there. This conclusion supports the perspectives of gerontechnology (Burdick & Kown, 2002), the interdisciplinary area of research involving gerontology and technology that focuses on the development and distribution of technologically based products, environments, and services (Fozard et al., 2000). However, it is still necessary to consider the cultural, regional, and social background of elderly people when applying technology intended to support their aging at home. Elderly people's necessity levels for some technologies differed depending on their cultural background, their locations, and their social characteristics. Tailored studies can suggest more practical guidelines for specific residents.

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# PUBLIC OPINIONS ON THE DESIGN AND PLANNING PRINCIPLES OF NEW URBANISM AND COMMUNITY PLANNING IMPLICATIONS

Suk-Kyung Kim, Jaechoon Lee\*

## Introduction

New Urbanism is an approach to community design that encourages walkable environments as one solution to such problems of suburban residential areas as passenger car reliance. Although resistance to New Urbanism initially arose because it was mostly applied to luxurious resort communities for upper-middle income residents (e.g., Seaside, FL), New Urbanism has now become a popular design practice for every income level (see *The Congress for the New Urbanism*, 1993). In addition to community design, the principles of New Urbanism have also been applied to the revitalization of older U.S. cities.

*The Charter of the New Urbanism* states design and planning principles with regard to the three standpoints of region, neighborhood/district/corridor, and block/street/building. Each standpoint has nine principles to guide public policy, development practice, urban planning, and design (*The Congress for the New Urbanism*, 1993). The notable features of those principles include mixed land use, pedestrian-friendly design, accessible public spaces, and urban public places framed by architectural and landscape designs. In addition, the *Charter* supports the integration of walkable environments and transit-oriented community design, affordable housing design, preservation of the natural environment, and so on. Community planners and

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urban policy makers in the nation, including Michigan, have increasingly focused on New Urbanism's principles as smart growth and sustainable development have become more crucial planning concepts.

With the overall economic downturn in Michigan, many cities have faced severe planning issues, including distressed downtowns, abandoned commercial buildings, obsolete residential neighborhoods, unmanaged streets, and so on. To overcome these issues, the state has taken strong steps, many of which incorporate New Urbanism principles. Representative examples include the Master Plan Projects in many Michigan cities, the Michigan Main Street Program, Brownfield Redevelopment, and various incentive programs that encourage urban economic activity. New Urbanist community design has also been launched in Michigan and some newly developed communities such as Cherry Hill Village. Growing interest and support have made New Urbanism a prevalent concept in the state. Urban and regional planners in Michigan have begun to explore the benefits of applying New Urbanism principles in their cities. This research furthers those efforts by investigating the responses of Michigan residents to New Urbanist principles.

### **Purpose**

This research was funded by the Institute of Public Policy and Social Research at MSU through the Michigan Applied Public Policy Research Grant program to answer the question "How do Michigan residents rate the importance of the design and planning principles selected from those presented in the *Charter of the New Urbanism* (established by the Congress for the New Urbanism, CNU)?" This study chose to use

the core design and planning principles of 1) walkable environments, 2) transit-oriented communities, 3) downtown revitalization, 4) open space and sports facility design, 5) wildlife and natural environment preservation, 6) energy efficient and affordable housing design, and 7) child-friendly residential environment design. Implications for community design and planning are suggested based on the results.

### **Methodology**

The State of the State Survey (SOSS) conducted by Michigan State University's Institute for Public Policy and Social Research is the most efficient method for surveying the representative opinions of Michigan residents (Hembroff, 2009). SOSS is a quarterly survey employing Computer Assisted Telephone Interviewing (CATI) technology to interview a stratified random sample of Michigan citizens. The survey stratifies Michigan into five regions: Upper Peninsula, North, Central, South West, and South East. It usually selects 1,000 Michigan residents and weights the sample size based on the demographic distribution of the state (Hembroff, 2009).

SOSS was conducted to investigate public opinions in Michigan on the selected seven principles of New Urbanism and related issues. For this study, the survey participants included 1,001 residents of Michigan. The survey began on January 28, 2009 and continued through March 25, 2009.

The standardized questionnaire used for the survey included demographic and socioeconomic questions and asked respondents to rate the importance of the selected seven New Urbanism principles. The principles were categorized into two groups: housing design principles (i.e., walkable environment, energy efficient and affordable

housing construction, and child-friendly residential design) and general planning principles (i.e., public transportation services, old downtown revitalization, open spaces and sport facility design, and wildlife and natural environment preservation). The questions used general and easy-to-understand terminology to facilitate responses, as participants may not have had specific knowledge about New Urbanism. For example, a question asking their opinions on public transportation read, “How important do you think the following issue should be as community planners plan for changes in your community? Issue 1: Providing good public transportation services such as more frequent bus service and more bus routes. Please indicate the level of importance from 0 (not at all important) to 10 (extremely important).”

## **Summary of Findings**

### *Demographic and Socioeconomic Characteristics of Respondents*

Respondents’ residential regions were identified first. More than 45% of the respondents resided in southeast Michigan, and the next two major areas were west central Michigan (14.2%) and southwest Michigan (13.8%). Other respondents were from diverse regions such as the Upper Peninsula, northern Michigan, and east central Michigan.

Participants’ demographic and socioeconomic characteristics were investigated. Among the 1,001 respondents, 48.6% were male and 51.4% were female. The average age was 45.8 years old; 20% were in their 20s or younger, 40% were in their 30s and 40s, and more than 35% of residents were in their 50s or older. Most of the respondents were white (84.3%), with the remainder including Black/African American, Hispanic,

American Indian/Alaska Native, Asian, Hawaiian/Pacific Islander, and “other.” More than half of the respondents were married (59.5%); 26.4% were single (never married) and 12.5% were divorced, separated, or widowed. A few households had more than one child currently living with them (25.3%), while the majority had no children currently living with them (74.7%).

The overall educational attainment level of the respondents was higher than high school graduate (96.8%), while 60% had completed between one and four years of college and 13.2% held master’s degrees. This shows that their overall educational level was high enough to understand the general contents of the survey.

The employment status of the respondents was also investigated. The employment rate was 55%. Among the 1,001 survey participants, 31 refused to disclose their employment status. Of the others, 550 respondents (54.9%) were employed full-time (37.8%), part-time (14.9%), work and study (1.4%), had a job but were not at work the previous week (0.1%), or were self-employed (2.5%). Further, 14.4% were retired, 11.8% were unemployed/laid off/looking for work, 11.6% were homemakers, 3.1% were full-time students, and 2.4% were disabled.

The homeownership rate was 85.8%, with 84.4% living in single-family homes. The remainders were dispersed between apartments, modular/mobile home/manufactured homes, condominiums, duplexes, or townhomes.

### *Public Opinions on the Importance of New Urbanism Principles*

Among the seven principles, the principle with the highest mean value was “energy efficient and affordable housing design” (8.27), the second highest was “child-

friendly residential design” (7.82), and the third highest was “wildlife and natural environment preservation” (7.77). Figure 1 shows the mean values of the seven principles. The importance of the housing design-related principles was generally rated higher than the general planning principles (see Figure 1).

**Figure 1. Mean Values of the Importance Level of New Urbanism Principles (N= 1,001)**

**Note: 1 = Not at all important to 10 = Most important**

Explanatory demographic and socioeconomic characteristics influencing opinions were as follows:

- *Gender*. Females strongly emphasized walkable environments and public transportation services and males strongly emphasized downtown revitalization;

- *Age*: The residents in their 40s rated child-friendly residential environments higher (=8.13) than any other age group;
- *Marital status*: Married residents showed higher mean values in the importance of child-friendly residential environments than unmarried residents;
- *The number of children living with*: Residents with children 4 to 12 years old rated energy efficient and affordable housing design and child friendly residential environment design higher than the residents with no children;
- *The current housing type*: Residents not living in single-family homes rated energy efficient and affordable housing design and child-friendly residential environment design higher. It seems that these residents have higher demands for better community design and planning than residents in single-family homes;
- *Homeownership*: Renters rated walkable environments, public transportation services, energy efficient and affordable housing design, and child-friendly residential environment design higher than homeowners;
- *Employment status*: Unemployed residents showed slightly higher mean values for public transportation and child-friendly residential design than employed residents.

## **Conclusion**

This study investigated Michigan residents' opinions on seven New Urbanism principles that can be applied in many ways in order to propose relevant planning directions. The results highlighted the importance of energy efficient and affordable housing design in Michigan, where the winter season is long and cold. Statewide efforts

should thus encourage builders and developers to achieve higher standards of energy efficiency and affordability for new homes and old home renovations.

The importance of child-friendly residential environment design was indicated by most respondents and indicates that it is important to provide safe neighborhood spaces for children's outdoor activities. All respondents, regardless of their residency with children, emphasized creating such amenities for children as playgrounds in neighborhood environments. Along with this, residents also emphasized creating more walkable environments, such as providing connected sidewalks that are safe from traffic accidents.

Among the general planning principles, preserving wildlife and the natural environment was the most important. Improving public transportation services and revitalizing old downtown areas were also important. Respondents expected that downtown revitalization, such as renovating old buildings or constructing new commercial spaces, would bring more dynamic economic and cultural activities to cities.

These survey results were presented at two urban planner meetings in order to facilitate further policy support in the State of Michigan. The survey results of this study could also be applied in states other than Michigan that have similar community and urban planning problems. We also expect that the questionnaire could be used by other researchers to explore state residents' opinions on relevant issues. The questionnaire is available in the appendix of the full report posted at <http://ippsr.msu.edu/Publications/UPNewUrbanism.pdf>.

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**THE LIVEABILITY HOUSE:  
REAL-LIFE APPLICATION IN A VIRTUAL REALITY**

Sarah D. Kirby, Debra M. Sellers\*

The LiveAbility House is a virtual home built to educate individuals about universal design principles and assistive technology devices. It is the result of a partnership formed within the eXtension Family Caregiving Community of Practice (FC/CoP).

eXtension is “an Internet-based collaborative environment where Land Grant University content providers exchange objective, research-based knowledge to solve real challenges in real time” (eXtension, 2010, n.p.). This Cooperative Extension national initiative provides funding to bring Extension professionals together into communities of practice to develop learning opportunities in critical subject matter areas. As of February 25, 2010, 24 CoPs are in various stages of development and 27 are providing educational programming and information to the public (eXtension, n.d).

The FC/CoP became active in 2006, with members from a variety of educational fields, including health, housing, aging, family resource management, and evaluation. This real-world collaboration is grounded in a mission of assisting people with care giving needs at the individual, family, and community levels; the FC/CoP began outreach to the public in February 2008.

Family care giving is a significant national issue, as more than 65 million caregivers in the United States provide care for another individual (National Alliance on

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Caregiving & AARP, 2009). Because the majority of care giving occurs at home, an essential component of family care giving is a supportive housing environment. Over half (51 percent) of care receivers live in their own homes, while only eight percent live in nursing homes or assisted living facilities (National Alliance on Caregiving & AARP, 2009). Home modifications may positively influence health outcomes by reducing the risk of injury, increasing accessibility, and allowing for the independence of residents engaging in everyday activities (Oswald & Wahl, 2004).

A safe and supportive home can greatly improve the environment for care. In discussing care giving, Olsen, Ehrenkrantz and Hutchings (1993) write that the home environment must protect the strengths and abilities of the care giver while providing for the safety and support of the care receiver. Universal design features are built in to the home environment and support individuals regardless of age, gender, ability, or change in ability. Examples of universal design features include widened doorways, lever-handled door hardware, adjustable hand-held shower hoses, and appropriately installed controls.

Assistive technology “is a generic or umbrella term that covers technologies, equipment, devices, apparatus, services, systems, processes, and environmental modifications used by disabled and/or elderly people to overcome the social, infrastructural, and other barriers to independence, full participation in society, and carrying out activities safely and easily” (Hersh & Johnson, 2008, p. 196). Assistive technology has importance for caregivers as it may reduce demands on them (Agree & Freedman, 2000) as well as potentially reduce certain types of costs (Mann,

Ottenbacher, Fraas, Tomita & Granger, 1999). Examples of assistive technology include a sock aid, adapted cutting board, and card holder.

Two members of the FC/CoP discovered that they were working within the complementary areas of universal design (housing specialist; NC) and assistive technology (adult development & aging specialist; KS). Discussions regarding the possibility of integrating these areas into one educational resource supported by eXtension and the FC/CoP took place over time. The result was The LiveAbility House (TLH), a virtual demonstration home that assists family caregivers in creating living environments that support the provision of care to care recipients, enabling them to live at home with as much independence as possible. Specifically, the goal of TLH is to raise public awareness of design features and assistive technology that can make it possible to remain in a home when facing physical or cognitive challenges due to aging, illness, or disability.

Real-world demonstration houses across the nation have been extremely effective in educating housing professionals and consumers. Homes such as the Utah House at Utah State University and La House at Louisiana State University are important tools in demonstrating appropriate construction techniques, energy efficient and accessible design, and building products. Other universities, including North Carolina State University, have considered building demonstration homes but have found that the construction, labor, land, and infrastructure costs were prohibitive. Typically, the design and construction of demonstration homes requires significant private funding, and the sustainability costs of staffing, maintaining, and updating homes over time can be a considerable barrier to the project. In addition, while these

demonstration homes are effective in reaching and teaching a statewide or local clientele, mere geography limits the number of individuals that can visit them.

For these reasons, North Carolina State University and Kansas State University looked for an alternative way to create a demonstration home that could be used globally by individuals, their family members, and care givers. The LiveAbility House (Figure 1) is designed as a virtual demonstration home that exists within the world of Second Life® (SL).

Educational institutions have an established presence within SL (Jennings & Collins, 2007), as the technology allows for the development of educational tools that are not possible in real life. Second Life® has previously been used to demonstrate home modifications and health education principles. Toth-Cohen and Gallagher (2009) evaluated the effectiveness of health and wellness exhibits in virtual worlds, and although more research is required, they suggest that virtual worlds can provide a connection for users, allowing them to see real-world applicability of home adaptation and healthy aging choices.

Second Life® (SL) is a free, Internet-based virtual world where global users interact using either chat or voice options. These users—called residents in SL—download the SL software from the World Wide Web, open an account, and create an avatar identity. Premium accounts exist with optional costs, but it is possible to become an active resident of SL without incurring expense. SL residents independently choose where to go and what to experience. Search functions, similar to those on the web, provide SL residents with the ability to find educational, recreational, and social items and events of interest to explore.



**Figure 1. Front Entrance of The LiveAbility House**

Once residents have located TLH and decided to visit the house, they teleport to its location. Individuals then tour the home on their own. Informational kiosks are placed around the home and provide visitors with in-depth audio and textual information about universal design, assistive technology, and care giving. Visitors have the opportunity to learn about 50 assistive technology devices and universal design features as they click on those items and are provided with names, descriptions, and real-world photographs (Figure 2).

TLH is also used as an educational experience for groups or classes. Interested parties contact the developers to schedule a tour and presentation. Attendees must be residents of SL with some level of skill within the SL environment. The developers provide a presentation about the project's development, answer questions, demonstrate the home's features, incorporate time for independent learning, and facilitate a summary discussion.



**Figure 2. Example of Information Users Receive When Clicking on a Universal Design or Assistive Technology Item**

Evaluating the impact of a project in a virtual environment is complex and challenging. TLH includes two different methods of collecting impact data. The first is through a short evaluation that uses note cards, a common method of communication within SL. A kiosk located at the mailbox at TLH invites visitors to complete a note card with three questions. The second method provides residents with a link to a web-based survey. This survey is longer and includes demographic questions. Figures 3 and 4 demonstrate the virtual world evaluation process. Current analytics indicate approximately 1650 visitors since TLH was developed (L. Phillips, personal communication, July 16, 2010). Survey completion to this point has been meager. Gathering survey information from the home's visitors has been difficult and the developers are exploring ways to increase feedback results.



**Figure 3. Evaluation Kiosk**



**Figure 4. Virtual World Evaluation Survey**

The use of Second Life® has made the project possible, easily modifiable, and cost effective. As there is a cost associated with real estate in SL, TLH sits on land owned by eXtension. Expert assistance for technical and building issues was provided by staff members of eXtension and K-State Research and Extension as part of their regular day-to-day duties. Additional design labor for this project was volunteered by individuals interested in furthering the use of SL as an educational tool.

The LiveAbility House is highlighted on the FC/CoP web page and components of it have been turned into an online learning lesson for consumers. The developers have plans to develop a field program for Extension agents. The current concept includes the use of machinimas (videos made in SL) and slide shows with audio overlay as foundational components within an on-line course. The goal is to educate individuals and demonstrate universal design and assistive technology features.

The demand for family care giving will increase, and as it does, so too will the demand for educational tools and resources for family caregivers. The *LiveAbility House* is one tool that family caregivers and care recipients can use to make decisions regarding assistive technology and home modifications that support both groups in maintaining independence and providing care.

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# **BOOMER HOUSING FOR LATER LIFE: COMPARISON OF CONVENTIONAL MULTIFAMILY HOUSING AND SENIOR HOUSING COMMUNITIES**

Hyunjoo Kwon and Julia O. Beamish\*

## **Introduction**

Boomers are defined as people who were born between 1946 and 1964. As of 2007, this generation comprised about 30% of the U.S. population (82.8 million) (U.S. Census Bureau, 2007). Boomers have started to retire, and they show housing preferences different from previous generations (e.g., traditionalists) for their later life. They prefer independent living in a comfortable and convenient residential environment rather than a senior housing community that is age-targeted (Overly, 2007). Lynn and Wang (2008) assert that boomers tend to prefer maintenance-free living, new experiences, customization, and multiple options. Historically, multifamily housing in the U.S. has focused on low- to moderate-income people. However, today's multifamily housing properties have been developed for middle-income residents with a higher quality of amenities and luxurious unit design, and the number of such properties is growing (Goodman & Scott, 1997). Multifamily housing provides residents with flexible mobility and predictable and affordable pricing, as well as various amenities and services that may be appealing to boomers at retirement. The purpose of this study is to compare amenity, location, and housing design characteristics between conventional multifamily housing and apartments in senior housing communities.

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## **Review of Literature**

Senior housing communities, also known as active adult retirement communities, are typically targeted or restricted to people who are aged 55 or older. The communities provide amenities, activity programs, recreational facilities, and daily living services, such as meals, house cleaning, and laundry. Senior housing communities can contain a range of housing options, including single-family housing, townhomes, and apartments (Suchman, 2001). Although both conventional multifamily housing and senior housing may have multi-units, they are different in several ways. First, conventional multifamily housing is intergenerational, with older adults having more opportunities to interact with people in all age groups. Second, senior housing communities focus more on activity programs, such as bingo, crafts, and yoga, while multifamily housing communities tend to provide more active amenities for all generations, including pools and tennis courts. Third, multifamily housing communities are in more locations than senior housing communities (National Investment Center, 2001), and they allow people to have more choice in where they live.

