

GREEN BUILDING:
PUBLIC OPINION, SEMANTICS AND HEURISTIC PROCESSING

by

CHRISTINA M. WEBB
B.A. University of Central Florida, 1999

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ABSTRACT

Research on public support for green building has, to date, been incomplete.

Understanding the demographics of individuals that support green building has remained secondary to merely determining real opinions on the topic. The identity of supporters and the motivation behind their support is the focus of this research. Specifically, is support for green building dependent on the way in which the issue is framed? This research aims to focus on those that are spreading the message about green building, industry experts, and the mass public. By exposing how green building experts talk about the issue, we may begin to understand why public support for green building has yet to reach the kind of mainstream acceptance other planning and design techniques, such as New Urbanism, have.

I predicted that green building experts perceived low levels of public awareness, with the exception of those within the Northwest region, which I believed would perceive higher levels of awareness. In addition, I assumed that industry experts would be most focused on energy efficiency as a primary concept of green building. As for the public, I hypothesized that those aware of green building and individuals age 50 and older would be more likely to support green building. With the introduction of source cues, I expected that support for green building would decrease when respondents received either an environmentalism cue or a government program cue. Using survey instruments, I was able to determine that all green building experts perceive public awareness as low and do, in fact, focus their efforts on energy efficiency. With regards to the public, support was highest among those that are aware, as well as those age 50 and older. In addition, insertion of source cues decreased support for green building, with the government program source cue providing the lowest levels of support for green building.

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CHAPTER ONE

Introduction

“We cannot solve our problems with the same thinking we used when we created them.” Einstein was assuredly not referring to building construction procedures when he expressed this sentiment. However, he could not have articulated a more appropriate declaration for the current state of modern building construction. Despite the fact that almost all Americans today live and work within buildings, few give thought to how these dwellings influence the greater society. Ironically, most of the professions that design, construct, and own buildings give little thought to a building’s staggering impact on its environment. Residential and commercial buildings account for 65.2 percent of total electricity consumption and 36 percent of total primary energy use in the United States. New building construction creates 136 million tons of waste per year (approximately 2.8 lbs/person/day). Moreover, building construction consumes 40 percent (3 billion tons annually) of all raw materials globally and creates 30 percent of total US greenhouse gas emissions (U.S. Green Building Council 2004).

Whether the issue is viewed as environmental, economic, or entirely industry related the fact remains that someone must take responsibility for proper building construction techniques. To date, there is little public debate about this issue. Perhaps this is because people are unaware that there are deficiencies in construction practices. Maybe Americans trust that, like most technical issues, the experts take care of any problems that arise. But unlike many technical issues we face today, there is a clearly defined approach to correct the crisis in inappropriate building technique. There are ways to reduce consumption, conserve resources and create healthier buildings. One such initiative is referred to as “green building.” While it is not the only

route to take towards mitigating the impact of buildings on the environment, it is an approach that has produced tangible results.

“Green building” is defined by the Office of the Federal Environmental Executive as a technique to “increase the efficiency with which buildings and their sites use energy, water, and materials, and reduce building impacts on human health and the environment through better siting, design, construction, operation, maintenance, and removal- the complete building life-cycle” (Office of the Federal Environmental Executive 2003). Often this kitchen-sink definition does little more than force people to pick out one component and create their own understanding of green building. More specifically the term “green building” refers to a design and construction method which takes into account the impact buildings have on the existing environment. Green building is a “Whole-Systems” approach for designing and constructing buildings that conserve energy, water, and material resources and are healthier, safer, and more comfortable. In practical terms, green building includes the following aspects:

- Using sun and wind for natural heating, cooling, and daylighting.
- Landscaping with native plants to conserve water used in irrigation.
- Building quality, durable structures.
- Insulating well and ventilating appropriately.
- Incorporating salvaged, recycled, and sustainably harvested materials.
- Maintaining healthy indoor air quality with appropriate construction techniques and materials.
- Using energy-efficient and water-saving appliances & fixtures.
- Reducing and recycling construction waste.

Green buildings are sited, designed, constructed and operated to enhance the well-being of occupants, and to minimize negative impacts on the community and natural environment. With most Americans spending more than 80 percent of the time indoors, green building is considered a healthy, common sense choice for a better life. As it stands now in traditional construction, the quality of our indoor environment is often far more polluted than the outdoor environment due to various building materials, inadequate lighting, and a variety of other considerations. (Environmental Protection Agency 1991). According to Environmental Protection Agency (EPA) reports, the air in new homes can be up to ten times more polluted than outside air due to volatile organic compounds (VOCs) and other chemicals used in product manufacturing. Contrarily, homes that follow green building guidelines use healthier paints, other building materials and adhere to strict gas emission and ventilation requirements improving the quality of a home's indoor environment.

Green building methodology also requires that fewer natural resources be used during construction. According to the U.S. Department of Energy's Center for Sustainable Development, buildings use 40 percent of the world's total energy, 25 percent of its wood harvest resources and 16 percent of the world's water supply. Compared to traditional construction, a green built home takes some of this pressure off the environment through deliberate efforts to conserve resources.

Green building is not the only approach for mitigating a building's influence on the environment. In the late 1980s and early 1990s, an urban design movement referred to as "New Urbanism" was developed. This approach embraces many of the same concepts as green building without the focus on building materials. New Urbanists, or supporters of the New

Urbanism philosophy aimed to affect regional and local development plans. Specifically, their techniques involve new development, urban retrofits, and suburban infill. Retrofits are structural stormwater management measures for urban watersheds designed to help minimize accelerated channel erosion, reduce pollutant loads, promote conditions for improved aquatic habitat, and correct past mistakes. Simply put, these best management practices (BMPs) are inserted in an urban landscape where little or no prior stormwater controls existed (Center For Watershed Protection). Suburban infills refer to the tracts of land between suburban developments and the gaps between suburban development and urban cores.

New Urbanists support regional planning for open space, appropriate architecture and planning, and the balanced development of jobs and housing. In all cases, New Urbanist neighborhoods contain a diverse range of housing and job opportunities. Supporters believe these strategies are the best way to reduce time spent in traffic, increase the supply of affordable housing, and rein in urban sprawl. Many other issues, such as historic restoration, safe streets, and green building are also covered. Like-minded architects formed the Congress of the New Urbanism in 1993 and developed the Charter of New Urbanism: a document that is often cited when people discuss and advocate for this type of development. The base idea is to create vibrant, mixed communities that are more sustainable and socially inviting.