## **Methodology**

Sixty multifamily (30) and senior housing (30) communities in nineteen U.S cities were studied utilizing content analysis of the communities' websites. The cities where the communities were located were randomly selected based on the lists of best places to retire from the AARP, CNNMoney.com, and U.S.News.com from 2007 to 2009. A total of seventy-seven cities were identified in four U. S. Census regions (Northeast, Midwest, South, and West). Cities with senior housing communities were selected and

then a luxury multifamily housing community in that same city was selected based on Apartmentratings.com information (price/nonsubsidized, residents ratings). Both types of communities were selected based on web searches using google.com and yellowpage.com with the key words “retirement apartments” for senior housing communities and “apartments” for multifamily housing communities from March 1 to May 1, 2010. Both types of communities had multiunit housing types with two bedrooms. The senior housing communities were chosen because they had independent living apartment housing.

### *Variables*

Scales for the amenity, location, and housing design variables were used as the criteria for evaluating the two types of communities. The scales were based on the number of items, with each counting as 1 point. The Amenity Scale was made up of ten items: the presence of a club house, fitness center, business center, security gate, garage parking, pools, tennis court, picnic area, walking trail, and catering kitchen (Pearce, 2007; Schoner, 2005; Wylde, 2002). The Location Scale was made up of six items: access to medical service, restaurant and shopping, cultural places, public transportation, universities, and working places (AARP, 2003; Junk & Anderson, 1993; Schoner, 2005; Shereman, 2009; U.S. News, 2010). The Housing Design Scale was made up of six items: washer and dryer in units, elevators, wheelchair accessibility, size of storages, optional storages, and number of bathrooms (Schoner, 2005). Descriptive statistics and t-tests were employed to analyze the data.

## **Results**

There is no significant difference between multifamily housing and senior housing communities on the Amenity Scale ( $t=1.121$ ,  $p>0.05$ ). However, descriptive statistics show that multifamily housing communities have a high percentage of outdoor activities, such as a club house, pool, fitness center, walking trail, and picnic area. Senior housing communities tend to show a high percentage of indoor amenities, such as a catering kitchen, business center, and fitness center. There is a significant difference in the Location Scale between the two types of communities ( $t=3.057$ ,  $p<0.05$ ). Both of the community types show a high percentage of access to restaurants, shopping, and cultural places, but senior housing communities have a low percentage of access to medical centers, working places, and universities. The Housing design characteristics of the two property types are also significantly different ( $t=3.228$ ,  $p<0.05$ ). Multifamily housing properties provide a high percentage of washers and dryers, storage, and optional storage in the housing units.

## **Conclusion and Implication**

The two community types had slightly different characteristics that seem related to the age and health of the target markets. Multifamily housing communities showed higher scores in terms of Location and Housing Design characteristics, which may make them appealing to boomers. The amenities of both properties were not significantly different. This research shows that multifamily housing communities could be a positive option for boomers who want to move to smaller and more convenient residences. The

Location and Housing Design features may especially be more appropriate in conventional multifamily housing than in senior housing.

This study did not include the costs of living in the various properties, and this could be an important criteria. The limitation of website analysis is that all properties, and especially senior housing communities, do not provide prices. Moreover, it is hard to generalize rent, service fee, and/or entrance fee for the two property types, but a future study should attempt to do this. Furthermore, concepts related to residents' satisfaction and perceptions of the two property types could also be a future study.

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# RECENT PROGRESS IN RESIDENTIAL ENERGY EFFICIENCY

Joseph Laquatra\*

## Introduction

Over the course of American history, houses have reflected concerns, or a lack thereof, regarding energy use. During colonial times, houses in the southern U.S. featured wide porches that shaded those houses from the sun, while those in the north were small with little windows to retain heat in the winter and prairie homes were built into the ground to protect them from harsh storms (Taylor, 2010). The availability of inexpensive energy eased concerns about efficiency until the Arab oil embargo of 1973-74. That event was followed by a relatively brief period of experimentation with active and passive solar homes and then with superinsulated homes (Nissen & Dutt, 1985). As energy prices dropped and stabilized, interest in energy efficiency waned because of a political environment that was hostile to the issue (Lutzenhiser, 2002). However, difficult economic conditions of recent years, coupled with rising energy prices, have seen a resurgence in this interest.

The objective of this paper is to review programmatic efforts to advance energy efficiency in the residential sector of the U.S. Various approaches currently underway will be described and potential impacts will be reviewed.

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## Federal Initiatives

According to the U.S. Environmental Protection Agency, over one million ENERGY STAR homes have been constructed in the United States since 1995 (U.S. Environmental Protection Agency, 2010a). Compared with 25,344,100 total housing starts in the U.S. since that time, 3.9% of all homes built in the U.S. between 1995 and 2009 have been ENERGY STAR homes. Homes qualify for the ENERGY STAR designation if they are at least 20 percent more efficient than those built to the 2009 International Energy Conservation Code. This efficiency is achieved through an airtight building envelope, high-efficiency heating and cooling systems, state-of-the-art measures to prevent water entry from the house exterior, efficient lighting and appliances, and third-party verification (U.S. Environmental Protection Agency, 2010b). But ENERGY STAR is not the only program designed to promote residential energy efficiency. From 1998 to 2008, the U.S. Department of Housing and Urban Development administered the Partnership for Advancing Technology in Housing (PATH), which focused on energy efficiency in addition to other housing features, including durability, disaster resistance, environmental performance, and affordability (PATH, 2009). PATH was funded through annual appropriations from Congress, but it has not been funded since 2008.

The U.S. Department of Energy administers the Building America program, which features the Builders Challenge (U.S. Department of Energy, 2010). This effort uses the EnergySmart Home Scale, or E-Scale, which is shown in Figure 1. The E-Scale is based on the Home Energy Rating System (HERS) index and ranges from 0 to 150, with 70 representing the score that qualifies a home as meeting the Builders Challenge.

A score of 0 qualifies a home as a Net-Zero Energy Home, one that produces at least as much energy as it consumes. Interestingly, there is no reference to ENERGY STAR homes on the E-Scale. In addition to focusing on energy efficiency, builders participating in the Builders Challenge must document every phase of home construction, develop and implement a plan to minimize construction site waste, design and install state-of-the-art systems that prevent water entry from the exterior to the interior of a home, follow a construction plan that minimizes material cuts and waste, follow proper sizing procedures for space conditioning equipment, specify Energy Star windows, install low VOC-emitting cabinets, and more. In short, homes constructed to the Builders Challenge criteria would qualify for green building certification as described below.

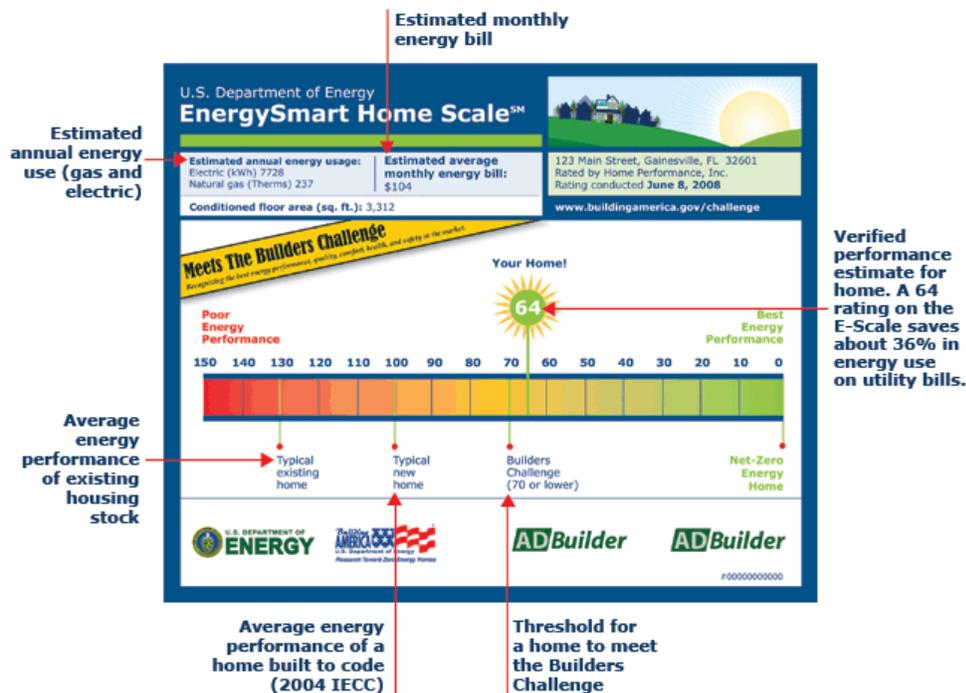


Figure 1. EnergySmart Home Scale

**Source: U.S. DOE,**

**<http://www1.eere.energy.gov/buildings/challenge/energysmart.html>**

Contractors can achieve the Builders Challenge designation either directly or by working with one of two partnering programs: The U.S. Green Building Council or the National Green Building Council. To date, 2,619 homes in the U.S. have met the Builders Challenge (U.S. Department of Energy, 2010), which represents 0.002% of the U.S. housing stock (Rice, 2010).

### **Ongoing Programs**

Other programs that promote residential energy efficiency are those with a green building focus. Four national green building standards are currently in use. The oldest is Leadership in Energy and Environmental Design (LEED), which is administered by the U.S. Green Building Council (USGBC). LEED is a program through which buildings are certified as meeting sustainability standards (U.S. Green Building Council, 2008). LEED focuses on specific areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality (U.S. Green Building Council, 2008). LEED criteria are performance-based, as opposed to prescription-based, which allow builders to meet program goals through a variety of ways. LEED is applicable to all buildings, including homes.

Since 2004, Enterprise Community Partners has administered the only national program to develop green homes for low-income families (Morley & Tohn, 2008). The

Green Communities Criteria established under this initiative relates to design, neighborhood fabric, resource efficiency, environmental health, and maintenance.

With input from several thousand stakeholders, the National Association of Home Builders (NAHB), the International Code Council (ICC), and the NAHB Research Center developed ICC-700, the National Green Building Standard. It was approved in 2009 as an American National Standard and is the only green standard that is consistent with ICC's I-Codes. Green features covered by this standard are similar to those in use by LEED and Enterprise and include a provision for homeowner education on maintenance of green status. ICC Codes are used as the basis of building codes in use across the United States (Building Design and Construction, 2009).

The EPA Indoor airPlus program of the U.S. Environmental Protection Agency is an enhancement to the ENERGY STAR Home program. To be certified as an Indoor airPlus home, over 30 additional construction features are added to a home to provide for healthy levels of indoor air quality (U.S. Environmental Protection Agency, 2009).

### **Energy Performance Scores**

In Oregon, the Energy Performance Score system is now in use for new homes on a voluntary basis. A pilot version of this system is being used for existing homes in Seattle and is under consideration in Chicago and Houston (DeFreitas, 2010). In addition, the state legislatures in Oregon and Washington have created task forces to explore the feasibility of making the program mandatory in their states. The U.S. Department of Energy (DOE) has set October 2010 as a deadline for developing a

voluntary national home rating standard so that banks could use it as a basis for applying favorable financing for energy efficient homes (World-Wire, 2010).

### **Conclusion**

A growing number of programs and approaches to promote residential energy efficiency exist at the federal and state levels in the U.S. These may be indicators of a movement toward routine inclusion of energy efficient features in homes. While long overdue, this movement is a necessary component of achieving energy independence in the U.S. and reducing carbon dioxide emissions in the residential sector. The number of programs, however, and the lack of coordination among them raise important policy issues that should be addressed. Which of the programs described is most suitable for a home builder or buyer? What criteria are most important for builders and buyers to follow when choosing among the programs? Which program is appropriate for a small home builder? Finally, should these programs be combined into one or two efforts that address the needs for high quality housing and environmental sustainability and eliminate the confusing and overlapping array of options now available to home buyers and producers?

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**YES, THEY DO WALK IN SUBURBIA:  
SUBURBAN MULTIFAMILY HOUSING AND TRIPS TO STRIPS**

Nico Larco, Jean Stockard, Bethany Johnson, Amanda West\*

**Issue**

Multifamily housing has been the largest growing housing market in the United States since 1970 and currently comprises one in five units in suburbia (U.S. Census Bureau 1973 through 2007). This housing type is often located around commercial strip malls and typically acts as a buffer between the strip malls and adjacent single-family home neighborhoods (Hess 2005; Moudon & Hess 2000). Contrary to what is typically considered the norm in suburbia, this proximity between multifamily housing and “daily use” commercial areas creates a strong potential for walking and biking to occur. The actual site design of a vast majority of these developments, however, continues to adopt the detached and enclaved single-family home development pattern, significantly reducing connectivity in these developments and challenging the potential for increased walking and biking (Larco, 2009).

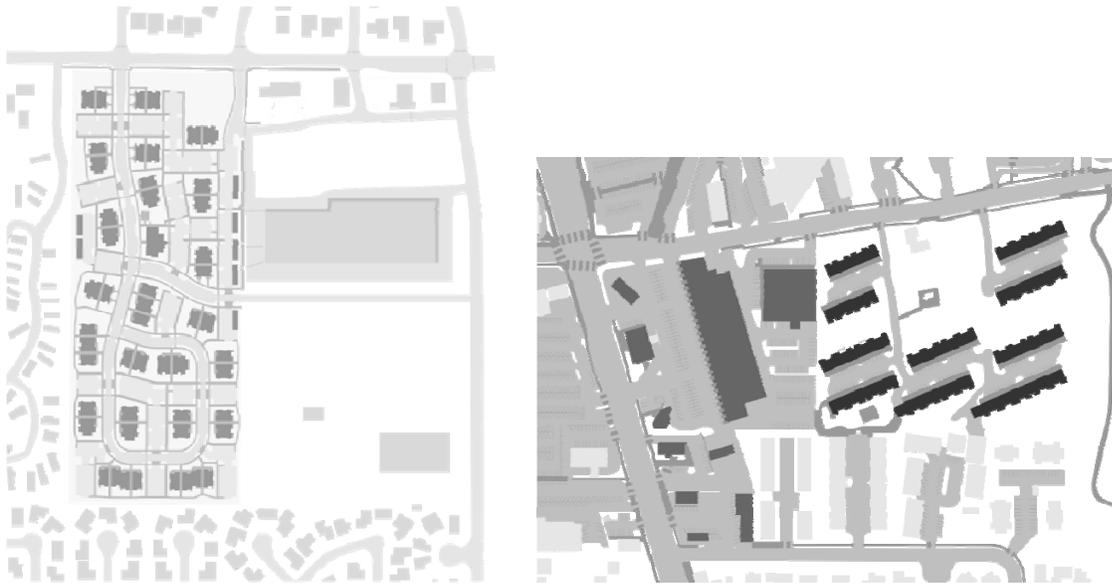
This study investigates whether connectivity in suburban, multifamily developments affects residents’ rates of walking and biking to their local commercial areas. This is a localized study, but given the generic nature of multifamily development around the country, we suspect that the results of this study may be applicable nationally. Our hypothesis was that increased connectivity would result in increases in walking and biking.

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## Methods

To test this hypothesis, we studied 14 multifamily housing developments in Eugene, Oregon. In 2001, Eugene revised its multifamily housing code to include specific language on street network requirements, parking design, and pedestrian infrastructure, all of which increased the connectivity of later developments. We chose eight developments built before the code change and six built after the change. We created connectivity ratings for each development that were based on such criteria as the presence and networked degree of pedestrian paths both internal and external to the developments, the pedestrian network node density, route directness, and access point distribution around the site. A composite score that included all of these criteria was derived for each site and the sites were ranked accordingly. A natural break in that ranking separated the well-connected developments from the less-connected ones (see Figures 1 and 2 for examples of these two categories of developments). Both groups of sites were similar in size, number of units, and distance to comparable local commercial areas (LCA) that included pedestrian magnets, such as banks, grocery stores, post offices, and restaurants.



**Figure 1 (left). Example of a well-connected site design (left) that has extensive internal pedestrian networks, directly connects to adjacent properties in multiple locations, and is organized around legible streets.**

**Figure 2 (right). Example of a less-connected site design (right) has no direct connection to adjacent properties, only connects to a fast moving arterial, is organized around parking, and has a limited internal pedestrian network.**

Using a direct marketing database, we gathered addresses for all residents and sent a survey to each household ( $n=1,493$ ) in these developments asking about transportation modes and frequency, attitudes toward travel modes, ease of walking and biking, housing choice, and personal information. Surveys were sent to all residents at the same time in order to eliminate any differences in responses that might be caused by weather or other factors. A total of 229 surveys were returned and analyzed. While the response rate of 15.34 percent did raise some questions as to how well the survey

responses represented residents in general, given the strength of many of the results outlined below, we do not feel that this is a major concern.

## Results

Contrary to popular perception as well as studies regarding mode choice in suburbia, residents reported a substantial amount of active transportation trips (walking and biking) across both well-connected and less-connected developments. We analyzed the results of the survey using both descriptive statistics and regression models. Across all sites, more than a third of all trips to the LCA are active transportation trips (38.7%), with most of those trips being walking trips (see Table 1 below).

**Table 1. Percent of Trips Per Week by Travel Mode**

Mode	Mean Percent of Trips Made by Mode		
	Both	Well-Connected	Less-Connected
Driving	60.5	54.0	71.1*
Walking	35.7	43.0	23.7**
Biking	3.0	1.7	5.1
Biking or Walking	38.7	44.7	28.8

\*p<.05, \*\*p<.01

n=197

n=123

n=74

In addition, travel mode use and connectivity are significantly associated as residents of well-connected sites are significantly more likely to walk and less likely to drive to the LCA than residents of less-connected sites. Almost half (43.0%) of the trips to the LCA were walking trips for residents of well-connected sites versus less than a quarter (23.7%) for residents in less-connected sites.

Looking at resident travel choices instead of total trips (see Table 2 below), we found significantly more residents choosing to walk and bike in the well-connected sites. Almost three quarters of residents (73.2%) in these sites use active transport to the LCA at least once a week as opposed to only 58.1 percent of residents in less-connected sites. In other words, the well-connected sites are correlated with more individuals considering and using active transport as a viable form of transport to their local commercial area. In addition, a significantly larger number of residents in well-connected sites (20.3%) only walk or bike to their local commercial area as compared to residents of less-connected sites (9.5%).