At the heart of New Urbanism is the design of neighborhoods, which can be defined by 13 elements, according to town planners Andres Duany and Elizabeth Plater-Zyberk, two of the founders of the Congress for the New Urbanism. An authentic neighborhood, which is what New Urbanism seeks to establish, contains most of the following 13 elements (New Urban News):

- The neighborhood has a discernible center. This is often a square or a green and sometimes a busy or memorable street corner. A transit stop would be located at this center.
- Most of the dwellings are within a five-minute walk of the center, an average of roughly 2,000 feet.
- There are a variety of dwelling types – usually houses, row houses and apartments – so that younger and older people, singles and families, the poor and the wealthy may find places to live.
- At the edge of the neighborhood, there are shops and offices of sufficiently varied types to supply the weekly needs of the household.
- A small ancillary building is permitted within the backyard of each house. It may be used as a rental unit or place to work (e.g., office or craft workshop).
- An elementary school is close enough so that most children can walk from their home.
- There are small playgrounds accessible to every dwelling – not more than a tenth of a mile away.
- Streets within the neighborhood form a connected network, which disperses traffic by providing a variety of pedestrian and vehicular routes to any destination.
- The streets are relatively narrow and shaded by rows of trees. This slows traffic, creating an environment suitable for pedestrians and bicycles.
- Buildings in the neighborhood center are placed close to the street, creating a well-defined outdoor room.

- Parking lots and garage doors rarely front the street. Parking is relegated to the rear of buildings, usually accessed by alleys.
- Certain prominent sites at the termination of street vistas or in the neighborhood center are reserved for civic buildings. These provide sites for community meetings, education, and religious or cultural activities.
- The neighborhood is organized to be self-governing. A formal association debates and decided matters of maintenance, security, and physical change. Taxation is the responsibility of the larger community.

Examples of New Urbanism can be found throughout the world. In the United States, Seaside, Florida is among the first and best known. The success behind New Urbanism is most telling in its name recognition. One does not have to be an architect, planner, or work within the real estate industry to have heard of the concept. Green building, however, has not enjoyed the same popularity. Nonetheless, the concepts at the core of New Urbanism run parallel to those of green building, namely the promotion of walkable communities; green spaces; and efficient, durable buildings. The primary distinction between the two movements is that New Urbanism is a large scale planning approach while green building is or can be applied to a single building. The Congress for the New Urbanism Charter does highlight green building concepts such as conserving energy and conserving environmental resources. It also states that “Natural methods of heating and cooling can be more resource-efficient than mechanical systems.” Unlike green building, New Urbanism does not specify materials and operating procedures for individual buildings. Nonetheless, the two movements both advocate a more efficient, sustainable living environment.

The similarity between the two initiatives and the contrasting saliency and acceptability begs the question: Why has the acceptance of New Urbanism not carried over to green building? Advocates of narrow thoroughfares, more parks, and transit alternatives - the component parts of New Urbanism - are not simply promoting aesthetic ideals. Those in favor of these techniques also support the end goal of resource conservation. Less time spent in automobiles, which is a key tenant of New Urbanism, also conserves energy resources and prevents further damage to air quality. Green building is merely an extension of these principles including healthier homes, more efficiently operated buildings, and the ability to conserve resources without a daily conscious effort.

Despite the fact that the green building concept has been around for over 15 years, there is little evidence of public opinion, no national political agenda,¹ and little talk of it outside a small fraction of the building industry. The issue of green building techniques has not evolved, nor has it become part of public debate over environmental and energy conservation issues. Some might claim that movements, such as green building that requires significant change will take decades to reach mainstream acceptance. Yet, with rolling blackouts and rising gas prices, it is conceivable that in the near future, issues concerning resource conservation and quality of life will be more prominently discussed.

Research Question

It is my belief that the low level of acceptance of green building is, in part, due to the term itself. To some people the word “green” strikes immediate association with environmental

¹ By national agenda, we refer to legislation and policies created and implemented in either the House of Representatives, the Senate or through the current administration. Efforts during the Clinton Administration are detailed in Chapter Two

movements not always accepted by mainstream America. Moreover, the term does little to convey the potential cost savings associated with these new building techniques. Some industry professionals are referring to green buildings as “High Performance Buildings” to avoid any negative reaction from financial lenders and investors who might be more conservative and predisposed to dislike environmental initiatives (Hodgsen 2005). Whether or not the difference in semantics is enough to create support for green building is unknown. The history of American public policy is filled with examples of programs and agendas that rested on one or two words.² For instance, it is possible that support for initiatives such as Homeland Security and the Patriot Act are, in part, a product of their names and the positive connotations that each invoke.

The question then becomes: Is there real support for the concepts of green building buried beneath the label? Perhaps more importantly, given that green building initiatives have not garnered public support: What, specifically, turns people away from the ideas that make up green building initiatives? In an attempt to answer these questions, I engage a two-pronged approach. First, I go to the source - the people actually talking about green building - and ask for their input. What are professionals, currently engaged in green building initiatives, saying and in what context?

Second, the research attempts to define what drives people in their support for green building and who these people are. This is accomplished by administering a random survey to people interested in buying homes in a “New Urbanist” setting. The specifics of the survey instrument and the data collection methods will be discussed in detail in a later chapter.

² While there is no literature cited here to support the weight of such semantics in politics, the author is simply making reference to ambiguous titles such as guerilla warfare, Clear Skies, and Homeland Security.

Specifically, the survey moves away from labels and focuses on the concepts behind green building to hopefully obtain a better gauge of “real opinions” on the issue.

To further investigate my theory regarding semantics or question-wording, the surveys incorporate the use of source cues to provide a deeper understanding of the nature of support, or the lack thereof, for green building concepts. More specifically, in the quasi-experimental research design implemented here, some surveys use an “environmental” cue to test support. This is intended to test whether integrating an environmental source cue will alter support. In another instance, a government program source cue is utilized to test support for green building concepts. Questions are reworded to suggest that the green building initiative is a part of a government sponsored initiative. Source cues have been studied by a number of scholars with regard to their use as cognitive efficiency strategies (e.g. Mondak 1993, 1994,1997; Kuklinski and Hurley 1994; Ottati 1990; Iyengar 1990; Hurwitz and Peffley 1997; Nadeau and Niemi 1995; Peffley Hurwitz and Sniderman 1997; Stoker and Jennings 1995) For the purpose of this research, the alternative source cues are employed along with baseline questions to test how framing an issue can alter support for green building concepts.

Chapter Two will provide a detailed review of the literature on source cues, including how, why and when researchers have opted to use them. In addition, the literature on green building and New Urbanism is outlined within this chapter. Most of what has been written on green building comes by way of case studies, delineating the brief history of support for the topic. Since the focus here is public opinion on residential green building, I look predominantly at what others have learned thus far through surveys and questionnaires. The study of New

Urbanism has more of an academic focus, with researchers discussing New Urbanism as both a social issue and as a means for combating urban sprawl.

Chapter Three begins to unravel the first question on how green building professionals attempt to sell the idea to consumers in both private and public spheres. Specifically, I query a sample of industry experts to begin deciphering how they describe green building programs. I also look to establish the views of industry experts, on public awareness of green building programs.