Further statistical analysis using regression models revealed that these differences in travel mode were not correlated with resident demographic characteristics or attitudes toward a particular mode, but were highly correlated with the connectivity of the built environment in which each person lived.

**Table 2. Resident Travel Mode by Site Connectivity**

Percentage of Residents That Use Specified Travel Mode In Typical Week			
Travel Mode Used	Both	Well-Connected	Less-Connected
Ever Walk	65.2	72.6	52.7**
Ever Bike	9.6	6.5	14.9*
Ever Walk or Bike	67.5	73.2	58.1*
Walk or Bike Only	16.2	20.3	9.5*
Ever Drive	82.8	78.2	90.5*
Drive Only	32.5	26.8	41.9*
Mostly Walk	36.9	44.4	24.3**
Mostly Drive	58.1	51.6	68.9*

\*p<.05, \*\*p<.01

n=198

n=124

n=74

Note: Columns do not add up to 100% because residents may be part of multiple travel mode categories.

### Implications

Residents of suburban multifamily housing do walk and bike to their local commercial areas, and they do so at significantly higher rates if they live in a well-connected development. Increases in active travel have been associated with improved health, reduced rates of obesity, and increases in independence (Frank et al., 2006). In addition, if active travel is replacing auto trips, it helps reduce green house gas emissions and traffic.

To create environments that foster increased active travel, planners must encourage developments that are well connected both internally and to their surroundings. Zoning codes throughout the country often include such provisions as

mandated buffers between dissimilar uses and limitations on direct connections between developments (especially to commercial areas). These codes also often lack provisions for pedestrian networks and the need for connections to adjacent development.

The result is that many suburban multifamily developments are dominated by parking, have little infrastructure that supports active travel, and have little to no connections to adjacent properties. Moreover, following ingrained suburban development practices, planners often review and evaluate proposed suburban multifamily housing projects without sufficient attention to adjacent development. Plan reviews are often based on documents that only show land use designations and not actual site designs of adjacent properties, negating any evaluation of potential connections between properties. To capitalize on the latent potential for active travel in and around suburban multifamily developments, planners will have to re-evaluate their codes as well as their perceptions of the amount of walking and biking that can occur in suburbia.

The Oregon Transportation Research and Education Consortium (OTREC) generously provided funding for this research.

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**TIME PASSAGES:  
USING THE AMERICAN HOUSING SURVEY AS LONGITUDINAL DATA**

Sung-jin Lee, Kathleen Parrott\*

**Introduction**

The American Housing Survey (AHS) is frequently employed in housing research. However, due to changes in coding schemes, the AHS has limitations when comparing data over different years. Lee (2010) conducted research regarding housing conditions of Asian and Pacific Island elders in the United States from 1995 to 2007. Based on Lee's research, this abstract provides tips to help housing researchers, professionals, and students who are interested in the AHS. In particular, this abstract discusses using the AHS as a form of longitudinal data.

**Background of the American Housing Survey**

The biennial American Housing Survey (AHS, previously called the Annual Housing Survey from 1973 to 1981) provides current and continuous data related to housing and demographic characteristics. The AHS is the largest regular United States sample describing people and their homes. It is conducted by the U.S. Census Bureau and sponsored by the United States Department of Housing and Urban Development (HUD) (Montfort, 1998). The AHS provides data on apartments, single-family homes, mobile homes, vacant homes, family (household) composition, income, housing and

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neighborhood quality, housing costs, equipment, fuels, size of housing units, and recent movers (HUD User, 2008).

The AHS consists of a national survey and metropolitan area surveys. The national survey started in 1973 with a sample size of 60,000 housing units. In 1985, the national sample was redesigned based on the 1980 Census. A base sample size is approximately 47,000 units and rotating supplemental samples of around 6,000 to 9,000 are added for each survey. The AHS national survey is conducted every other year on the same housing units. The repeated data collection at the same housing units results in a form of longitudinal interviewing. In order to measure local conditions, additional samples in some metropolitan areas are added every 4 to 6 years (HUD User, 2008; Montfort, 1998; U.S. Department of Housing and Urban Development, 2003).

### **Consideration of the AHS-Related Research**

When approaching the AHS, three aspects need to be considered: (a) single file/flat file version, (b) variations in coding schemes, and (c) limitations of longitudinal research.

#### *Single File/Flat File Version of AHS National Data*

Before 1997, AHS data was provided as a single file or flat file version. In the flat file, each housing unit's information was contained on a single logical record with a set number of characters for each observation, and each variable had a fixed location in the file. After 1997, as part of a conversion of the server environment, AHS data was formatted as different modules (files) to provide a more efficient file structure (D. A. Vandembroucke, personal communication, August 4, 2009). However, if a single file

version is preferred, a file-flattener program that is distributed on the HUD User website can be used (ICF Consulting, 2001; ICF International, 2009). Figure 1 shows a brief procedure for file-flattening. Converting each year's data to a single flat file is recommended when using data both before and after 1997.

### *Variations in Coding Schemes*

When dealing with AHS data before and after 1997, different coding systems must be referenced. When investigating AHS data generated in 1995 and earlier, two codebooks are used: the *Codebook for the American Housing Survey Codebook Volume 1* (U.S. Department of Housing and Urban Development, 2010) and the *Codebook for the American Housing Survey Volume 2: Supplement for 1984-96* (HUD, 1998). With data from the 1997 AHS and later, the *Codebook for the American Housing Survey, Public Use File: 1997 and Later* (ICF International, 2009) is the reference. Some coding schemes are similar, but some variations are coded quite differently. The following examples from Lee's study highlight coding differences.

*Race.* The variable related to race of the head of the household has been named as RACE1, HHRACE, and RACE. Previous to 2001, the variable related to race had five categories, while after 2003, the variable was categorized into 21 groups (Eggers, 2006). For example, Asian and Pacific Islanders appeared in a single category until 2001. When the AHS categorized race into 21 groups in 2003, Asians appeared in ten categories and Pacific Islanders appeared in six (Table 1). When matching a racial group previous to 2001 to those after 2003, there is no official statement from HUD about how to match the two systems (D. A. Vandenbroucke, personal communication, March 30, 2009).

*Other Exemplary Variables.* In Lee's research, some variables were coded under the same variable name (e.g., the rating of a unit as a place to live was coded under HOWH from 1995 to 2007). Other variables were coded under different variable names even if the value labels were identical. For example, sex of the head of the household was coded under sex1 from 1997 to 2007 and under SEX in 1995. Since 2001, HHSEX has also appeared as an additional variable named for the same construct, sex1.

Some questions in the AHS cannot be directly compared due to different value labels or names. *Documentation of Changes in the 1997 American Housing Survey* (ICF Consulting, 2001) provides important changes of some questions since 1997. For example, housing subsidy questions have been changed. In 1995, two variables (SUB and SUBLOC) provided information on housing subsidies. SUB was used for federal housing subsidies while SUBLOC was designated for state and local housing subsidies. Since 1997, SUBRNT has been used to indicate government subsidies, including federal, state, or local housing subsidies. Therefore, the data related to housing subsidy cannot be directly compared from year to year because different questions led to changes in the data.

#### *Limitations of Longitudinal Research*

When employing consecutive AHS datasets, a study is not a true longitudinal study because an interview is performed by tracking housing units, not persons. Rather, it can be said that the AHS uses a similar form of longitudinal interviewing in that the interviewers go back to the same housing units in each interview period to record changes in the characteristics of the units and occupants (Montfort, 1998).

## **Conclusion**

The AHS is conducted biennially, thus it provides more updated, time-sensitive, and accurate information than the decennial census about housing and demographic characteristics. Therefore, even though the AHS has limitations, it is still beneficial to housing researchers, professionals, and students. Research results using the AHS can also be useful for policy makers.

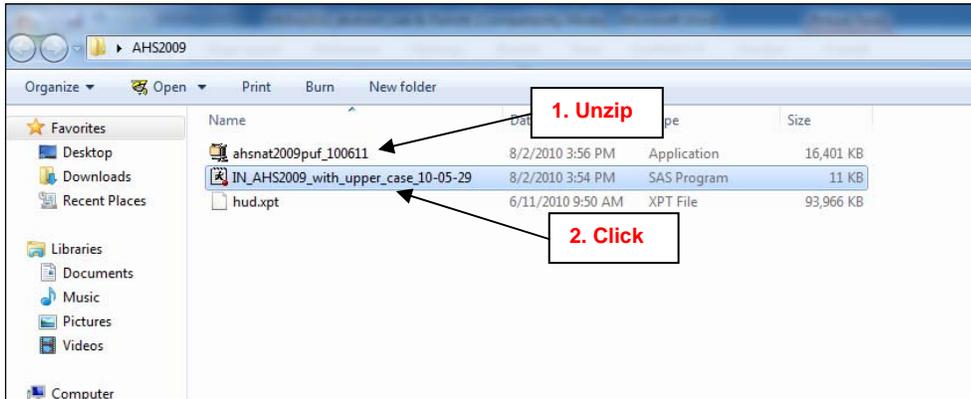
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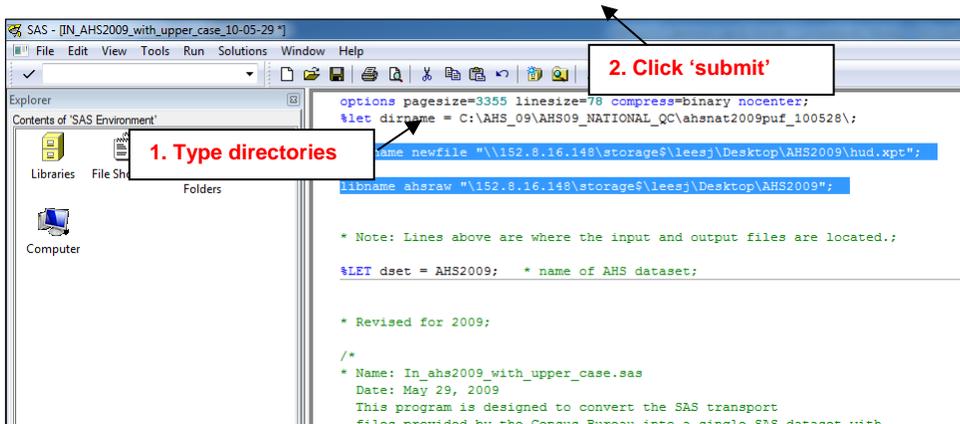
**Phase I.  
Download  
files**

- a. Download files from the HUD User website (<http://www.huduser.org/portal/datasets/ahs/ahsdata09.html>).
  - 2009 National AHS data SAS version (Download as \*.exe, 16 MB or \*.zip, 15.2 MB)
  - Download the SAS "file flattener" program for the 2009 AHS dataset (Download \*.sas, 11 KB)
- b. Unzip 'ahsnat2009puf\_100611' to obtain 'hud.xpt'.
- c. Click 'IN\_AHS2009\_with\_upper\_case\_10-05-29' ← The SAS "file flattener" program.



**Phase II.  
Preparation  
for a  
dataset**

- a. Type directories in the two lines and click 'submit'.



**Phase III.  
Obtain  
dataset**

- a. Obtain dataset. Can be saved as SPSS file.

The screenshot shows the SAS software interface with a data table. The table has the following columns: Owner/resident manager lives on-site, Edit flag for OWNHERE, Control number, Cost of alteration/repair, racost1, racost2, racost3, racost4, and racost5. The data rows are numbered 1 through 17.

	Owner/resident manager lives on-site	Edit flag for OWNHERE	Control number	Cost of alteration/repair	racost1	racost2	racost3	racost4	racost5
1			100003130103	.	.	.	.	.	.
2			100003130203	.	.	.	.	.	.
3			100006110140	.	.	.	.	.	.
4			100006110249	.	.	.	.	.	.
5			100006130103	.	.	.	.	.	.
6			100006370140	.	.	.	.	.	.
7			100006520140	D	D	D	D	D	D
8	1		100007130148	.	.	.	.	.	.
9	1		100007390148	.	.	.	.	.	.
10			100007540148	200	200	.	.	.	.
11	1		100008700141	.	.	.	.	.	.
12			100008960141	1500	1500	200	100	.	.
13	2		100009170148	.	.	.	.	.	.
14			100010190149	9000	9000	.	.	.	.
15			100013130103	15000	15000	10000	2000	.	.
16			100013230103	.	.	.	.	.	.
17	1		100013330103	.	.	.	.	.	.

**Figure 1. Brief Procedure for File-Flattening**

**Table 1. Percentage Distribution of Asian and Pacific Islander in 2001 by Race in 2003 Categories**

Race as reported in 2003 AHS		Asian or Pacific Islander (as a race category reported in 2001 AHS)	
		Responses	%
1	White Only	182	8.4
2	Black Only	5	0.2
3	American Indian, Alaska Native Only	2	0.1
4	<b>Asian Only</b>	1,773	81.8
5	Hawaiian, <b>Pacific Islander Only</b>	117	5.4
6	White/ Black	0	0.0
7	White/ American Indian, Alaska Native	0	0.0
8	White/ <b>Asian</b>	41	1.9
9	White/ Hawaiian, <b>Pacific Islander</b>	10	0.5
10	Black/ American Indian, Alaska Native	0	0.0
11	Black/ <b>Asian</b>	4	0.2
12	Black/ Hawaiian, <b>Pacific Islander</b>	0	0.0
13	American Indian, Alaska Native/ <b>Asian</b>	1	0.0
14	<b>Asian</b> /Hawaiian, <b>Pacific Islander</b>	17	0.8
15	White/ Black/ American Indian, Alaska Native	4	0.2
16	White/ Black/ <b>Asian</b>	0	0.0
17	White/ American Indian, Alaska Native/ <b>Asian</b>	0	0.0
18	White/ <b>Asian</b> / Hawaiian, <b>Pacific Islander</b>	11	0.5
19	White/ Black/ American Indian, Alaska Native/ <b>Asian</b>	0	0.0
20	Other combinations of 2 or 3 races	0	0.0
21	<b>Other combinations of 4 or 5 races</b>	0	0.0
Total		2,167	100.0

Note. From Eggers, F. J. (2006). *Analysis of racial characterization under different reporting options*. Retrieved October 21, 2010, from HUD USER website:  
<http://www.huduser.org/datasets/ahs/AnalysisRacialCharacterization.pdf>

**TRANSITIONING TO ASSISTED LIVING:  
EXPLORING ELDER WOMEN'S PERCEPTIONS OF HOME AND SELF**

Laura L. Lien, Marilyn J. Bruin\*

**Introduction**

The concept of home, a prevalent element of place-based theory, is complex and multifaceted. While difficult to define, the home environment is a critical aspect of physical, social, and psychological well-being, especially among elders (Chaudhury & Rowles, 2005; Oswald et al., 2006). A continued theoretical focus on aging-in-place in independent housing, however, stymies the understanding of the meaning of home within other types of senior supportive housing environments, such as long-term care facilities. As a result, the literature surrounding the transition from independent to supportive housing in the context of environmental meaning and personal impact is deficient.

The purpose of this study is to describe the experience of residential change and subsequent influence upon elder women's perception of home and self, specifically between independent and assisted living. This research aims to define concepts and identify relationships to further the development of theory in explaining the meaning of home over time and circumstance. In addition, the study is designed to add to the literature to form the basis for design, policy/programming, and research to minimize negative impacts and support transitions between independent living and assisted living.

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## Methodology

This study employed a qualitative research design utilizing a phenomenological methodological tradition to further understand how a transition from independent to assisted living influenced elder women's perception of home and self. Since the meaning of home is both objective and subjective, describing participants' experiences through their own words provided a deeper understanding of the impact of moving to assisted living. Qualitative data were gathered through open-ended, in-depth interviews, observations, field notes, and photographs.

Oswald et al.'s (2006) four-domain model of perceived housing, including housing satisfaction, usability, meaning, and control concepts, along with components from Atchley's (1999) continuity theory, informed the interview questions and became the theoretical basis to explore the meaning of home and self. Oswald et al.'s (2006) model stemmed from the European ENABLE-AGE project ([enableage.arb.lu.se](http://enableage.arb.lu.se)), utilizing a person-environment fit analysis (Lawton & Nahemow, 1973). This model has since been used in multiple other studies by the same authors. Atchley's (1999) continuity theory traditionally appears in psychological studies, such as those exploring elders' self-perception and consequent effects on physical and cognitive health and well-being (i.e., Levy, 2003; Schafer & Shippee, 2010; Westerhof & Barrett, 2005). While each theory has been used by other researchers in multiple disciplines, they have not previously been used in conjunction with one another.

Twenty-two interviews were conducted with women aged 65 and older living in two different assisted living facilities (11 at each) within one urban geographical location. Women were selected for participation with help from administrators, since women

comprise the majority of assisted living residents (Marsden, 2005; Tinsley & Warren, 1999). While including only women limits the lived experience of men, the high number of participants and subsequent theoretical saturation provided an in-depth perspective into perceived meaning of home and self among elder women in assisted living.

### **Findings**

Significant statements from interviews were grouped into formulated meanings and further analyzed for emergent themes using Bloomberg and Volpe's (2009) template approach. Strategies such as bracketing assumptions, peer and adviser debriefing, triangulation, and comparison of data against current literature assured trustworthiness. Multiple, in-depth reads of the data highlighted dependence, adaptation, and socialization as prominent themes related to participants' perceived self-identity. Perceived meaning of home was found through the themes of satisfaction, rules and regulations, ties to previous home and memories, and decision-making.

The prevalent themes found in the data analysis were similar, albeit not exact, to the concepts identified in Atchley's (1999) continuity theory and Oswald et al.'s (2006) four-domain model of perceived housing. These findings shed light on the validity of both frameworks, but they also identify additional concepts related to meaning of home and self for elders facing changes in residential environments. Further exploration into the new concepts identified in this study could advance knowledge and contribute to literature.

## **Recommendations**

Self-perception plays a significant role in how one conceptualizes the meaning of home, especially after a transition to assisted living. Since the home environment of elders is increasingly tied to their physical, social, and psychological well-being (Chaudhury & Rowles, 2005; Oswald et al., 2006), a change in residential environment can impact how the meaning of home and self is perceived. By further understanding the meaning of home and self through the emergent themes found in this study, future implications for design, policy/programming, and research surrounding assisted living for elders are possible.

Although designs of assisted living environments have improved significantly, it is still imperative to consider the symbolic nature of home among elders. Therefore, it is important for designers to focus on how the physicality of assisted living environments can innovatively and creatively maintain sameness between the former and current roles, choices, relationships, and experiences of its residents. This can be done through multiple flexible living spaces that allow and encourage various activities, gatherings, and levels of socialization. Creating spaces where residents can maintain continuity between their former homes and their current living environment, such as craft and project rooms, functional kitchens, outdoor spaces, and places for families to gather privately and visit for extended periods of time, can help foster a positive relationship to assisted living by increasing control, autonomy, and independence.