Chapter Four continues the exploration by detailing the findings of the public opinion survey. Here I exploit the amount of awareness surrounding green building, but also test support by collecting data on demographics. This will reveal something about the type of people more inclined to support residential green building concepts. The public opinion survey tests support among people with potential for buying a home in a New Urbanist environment.

Chapter Five presents the results of the analysis of source cues. Using a baseline survey, I measure relative support for green building concepts after providing an environmental source cue and a government program source cue. Chapter Six concludes with an overview of the findings and comments on where the research needs to move for a better understanding of support for the green building initiative.

With five cents of every dollar spent in the US economy directly linked to residential construction (National Association of Home Builders Research Center 2003), the state of sustainable development is quickly becoming an issue we cannot afford to avoid. Currently, there are a plethora of national, state, and local programs promoting energy efficiency, water

conservation and green building but, public awareness is weak.³ Likewise, there is a growing trend across the country for a change in public policy on the issue. This is seen through the increase in state and local legislation encouraging and, in some cases even requiring, sustainable building construction methods. Despite success across the board, participation and knowledge on the issue seems to have stopped with those creating and implementing the policies. The “public” in public policy is inexplicably absent. The goal of this research is to begin to uncover the level of public support for residential green building concepts and to attempt to provide explanations for its absence.

³ The research reported here will provide evidence of the lack of public knowledge of green building initiatives in Chapter 4.

CHAPTER TWO

Green building

The roots of green building can, arguably, be traced to the nineteenth century with structures such as London's Crystal Palace. Using passive systems, like roof ventilators and underground air-cooling chambers this structure relied on the natural environment to improve efficiency in building operations. Since then, icons such as The Rockefeller Center in New York City and Chicago's Carson Pirie Scott store have used shading techniques still highly acknowledged as primary green building practices. Green building concepts continued to appear in architecture and construction throughout the twentieth century; however it was not until the 1960s that green building practices received any publicity. Many acknowledge the birth of the movement during the 1960s with books such as Rachel Carson's *Silent Spring* in 1962. A blockbuster at the time, *Silent Springs* became the launch pad for the environmental movement. It painted a grim picture of a world without environmental conservation argued that both animals and humans would be irreversibly damaged by the use of chemicals. The most notorious of these chemicals, according to Carson, was dichlorodiphenyltrichloroethane (DDT). DDT was widely used in agriculture at the time preventing billions of dollars in crop losses. It was also used for many insect control purposes, including worldwide mosquito programs that helped drastically reduce deaths and illnesses from malaria.

The beginning of an ongoing controversy among environmentalists and those who use DDT started in 1939 (Leary, Fishbein, and Salter 1946 65). A few years later, in 1942, DDT was credited with saving the lives of millions of soldiers and civilians during World War II who

would have died of insect-borne typhus and malaria (Easton and Goldfarb 2004 138). Over three million people had died of typhus alone in World War I and it is estimated by the World Health Organization that DDT for malaria control saved 50 million to 100 million lives. Despite the benefits from DDT and other chemicals, Carson powerfully prophesied a world in which these chemicals were so insidious that even the birds would become extinct, resulting in silent springs.

While Carson was not the first to question what she called "elixirs of death" (man made chemicals), it was she that spoke up and openly criticized the chemical industry. With her fame, eloquence, and reputation for precision Carson was well positioned to command a hearing and was supported by leading scientists and conservation organizations. Carson testified before Congress in 1963, calling for new policies to protect human health and the environment based on findings from her book. By 1972, the use of DDT was banned in the United States.

The work of Rachel Carson has been carried on since her death in 1964. The Silent Springs Institute was founded in 1994. The Institute is a non-profit scientific research organization dedicated to identifying the links between the environment and women's health - especially breast cancer. Today, the institute is tackling issues involving household toxins. According to the Silent Springs Institute, people spend a lot of their time at home and as a result household environments are an important source of chemical exposures (Silent Springs Institute). The many chemicals in building materials and household products coupled with limited ventilation and slow chemical degradation indoors (away from sun, water, and temperature extremes) lead to indoor chemical concentrations being higher than outdoors levels. To understand the role these contaminants may have on breast cancer Silent Spring Institute

scientists are investigating women's household exposures to a broad range of organic chemicals. Identified as ethylene dichloride (EDCs) or mammary carcinogens, these chemicals are found in commercial products and building materials. The chemicals targeted for analysis include phthalates, alkylphenols, pesticides, parabens, polybrominated biphenyl ethers (PBDEs), polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and other estrogenic phenols such as bisphenol A. In 1994, the Silent Spring Institute began a long-term, epidemiologic study on Cape Cod women to investigate the role environmental factors may have on the incidence of breast cancer. Researchers collected samples of household air and dust and studied participants' urine samples from 120 homes. They also collected detailed information about each woman's home and her use of products containing the targeted chemicals. Collaborators on the Household Exposure Study included the U.S. Centers for Disease Control who conducted urine analyses; Southwest Research Institute for the air and dust chemical analyses; and John D. Spengler at the Harvard School of Public Health who directed air and dust sampling methods (Silent Springs Institute). The study is ongoing, but has already contributed to research on hormone-related diseases and pollutants.

Less recognizable authors were also making the case for environmental protection during the 1960s. Victor Olgyay's⁴ *Design with Climate*(1963) and Ralph Knowles'⁵ *Form and Stability* (1968)⁶ became for many architects, environmentalists and ecologists a starting point for looking at buildings as living entities that consume resources. Olgyay dared architectural

⁴ Victor Olgyay also founded The Renewable Energy Information Service (REIS) in 1987. REIS is a 501C3 nonprofit corporation developed to provide information regarding architecture and energy saving technologies to locations which would otherwise not have access to such information such as Africa, Eastern Europe, and parts of China.

⁵ Mr. Knowles is currently Professor Emeritus at the University of Southern California, School of Architecture

⁶ 1968, University of Southern California

students to design buildings that would react to sun, wind and water. Since Viktor Olgyay's inspiring work, environmental generalists have broadened the theories on climate and design (e.g. Givoni 1969, 1976; 1998; Szokolay et al 1996).

Knowles' *Form and Stability* raised the issue of building envelopes. The key components of the building envelope include the foundation, floor systems, walls and roof systems. Knowles began the exploration of using the sun to contribute what he would later term the solar envelope; a container to regulate development within limits derived from the sun's relative motion. Buildings within the solar envelope will not shadow their surroundings during critical periods of the day. The solar envelope calls for a design strategy based on what Knowles refers to as natural rhythms. "Sunlight is assured within the envelope's boundaries; hence, designers can make use of the changing directions and properties of light without fear that a taller building will one day cancel their ideas. The potential exists to conceive of architecture in other than static terms. Sunlight can add a dimension of time to conceptions of form and space" (Knowles 1998). Knowles' work has given designers, planners and architects a new aspect in building development which includes the natural environment and not simply a form within.

With the creation of Earth Day in 1970 and the Department of Energy in 1977, it would seem that these environmental construction concepts were on a fast track to becoming dominant issues in American policy. Globally, in 1987, the United Nations World Commission on Environment and Development had created the first definition of the term "sustainable development." In the 1980s and 1990s, advocacy was continued through the work of prominent environmental construction activists such as Robert Berkebile, Bruce Fowle, Vivian Loftness and Robert Fox. In addition, the design of green roofs, water-reclamation systems and

prefabricated energy-efficient wall systems appeared to show signs of providing a means to self-correct the environmental damage that had been occurring. But somewhere the movement lost its luster. In 1993, President Clinton provided a spark to green building concepts by announcing plans to make the White House “a model for efficiency and waste reduction.” Hundreds of industry experts were asked to participate in the “Greening of the White House” and the result was nearly \$200,000 in annual energy and water savings, landscaping expenses, solid-waste costs, and a reduction of atmospheric emissions by 8.45 tons of carbon a year; all within three years (Federal Energy Management Program 1999).

Nearly five years later, President Clinton issued the first “greening” executive orders. Executive Order 13101 called for the Federal government to improve its use of recycled and “environmentally preferred” products. Executive Order 13148 focused on integrating environmental accountability into day-to-day decision-making and long-term planning for Federal agencies. And Executive Order 12123 charged government agencies to improve energy management and reduce emissions in Federal buildings through better design, construction and operation.⁷ As a result of Executive Order 13101 the White House Task Force on Waste Prevention and Recycling (Task Force) was created. The Task Force has successfully promoted Federal purchases of recycled content products. In areas of procurement, the Task Force has seen its most immediate success. According to the Task Force, “from an initial list of five products in the 1980s, Federal agencies and government contractors now buy 54 different types of recycled content products daily, ranging from office supplies, to building materials, to re-refined oil and retread tires” (White House Task Force on Waste Prevention and Recycling Accomplishments --

⁷ Executive Orders enacted under President Clinton can be found at www.clintonfoundation.org/legacy3.htm?dt=executive+orders

1993-2000 1). Government purchases in 1997, for certain Environmental Protection Agency (EPA)-designated recycled content products, exceeded \$350 million; an increase of \$112 million a year, or 30 percent over the 1992 level (Office of the Federal Environmental Executive). The most notable success for procurement efforts are found in copier paper purchases. The General Services Administration (GSA) and the Government Printing Office, the two largest suppliers of copier paper, reported that in just 18 months after the enactment of E.O.13101, in 1998, agencies increased their purchases of compliant recycled content paper from 12 percent to 98 percent.

Executive Order 13101 has also positively impacted the small business community. The Task Force worked with a number of government agencies to intensify the use of "green.com" web sites, and modify existing electronic catalogs and contract schedules. The purpose was to further promote use of recycled content, environmentally preferable and bio-based products and services. Efforts include the greening of "Pro-Net," an electronic gateway of procurement information on more than 195,000 small, disadvantaged, 8(a)⁸, HUBZone⁹, and women-owned businesses. This will highlight in the database small businesses that offer green products and services (Office of the Federal Environmental Executive).

Perhaps one of the biggest achievements of Executive Order 13101 is work the Task Force performed towards sustainable construction materials. The EPA has developed a common database for green specifications and placed it on their web site. The Task Force also worked

⁸ The U.S. Small Business Administration defines "Section 8A" businesses as minority-owned businesses (as defined by the federal government). Businesses classified as Section 8A minority businesses can be awarded a main contract (a "Prime Contract") without competition, because their owners are of a certain racial or ethnic background.

⁹ Historically Underutilized Business Zone. In order to qualify as a HUBZone business, the business must be small; owned by a US citizen; the principal office must be located in a HUBZone; and at least 35% of the employees must reside in a HUBZone.

with GSA to incorporate waste prevention, recycling, and green product clauses into building leases (Office of the Federal Environmental Executive). Future programs of the Task Force include focusing on assisting construction designers and contractors to include sustainable material in their buildings, and also to develop a training module on the use of sustainable construction materials (Office of the Federal Environmental Executive).

Executive Order 13148, also known as *Greening the Government Through Leadership in Environmental Management*, has yet to produce any quantifiable results. Goals set for this order have a target date of December 31, 2005. Some of the objectives that pertain to green building set forth under the program include the following (Department of Energy, 2003):

- Reducing hazardous waste from routine operations 90 percent.
- Reducing releases of toxic chemicals subject to Toxic Chemical Release Inventory reporting 90 percent.
- Reducing sanitary waste from routine 75 percent by 2005, and 80 percent by 2010.
- Recycling 45 percent of sanitary wastes from all operations by 2005 and 50 percent by 2010.
- Reducing energy consumption through life-cycle¹⁰ cost effective measures 40 percent by 2005 and 45 percent by 2010 per gross square foot for buildings.
- Increasing the purchase of electricity from clean energy sources.

¹⁰ Allows for the consideration of environmental, social and economic costs and benefits that occur through the life of a product or service, rather than simply restricting these to the financial outlay involved in the initial procurement.

- Reducing Ozone depleting substances and green house gases by retrofitting or replacing 100 percent of chillers¹¹ greater than 150 tons of cooling capacity and manufactured before 1984 that use class I refrigerants.
- Reduce greenhouse gas emissions attributed to facility energy use through life-cycle cost effective measures 25 percent by 2005 and 30 percent by 2010.

The Energy Policy Act of 1992, Executive Order 12123, has perhaps been the most ambitious of the three Executive Orders. The first step is to identify how public utilities can work with Federal agencies at specific sites to achieve energy savings. This would prove to be a difficult feat. To date, there has been little information released directly related to the achievements of Executive Order 12123¹². In April 2001, the U.S. Department of Energy Secretary, Spencer Abraham, approved a final rule allowing bio-diesel fuel to qualify as an alternative fuel for automobile fleets under the Energy Policy Act. Vehicle fleets required to purchase light duty alternative fueled vehicles under the Energy Policy Act of 1992 are allowed to purchase bio-diesel fuel as an alternative. In 2003, the Energy Policy Act was reviewed by the legislature and parts of the act were revised for clarification. Again, there is little information showing success of the act thirteen years after it was passed.

Despite the otherwise positive achievements in efficiency for federal buildings, support from the national government, and green building exposure, the concept of green building as an obvious choice for new home design and construction has yet to be realized. The creation of the US Green Building Council (USGBC), a non-profit consensus based organization, is trying to

¹¹ Mechanical equipment used for cooling the building temperature.