Additionally, increased policy and programming in terms of how assisted living is defined would help balance issues of risk and safety and ensure that residents are residing with others of similar capacity. Increasing assisted living options within geographic areas of primarily elder residents would help minimize the impact of moving long distances from

former homes by maintaining ties to friends, family, and memories over the life course. Subsidization and marketing of assisted living as a feasible and cost-effective long-term housing solution would also help elders obtain the supportive housing they need without entering institutional care. Similarly, programs that aid in transitioning from independent to assisted living, such as financial advising, reduction of belongings, and welcoming festivities, would further bolster sense of home and self.

More research needs to be done surrounding place-based theories to gain a better understanding of how alternate home environments affect elders' meanings of home and self. Alternative methodological approaches or sampling techniques could be employed, such as mixed-methods or longitudinal designs, which would further validate findings related to person-place relationships. Additionally, a shift away from aging-in-place to a greater acceptance of supportive living environments as valid and necessary components of senior housing is needed, especially for elders unable to remain in their homes. In essence, further exploration into how senior housing environments can be created that not only capture a sense of home and continuity to former selves but also enable successful aging is necessary.

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# NEIGHBORHOOD ENVIRONMENTAL CHARACTERISTICS AND PHYSICAL ACTIVITY IN OLDER ADULTS: A PILOT PROJECT USING PHOTOVOICE

## METHODS

Atiya Mahmood, Habib Chaudhury, Yvonne L. Michael, Michael Campo, Kara Hay\*

### Background

Physical activity among older adults is associated with improved cardiovascular health, musculoskeletal health, psycho-social well-being, independent living, and quality of life (Bauman et al., 2002). Research indicates a significant association between built environment features and physical activity (e.g., Frank et al., 2004; Frank et al., 2005). The role of neighborhood environment is important in supporting quality of life for older adults faced with multiple physical and social changes (e.g., Lawton, 1980). Physical activity accomplished as part of daily life, such as walking for travel or recreation, usually occurs within one's neighborhood environment (Ball et al., 2001; Giles-Corti & Donovan, 2002). Studies that examine the effects of neighborhood environment on physical activity have often overlooked the effects on older adults. To address this gap, this study uses a participatory research method *Photovoice* to understand the role of the physical environment on physical activities in older adults. *Photovoice* is a process by which people can identify, represent, and enhance their community through photographic documentation of their environment (Wang & Burris, 1997). It enables the research participants to record and reflect about their communities' strengths and

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concerns through a photographic inventory and promotes them to engage in critical dialogue with other community stakeholders about issues relevant to their communities. The overarching research question of this study is: How does the physical environment of neighborhoods affect the physical activity of older adults?

### **Method**

This paper is based on the findings from the *Photovoice* sessions conducted during a multi-year research study in Portland, Oregon and Vancouver, British Columbia. Participatory-action research strategies, such as *Photovoice* (Wang & Burris, 1997), have emerged as potential tools for collecting and disseminating knowledge in a way that enables local people to get involved in identifying and assessing the strengths and concerns in their communities, causing empowerment and ownership (Rose, 2007; Wang et al., 1998).

In Vancouver, BC, 34 older adults from four study neighborhoods and in Portland, OR, 33 older adults from four study neighborhoods participated in the *Photovoice* sessions. The neighborhoods with varying levels of residential density (literature shows that high residential density neighborhoods foster walking behavior in their residents) and income levels were selected. Census tracts were used as a base to select neighborhoods.

The participants were mainly recruited from local community centers through purposeful sampling. To be eligible for the study, a person needed to be 65 years of age or over, living in community-based housing, able to communicate and understand basic English, be functionally mobile and comfortable walking in neighborhood with or without

assistive devices, be able to self-report physical and social activity, and have no hindrances that would impede their ability to operate a camera.

Participants in each city attended two half-day sessions. One session was for training and information before the photographs were taken and the other session was for discussion and theme development after the photographic had been taken. Each participant was provided with one disposable, 27-exposure camera (i.e., 77 participants were each given one camera) to photograph environmental facilitators or barriers to physical mobility within his or her neighborhood. They were also given a photo journal to document information about their photographs. Each participant who completed the study up to this point was given a stipend of \$100 to partially compensate for their time and travel expenses. The participants were asked to take the photographs over a two-week period and then mail the disposable camera back to the research team in the pre-paid envelope provided to them.

## **Results**

All of the photographs and photo journals were organized and coded by two researchers in each city. A variety of themes emerged based on this systematic analysis (see Table 1 below).

**Table 1. Summary of Themes**

Vancouver Themes	Portland Themes
<ol style="list-style-type: none"> <li><b>1. Safety and Security:</b> <i>maintenance, traffic Hazards, atmosphere</i></li> <li><b>2. Accessibility:</b> <i>transportation, amenities</i></li> <li><b>3. Comfort of Movement:</b> <i>environment, convenient features, available amenities</i></li> <li><b>4. Destinations:</b> <i>recreational, utilitarian</i></li> <li><b>5. Community-Based Programs:</b> <i>formal programs</i></li> <li><b>6. Peer Support:</b> <i>formal and informal, gardening</i></li> </ol>	<ol style="list-style-type: none"> <li><b>1. Safety and Security:</b> <i>maintenance, traffic Hazards, atmosphere</i></li> <li><b>2. Accessibility:</b> <i>transportation, amenities</i></li> <li><b>3. Comfort of Movement:</b> <i>environment, convenient features, available amenities</i></li> <li><b>4. Destinations:</b> <i>recreational, utilitarian</i></li> <li><b>5. Community-Based Programs:</b> <i>formal programs</i></li> <li><b>6. Peer Support:</b> <i>formal and informal, gardening</i></li> <li><b>7. Intergenerational/Volunteer Activities</b></li> </ol>

*Safety and Security*

This theme refers to built environment features that are related to safety and security concerns of older adults. Uneven sidewalks, damage to the pavement, sidewalks that abruptly end or no sidewalks at all, lack of sidewalk curb cuts, narrow sidewalks, obstacles on sidewalks, and lack of visibility to oncoming traffic from sidewalks or street crossings were seen as barriers. Some mentioned the presence of drug use, criminal activity, vandalism, or poor housing as unsafe. On the other hand, adequate lighting and police presence in neighborhoods and recreational areas were found to be facilitators.

*Accessibility*

This theme refers to amenities within the community important for older adults to participate in recreational or utilitarian activities. Poor scheduling of public transportation and location and condition of infrastructure (e.g. bus stops shelter) were seen as

barriers. Presence of neighborhood amenities, such as library, grocery store, bank, pharmacy, post office, and shopping centers, were seen as facilitators.

### *Comfort of Movement*

This theme refers to physical environmental features that assist older adults in navigating their environments (indoors or outdoors). Condition of sidewalks and walking paths, availability of seating and presence/absence of accessibility features and amenities such as drinking fountains, restrooms, stairs vs. ramps, and handrails were all seen as important environmental features related to physical activity.

### *Destinations*

This theme refers to places/events within neighborhoods that older adults frequent. These were recreational spaces (community centers, gyms, golf courses, pools, etc.), utilitarian spaces (grocery store, bank, post office, etc.), and community events (farmer's market, multicultural events, etc.).

### *Community-Based Programs*

This theme refers to the formal programs and services in which older adults participate that are important for physical and social activity. Availability of a variety of programs in both physical (e.g. Tai chi, water aerobics, etc.) and social (e.g. lunch programs) categories, the opportunity to join community groups (that provided both physical and social activity), and availability of community spaces (such as a library or places for worship) to promote these activities were all seen as facilitators.

### *Peer Support*

Peer support refers to the role of socialization in encouraging older adults to become physically active in their neighborhoods. Both informal social support in the form of socialization during or after physical activity and formal social support in the form of incidental socialization due to planned activities were seen as facilitators.

### *Intergenerational and Volunteer Activity*

This theme refers to activities (including volunteer activities) that put older adults in contact with younger people, including children, and promote physical activity. This theme mainly emerged in the Portland area. Both intergenerational spaces (e.g., churches, community centers, community gardens, etc.) and intergenerational activities (e.g., seniors helping at local schools, libraries, community gardens) were documented as facilitators.

## **Conclusions**

The older adult participants in this study used the *Photovoice* participatory research method effectively to capture the facilitators of and barriers to physical activity within their neighborhoods through their own “lenses”. They were able to identify not only facilitators and barriers of the physical environment, but also to gain an understanding of how these factors affected the levels or types of physical activity within their neighborhoods. Engaging the participants to document their neighborhood environment through photography and then discuss potential strategies to enhance physical activity in their neighborhoods empowered them to think critically about their

neighborhood environment and start a dialogue with city officials about potential policy implications.

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**REALTORS' PERCEPTIONS OF THEIR CLIENTS' KNOWLEDGE OF THE HOME  
BUYING PROCESS AND THEIR OWN KNOWLEDGE OF GOVERNMENT  
HOMEOWNERSHIP PROGRAMS**

Jean Memken, Shirley Niemeyer\*

The purpose of this descriptive study is to examine realtors' perceptions of their clients' knowledge of the home buying process. In addition, the study gathered information about realtors' knowledge of government homeownership programs that could assist their clients in the purchase of a home. This study will include the results of the research as well as an overview of the various government housing programs that were included in the study.

The realtor, who is a primary player in the home buying process, could be an important source of information to the housing consumer. However, little research has been conducted on the role realtors play in educating their clients about the steps to homeownership and what programs might be available to assist them in buying a home. For many housing consumers, the realtor is the first professional encountered in the home buying process. Therefore, realtors are in an ideal position to serve as a source of home buying information, particularly information on government-sponsored housing programs targeted to help first-time homebuyers or households that might not qualify for a conventional mortgage. The researchers conducted an extensive search of the literature for studies that addressed this topic but found none. Therefore, a primary

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objective of this study was to discover how much realtors actually do know about housing programs that could help their clients purchase homes.

Data for this study were collected via mail survey in 2002 from licensed realtors in both rural and urban areas of Nebraska. Survey design and mailings were based on a modified Total Design Method (Salant & Dillman, 1994), where a mail questionnaire in booklet form and a cover letter describing the study in general terms were mailed to each person selected to be in the sample. A stamped return envelope was also included in the mailing. A second mailing was sent to non-respondents. The sample included all realtors licensed by the Nebraska Real Estate Commission. Questionnaires were mailed to a sample of 800, and 164 were returned (20.5% response rate). Due to lack of funds, it was not possible to send out another round of questionnaires, thus it was not possible to obtain a higher response rate.

The realtors that served as respondents in this study were asked to evaluate their clients' knowledge about the home buying process through their responses on two separate questions. The results of this analysis are shown in Tables 1 and 2 below.

**Table 1. Realtors' Perceptions of Whether their Clients Read the Documentation Associated with the Home Buying Process: Buyers and Sellers.**

Question: To what extent do you believe the buyers and sellers read the papers that are signed before or during the house closing? (n=121)

	Realtors' Responses (%)				
	Do Not Read	Read Some	Read Half	Read Most	Read All
Buyers	5.6	39.5	20.2	26.6	8.1
Sellers	4.8	38.7	20.7	27.4	8.9

**Table 2. Realtors' Perceptions of their clients' Understanding of the Content of the Documentation Associated with the Home Buying Process: Buyers and Sellers**

Question: How knowledgeable do you think the buyers and sellers are about the content of the papers being signed during the housing transaction? (n=124)

	Realtors' Responses (%)			
	No Knowledge	Very Little Knowledge	Some Knowledge	Great Deal of Knowledge
Buyers	0.0	21.0	69.4	9.7
Sellers	0.0	15.3	71.8	12.9

Results of this analysis show that realtors perceive that a majority of their clients, both buyers and sellers, read very little of the documents they sign when buying or selling a home and that, overall, they are not very knowledgeable about the contents of those documents. Almost two thirds of the realtors believed that their clients read one half or less of the documents they sign at the closing. In addition, only about 10-13 percent of realtors rated their clients as having a great deal of knowledge about the contents of those closing documents.

When realtors were asked about their own knowledge of federal, state, and local housing programs that could help their clients buy a home, the results were very surprising (see Table 3 below). Very few realtors rated themselves as having a great deal of knowledge about any of the programs, and only the FHA and VA loan programs garnered more than 25% of the realtors saying that they had more than a little knowledge of these federal programs. In most cases, realtors had little or no knowledge of USDA housing programs, Fannie Mae programs, or any programs that would support Native Americans in their quest to purchase a home. Realtors did seem to have somewhat more knowledge about state housing initiatives than federal programs.

**Table 3. Realtors' Knowledge of Government Assistance Programs for Homebuyers.**

Government Program	Realtors' Responses (%)				
	No Knowledge	Very Little Knowledge	Some Knowledge	More Knowledge	Great Deal of Knowledge
HUD Programs in General	5.6	22.6	55.6	12.1	4.0
HUD's Indian Home Loan Guarantee Program	76.6	18.5	4.0	0.8	0.0
HUD's FHA Mortgage Insurance	11.3	15.3	32.3	27.4	13.7
HUD's Section 203K Rehab Program	24.2	41.1	25.8	8.1	0.8
HUD's Home Equity Conversion Mortgages	50.0	37.1	11.3	1.6	0.0
HUD's Section 811 Supportive Housing for Persons with Disabilities	52.4	37.1	9.7	0.0	0.8
HUD's Energy Efficient Mortgage (EEM)	54.8	37.1	9.7	0.0	0.8
HUD's Home Equity Conversion Mortgage (HECM)	60.5	31.5	6.5	1.6	0.0
HUD's Home Investment Partnerships (HOME)	66.1	27.4	5.6	0.8	0.0

USDA Rural Housing in General	63.7	21.8	11.3	3.2	0.0
USDA Direct Home Ownership Loan	55.6	25.8	13.7	4.8	0.0
USDA Rural Home Repair Loan & Grant	60.5	29.8	8.1	0.8	0.8
USDA Technical Assistance for Mutual Self-Help	76.6	21.8	1.6	0.0	0.0
USDA Direct Home Ownership Loan	61.3	21.0	12.1	5.6	0.0
USDA Guaranteed Home Ownership Loan	56.5	25.8	12.9	5.6	0.0
Fannie Mae Products in General	11.3	19.4	55.6	13.7	0.0
Fannie Mae Community Lending	31.5	37.1	25.8	5.6	0.0
Fannie Mae Construction-to-Permanent	38.7	29.8	20.2	8.9	2.4
Fannie Mae Fixed, Adjustable & Balloon	22.8	22.6	30.6	17.7	6.5
Fannie Mae Home Improvement	27.4	28.7	27.4	4.8	1.6

Government Program	Realtors' Responses (%)				
	No Knowledge	Very Little Knowledge	Some Knowledge	More Knowledge	Great Deal of Knowledge
Fannie Mae Low/No Down Payment	20.2	26.6	33.9	13.7	5.6
Fannie Mae Native American Conventional Lending Initiative	75.0	19.4	5.6	0.0	0.0
Fannie Mae Reverse Mortgage	23.4	35.5	30.6	9.7	0.8
Fannie Mae Community Home Performance Power	60.5	32.3	7.3	0.0	0.0
Fannie Mae HOMECHOICE Mortgage Loans	56.5	33.1	8.9	1.6	0.0
Fannie Mae Home Keeper for Home Purchase	62.9	29.8	6.5	0.8	0.0
VA Loans	2.4	12.9	41.1	33.9	9.7
Federal Home Loan Bank of Topeka Affordable Housing Program	74.2	20.2	4.8	0.8	0.0
Community Housing Development Organizations (CHODOs)	66.9	22.6	9.7	0.8	0.0
REACH - Readiness Education Awareness Collaborative for Homebuyers & Homeowners	66.9	26.6	5.6	0.8	0.0
Local or Area Non-Profit Housing Development	45.2	36.3	16.9	0.8	0.8

State Programs					
State Investment Finance Authority	3.2	15.3	52.4	21.0	8.1
Single Family Mortgage Loan	4.0	15.3	52.4	21.0	8.1
Credits to Own (CROWN)	55.6	20.2	17.7	4.0	2.0
Homebuyers Assistant (HBA) Mortgage	11.3	21.8	24.2	29.0	13.7
State 5% Dollar & Energy Savings Loans	58.9	26.6	10.5	2.4	1.6

This research has important implications for housing educators, both in the classroom and in the community. Realtors do not perceive their clients as being knowledgeable about the contents of the documents associated with the home buying process. In addition, they appear to have little knowledge about housing programs that could conceivably increase their clientele by assisting housing consumers in purchasing the homes the realtors are trying to sell. Therefore, housing educators should look at realtors (and future realtors in the college classroom) as potential recipients of housing education related to home buying programs at the federal and state level. Housing educators in the classroom need to make a concerted effort to keep abreast of housing finance opportunities and programs offered at the federal and state level and pass the knowledge of those programs to their students. Housing Extension Specialists might consider special programming for realtors in their states to help them better understand various home buying programs that are available for their clients.

This research also has implications for further research. With the current housing crisis, more people may be looking to government-sponsored home ownership programs to help them achieve their housing goals. Realtors may now be seeing the need to counsel their clients about home buying programs that could help them purchase a home. A replication of this study is merited to see if realtors have become more aware of programs that would help households purchase housing. In addition, it would be interesting to see if realtors are making a more concerted effort to educate their clients about the home buying process to guard against future financing problems and eventual foreclosure. It would also be interesting to see if realtors see their clients as more knowledgeable about the home buying process.

According to Essene and Apgar (2007), everyone in the housing industry has a role in improving the efficiency and fairness of the mortgage marketplace. Housing educators can assure that all housing industry players, and specifically realtors and their clients, are well informed about government-sponsored homeownership programs that could benefit them both.

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**CREATING AN INTERDISCIPLINARY EXPERIENTIAL-  
AND SERVICE-LEARNING PROJECT:  
BUILDING *THE BIG BUILD***

Kimberly J. Mitchell\*

**Introduction**

*The Big Build*, an on-campus house-build experiential- and service-learning project, was created to provide a forum for students of all academic levels to actively participate in decision making and, thus, develop leadership skills through its coordination. By volunteering with *The Big Build*, students could join together in a common goal of serving the community and increase their awareness of green housing, sustainability, and housing affordability. Although the final goal of constructing the house was not achieved this year, valuable learning experiences were still important outcomes.