¹² Chapter Four does provide a brief discussion of Portland's use of alternative fueled vehicle fleets used under this Executive Order.

educate the public and promote the concepts of green building. Founded in 1993, the USGBC has worked to be the industry standard for certifying green buildings. Using a point-based rating system called Leadership in Energy and Environmental Design (LEED), the USGBC certifies buildings at varying levels of “green.” During years 1995 through 1998, volunteer committees developed the rating system. By March 2000, 12 projects nationwide had become LEED certified.

There has been some progress made in green building awareness; and in particular, there has been discussions and considerations associated with the construction of public buildings. Experience is coming from varied sources, mostly with pilot programs for schools and incentives for commercial building design and construction. Moreover, the US Green Building Council has been growing its membership at a considerable rate. The council started with 23 members using \$125,000 of seed money from the Department of Energy. At the time, it had one staff person. By 2003, just 10 years later, the council mushroomed to over 3,400 members with a budget of \$10 million and 40 full-time staff members. The USGBC is projecting its membership to grow to 50,000 by 2007, with the number of chapters representing municipalities around the US projected to rise from 20 to 200 by 2005 (U.S. Green building Council). This level of growth is creating credible and consistent support across the country. There have also been significant strides made by local governments to adopt green building policies. Austin, Texas set the standard more than ten years ago and the City of Portland, Oregon has practically transformed into a green building leader. As of 2004, there were 75 LEED certified projects and 884 registered projects (in process of design and/or construction) in the city of Portland (U.S. Green building Council- Cascadia).

In terms of public opinion on green building, there have been industry experts looking for market trends to enable competitive advantage in the sale of environmentally sensitive buildings. From 2000 to 2003 there were four surveys¹³ conducted on consumers' opinions about green building. Sponsored by the National Association of Home Builders Research Center (NAHBRC), the National Environmental Education and Training Foundation (NEETF), and Roper ASW, these surveys used random sampling to find out what priority the public gave to "green features" and what level of knowledge Americans had on conservation items. The results were a mixed bag at best. Responses showed inconsistency, lack of real knowledge, and a roller coaster pattern from the first year to the last year. There simply is not enough exploration to warrant labeling public opinion on green building as anything other than inconclusive. For instance, the NAHBRC study in 2000, which was one of the first public opinion reports on green building, suggested that perhaps opinion about green building was higher than most thought. Energy-efficient features ranked highest among values of homeowners, followed by indoor air quality and resource conservation. In a subsequent survey in 2001, opinions held strong and these three factors were again the highest-ranked features. There are interesting findings when one compares studies from 2000 to 2001. Homeowners decreased their support for upgrades such as kitchen cabinets and increased their support for energy-efficient features and xeriscaping from 2001 to 2002. Xeriscaping is a landscaping method that promotes slow-growing, drought-tolerant plants to conserve water and reduce yard trimmings. Likewise, the use of engineered lumber and gray water recycling, neither of which carry mainstream name recognition, raised in public support by more than 11 percent.

¹³ There are in fact a number of public opinion polls that survey specific issues such as home energy usage and water conservation efforts, but this number refers to surveys specifically addressing the components of Green building.

Also according to the surveys studied Americans are not nearly as knowledgeable about energy conservation as once thought. Evidenced from the 2001 National Environmental Education and Training Foundation (NEETF) Report Card suggests only 12 percent of those surveyed could pass a basic energy quiz. While this may be a testament to a lack of energy education (only 2 in 5 individuals understood that conserving fuel and electricity is the only way to address immediate energy demands), it is also a reflection of changing values about the environment and American homes. Home energy efficiency tends to be most salient after a direct environmental crisis or event (Smith 2002). The rolling blackouts of 2001 was one such event and consumers put energy efficiency at the top of their value list, but later replaced it with a completely different value, for example, security, following the events of September 11th, 2001.

The Energy IQ, part of the tenth annual National Report Card, gives insight into opinions on consumer behavior. In 2000, 85 percent of those surveyed reported home energy-efficient behavior such as turning off lights and power when not in use. In 2001, those reporting this behavior had increased to 89 percent. In a similar report, the 2001 Green Gauge Report, the same home energy efficiency activity was echoed, reporting that saving electricity at home was the highest ranked environmental activity with 65 percent participation. However, in 2002 the Green Gauge Report which asked about this same type of activity reported only a 57 percent participation rate. In fact, all of the energy saving activities in the 2002 Green Gauge Report were down by at least 2 percentage points from 2001, and some as much as 9 percentage points.

To add to the inconsistency of increasing support for energy-efficient homes and decreasing participation of energy saving activities that garner such efficiency one can add the

element of consumer spending on energy-efficient appliances and systems. According to the Green Gauge 2002 Report, consumers are willing to pay for products that conserve energy and are less polluting. In fact, appliances that use one-third less energy and electricity generated from renewable sources show an increase in support by as much as 7.6 percent. Interestingly enough, those most willing to pay for renewable energy are among those with lower incomes. Those individuals with the highest income bracket (over \$75 thousand annually) were the least likely to pay for energy efficiency. In addition to income, women and adults aged 18-29 were also more willing to pay more for electricity generated from renewable sources. Overall, Americans increasingly recognize energy efficiency as a top priority in their homes, but the number of individuals reporting participation in what most consider a top home activity varies among surveys

Perhaps the most difficult opinions to capture are views on support for water conservation in homes. There are two basic types of water conservation methods: changing water use habits and installation of water-saving and recycling equipment. Changing daily water use habits involving activities like taking showers instead of baths; filling the sink with water when shaving or brushing teeth instead of letting the water run; or only running the washer when full. Installing faucet aerators and water-efficient toilets and showerheads are important water saving practices. The water conservation practices with most economical payback include: plumbing retrofits, leak detection and repair, xeriscaping, and education. Here I look at techniques for each:

- Plumbing Retrofit: Replacing older water-wasting fixtures with more modern water-efficient fixtures. One flush of a conventional toilet consumes about 3.5 gallons and 5-7

gallons for older toilets found in 80 percent of all homes. There are also water-conserving toilets now available which consume as little as 1.6 gallons per flush, known as “low-flow” toilets. One 5 minute shower (with an older showerhead) uses as much as 25 - 35 gallons. Using water-efficient plumbing fixtures (showerhead, faucet aerators, automatic shutoffs for hoses, and low flow toilets) reduces the amount of water used (*Air Force Pollution Prevention Strategy, 1995*).