The purpose of this presentation is to share information regarding the challenges and lessons learned from the development and coordination of the interdisciplinary experiential- and service-learning project *The Big Build*. The importance of building partnerships among university departmental personnel and the discovery of competing University priorities (i.e., education and research versus safety and liability) will be presented. Finally, reflection upon the project to understand what occurred, what the successes were, how and why decisions occurred, and how it can be improved to ensure full implementation in the future will be discussed.

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## **Literature Review**

“Service-learning is a method of teaching through which students apply their academic skills and knowledge to address real-life needs in their own communities” (McPherson, 2005, p.1). According to Kronick (2007), “service learning is the process of integrating active assistance in the community into the learning that is occurring in the classroom. Journaling and reflection are ways in which this occurs” (p. 298). Reflection is often viewed as the connection between service and learning, where students link the classroom learning to the community service, obtain understanding for themselves, and realize gained skills (Eyler & Giles, 1999). Service learning as pedagogy should be a woven network of partnerships across the university, community partners, governments, non-governmental organizations, and community members (Jacoby, 2003).

Interdisciplinary learning is pedagogy that includes students and faculty from multiple disciplines to integrate knowledge, skill sets, and experiences (classroom and real life) to support and enhance the contributions and attributes of each discipline (Connors & Seifer, 2005). Interdisciplinary service learning is gaining momentum in higher education due to the beneficial outcomes associated with its integration. Evidence has been linked to critical thinking, collaborative problem solving, and appreciation for diverse ways of thinking. (Connors & Seifer, 2005).

## **Project Background**

*The Big Build* was initially created through a partnership of two faculty members in Apparel, Housing, and Resource Management (AHRM) and Residence Life. Community Housing Partners (CHP), a 501(c)(3) community development corporation

that provides housing to low-income and low-wealth families, was brought in as a partner due to one of the project advisors serving on its Board of Directors. CHP, in collaboration with volunteers, was scheduled to build the house on the Virginia Tech campus in Spring 2010. At the completion of the build, the house would be transported to its permanent site in Pulaski County, Virginia.

Five students and three faculty members from multiple disciplines volunteered to assist on the CHP design portion of the build by participating in a design charrette. Once the design was developed, students in the Advanced House Planning course evaluated the plans for any additional revisions, especially in kitchen and bath design, lighting, and material choices. The integration of these multiple disciplines and participants in the design process produced a more efficient, better designed, and more cohesive product. The students participating in the design process had a unique experience working with the limited budget of the project, as well as the challenge of creating a sustainable design that could be transported after construction.

## Results

*The Big Build* was a service- and experiential-learning project that was scheduled to build an affordable and Leadership in Energy and Environmental Design (LEED)<sup>13</sup> Gold house. *The Big Build* would provide service- and experiential-learning opportunities to core student leaders through the coordination and direction of marketing, fundraising, and volunteers. Core student leaders were responsible for

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<sup>13</sup> LEED is a green building certification program that provides a third-party-verified rating system that promotes and evaluates the design and construction of green homes. Homes are evaluated based upon water efficiency, energy and atmosphere, site location, education and awareness, materials and resources, and indoor environmental quality. LEED Certification ratings are as follows: LEED Certified 40-49 points, LEED Silver 50-59 points, LEED Gold 60-79 points, and LEED Platinum 80+ points. Retrieved August 13, 2010 from <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=147#2008>

promoting and marketing the build, recruiting student, faculty, staff, and community volunteers for the actual build, encouraging local businesses to support the project through monetary donations, and managing communication between student peers.

A student leader reflected, “Beyond pride there are multiple facets of skills, education and experiences gained from participating in a project for the betterment of a family and a community as a whole. My involvement with the planning of *The Big Build* at Virginia Tech was beyond question an opportunity for me to learn, educate, experience, showcase my existing skills, and build my lacking ones.”

The project was halted when miscommunication among university staff and departments did not adequately address liability and safety concerns of select administrators in advance of project implementation. Post April 16, 2007, Virginia Tech is a different environment. Its administrators are keenly aware of potential liabilities. Based upon administrators’ comments, it appeared that they were not confident in AHRM faculty managing *The Big Build*. Their expectation was that the project should have been coordinated through the Department of Building Construction (BC). In the future, a partnership will be forged with BC to ensure full implementation. Additionally, administrators placed unrealistic and cost-prohibitive safety training constraints on the project. Each thirty-minute shift volunteer would have been required to attend an eight-hour safety-training module. Previous student house-build projects did not require eight-hour safety training modules, but these projects were managed by BC and were conducted off-campus. Building the house on-campus required the build to be overseen by the University.

Upon encountering the roadblocks from the University, building site alternatives were explored. Expansive strip-center parking lots, vacant retail store parking lots, and private club parking lots were explored. However, changing the site location was not feasible due to permitting delay and schedule conflicts with Virginia Tech's calendar (i.e., graduation and unavailability of students).

Even after all of the frustrations, a student leader commented, "I learned a great deal not only from the project but from its unfortunate demise as well. I think this was a huge learning curve for all of us and proved to be quite difficult to implement. We encountered so many bumps in the road, but it was honestly fun to hop over every single obstacle and regroup to face the next."

### **Conclusion**

Those associated with this project became keenly aware of University processes, the current litigation and political climate, the reality of the decision-making context, and how the climate had been underestimated. Even though the house was not built, this experience provided an opportunity for students to learn about a community service project, build partnerships to reach a goal, understand University procedures, and expand their awareness of affordable and LEED housing. Furthermore, information and processes were documented to improve and ensure success in the future. According to a student leader, "Even without achieving the end goal, ...the process is where the learning experience lies. The process of achieving our common goal was beyond all doubt a learning experience and an opportunity to build a foundation for future groups with similar aspirations to achieve and improve where our team fell short."

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# **ENERGY EDUCATION AND LOW-INCOME HOUSEHOLDS: AN EDUCATIONAL INTERVENTION**

Shirley Niemeyer\*

## **Purpose**

This paper identifies changes in energy conservation and efficiency made by low-income participants in their homes as measured after the newly developed educational program Get a Head Start on Energy was delivered and compared to before the educational intervention.

## **Program Need**

According to Rosenbaum, Parrott, and Stone (2009, p. 1), low-income consumers are the “least able to afford new energy-saving vehicles and appliances, and already face major challenges making ends meet,” and they spend a larger share of their budgets on necessities such as energy. Home energy costs have increased faster than incomes for very low-income households in recent years, and costs have risen 33% since 1998 (American Gas Association, 2007). Families classified as eligible for federal home energy assistance spend one-fifth of their income on home energy bills—six times more than the level other income groups spend” (AGA, 2007, p. 8).

Educational programs directed to low- and moderate-income households may help households increase their understanding of available energy assistance, grant programs, and lower-cost energy efficiency methods with higher impacts to reduce energy use. In response to these and other needs, a new educational program—Get a

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Head Start on Energy—was created. This abstract focuses on the results of the program used in a collaborative effort with the Nebraska Head Start program.

### **Background**

The Nebraska Energy Assistance Network (NEAN) education committee, along with the University of Nebraska Extension, developed the Get a Head Start on Energy educational program to address energy needs. NEAN's mission, as a non-profit organization, is to assist Nebraskans with their energy needs through education, advocacy, and partnerships, and to help Nebraskans use energy wisely. NEAN members include public utility systems, non-profits, the government, educational institutions, and community action agencies. There are other cooperative energy educational programs among organizations, government, and agencies, but those programs are different in composition and goals.

The Get a Head Start on Energy curriculum, available in English and Spanish, is focused on low- and moderate-income households. The program is based on a train-the-trainer model, with housing and social services professionals being trained in the use of the curriculum to use with their clientele. The curriculum consists of seven modules, each with a DVD, pre- and post-evaluations, teaching guides, activities, and handouts. Energy saving items in kits are used with the activities; they are provided to participants when funding from grants or public utilities is available.

The curriculum includes an introduction and pre-survey and seven modules, each with video, focused on Budgeting for Energy Costs, Energy Efficiency, Keeping Your Home Healthy and Safe, Finding an Energy-Efficient Home, Energy Resources, Kids Can Save Energy Too!, and Communication Tips for Problem Solving, as well as the Summary and post-survey. Modules vary in length with the longest 39 minutes and the shortest at 7 minutes. The modules are divided up into topic segments and can be used during several instruction times or home visits by the trainers. The accompanying videos are stopped for the structured activities and then restarted to continue to the next segment.

The NEAN education team, partnering with the Nebraska Head Start program, provided training about and use of the curriculum to 54 volunteer Nebraska Head Start and Early Head Start professionals from the area divisions across the state. These trained professionals used the curriculum, DVD, and funded kits with Nebraska Head Start and Early Head Start families either in the families' homes during regular home visits over time or in small groups at Head Start agency offices or community locations.

Extension was involved in writing curriculum, translating modules to Spanish, obtaining grants, training the trainers, and writing and summarizing the evaluations. The collaboration and work of all of the team members makes this program work and is essential to its success.

## Methods

Surveys include 27 questions with three scales that total 93 item measures focused on the clientele's energy practices and demographics. The pre- and post-surveys are included in the curriculum. The surveys are completed by the Head Start clientele at the start of their program, as determined by the Head Start trainer working with each clientele, and again at the end of the last module to assess differences in energy practices and materials and equipment improvements.

The Head Start trainers used the curriculum over a span ranging from two to seven months with about 600 families during this analysis period. They are continuing to use the curriculum. Because clientele needs and the Head Start program structure varies, starting and ending session times and the months varied.

The questionnaire was composed of Likert-type responses, scales, and multiple choice, dichotomous, and open-end questions. All clientele were asked to fill out the questionnaires but not all filled out both the pre- and the post-survey and not all answered each question item. After completion of each survey, they were given to the trainer and then forwarded to Extension for analysis.

Pre-surveys ( $n=391$ ) and post-surveys ( $n=121$ ) were returned at the time of the analysis. Additional post-survey responses are continuing. Of those 121 post-surveys returned, 118 could be paired with pre-surveys and used in the paired t-test analysis.

## Demographics

Of the 391 clientele who completed the pre-survey questionnaire, 48.8% have household incomes of less than \$20,000 and 70% have incomes of less than \$30,000 ( $n=391$ ). This places these households below poverty level. According to data released by the 2006-2008 American Community Survey 3-Year Estimates, the Nebraska median household income was \$49,231. At least 90% of Head Start enrollees must be from families whose income is below the poverty line, from families receiving public assistance, from homeless families, or from children in foster care.

About 58% (220) of the respondents were married; 37% (141) were currently single, widowed, separated, or divorced; and 5% classified self as other ( $n=20$ ). The mean household size ( $M=4.6$  persons,  $n=391$ ) was higher than the Nebraska mean household size of 2.45 persons (American Housing Survey 2006-2008).

About 44% were owners/buying ( $n=166$ ) and 56% were renting ( $n=213$ ) with 379 total responding. The clientele were asked about the cost of household utilities (electricity, gas, and other fuels) during the past 12 months. Of the 378 responding, 24% ( $n=92$ ) were paying less than \$1,000 per year for utilities, 31% ( $n=115$ ) were paying \$1,000 to \$1,999 for utilities, and 24% ( $n=90$ ) were paying \$2,000 or more a year for utilities. An additional 21% ( $n=81$ ) did not know how much they were paying for utilities.

## Analysis and Findings

There were significant differences in the pre- and post-survey results using a paired t-test analysis with significance level set at  $p \leq 0.05$ . The number of responses for each paired question varies from  $n=59$  to  $n=81$  pairs per item measure. This difference is due to participants leaving portions of the item measures blank in either the pre- or post-survey.

Questions were asked about actual practice change, installation, or purchase of energy-efficient item that had occurred between the pre-survey and the post-survey time period. There are significant differences before and after the educational intervention when it comes to the actual installation of programmable thermostats ( $n=81, p=*.005$ ), closing shades or curtains in winter ( $n=81, p=*.012$ ), weather stripping or caulking ( $n=81, p=*.038$ ), and purchasing compact fluorescent bulbs ( $n=81, p=*.004$ ). Almost all of the energy efficient action measures increased or changed to more efficient practices after the educational intervention compared to before the program, although not all were significant.

Chi-square tests were performed for client's age, marital status, household income, and other item measures with the dollars spent for utilities. Results indicate that after completing the program, respondents who spent less than \$2,000 for utilities are more likely than those who spent more to say yes, they adjust water levels in washing machines and dishwashers to conserve energy ( $\chi^2 (1, n=72), p=*.049$ ).

Since completing the program, married persons are more likely than those not married to confirm that they use space heaters, wood stoves, or other alternative heating devices to supplement heat ( $\chi^2 (1, n=75), p=*.016$ ). Married respondents are

also more likely to confirm that they hang clothes out to dry to reduce energy costs ( $\chi^2$  (1,  $n=79$ ),  $p=*.038$ ). Home owners are more likely than renters to report that they had purchased a new high-efficiency natural gas or propane furnace to reduce energy costs ( $\chi^2$  (1,  $n=59$ ),  $p=*.026$ ). Owners are also more likely than renters to have cleaned refrigerator coils to lower energy costs since completing the program ( $\chi^2$  (1,  $n=72$ ),  $p=*.018$ ). Although owners are more likely to have purchased higher efficiency appliances to save energy cost, the relationship was not significant at  $\leq .05$  level with  $\chi^2$  (1,  $n=69$ ),  $p=.078$ .

## **Discussion**

The findings reported and discussed here are part of a larger analysis that includes all of the questions and scale measures. Homeowners may have more flexibility than renters in what energy improvements and maintenance can be made in their own homes. Renters may have lease restrictions and less decision-making influence concerning the selection of such major items as furnaces, windows, etc., which typically are the responsibility of the property owner. Alternative heating devices may not be allowed in some rental properties. In addition, renters are less likely to have outdoor spaces in which it is possible or allowed to hang laundry, and they may view cleaning refrigerator coils as the responsibility of the property owner.

Those who do not know how much they pay for utilities are at a disadvantage when it comes to monitoring their energy use and connecting it with any changes in energy efficient practices and materials. It may be that these households were paying for the utilities in their rental fees and did not have access to the utility records and were

unable to track the utility bills, or the bills were not easily available when completing the pre-survey. They may not be aware that increases in utility use could impact their total rent and housing costs. Educational programs and media and web sites targeting renters and homeowners can include information about how costs of utilities relate to total cost of rent and total housing costs and what can be done to reduce energy use.

These initial results indicate that the curriculum and training program may be applicable to both other Head Start programs and other social service agencies who work with low-income households. However, because this study focused on education that was primarily delivered in homes, it is not known how the program would be received by larger groups over a series of weeks or months or by moderate- or higher-income audiences.

### **Limitations**

Because the seven educational modules were not all delivered in exactly the same time period and number of sessions, the data is not consistent for the climate factors or seasons of the year and not representative of a structured study. Rather, it is representative of the Head Start professionals in this study working with the clientele and consumers in their normal work and conducting educational activities over time. It represents the client respondents in this study. The findings cannot be generalized to other states, audiences, or agencies.

## **Implications**

Due to the positive results of the program, Nebraska Salvation Army professionals were trained at their state conference and 116 professionals from Extension across the U.S. and from other Nebraska agencies and organizations registered for a recent train-the-trainer series on the use of the curriculum, with 96 completing the training. This program and curriculum has the potential to achieve results with other low- and moderate-income households in other states and with other agencies that work with clientele one-on-one or in small groups. The curriculum may also be of use in classrooms and general meetings. More assessments are needed with other audiences, settings, and timelines.

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## **LEARNING CONTRACTS IN THE DESIGN STUDIO: FOSTERING SELF-DIRECTED LEARNING**

Kathleen R. Parrott, Hyunjoo Kwon\*

In the literature of the pedagogy of teaching design in a studio setting, the teacher is often referred to as a coach rather than an instructor. Design is taught indirectly, creating opportunities for the students to experience learning rather than just learning through explanation of content (Ledewitz, 1985). Reimer and Douglas (2003) suggest that studio teaching is a collaborative and interactive process. Schön (1986), whose work was particularly influential on design educators in the 1980s and 1990s, advocated the coach model and suggested that design education required students learn by doing and engage in reflection-in-action. The Concept-Test Model of Ledewitz, built on the work of Schön, identifies teaching studio design as a developmental process that requires students to be self-directed, as they must constantly test and reflect on their ideas.

This collaborative and experiential approach to design education requires that students possess the skills associated with self-directed learning, such as goal setting, time management, and critical thinking. Grow (1991) argues that a goal of the educational process is to develop adults who are life-long, self-directed learners—and that these necessary skills can be taught. The Staged Self-Directed Learning Model, developed by Grow, has four stages that move the student from dependent (with the teacher as authority coach) to self-directed (with the teacher as consultant or delegator). The model's matrix is useful in matching both teaching and learning styles, as well as in

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identifying needed skill development in students and appropriate educational methodologies.

In order to foster a more collaborative and experiential educational approach in an advanced residential studio class, a learning contract methodology was developed as the basis of course assignments and evaluation. The experience of this class, including student outcomes and the development of self-directed learning skills, are reported in this abstract.

### **Class Overview**

The class was developed for students to pursue advanced studio residential design work in house planning—particularly kitchen and bath design—with an emphasis on independent work of portfolio quality. Students chose their own topics after discussion with the instructor. They developed and implemented a learning contract to cover their work for the semester that included learning objectives, a timeline, and outcomes. During twice weekly scheduled studio times, the professor was available for assistance or consultation as needed. Once every two weeks, students also had time to share progress on their individual projects and to benefit from group discussion and review of their project ideas and progress. The majority of each student's grade was based on successful completion of the course learning contract. However, participation in all scheduled class activities also made up a portion of their grade. Five senior students and one Ph.D student completed the course. Projects included kitchen and bath designs, offices, hotel rooms, multifamily housing for students, and apartments for older adults. The design projects included work for actual clients (a kitchen design for a

middle-aged couple) and future clients based on a survey (college students planning to move into apartments off campus) and a literature review (baby boomers living in multifamily communities).

### **Outcomes**

The learning contracts as used in the studio course were targeted at Stage 3 of Grow's (1991) Staged Self-Directed Learning Model, where the student was considered *involved* and the teacher was a *facilitator*. In this stage, there was shared decision making, with the students taking increasing responsibility, negotiation of interim goals and evaluation, and standards that could be related to external requirements, such as accreditation. Most students were successful at this level of self-direction, but some were less successful in accomplishing their goals with the teacher as facilitator, despite their enjoyment of the freedom and flexibility of the course.

### *Student Feedback*

- The students stated that the contract was a useful device for keeping them on track in a course where they had freedom to develop their own learning goals and choose their own projects.
- The flexibility to determine due dates was exciting, although in practice not all students met them.
- The contract helped students clarify what they were going to do for the semester, and they liked having a plan in a course that functioned like an independent study.

- The students liked having the opportunity to re-evaluate the contract as needed and believed having to estimate the time commitment of a project was a valuable learning experience.
- The students identified the contract as a transition to professional experience.

### *Suggestions for Improvements*

In order to develop the skills needed for success with a learning contract—especially goal setting, developing project objectives, time estimating, and project management—the use of learning contracts needs to be introduced in courses prior to the last semester of students' senior year. Some students tended to view the learning contract as less binding than a course syllabus.

A related issue was that there was too much flexibility allowed in changing the contract. Suggestions include allowing no changes after a certain date or instituting penalties for unfulfilled contract commitments.

### **Summary**

It is worth noting that fields other than design are implementing studio courses in part because the collaborative, experiential learning of a studio increases the development of self-directed learners and the associated skills (Gonsalvez & Atchison, 2000; Reimer & Douglas, 2003). The use of a learning contract is a methodology that allows the student and teacher to collaborate in the studio learning experience. Further, the learning contract provides the student with a progressively self-directed learning experience, but it gives the teacher accountability for educational accomplishments.

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**HOMEOWNERSHIP POLICY:  
A BRIEF HISTORICAL OVERVIEW WITH COMMENTARY**

Gina Peek\*

Hoping to increase positive outcomes, United States policy, supported by taxpayer dollars, has overwhelmingly encouraged homeownership. It is important to note that policy may have supported homeownership intentionally or unintentionally. Positive outcomes, such as increased citizenship, are anecdotally associated with homeownership. Dietz and Haurin (2003) observe that there is evidence to substantiate the relationship between homeownership and household behaviors and outcomes, but for much of the previous 30 years, the literature has been theoretically or technically deficient. Two reasons support this 30-year benchmark. First, Dietz and Haurin criticize early studies as having significant deficiencies given present day data and econometric techniques. For example, these studies may lack key control variables. Second, many pre-1990 studies are deficient in that the single-equation models used are unable to control unobservables. Data and techniques have undergone evolution that warrants analysis from a contemporary perspective.

Given technical difficulties in the literature related to homeownership consequences and the fact that mortgage markets have spiraled downward and the U.S. and global economies have suffered tremendously, have policy dollars been effectively spent with respect to expected outcomes? This study is unable to answer this overarching question. Instead, the goal of this study is to give a brief historical overview of land and ownership in the United States and give limited comments on outcomes.

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This study illustrates that throughout history, government policy has encouraged homeownership with the expectation of positive outcomes for individuals, communities, and the nation. This study provides commentary suggesting that, on face value and at minimum, policy that has intended to increase homeownership rates has been successful, as evidenced by historic rates. However, looking beyond this simple measure reveals that not all homeownership policy dollars have achieved desired outcomes.

### **Brief Overview of Housing Tenure in the U.S., Pre-1900**

As noted by Del Papa, early homeownership was determined not through numerous policy measures but through loose governmental gestures that intended to encourage or prohibit settlement. These gestures sometimes increased desired settlement and ownership. At other times, externalities, including political instability and war, thwarted efforts. In addition to governmental gestures, individual acts of defiance established homeownership (Del Papa, 1975).

Initially, colonies were expected to self organize (Curtis, 1972). In an effort to expand westward and secure land, colonies encouraged settlement. This settlement caused problems between individuals, within colonies, and between colonies. The government attempted to solve settlement issues with the Proclamation of 1763. Per Curtis (1972), the purpose of the Proclamation of 1763 was to alleviate problems between the colonies and Native American populations. For example, a Proclamation Line along the Appalachians intended to stave off further western settlement by English settlers (Del Papa, 1975). English subjects under George III were prohibited from

settling west of this line (Del Papa, 1975). In addition, new provinces with defined boundaries were established to help mediate border disputes between colonies. As noted by Curtis (1972), England used land granting to encourage settlement in these new provinces.

The Proclamation of 1763 was not without problems. While large land speculators were duly restricted from settling westward, the policy had little effect on frontiersmen migration (Curtis, 1972). Advancing frontiersmen threatened to disrupt stability on the frontier (Oaks, 1977). Land distribution reform was attempted, but difficulties continued for some time (Curtis, 1972; Sioussat, 1918).

Eventually, states used lottery systems to distribute lands. Weiman (1991) discusses how proponents developed the lottery system to facilitate homesteading and settlement via distribution of essentially free land. For example, Georgia used a lottery system to distribute lands along its western frontier (Weiman, 1991).

Later, the Preemptive Act of 1841 allowed individuals living on and making improvements to public lands to purchase property (Allen, 1991). This set the stage for the Homestead Act of 1862, which granted land to qualifying individuals, including United States citizens or those intending to become citizens. Given that the Homestead Act was enacted during the Civil War, it further stipulated that these individuals must have remained true to the United States government by never bearing arms against it. The Homestead Act makes no mention of race (Library of Congress, n.d.). Qualifying homesteaders could take the land, but they had to make improvements by building a home and growing crops (The National Archives, n.d.). Establishing and maintaining a homestead was difficult at best. For example, many post-Civil War homesteaders on the

Great Plains found blizzards, drought, and financial panic to be too burdensome and subsequently abandoned their properties (Popper & Popper, 1987).

### **Brief Overview of Housing Tenure in the U.S., 1900-1945**

The phrase “American Dream” was coined to describe “that dream of a land in which life should be better and richer and fuller for everyone . . .” (Adams, 1931, pp. 214-215). This “better and richer and fuller” life included property ownership, facilitated intentionally or unintentionally by policy. For example, the Underwood-Simmons Tariff Act of 1913 created the mortgage interest deduction. Carliner (1998) notes that homeownership was not the impetus for creating the mortgage interest deduction. Currently, the mortgage interest deduction may not act as a catalyst for homeownership, but instead as a means of increasing consumption. As discussed by Jackson (2005), the mortgage interest deduction subsidizes lending, which in turn influences rates of consumption, or amount and quality of housing demanded. In current times, the mortgage interest deduction is available to those who itemize deductions (Internal Revenue Service, n.d.). It benefits wealthier populations (Glaeser & Shapiro, 2003).

Other early twentieth century programs, such as Own Your Own Home (1918), encouraged homeownership outright. Promotional material stated that “the man who owns his home—is a better worker, husband, father, citizen, and a real American” (Luken & Vaughan, 2005, p. 1615).

The Great Depression had a negative impact on homeownership. In 1940, rates reached the lowest point in the 20<sup>th</sup> century at 43.6% (US Census Bureau, 2004). This

decline was due in part due to mortgage industry failure. Green and Wachter (2005) highlight just one example. Prior to the Great Depression, mortgages were usually short term, featuring balloon payments at the end. Borrowers could either refinance when loans came due or sell the property. During the Depression, declining property values, insufficient equity, and unemployment had a negative effect on the housing market. Lenders were dealing with foreclosed properties and a depressed market. To compensate, Congress enacted New Deal policies to buffer financial crisis. The most relevant included the Federal Home Loan Bank Act (1932), the Home Owners Loan Act (1933), and the National Housing Act (1934).

Of these New Deal policies, the most encompassing was the National Housing Act (1934). This is just one example of a federal program that aimed to buffer both banks and consumers from financial crisis. The National Housing Act was passed to affect market reform and increase unemployment relief (U.S. Department of Housing and Urban Development, 2007).

Borrowing practices were revolutionized with the advent of the Federal Housing Administration (FHA), created by the National Housing Act (Colton, 2003). The purpose of the FHA is to provide mortgage insurance to FHA-approved lenders (U.S. Department of Housing and Urban Development, 2006). Per Green and Wachter (2005), FHA adopted more conservative mortgages (longer term, fixed rates) as a means to avoid the need to refinance under terms of balloon loans. In addition, the National Housing Act created jobs by spurring the construction industry (Gaus & White, 1935; U.S. Department of Housing and Urban Development, 2007).

In 1938, the secondary mortgage market was established via the Federal National Mortgage Association (Fannie Mae) (Colton, 2003). Later, the Servicemen's Readjustment Act of 1944 encouraged homeownership among veterans. This policy encouraged homeownership as a means to help servicemen and women readjust to civilian life, with veterans purchasing 20% of all new homes built after the war (Our Documents Initiative, n.d.).

### **Brief Historical Overview of Housing Tenure in the U.S., 1945–Present**

Despite efforts to boost housing opportunity, majority homeownership among non-Hispanic whites did not occur until after World War II and a period of strong economic growth when real incomes rose (U.S. Department of Labor, 2009). For example, United States homeownership rates went from 43.6% in 1940, to 55% in 1950, to 61.9% in 1960 (U.S. Census Bureau, 2004). However, homeownership rates did not rise equally across all groups. For example, Gordon argues that the FHA insurance program benefitted whites, not African-Americans; underwriting guidelines proved to have devastating results for this population (Gordon, 2005). Gender and marital status may also have affected homeownership rates. Programs such as Own Your Own Home promoted the connection between marriage and homeownership (Luken & Vaughan, 2005).

Despite shortcomings, supportive homeownership policy continued. For example, the Housing Act (1949) called for a “decent home and suitable living environment for every American family.” Martinez (2000) states that homeownership democratization is one of the greatest national achievements of the twentieth century, as decreed by the

promise of 1949. Martinez also discusses that the promise of 1949 relocated low-income families via slum clearance and advanced segregation. As motivated by unrest, the Civil Rights Act of 1968 (or Fair Housing Act) strove to eliminate inequalities in housing and housing finance through, for example, the Government National Mortgage Association (Ginnie Mae) (Duke Law Journal, 1969; U.S. Congress, 1968). Despite efforts, though, inequalities in homeownership persist (Martinez, 2000). The Emergency Home and Finance Act (1970) created the Federal Home Loan Mortgage Corporation (Freddie Mac), which provides Fannie Mae with competition (Sirota & Barrell, 2003).

The Cranston-Gonzales National Affordable Housing Act (1990) created the Home Investment Partnership Program (HOME) to increase affordable homeownership opportunities (U.S. Department of Housing and Urban Development, 2009). The Housing Opportunity Program Extension Act of 1996 created the Self-Help Homeownership Opportunity Program (SHOP) to further provide ownership opportunities (U.S. Office of Management and Budget, 2009). Most recently, the Obama administration maintains ownership with programs such as Making Home Affordable, which aims to help upwards of seven million homeowners reduce mortgage payments to more affordable levels (U.S. Department of the Treasury & U.S. Department of Housing and Urban Development, 2009).

## **Discussion**

The United States' housing policy has historically encouraged homeownership with the expectation of positive outcomes for individuals, communities, and the nation. Policy intended to support homeownership has been successful, as evidenced by

historic rates. As stated by Morris and Winter, homeownership is the tenure norm (Morris & Winter, 1975). Homeownership and associated policies have played an undeniable role in consumers' psyches and net wealth. However, these simpler measures do not indicate that all homeownership policy dollars achieve desired outcomes.

Again, as noted by Dietz and Haurin (2003), the literature related to homeownership consequences features theoretical and technical difficulties, especially when written prior to the 1990s. Additionally, mortgage markets have spiraled downward and the U.S. and global economies have suffered tremendously. With these two factors in hand, have policy dollars been effectively spent with respect to expected outcomes? Is housing policy friend or foe for individuals, communities, and the nation?

If policy dollars have been spent with the sole purpose of increasing homeownership, then yes, it may be said that, throughout history, dollars have been effective. Homeownership rates reached record heights at 69.2% in 2004 (U.S. Census Bureau, 2005). Policy intending to increase homeownership has served as a friend to individuals, communities, business interests, including the financial and construction industries, and the nation only if ownership rates are measured. On the other hand, these same policies and practices that increased the number of homeowners to historic rates may be the "foe" that led to financial collapse. Practices that were not sustainable led to the recent financial crisis. To compensate, programs, including the Helping Families Save Their Homes Act, intend to help victims and potential victims of the housing crisis. The White House estimates that nine million homeowners will benefit from the Helping Families Save Their Homes Act (The White House, 2009).

If policy dollars have been spent with the intent increase some specific outcome perceived to be associated with homeownership, caution is in order. For example, if policy dollars have been spent to increase citizenship through homeownership, efficiency must be questioned. It may appear that self selection and many other characteristics, such as race, ethnicity, gender, motivation, industry, frugality, and moderation, as opposed to specific policies, have played a role in homeownership.

Distilling a statistically unbiased effect of homeownership on positive outcomes, such as citizenship, is difficult due to many unobservables. Recent research cautions against causality (Dietz & Haurin, 2003; Glaeser & Shapiro, 2003). That is to say, housing policy that intends to increase homeownership may not cause individuals to volunteer more or increase other social or political activity. Most recently, Engelhardt et al. (2010) refute previous research that supports a positive relationship between homeownership, local amenities, and social capital. Due to public and policy interest, examining the relationship between homeownership and homeownership consequences, such as citizenship, is worthy of attention as evolution in the literature takes place.

Moving forward, it may be best to acknowledge that, despite shortcomings, the importance of homeownership in many consumers' psyches will continue for the foreseeable future. Tenure norms will persist. However, it may be prudent to keep the memory of the recent economic downturn in mind as industry and consumers take a more conservative approach to homeownership, which could include lenders using stricter underwriting standards and consumers reducing housing costs to less than the currently recommended 30% of income. Congleton (2009) argues that more oversight

and review will reduce future risk. Policy that supports this oversight may be the “friend” needed to prevent another gut-wrenching economic downturn, such as the one experienced during the late part of the 2000s.

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**THE WASH-N-WEAR HOUSE:  
EXPANDING THE MEANING OF HIGH-PERFORMANCE, AFFORDABLE HOUSING**

Claudette Reichel, Katie Gunsch\*

An energy-efficient home that is too wet, moldy, or damaged to live in after a storm or flood is neither sustainable nor affordable. To showcase and assess practical building system solutions for more sustainable homes, a partnership of building scientists (a U.S. Department of Energy Building America program team), Extension housing educators, and a philanthropic, non-profit organization built two high-performance, *Wash-n-Wear* demonstration houses for families whose homes were destroyed by long-term, deep floodwater and wind. The projects also served as Extension educational exhibits, mass media attractions, and training venues.

The Extension objectives of this project were to:

1. broaden the standard definition of and criteria for "high-performance" housing among housing providers and consumers to include local hazard resistance;
2. gain experience with and demonstrate alternative high-performance, flood-hardy wood frame building systems and identify hurdles associated with adopting them to determine solutions and training needs; and
3. create awareness, interest, and, ultimately, stimulate adoption of high-performance, flood-hardy home building practices in flood hazard areas.

The houses were designed and constructed to integrate high energy efficiency (30 to 40 percent more energy efficient than the building energy code) with a drainable,

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dryable, flood-hardy, wood-frame building that is also 130-mph wind resistant, whole-house termite resistant, highly moisture managed, and that provides good indoor air quality. If a flood or storm similar to Katrina were to happen again, those families will be able to rapidly resume living in affordable comfort with little restoration expense, time, and hassle instead of becoming homeless, as before, or saddled with a devastating economic loss, ordeal, and massive mold.

The collaborative design team adapted simple, affordable house plans to innovative building systems designed to achieve a high durability and energy performance standard with readily available materials, technologies, and standard labor skills. The houses had raised pier foundation systems with one of two alternative assemblies of flood-resistant materials that can be drained, flushed, and dried following a flood with little damage or need for replacement. This entailed the use of:

- pressure treated solid lumber and plywood structural materials (i.e., no oriented strand board or other engineered wood products) with only closed-cell foam insulation for walls and subfloors (i.e., spray foam in one house, rigid foam exterior sheathing in the other house) installed to allow wall cavity drainage and drying in the event of flooding;
- water-draining weather barrier systems (i.e., house wrap and treated wood strips to create a drainage gap behind siding with shingle-fashion integrated window flashing installation details) behind fiber cement siding;

- unvented attics sealed and insulated with open-cell spray foam under the roof decking (i.e., not attic floor) so the high efficiency heat pump and duct work is high above flood potential, within conditioned space and no entry point for wind-driven rain;
- filtered, flow-controlled fresh air intake and high efficiency dehumidifier for good indoor air quality;
- hurricane connectors and full structural exterior plywood sheathing for high wind resistance;
- adhesive membrane roof underlayment (i.e., instead of felt paper) and high-wind-rated roof shingles and installation methods;
- interiors finished with moisture-resistant, paperless gypsum drywall with latex paint, tile, and solid wood floorings that can be restored after flooding (i.e., eliminating the need to gut the house and wait for scarce, expensive replacement materials and labor);
- energy efficient, low-e, impact rated vinyl frame windows and fiberglass doors; and
- gas tankless water heater, Energy Star appliances, fluorescent lighting, and water-efficient fixtures.

Both house designs and specs were energy modeled and specified to exceed U.S. Department of Energy Builders Challenge program energy efficiency and Quality Assurance Criteria, achieving 42% and 57% estimated energy use reductions from the program benchmark while providing good indoor air quality and humidity control.

Blower door and duct blaster performance testing was conducted to fine tune and verify performance.

Coordination, construction quality control, and management posed challenges in the projects that caused delays and cost overruns, but they produced valuable lessons and insights for future recommendations. The local status quo workmanship methods, fragmented scheduling, insufficient training and oversight of workers, volunteer coordination, and cost constraints of the homeowners in strained economic circumstances presented difficult obstacles to project goals.

The construction process of the homes was utilized as a training venue for professional and volunteer workers, and invited affordable housing organizations. Outreach to the public included open houses, photo blogs, and media releases, including a feature segment on the Discovery Channel. Photo collections provided rich visuals for illustrated handouts, displays, internet sites, and presentations at professional meetings, which have extended the outreach to national trade publications and professional conferences.

Although adoption of the *Wash-n-Wear* building systems has not made much headway to date in the community, the demonstration homes have proven to be exceptionally valuable learning experiences, case studies, and educational methods that continue to ripple and spread beyond their completion and community. The same systems can be used in the restoration of most existing homes damaged by floods or storms, offering the potential to benefit many others nationwide. It is the hope of the participating partners that these projects and building systems will offer an added viable solution to other storm and flood vulnerable areas to reduce family economic losses,

health effects, productivity losses, and national dependence upon recovery assistance and non-renewable energy resources.

## **Acknowledgments**

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**MY FLORIDA HOME: A FIRST-TIME HOMEBUYER EDUCATIONAL PROGRAM IN  
OSCEOLA COUNTY, FLORIDA**

Laura Royer, Hyun-Jeong Lee\*

**Introduction**

A home is one of the three essentials for mankind, alongside food and water. However, financing, obtaining, and maintaining a home is often challenging to many consumers. Locally, residents of Osceola County, Florida face several housing challenges, including the availability of affordable housing for low- to moderate-income families. In 2008, the median price of single-family homes in Osceola County was \$190,000 (Florida Housing Data Clearing House, 2008). However, based on the local median income of \$45,766 (Economic Research Service, 2008), the average family could afford a house valued around \$135,000. According to the 2008 Census Bureau American Fact Finder, almost 57% of Osceola County homeowners are spending more than 30% of their income on housing expenses, which can cause financial hardship.