- **Leak Detection and Repair:** A leak detection and repair program is vital to water conservation. A leak detection and repair program in Arlington, Massachusetts, (with a population of 50,000) reduced water usage from 131 gallons to 100 gallons per person/per day. The East Bay Municipal Utility District of Oakland, California recovered 4 million gallons per day in the first two years of its leak detection program.
- **Xeriscaping:** Xeriscaping is the use of water-conserving landscaping which includes the use of drought-resistant plants, water restrictions and reduced lawn size. The use of landscape demonstration gardens that use low water-using plants can be a significant communication tool in water conservation. These gardens may be planted in locations used for various military ceremonies such as change of command, promotions, or other awards. The gardens demonstrate a variety of attractive, native low water-using plants, irrigations methods, permeable walkways, and other water-saving techniques.
- **Water Conservation Education:** Education designed to raise awareness through public campaigns and offering tips for saving water should reduce residential water use. This may be accomplished by posting notices regarding proper use of water equipment or

advising visitors of water conservation efforts. An installation water-conservation hotline for information and leak reporting is also an option.

A study from the U.S. Geological Survey released in 2004 boasts water consumption as largely unchanged since 1985. However, according to the survey, homes and small businesses make up only about 11 percent of the national consumption numbers. It is naïve to assume that homeowners have voluntarily contributed to this stability. In fact, some of the success that has been made in household water conservation is possibly a result of the National Energy Policy Act of 1992, which changed the standards of low-flow fixtures and water saving appliances¹⁴.

The Energy Policy Act of 1992 is a wide-ranging effort to effect change in the use of energy and water in the United States. Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities, focuses on providing a better institutional process for Federal agencies to achieve the mandates of the Energy Policy Act. The order was signed March 8th 1994, requiring each agency responsible for managing Federal facilities to conduct a prioritization survey. These prioritization surveys will be used to establish priorities for conducting comprehensive facility audits (CFAs). Only cost-effective water conservation projects recommended in the CFA will be implemented. A water conservation project is considered cost-effective if its payback period is less than 10 years. In addition, the reductions must not interfere with the mission of the agency by hindering effective operations. Federal agencies must accomplish all cost-effective water conservation projects by the year 2005. Federal agencies must prepare an annual report on progress in achieving water conservation to

¹⁴ There is no empirical data to support this and is strictly the opinion of the author inferring the effect of mandates over personal choice.

the Department of Energy (DOE) and the Office of Management and Budget (OMB) (Executive Order 12902, 1994).

In addition to national legislation, many local municipalities have taken the lead with price and non-price programs. Data on the effectiveness of pricing programs is still unfolding, but when consumers pay, based on usage, there is noticeable water savings. Metering has given utility companies and researchers the ability to track water conservation by individuals. GreenLane, a Canadian environmental research group, notes that when water usage is tied to price increases, metered households generally show reductions in water use. The greatest savings occur during the summer months, when water use is usually much higher due to frequency of lawn watering, car washing and other outdoor uses. According to the group, “in 1999, water use was 70% higher when consumers faced flat rates rather than volume-based rates” (Environment Canada 2005). Non-price programs such as rebate and retrofit device programs are also used, but again, data on the effectiveness is inconclusive.

The Environmental Protection Agency suggests two methods to conserve water: engineering practices and behavioral practices. To establish a theory on attitudes towards home water conservation I look at opinions on water as an environmental issue. Questions of water conservation are largely trumped by questions of water pollution. Several surveys researched, had an overwhelming focus on pollution as opposed to conservation (Green Gauge Report 2001; 2002; 2003; Environmental Defense 2001).

According to the 2002 Green Gauge Report, water pollution, which was once a big public concern, now ranks 12th among individuals’ priorities dropping 7 points from the previous year. It should also be noted that water issues, are often seen as a part of larger environmental issues

and not large enough to stand alone like energy issues. For the most part opinions on water conservation in residential homes are under researched. As noted above, public opinion on green building, home energy efficiency and home water conservation has yet to paint a lucid picture. For this reason, this research will conduct new surveys on green building with a focus on energy efficiency, water conservation and indoor air quality. The results are discussed in Chapter Four.

New Urbanism

The issue of New Urbanism, as it pertains to green building, is a relatively hollow question. To date, there are no case studies of cities, communities, urban revitalization or planned developments that have incorporated both New Urbanism and green building¹⁵. New Urbanism has grown out of a response to unmitigated urban sprawl. Conventional suburban development grew after World War II, replacing neighborhoods and homes within walking distances of town amenities (New Urban News). Suburban development quickly became the norm, increasing automobile use and consuming large tracts of land. The social implications of sprawl quickly became apparent as the working poor spent more of their income on transportation and communities became fragmented. Sprawl and a lack of transportation choices force people to own and drive cars in order to reach most destinations. In communities across America sprawl-scattered development, increases traffic, saps local resources, destroys open

¹⁵ A thorough search by the author returned no evidence of any existing New Urbanist community employing green building within the United States. Should such a town or city develop during the time of publication, I stand corrected. Sprawl lengthens trips and forces us to drive more often. According to The Coalition for Smarter Growth, a D.C. based professional association, the average American driver spends 443 hours per year-the equivalent of 55 eight-hour workdays-behind the wheel. "Residents of sprawling communities drive three to four times as much as those living in compact, well-planned areas. Adding new lanes and building new roads just makes the problem worse" says the Coalition. Studies show that increasing road capacity only leads to more traffic and more sprawl (Noland and Lewison 2002; Fulton, Noland, Meszler and Thomas 2000).

space and has taken a serious toll on American's health, environment, and quality of life (Cervero 1998).

As sprawl increases our reliance on cars and driving, it makes our air dirtier and less healthy. In fact, the transportation sector is responsible for a majority of the gases that cause smog and 56 percent of the total US emissions of nitrogen oxides (NOx) and 47 percent of the volatile organic compounds (VOCs) (Brenner 2000). Up to three times more energy from driving can be consumed in sprawling areas than in better planned, more compact cities that offer transportation choices (Cervero 1998). Between 1980 and 1997, the number of miles people drove in cars, trucks and buses increased an astounding 68 percent (Heart, Bennet and Biringer 2000) while population only increased by 18.7 percent¹⁶.

As for local resources and open spaces, a recent report by the American Farmland Trust revealed that every year in the United States, one million acres of productive farm land and open space is bulldozed by sprawling development. According to the agency, development is replacing farmers' fields, disrupting small-town agriculture and a way of life. An astounding 70 percent of prime or unique farm land is now in the path of rapid development.

Sprawl also threatens wildlife by destroying habitat. Some of America's premier ecosystems are directly jeopardized by sprawl. This includes areas like the Chesapeake Bay, the Great Lakes, Puget Sound and the Florida Everglades (Florida Department of State, 1995). In Florida, especially, sprawl has threatened wetlands. Each year, more than 110,000 acres of these natural filters are destroyed (Sierra Club 1999). Because wetlands act as flood-absorbing

¹⁶ www.census.gov/population/estimates/nation/intfile1-1.txt

sponges, there are serious consequences for allowing sprawling development in wetlands, especially in disaster-prone floodplain areas. In the past eight years, floods in the US killed more than 850 people and caused more than \$89 billion in property damage. Much of this damage occurred in states and counties where weak zoning laws allowed developers to drain wetlands and build in flood plains (Rhode Island Sustainability Conference 2000).

New Urbanism came about in a response to urban sprawl. In walkable communities, the architecture inspires a sense of pride and ownership, and the build planning concentrates on centralized meeting places for the community. From its start in the late 1970s, New Urbanism has been represented in hundreds of new towns, neighborhoods and villages. To be exact, as of the end of 2003, there were 648 New Urbanist communities built, under construction or planned¹⁷. New Urbanism has become a constant consideration among planners and government officials. Today, there are at least fourteen new large-scale planning initiatives that have been based on the principles of New Urbanism; with hundreds more in the planning stage (New Urban News 2004). Sometimes referred to as Neotraditional Design (NTD), Transit Oriented Development (TOD), and Traditional Neighborhood Design (TND), New Urbanism, or at least elements of New Urbanism, can be found in almost every major city in the United States. Within Central Florida, there are half a dozen communities that prescribe to New Urbanism. As mentioned earlier, Seaside, Florida was the first New Urbanist town. Developed in 1981 on 80 acres, the town has remained the first true success story, creating a New Urbanist style in a commercially functional marketplace. The best-known of New Urbanist designs, perhaps around the world, is the Town of Celebration, Florida. The Disney created city, built in 1996, is a true

¹⁷ These are designed according to the principles of the New Urbanism and are at least 15 acres.

success story for New Urbanism and has been hailed as a blueprint for future town development (National Public Radio 2005).

As outlined above, New Urbanism has its roots in creating a better quality of life. Perhaps the notion that is overlooked in New Urbanism is the fact that a better quality of life is not at the expense of the surrounding environment. In fact, it would be nearly impossible to create a healthier more statically integrated community life without the consideration of all living things within the environment. It is for this reason that I see the concepts of New Urbanism and green building speaking the same language.

Source Cues

The issue of source cues has received much attention over the last few decades. Research has addressed the frequency of source cue use, the subject matter most susceptible to source cues, and even the type of individuals that use source cues (e.g. Mondak 1993, 1994,1997; Kuklinski and Hurley 1994; Ottati 1990; Iyengar 1990; Hurwitz and Peffley 1997; Nadeau and Niemi 1995; Peffley Hurwitz and Sniderman 1997; Stoker and Jennings 1995). Among scholars that have devoted considerable research time to the topic is Jeffrey Mondak. Mondak (1993) points to the relationship between individual level cognitive processing and influence on political behavior. Specifically, how an individual's use of heuristics for decision-making garners true impact when viewed at the aggregate level. The ability of individuals to use efficiency strategies such as heuristic processing to simplify otherwise complex issues is no longer in question. In fact, the accuracy of or degree that heuristic processing is used is also of little importance to Mondak. The researcher notes that reliance on heuristic processing of source cues occurs, and must only meet two criteria to function as a method of cognitive efficiency. First, the cue must

be available. Second, the cue must be relevant. However, according to Mondak, issues of high saliency are relatively less likely to use heuristic processing such as source cues because of the availability of relevant information on the issue. This access to information reduces the need for an efficiency strategy. Mondak (1993) performed a quasi-experimental study using existing public opinion surveys to measure whether the use of a source cue, in this case the name Ronald Reagan, would influence respondents' opinions on public policy issues. The surveys were performed by separate organizations but contained the same substantive concerns. The difference between the surveys was that one had included Ronald Reagan's name within the question. The author entertains other possible causes for any differences that may be found between respondents' answers, adding that inconsistency in wording could explain some discrepancies. It should be noted that the green building survey was not tested for wording bias. The decision to not pre-test the wording of the survey was made on the basis that only the source cue words were different between the three surveys, providing all respondents with exactly the same wording except the source cue words.

Mondak's quasi-experimental study contained six classes of variables. The purpose of the measures were to expose any contextual factors that would explain discrepancies. Of these, three are relevant to the green building survey. First is media attention. According to the author, "the impact of source approval on issue evaluations should be inversely related to the level of media coverage" (Mondak 1993 196). Therefore, more media coverage on the issue results in more familiarity for the respondent and ultimately less influence from the source cue. The green building survey did not have an opportunity to measure direct exposure in the media, neither prior to or during the experiment. However, the research does control for "awareness." the

overall lack of media attention to green building does not afford an opportunity to test media exposure directly. An online search was run on the local newspaper (The Orlando Sentinel) which serves as the main publication for the four surrounding counties: Orange County, Seminole County, Osceola County, and Volusia County; returned no articles referring to green building within the six months preceding the administration of the survey.¹⁸

The second applicable variable is question length. Mondak supports Schuman and Presser (1981) in his conclusion that wording of survey questions can influence respondents' choices. The more information the respondent is able to extract from the question, the less need there is for an efficiency strategy such as a source cue. Mondak proposes that the length of the survey question can impact the respondent by providing substantial information regarding the issue. Therefore, Mondak chose to use only brief survey questions with cue items. These questions have twenty words or fewer. Drawing on this logic, the questions on the green building survey was limited to twenty words or fewer to mitigate any additional information on the topic other than the source cue. This should not only create a need for use of an efficiency strategy, are the use of the cue as an efficiency strategy.

The third and final variable I took into consideration from the Mondak (1993) study was the consideration of a "new issue." According to Yeric and Todd (1989), issue typologies are broken down into three categories: enduring, emerging and transitory. Enduring issues have had a presence in the public realm for a number of years; emerging issues are at the commencement of a long stay in the public realm; and transitory issues experience a prominent position in the public realm but only for a short period of time. To categorize green building is difficult due to

¹⁸ A word search was performed online using the term "Green building" for the last six months and returned no articles found.

its lack of public exposure and infancy, placing it between emerging and transitory. I believe the issue will secure its place as emerging, but for the purposes here it is more important to make that it is simply a new issue. New issues necessitate reliance on external cues because they provide little or no public past perception (Yeric and Todd 1989). Using Mondak's (1993) study as a guide to developing the survey questions, I have created relatively simple survey that provides source cues that are easily understood and relevant.

In addition to Mondak's influence on the design of the survey, the overall theory of heuristic processing at the aggregate level holds true for this issue. As Mondak argues, "insight regarding the character and shape of mass opinion (can be) gained by considering an individual-level psychological process while studying an aggregate-level phenomenon" (Mondak 1993 205). Cognitive heuristics has long been established as playing a role in individual decision-making. Mondak (1993) continues this research by looking into the "how" of cognitive heuristics, specifically source cues. Mondak predicts that heuristic processing is widespread and used for a range of decision making. Specifically, where substantive information is limited or the subject is of low or no personal interest to the individual. According to other scholars, the most powerful criteria driving decision-making is not necessarily the one most important to the individual, but often the one most accessible, or recently primed to the "top of the head" (e.g. Zaller 1992, Iyengar and Kinder 1987, Riker 1986, Barker 2002, Jones 1994). In addition, scholars have argued that "gut level" heuristic processing (Popkin 1991) often produces political outcomes that are virtually indistinguishable from those produced under conditions of complete information (e.g. Downs 1957; Nisbett and Ross 1980; Lupia 1994).