Furthermore, in 2009, Osceola County had the highest foreclosure rate among 67 Florida counties, with one in eight homes being in foreclosure (RealtyTrac<sup>®</sup>, 2010). With increased home foreclosures, mortgage financing opportunities have declined, making home buying more challenging for renters. Several factors have led to increased foreclosure rates, including consumers initiating a purchase that they could not afford and accepting financing that they could not understand. For these reasons, a first-time homebuyer education program stressing financial readiness and explaining how

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mortgage financing works is more critical now than ever. Financial readiness is defined as a consumer's ability to manage personal finances properly, decreasing debt, saving money, and taking steps to improve credit.

The purpose of this paper is to introduce *My Florida Home*, a first-time homebuyer education class in Osceola County, Florida. The *My Florida Home* program is an example of the University of Florida Extension's educational efforts to guide potential homeowners in preparing for homeownership in tough economical times.

### ***My Florida Home* Program: Program Goal and Objectives**

*My Florida Home* is a first-time homebuyer education program in Osceola County, Florida provided by the Osceola County Extension Services. Program funding is supported by state and county budgets and class registration fees. The program goal is to guide renters through financial preparation and teach them how to find, finance, and purchase a home meeting family's needs. The objectives of the program include increasing participants' knowledge of the home purchase process, helping them identify their financial readiness, and understanding the financial aspects of being a homeowner.

### **Target Audiences**

The target audience includes all renters and prospective homebuyers in Osceola County. Successful partnerships with the Osceola County Human Services department, which provides first-time homebuyer down payment and closing cost assistance, have created a gateway to reaching clientele. Currently, there are two down payment

assistance programs offered to low- to moderate-income families (based on the federal median income guidelines for Osceola County): The State Housing and Initiatives Partnership (SHIP) program and the Neighborhood Stabilization Program (NSP). The SHIP program is funded by the Florida state doc stamp tax and the NSP program is funded by federal stimulus dollars released in 2009. The funding programs require homebuyers to take at least eight hours of homebuyer education before they are eligible to apply for funds. The Osceola County Extension Service has successfully partnered to be the sole provider for homebuyer education in the county. Although the *My Florida Home* program is open to anyone, most attendees register and complete the class in hopes of qualify for funding.

### **Method of Delivery**

*My Florida Home* is a seven-chapter curriculum offered as a 12-hour course. The curriculum focuses on financial budgeting; debt reduction; credit; comparison of renting versus buying; comparison of buying an existing home, a new home, and building a home; how to find, inspect, and negotiate; working with housing professionals; comparing mortgage options; the closing; homeowner's insurance; homebuyer's rights; and financial aspects of owning a home. Participants use course information to evaluate their current readiness to finance, purchase, and maintain a home. *My Florida Home* is offered in four separate sessions rather than in one day, like other organization's homebuyer classes, to allow for optimal learning and application.

The course is offered seven to ten times a year and reaches maximum capacity quickly. Pre-registration is taken a month in advance in-person or online on a first-come,

first-served basis. Teaching methods include lecture, use of visuals, and hands-on activities, such as completing budget and financial spending exercises, tracking spending over four weeks, and reviewing sample credit reports, home purchase contracts, and closing documents.

On another note, 40% of Osceola County's population is Hispanic. Since some of this population only speaks Spanish, language can present a barrier to reaching them. To overcome this barrier, Extension translated the curriculum into Spanish and has trained volunteers to teach the class in Spanish. Marketing efforts utilize various sources of media, including press releases, fliers, the Internet, and word of mouth. Classes taught in Spanish are marketed heavily in predominantly Hispanic Communities, radio stations, and newspapers.

### **Program Outcomes and Impacts**

In the past three years, twenty-four 12-hour classes have been taught to 4,095 individuals. One brochure, four multimedia educational presentations, a seven-chapter curriculum, and six fact sheets have been created for the program. The curriculum and fact sheets are in both English and Spanish. Post-class evaluations are conducted immediately following the class and again a year later to measure knowledge gained and behavior changes.

### *Evaluations Immediately Following the Class*

- 100% ( $n=1,554$ ) of the participants indicated that they had increased their knowledge in at least one of the of topics taught, such as financial budgeting, improving their credit, finding a home suitable for their family, choosing a mortgage, etc.;
- 96% ( $n=1,492$ ) of participants indicated their intent to take steps to improve their credit rating in order to qualify for a loan;
- 95% ( $n=1,476$ ) of participants intended to reduce debt;
- 97% ( $n=1,507$ ) of participants intended to begin or increase personal savings;
- 97% ( $n=1,507$ ) of participants intended to read over all contracts and paperwork carefully and identify all necessary components;
- 97% ( $n=1,507$ ) of participants intended to keep housing costs below 30% of their monthly gross income;
- 90% ( $n=1,399$ ) of participants indicated that they felt more confident in their ability to purchase a home; and
- 56% ( $n=870$ ) of participants recognized, based on what they learned in class, that they were not currently ready to purchase a home.

### *Evaluations a Year After the Class*

- 91% ( $n=207$ ) of the participants had continued using a financial budget to help them effectively manage money;
- 83% ( $n=189$ ) of the participants had taken steps to improve their credit rating in order to qualify for a loan;
- 87% ( $n=198$ ) of the participants had taken steps to decrease outstanding debt;

- 50% ( $n=114$ ) of the participants still felt that they were not financially ready to purchase a home; and
- 31% ( $n=73$ ) of the participants had been able to evaluate housing options and buy a home fitting family needs.

### **Program Transferability**

The *My Florida Home* curriculum is research based and easily adaptable for any other state or county to use in its respective communities. It is a seven-chapter curriculum that is available in PowerPoint, making it ready to use and is available in both English and Spanish. The curriculum is written at the sixth grade level for easy comprehension.

### **Conclusion**

Knowledge and preparedness are the critical keys to a successful and sustainable homeownership experience. Through the development and implementation of a research-based homebuyer curriculum and the effective building of local partnerships, The University of Florida Extension Service is seen as the leader in Osceola County, Florida in providing homebuyer and other housing education. The *My Florida Home* program has proven successful by achieving its goal of increasing knowledge. Although only 31% of participants have bought homes, others realized that they were not ready to buy, thus avoiding potential foreclosures. The *My Florida Home* program is also the winner of the 2009 National Extension Association of Family and Consumer Science Housing Outreach award (state, regional, and national). It has

opened the door for other local organizations to address various housing education issues, such as home maintenance, energy efficiency, and home health.

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Appendix

**1. A Home of Your Own Survey -Osceola County Extension Services**

Please take a minute to answer the evaluation questions and submit by November 20, 2009. This information is vital to the continuance of the First-Time Homebuyer program, so your assistance is greatly appreciated.

**1. As a result of the first-time homebuyer program,**

	Stongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
I decided I/my family was not financially ready to purchase a home.	<input type="checkbox"/>				
I better understand homebuying documents (i.e., home purchase contract, insurance, closing costs, etc.)	<input type="checkbox"/>				
I learned how to resolve credit problems to qualify for a mortgage loan	<input type="checkbox"/>				

**2. After the first-time homebuyer class:**

	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
I obtained a copy of my credit report	<input type="checkbox"/>				
I corrected errors I found on my credit file	<input type="checkbox"/>				

	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
I took steps to improve my credit score	<input type="checkbox"/>				
I track my spending	<input type="checkbox"/>				
I reduced unnecessary or impulse spending	<input type="checkbox"/>				
I started to save money	<input type="checkbox"/>				
I increased the amount of money I save	<input type="checkbox"/>				
I reduced my current debt	<input type="checkbox"/>				
I created a spending plan/budget	<input type="checkbox"/>				
I stick to my spending plan/budget	<input type="checkbox"/>				
I better manage my money and make it work for me/family	<input type="checkbox"/>				

**3. Have you purchased a home?**

- Yes
- No

**4. If you purchased a home, were you able to:**

	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
Choose appropriate home-buying professionals	<input type="checkbox"/>				
Effectively negotiate purchase price	<input type="checkbox"/>				

	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
Understand various closing costs	<input type="checkbox"/>				
Understand the home purchase contract	<input type="checkbox"/>				
Select appropriate homeowner insurance	<input type="checkbox"/>				

**5. Please explain specific accomplishments you/your family have made as a result of attending this class.**

Please explain specific accomplishments you/your family have made as a result of attending this class.

**6. Additional Comments?**

Additional Comments?

# A Home of Your Own Survey



Prior to this program did you have a spending plan developed for you or family? \_\_\_\_ YES \_\_\_\_ NO

Have you been tracking your spending? \_\_\_\_ YES \_\_\_\_ NO

If yes, **list at least two things** you have learned so far from doing this activity.

\_\_\_\_\_

As a result of this program, <u>I learned how to:</u>	Strongly Disagree	Disagree	Agree	Strongly Agree
Take steps to improve my financial situation	1	2	3	4
Develop a spending plan	1	2	3	4
Identify spending leaks and reduce them	1	2	3	4
Review my credit report and correct errors	1	2	3	4
Find a home- appropriate for me and my family	1	2	3	4
Negotiate an affordable price on a home	1	2	3	4
Effectively choose home-buying professionals	1	2	3	4
Properly insure my home and personal belongings	1	2	3	4
As a result of this program, <u>I intend to:</u>	Strongly Disagree	Disagree	Agree	Strongly Agree
Continue budgeting/planning my spending	1	2	3	4
Stick to my budget	1	2	3	4
Continue tracking my money	1	2	3	4
Reduce spending leaks	1	2	3	4
Pull my credit report and correct any errors	1	2	3	4
Work towards improving my credit score	1	2	3	4
Decrease my debt	1	2	3	4
Start saving money or increase what I currently save	1	2	3	4
Choose home-buying professionals wisely	1	2	3	4
Read over the purchase contract carefully and identify all	1	2	3	4
Only borrow the amount of money I can realistically afford to pay back based on the University of Florida guidelines.	1	2	3	4
Pre-pay towards my mortgage principal	1	2	3	4

**PLEASE TURN OVER!**

After taking this class:	Strongly Disagree	Disagree	Agree	Strongly Agree
I am more confident about my ability to buy a home	1	2	3	4
I believe this class is essential before buying a home	1	2	3	4
I realize I/my family is not ready to purchase a home now, but maybe later on.	1	2	3	4
What did you like best about this workshop?				
What would you change to improve this workshop?				
Concerning these uncertain economic times, what would you like to know more about?				
Tell us about your overall experience from taking this class.				

*☺ Thank you for attending! ☺*

## MULTIPLE CHEMICAL SENSITIVITY

Randall Russ, Melinda Lyon, Bill Beitz, Gina Peek\*

### Introduction

Multiple chemical sensitivity (MCS) is a condition in which persons become ill following exposure to certain chemicals encountered in everyday life. Such chemicals include smoke, pesticides, plastics, synthetic fabrics, perfumes, scented products, petroleum products, fumes, and paints (Miller, 1996).

As highlighted by Nussbaumer (2004), the impact of MCS on individuals and society is significant in terms of both its potential severity and the number of people affected. "Most patients with MCS are female, the median age is 40 years old, and most experienced symptoms before they were 30 years old" (Thivierge, 1999, p. 1953). Caress and Steinemann (2004) also found a higher percentage of MCS among females, as well as middle-aged and older individuals. Nash (2001) estimated that "25 percent to 33 percent of the population has MCS, but those with chronic symptoms are a subset of this, with estimates varying between four percent and 15 percent" (Nash, 2001, p. 21). Chemical sensitivities are also reported evenly among ethnic and racial groups except for Native Americans, who reported a higher prevalence (Meggs et al., 1996). It should be of concern to researchers and housing educators that this devastating and potentially preventable illness is affecting an increasing percentage of the population.

Many people with MCS have lost everything, including their health, homes, careers, savings, and families. They are chronically ill and struggle to obtain such

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necessities of life as food, water, clothing, and housing. These individuals are sometimes forced to rely on public assistance for income and housing (Davis et al., 1998).

Finding housing that does not make those suffering from MCS more sick—that is, housing not contaminated by pesticides, perfume, cleaning products, cigarette smoke residues, new carpets or paint, and formaldehyde-containing building products—is especially difficult. For instance, an elderly woman with MCS was forced out of public housing and became homeless when staff insisted on remodeling her apartment even though she warned them that the new carpet and cabinets would make her too sick to continue living there (Wachsler, 2001).

Federal agencies are giving multiple chemical sensitivity attention. The Social Security Administration and U.S. Department of Housing and Urban Development (HUD) do not recognize MCS as a disability unto itself (Custer, 1996; Labarge & McCaffrey, 2000), but HUD does recognize it as a handicap (U.S. Department of Housing and Urban Development, 1992). The US Environmental Protection Agency acknowledges MCS with a definition (U.S. Environmental Protection Agency, 2010).

Regardless of federal definitions, individuals with multiple chemical sensitivity are guaranteed certain rights related to housing conditions and quality. Property owners must comply with the Fair Housing Act, which provides protection for those with disabilities. These protections include allowing tenants to make reasonable modifications to a dwelling in order to accommodate a disability (U.S. Department of Housing and Urban Development, 2009). Gibson (2000) cites that the definition of

"reasonable" is unclear. What defines the line of reasonableness is unknown and not legally defined.

### **Program Development**

Since MCS is difficult to diagnose and empirical literature is limited, researchers determined that multiple chemical sensitivity in Oklahoma merited attention.

Researchers created a logic model to aid in guiding the project. The logic model simply provides an outline of the project, including inputs and expected actions. Additionally, researchers created a post-program evaluation tool to determine the effectiveness of any face-to-face education provided to public housing residents. The logic model and post-program evaluation tools are available upon request.

The Healthy Homes Partnership administered by Auburn University funded the project as part of the 2009 grant cycle. Researchers received a total of \$3,8540.50. These funds were spent on copies of the booklet *Help Yourself to a Healthy Home: Protect Your Children's Health* (Wysocki, 2000), a healthy homes exhibit, postage, and other materials, including the Quick Environmental Exposure and Sensitivity Inventory (QEESI) survey (Miller, 1998).

### **Purpose**

The purpose of this study is to focus on program development, implementation, and replication. First, researchers wanted to ask public housing residents about their home environments and personal reactions to them. Second, researchers wanted to

deliver healthy home education that might help these individuals reduce exposure to chemicals and allergens that may be a factor in MCS.

### **Implementation**

The study site is limited to six Oklahoma counties. The target audience consists of those living in multifamily housing units and those using housing choice vouchers to live in single-family housing. Since public housing resident addresses are not public information, researchers developed relationships with public housing authority managers and personnel. These relationships served as a conduit for the researchers to contact residents.

All study participants were given the QEESI survey (Miller, 1998). This survey asks a variety of questions that intend to isolate chemical intolerances. The purpose was not to question multiple chemical sensitivity validity or diagnose individuals as having MCS. Instead, the intent of the query was to determine environmental conditions and personal reactions to chemicals and allergens on the individual level. Specifically, researchers used the QEESI questionnaire to determine chemical and allergen exposure levels, sensitivity levels, and, if sensitive, the extent of sensitivity. This information is important, as not all individuals are sensitive to chemicals and allergens, not all sensitive individuals will have the same reaction, and not all reactions are the same. Sensitivity and reaction are unique to each individual.

Study participants received healthy housing education in one of two ways. The first group of residents received a packet containing the QEESI survey and a copy of the booklet *Help Yourself to a Healthy Home: Protect Your Children's Health*. This low-

literacy self-help booklet addresses a variety of housing-related health concerns, many of which may affect those with chemical sensitivities. Cooperative Extension provided no face-to-face education to this group. The second group of residents received the same packet containing the educational book and QEESI survey. In addition, this group received face-to-face healthy homes education via Cooperative Extension. This education took place onsite in housing authority meeting rooms. Given time constraints associated with face-to-face programming, researchers have relied solely on the QEESI to collect data. All study participants who completed the QEESI survey received five dollars as a token of appreciation.

In addition to resident instruction, public housing authority managers and personnel received healthy homes training at an Oklahoma National Association of Housing and Redevelopment Officials (NAHRO) conference on May 11, 2010. This training was based on HUD's seven healthy housing principles (U.S. Department of Housing and Urban Development, n.d. b). Using this holistic approach to healthy housing may help Oklahoma NAHRO members think differently about housing in general and better understand the needs of residents with diagnosed and undiagnosed MCS.

### **Replication**

The purpose of this project was to focus on program development, implementation, and replication. This project is unique in that it combines empirical research with Cooperative Extension healthy homes educational programming to provide value to participants. The project represents collaboration between resident

faculty, Cooperative Extension faculty and staff, and public housing authority administrators. Materials used are available to the public—the QEESI survey and the booklet *Help Yourself to a Healthy Home: Protect Your Children's Health* are available via the internet. As stated, logic model and post-program evaluation are available upon request. Any land-grant university may easily replicate the project, given resident, Cooperative Extension faculty and staff, and housing authority administrator cooperation.

Multiple chemical sensitivity is timely and relevant, especially in a broader healthy homes context. The U.S. Department of Housing and Urban Development is taking a holistic approach to healthy housing (U.S. Department of Housing and Urban Development, n.d. a). Conditions that lead to multiple chemical sensitivity are one aspect of healthy housing. There has been little systematic research into the impact of building elements on public housing residents with multiple chemical sensitivity. Further research into the built environment of public assisted housing is needed.

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**RELIABILITY AND VALIDITY:  
ADAPTING THE HOUSING ENABLER ASSESSMENT TOOL FOR THE U.S.**

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**Introduction and Purpose of the Study**

A good “fit” between the residential environment and people who are aging in place is essential to personal safety and quality of life. The widely accepted Press-Competence Model (Lawton, 1989) explains that an appropriate balance between an individual’s competence and the “press” of the environment may optimize comfort and performance. As straightforward as that idea is, assessment of person-environment fit is challenging. Research on residential environments is fairly extensive, but it tends to be primarily at the descriptive level (Gitlin, 2003) and is focused on the range of environmental features that pose potential hazards to people with impaired abilities (e.g., Carter et al., 1997; Clemson et al., 1997). The literature identifies a broad range of environmental hazards. It is difficult to draw generalizable conclusions, however, because private homes are highly individualized and because different approaches are used in each study. Further, environmental attributes may be more or less hazardous, depending on an individual’s competence. For example, environmental press created by a particular flooring material may impact individuals differently, depending on cognition level, eyesight, or mobility.

The Housing Enabler (HE) is an assessment tool designed to address dimensions of the physical environment in relation to the specific functional capacity of an individual

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(Iwarsson & Slaug, 2001). The tool measures person-environment fit by weighting particular environmental characteristics according to specific person characteristics. Validity (Fange & Iwarsson, 2003; Iwarsson & Isacson, 1996) and inter-rater reliability (Iwarsson & Isacson, 1999; Iwarsson et al., 2005) are well established. Studies of HE validity and reliability, however, have taken place only in Europe, and these were based on Swedish and British-English versions. Additional versions exist in Germany, the UK, Latvia, and Hungary. Most recently, the Housing Enabler has been adapted according to accessibility norms and guidelines for Sweden, Denmark, Finland, and Iceland (Nordic Housing Enabler). The Nordic Housing Enabler also stands up well in tests of inter-rater reliability (Helle et al., 2010).

Despite strong validity and reliability and its wide use in Europe, the Housing Enabler has not been adapted and tested for use in the U.S. The purpose of this project was to develop a content-valid U.S. version of the Housing Enabler and to investigate inter-rater reliability with the new version. This paper reports the first steps of that endeavor.

### **Materials and Methods**

The research group included the principal investigator (Ph.D., Housing), two co-investigators (M.S., Gerontology), and 63 upper-class undergraduate assistants with majors in Housing Studies, Interior Design, or Human Development/Gerontology. Work began in September 2009 and continues to the date of this writing.

The Housing Enabler consists of two distinct parts: (1) the individual assessment, including a functional analysis of 15 items, and (2) the environmental assessment,

including an analysis of 188 items comprising the outdoor environment, entrances, the indoor environment, and environmental communication features. The focus of this phase of the project is the environmental assessment portion. Originally developed as a tool for Occupational Therapists, the U.S.-adapted version of the HE will first be used to analyze the fit between elderly clients' functional limitations and their living environments.

Utilizing an instrument across national contexts challenges validity. Our first step was to identify and “translate” European English words not commonly understood in American English. For example, “hob” refers to a cooktop in Europe. This and other words were discussed among the lead investigators and research assistants and changed by consensus. Next, we made a straightforward conversion of metric measurements to imperial measurements. Third, we conducted a rigorous content analysis of each of the translated/converted items. Items in the original version are aligned with European norms and standards. In this project, we compared each item to standards and guidelines contained in these U.S. codes:

- Accessibility Guidelines of the Americans with Disabilities Act;
- Architectural Barriers Act;
- American National Standards Institute (ANSI);
- International Building Code; and
- Fair Housing Accessibility Guidelines.

Where U.S. standards and codes were not aligned, we selected the most rigorous guideline to revise items. Revisions were required for 81 items (43%).

Simultaneous with the translation/adaption process described above, we created expanded explanations and collected photographs to illustrate each item. We compiled all into a slide presentation that was used to validate the understanding of each item. After refinement, the slide presentation was used as a training guide to prepare the two lead investigators and five research assistants for the next step: field testing of the Housing Enabler tool.

The initial field test was conducted in a private residence. Each of the researchers (two senior investigators and five research assistants) conducted a comprehensive assessment. Scoring was compared item by item; initial inter-rater reliability was found to be Kappa = 0.48 ( $p \leq 0.001$ ), indicating moderate agreement (Landis & Koch, 1977). Differences were discussed and reconciled and revisions to the training guide were made to minimize confusion on troublesome items. Second-phase field tests were conducted in an alternative private residence and also reflected moderate agreement (Landis & Koch, 1977). Inter-rater reliability was found to be Kappa = 0.46 ( $p < .001$ ).

### **Implications and Next Steps**

At this writing, further refinements to the training guide are in process and additional field tests are scheduled. The adapted HE instrument will be used in an ongoing longitudinal evaluation project beginning in November 2010. Future plans include collaboration with the Iwarsson group and field tests across the U.S. by collaborating researchers.

A version of the Housing Enabler that is both reliable and valid in the U.S. is important to facilitate individual assessment in practice. Moreover, a standardized

instrument coupled with standardized methodology could provide comparable results within the U.S. and cross-nationally. This will contribute substantively to the body of knowledge in environmental gerontology and will serve to advance the field.

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**DETERMINING WORKFORCE HOUSING NEEDS AND HELPING TO DEVELOP A  
LOCALLY BASED HOUSING PLAN: A CASE STUDY IN  
SANDERSVILLE/TENNILLE/WASHINGTON COUNTY, GEORGIA**

Karen Tinsley, Anne Sweaney, Tom Rodgers\*

Many local leaders have a clear vision for their community's housing but lack specific data and information to describe the housing problems and a clear work plan to achieve their vision. This paper presents a case study on how the Housing and Demographics Research Center (HDRC) at the University of Georgia is helping to put these pieces together, enabling local leaders in Sandersville/Tennille/Washington County, Georgia (referred to as Washington County) to develop a housing plan for their area. This community housing program should be sustainable, since the work plan is developed and implemented at the grassroots level. One vital component of a housing plan is a housing needs assessment, which is the focus of this paper.

**Developing a Plan**

Recognizing the need for technical assistance related to housing, Washington County established a local housing team and applied for and was accepted into the Georgia Initiative for Community Housing (GICH or Initiative), which is a collaborative program of the HDRC, the Georgia Department of Community Affairs, and the Georgia Municipal Association. The Initiative provides cities and counties with a three-year program of training, technical assistance, and facilitated collaboration for community

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housing teams to develop a locally based housing plan. Community team members include city and/or county government, housing authorities, local nonprofits, local lenders, real estate professionals, chambers of commerce, local school boards, and other key players in the housing arena.

In addition to housing construction, rehabilitation, removal of dilapidated units, counseling, down payment assistance, and reviewing ordinances and implementing code enforcement, the Initiative builds local social capital related to housing and community development (Tinsley & Massey, 2009). Throughout the GICH process, community team members become housing advocates and mentors for other communities while also detailing local housing plans.

The goals itemized in the Washington County plan include conducting a housing inventory and needs assessment, hiring code enforcement personnel, and providing community-wide education on the issues and plans. The HDRC assisted the community in conducting a workforce housing needs assessment, one of their stated goals. The next section describes the methodology and general results of this study.

### **Determining Needs**

Following the survey methodology of Tinsley et al. (2008), a housing survey was conducted at the employer workplace. This methodology was enhanced and expanded in two important ways. First, prior to conducting the survey, local leaders were involved in a focus group meeting to design a more comprehensive survey specific to the needs of their community. Many of the local leaders are members of the GICH housing team. Second, rather than concentrating on one firm, employees of all major employers

participated in the survey. This yielded a more representative sample of the local workforce.

Employees at six of the largest employers in the County were surveyed. This included two city governments, the school system, the hospital, a technical college, and a private industry. Human resource managers coordinated the logistics of conducting the survey at their organizations to minimize workplace disruption. For example, the hospital representative set up a room with tables and chairs and throughout one day asked waves of workers to take 15 minutes to complete the survey. Few people refused to take the survey, but the exact number is not known. There were a total of 555 returned and completed questionnaires.

Four measures were used to describe the workforce housing needs. The survey described above provided the data to create and analyze the following four dichotomous variables: 1) looking for a new place to live, 2) in need of home repair, 3) housing cost burdened, and 4) qualify for housing assistance programs. These variables describe the different scenarios that would categorize a household in need of housing: looking for different housing accommodations, physical problem with housing unit, and housing affordability. Households are classified as housing cost burdened if their housing payments are more than 35% of gross household income. The percentage of households with lower incomes gives a good idea of the need for housing assistance programs.

### **Key Results**

Most (82 percent) of the respondents lived in Washington County. Almost all of those that worked in the County but lived elsewhere did so because they wanted to

remain in their hometown. Nearly 85 percent of the respondents were homeowners—76 percent lived in a single-family home, 20 percent lived in a mobile home, and four percent lived in an apartment, with 49 percent were living in a household composed of a couple with children. It is noteworthy with respect to housing needs that 12 percent lived with immediate or extended family. Nearly 50 percent of the respondents had an annual household income of \$75,000 or greater and only 15 percent had a household income of less than \$35,000. The employees surveyed had higher incomes than the county has a whole. The 2008 Washington County median household income was \$35,394, although this includes individuals not working and on fixed incomes (U.S. Department of Agriculture Economic Research Service, 2008).

The key results of the survey indicate that there is a need for workforce housing in the local area. Specifically, 17.5% were looking for a new place to live ( $n=97$ ), 21.3% were in need of home repair ( $n=118$ ), 17.5% were cost burdened ( $n=97$ ), and 32.2% had a household income less than \$70,000 ( $n=179$ ) and would thus most likely qualify for housing-assistance programs. Mobile home residents were more likely to be in need of home repair and looking for a new place to live than those living in single-family homes or apartments (Chi Square .01 or .05 significance level).

These results indicate a need to help improve employees' housing situations and an opportunity for community and economic development. A community-wide meeting was convened to present the survey findings. The GICH housing team and others are using the results to refine their housing plan and begin implementation of new ideas and programs.

## **Discussion**

This workforce housing survey project should be of interest to Extension and outreach faculty working with local communities on housing issues, as the survey methodology offered can be replicated in any community and the process is inexpensive. Although GICH is a state-specific housing technical assistance program, practitioners in other states can assemble a housing team and look for technical assistance to help develop a similar comprehensive local housing plan.

A dedicated local liaison is important for comprehensive community involvement in both phases of the project: developing a housing plan and determining needs. A constant link between the GICH team members, participating employers, the community at large, and the researchers is important to make sure that all aspects of the project are progressing as needed. For example, in the project described here, the local housing team experienced a change in leadership and needed assistance getting back on track. An Extension agent or other local community university faculty can serve as the liaison and is critical in helping to overcoming obstacles and roadblocks in the course of the work.

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**LEAD EDUCATION PROGRAMMING:  
REACHING FOREIGN-BORN POPULATIONS**

Pamela R. Turner, Sharon M.S. Gibson\*

Ideally, children should live in a lead-safe environment. Unfortunately, children continue to be exposed to lead in and around their homes. In the United States, nearly half of the housing stock was built before 1978, when the Consumer Product Safety Commission (CPSC) banned the sale of paint with more than 0.06% lead for consumer use (Consumer Product Safety Commission, 1977). Up until 1940, paint contained up to 50% lead, with decreasing levels until it was banned in 1978 (Centers for Disease Control, 1991). A look at housing in the U.S. reveals that 21% of owner-occupied housing units and 24.5% of renter-occupied housing were built before 1950 (U.S. Census Bureau, 2000). Lead-based paint remains the most common source of lead exposure for preschool children, followed by lead-contaminated soil. Other sources of exposure to lead come from household dust, drinking water, crystal, pottery, candy, cosmetics, and folk medicines.

There has been an increase in the number of diagnosed lead poisonings as a result of less traditional sources of lead. In Arizona, folk remedies and pottery have accounted for 17% of elevated blood lead level cases (Arizona Department of Health Services, 2005). The Centers for Disease Control and Prevention (CDC) has documented several cases related to the use of ayurvedic medicines and folk remedies (Centers for Disease Control, 2004, Kales & Saper, 2009). New immigrants, and

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especially those from Asia, are at risk of being exposed to high lead levels through ayurvedic medicines and cosmetics like kohl and sindoor (Kapoor, 2007; Lin et al., 2010).

As the U.S. is becoming an increasingly more culturally diverse society, it is important to increase awareness about all sources of potential lead hazards in the home. It is predicted that by 2025, one in five (19%) Americans will be foreign born, compared to 12% in 2005 (Passel & Cohn, 2008). This surpasses the numbers between 1860 and 1920, when 13.2% to 14.8% of the population were foreign born due to the waves of people immigrating to the U.S. (U.S. Census Bureau, 1999). Some of the fastest growing areas are the southeastern states. Georgia climbed to tenth among all states for the number of foreign born in 2000, which was a 233.4% increase from 1990, second only to North Carolina with a 273.7% increase (Migration Policy Institute, 2008). By 2008, Georgia moved into ninth place for the number of foreign born, with a total of 910,473 (Migration Policy Institute, 2008).

With immigrants and refugees come new beliefs, practices, products, and customs used in and around the home. Immigrants from several parts of the world, in particular Asia, Africa, Mexico, and Central America, inadvertently expose their children to lead through the use of cooking vessels, pottery, foods, cosmetics, and folk remedies that contain harmful quantities of lead (Tehraniifar et al., 2008). Such cultural practices as eating on the floor can also increase the possibility of ingesting lead paint chips or dust.

Customs, language, health, and economic issues place immigrants and refugees at increased risk of lead poisoning from current cultural practices as well as the more

common sources—lead-based paint and contaminated dust—of which they may not be aware. Economic barriers may result in families living in poorer or older housing (Garrett, 2006).

To reach the foreign-born population, the authors designed tools that provide information about potential sources of lead, related health risks, importance of testing, and where to go for blood tests. The focus is on ways to reduce exposure to lead at home, including frequent cleaning and adding a doormat by exterior doors. Targeted audiences are immigrants and refugees, but the materials are applicable to all low-literacy audiences. As recommended by the CDC, the authors integrated cultural beliefs and practices into outreach efforts, developing culturally appropriate and sensitive educational resources (Centers for Disease Control, n.d.). To reduce language barriers, the materials are more visual than verbal. The authors are working with personnel from the state lead poisoning prevention program and extension agents to pilot the materials. We encountered several challenges in developing economically feasible educational tools for use with different foreign-born populations. The success of the project depends upon gaining the trust of the different populations, finding ways to reach people in the places they frequent, and not judging behaviors.

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# **BARRIERS TO INNOVATION IN THE DESIGN OF AFFORDABLE HOUSING: THE MINNESOTA EXPERIENCE**

Becky Yust, Marilyn Bruin, Sarah Belleful\*

Assessment of the barriers that exist in the design of affordable multifamily housing and how those barriers could be reduced were explored in this qualitative research project. The McKnight Foundation has been instrumental in providing incentives for the development of affordable housing in Minnesota, and they approached the researchers to identify ways to advance design of multifamily housing. Some of the Foundation's directors saw more innovation occurring in California, for example, than in Minnesota. Criticism about housing design is not unique to Minnesota, though. A call for innovation in residential design in the United Kingdom was addressed by Ball (1999), and Franklin (2001) purported that most strategies address urban design rather than physical design of structures. Additionally, residents' needs and preferences also need to be addressed through design (Heywood, 2004; Hoffman et al., 2006).

The research questions, which were framed by the McKnight Foundation to assess design in Minnesota, were:

1. What are the current design standards and typical practices of the affordable housing field related to the design of affordable housing units?
2. What resources are available to the field for improving the design of affordable housing?

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3. What are the barriers to and gaps in resources that inhibit the field from establishing higher standards and achieving greater excellence in design?
4. How can these barriers and gaps be addressed to promote the greatest opportunities to advance excellence in the design of affordable housing?

## **Methodology**

Individuals in 16 organizations that have been involved in the design, development, and funding of affordable housing in Minnesota were first identified by the three researchers. The organizations are well-known in the state for their work in affordable housing and included architects, developers, housing managers, funders, and municipalities. After receiving approval from the University of Minnesota Institutional Review Board, the researchers called each organization to arrange for an in-person interview with those in their organizations that they felt would be helpful to the discussion. Each organization contacted was willing to participate without compensation. At the end of each interview, participants were asked to identify projects that they considered well designed (see Figure 1). At least two of the three researchers attended each interview and took notes. The notes were then compiled, word processed, and reviewed by the researchers to identify response themes related to the research questions.

## **Results**

### *Design Standards*

Design standards are driven by the funding agencies and the local communities in which each project is built. Minnesota Housing, the state housing finance agency,

established design standards 30 years ago and has recently added accessibility, visitability, and sustainability standards (Minnesota Housing, 2010). The standards focus on parking and garages, play areas and equipment, signage, laundry rooms, elevators, unit size and materials, patios, and mechanical and electrical systems. Many communities and Minneapolis-St. Paul neighborhoods also have standards that address, for example, façade articulation and percentage of window area. The standards tend to be prescriptive rather than performance based, which can limit innovative strategies to achieve design outcomes.

#### *Resources to Improve Design*

There are limited resources available for building affordable housing, and each participant struggled on every project to maximize funding and the number of housing units provided while maintaining integrity of the design to serve families. The main source of funding for the projects, Minnesota Housing, sets the architectural fee as a percentage of the project cost. Frequently, architects and developers spend unfunded time to get the projects accomplished and do not have the resources to explore innovations that could be applied to projects.

#### *Barriers and Gaps in Resources*

There were three main barriers to achieving well-designed projects. The first was the limited funding available for projects and the amount allocated for architectural design fees. Second, the work is exceedingly intermittent. The developer engages an architect to complete a site assessment, followed by a series of meetings with the community and funders. If the project is feasible, the architect prepares drawings for funding applications; and if it is funded, the architect completes construction drawings.

The time span between stages can stretch into years. Land holding costs, changes in funding priorities, and changes in building standards requiring redesign strain the operating budgets of the architects and developers. The third barrier was the community context. This includes the authority of the neighborhoods to require and/or veto design features; zoning regulations, especially those that pertain to parking; and cultural practices of residents (e.g., ritual washing) that affect future maintenance.

### *Reducing the Barriers*

Reassessment of the development process, and particularly the funding application process, should be a high priority. Minnesota Housing's Super RFP model is among the best in the nation, but it also presents constraints to development. Secondly, exposing Minnesota policy makers, funders, and community staff to successful affordable housing developments from other areas would help to educate and assist them in advancing the design threshold.

### **Conclusion**

As a result of the report of our findings, initial steps are being taken to address the barriers. The first step is a series of forums sponsored by the McKnight Foundation titled *Beyond the Façade: Local and National Case Studies of Good Design in Affordable Housing*. In each forum, an architect presents a local project of his/hers, reviewing the process and the stressors that occurred at different stages. He or she also presents a project with similar programming from another city as a comparison so that attendees can learn about other projects and the ways in which they were successful. Members of the local project's development team, funders, local officials, and

community members attend and share their perspectives on the projects. The rest of the forum audience is made up of Minnesota Housing officials and other architects who work on affordable housing. The second step is targeted conversations with Minnesota Housing to assess ways that their processes can be more facile. Finally, the need for post-occupancy evaluations is recognized in order to assess the residents' satisfaction with their housing environments. While the context of this research was Minnesota, other states could use a similar method to understand design issues in their states.

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**Figure 1. Examples of multi-family affordable housing projects deemed well-designed by participants.**