Anthony Downs has served as the grandfather of the study of the use of heuristic rationale. Downs noted that uses of cognitive mechanisms are an efficiency means of processing information. Mondak (1993) does suggest, however, that “correct decisions are preferable, but precision brings inefficiency; the citizen must balance the competing demands of accuracy and expedience” (Mondak 1993 168). Petty and Cacioppo’s (1986) Elaboration Likelihood Model also illustrates the difference between the central- or periphery-route processing. According to this model, individuals that examine the context of the information use central-route processing method, and those that use a relatively short examination periods (or none at all) utilize short cut indicators or peripheral-route processing methods. Chaiken (1976) elaborates on this model by suggesting that even the simpler of the two methods, peripheral-route, is a heuristic process. The theory that the simplest of heuristic processes is based on cognitive action is supported.

Mondak (1993) expands on this theory by focusing his attention on opinion holding and opinion direction. The purpose of both is to determine support for the theory that individuals using cues can be influenced in their opinion of an issue even if they have no prior knowledge, and the influence can be either positive or negative.

Many scholars have concluded that citizens’ use of heuristics, specifically cues taken from political elites, serve as a rational and effective way for citizens to make the right choice. Authors Kuklinski and Hurley (1994), however, question whether the use of such heuristics, are in fact, an effective means for political decision-making. With political elites as the source cue, the influence on the public can (and perhaps should be) one of self-motivation. In addition, the way in which individual citizens interpret and validate information leaves open the possibility that the “real opinion” may never be obtained.

To establish that citizens do, in fact, use source cues to guide them in their opinion, I cite Downs (1957) and Zaller (1992). Consistent with Downs, I suggest it is rational to use cues in decision-making. Zaller supports this theory by noting that individuals use political elite's reputations as contextual information to analyze specific issues, leading to the concept that elite consensus generally produces mass consensus (Zaller 1992). The question for Kuklinski and Hurly comes not from whether individuals use heuristics such as cue-taking, but why they do not appear more knowledgeable about the issue from which the cue was received. To support the notion that using heuristics may not produce effective decision-making, Kuklinski and Hurley (1994) conducted an experiment using surveys to determine whether individuals' opinions are influenced by the messenger. The experiment required using a subject matter that the authors could confidently assume the public had already established an opinion on. To determine "true attitudes," the authors used race as their subject matter. Supporting this decision are Sniderman, Brody, and Tetlock (1991) writing that "No one supposed that the public is similarly handicapped on issue of race" (1991 78). With the subject outlined, I use a four page survey instrument on a split sample of black and white non-students to measure the question of effectiveness. Specifically, they hypothesize that the issue of black self-reliance would be unaffected, or "inelastic" by the deliverer of the message. The instrument used four different messengers of the same exact quotes. The dependent variable, the measure of the effect, is how much the respondent supports the statement. The independent variable, the measure of the cause, is the messenger. Two of the messengers were black political figures, two were white political figures, and all four had a specific political ideology. There were also non-attributable statements. What Kuklinski and Hurley found was the ability to reject the null hypothesis. The

research showed evidence of the black sample being directly influenced by the messenger. On the contrary, the white portion of the sample seemed unaffected by the messenger. Looking further into the research, we see that controlling for race and ideology appeared to produce a stronger causal relationship, as the black respondents were more influenced by the color of the messenger's skin than his ideology. Kuklinski and Hurley also found that when performing recall measures, those respondents that received non-attributable statements were more likely to remember the context of the statement. It should be noted that a recall measure was not an option for the green building survey. However, a recall measure should be pursued in future research to understand the significance of the source cue impact.

Turning to Chaiken (1976) I also question how individuals use cues. The focus here is whether individuals evaluate the validity or reliability of a message received from political elites. While Chaiken speculates that these heuristics are acceptable in guiding citizens, he points out that most citizens are not using the cues merely as guides, but as answers. Here, Kuklinski and Hurley point out that for many, the "who" takes precedent over the "what". In the case of green building, this is perhaps one of the key pieces to understanding support. When asked questions about green building, do respondents use a more central-route method to establish their opinion? Are they capable of using anything other than a peripheral-route method due to the lack of exposure green building has received in the media?

One issue that has repeatedly surfaced during the research on support for green building is the association it has with the environmental movement. Whether individuals classify the green building movement as a subgroup of environmentalism along side topics such as arctic drilling and logging, is unknown. While green building has not garnered the attention that the

before-mentioned topics have, the ability of individuals to link green building to environmentalism and transfer their existing opinion about other environmental issues exists. Simplifying this concern, I turn to the question of stereotyping. Researchers Mark Peffley, Jon Hurwitz and Paul Sniderman (1997) have taken on the issue of stereotyping. Their research focused on stereotypes and the affect the stereotypes have on welfare and crime policy. The researchers inversed the typical questions of stereotypes and manipulated the issue to question what happens when whites who embrace negative stereotype of blacks are confronted with scenarios in which blacks do not fit the pejorative impression. The goal was to determine two things. First, to find the extent of whites' political evaluations of blacks in areas of welfare and crime biased by race and second to evaluate those who embrace and reject negative racial stereotyping to determine how they react when information is inconsistent with their previous knowledge. More accurately, when does theory-driven become data-driven? Theory-driven data involves testing a predetermined theory. This theory, built from prior knowledge, is applied to the new data set to draw out valuable information to confirm or refute the theory. Data-driven data refers to processing in the opposite manner, using tools to create patterns found in the new data (Bordens and Abbot, 1988).

Cognitive psychology has long questioned whether individuals explain issues by recalling their already established impressions. Conversely, data-driven models suggest that individuals who possess these established stereotypes will still process information to a conclusion that is divergent of their established belief. What Peffley, Hurwitz and Sniderman (1997) found in their research did not fully support either theory. When blacks were nonconforming to the stereotype, whites even with negative stereotypes deterred from their established impressions.

To explain this, the authors cite Fiske and Neuberg (1990), who argue that “positive racial subtypes of especially hard-working or well-behaved blacks may exist alongside negative global categories, with subtypes being reserved for the few exceptions that prove the rule” (1990 53). This subtyping may also be used by negative stereotypes to “deny, in a sense, their own prejudice by being able to conceptualize good blacks while simultaneously disparaging most others” (1990 53). Other possible explanations are that those with negative stereotypes attempt to overcompensate for their admitted negative generalized responses. The idea that respondents of the green building survey are able to conceptualize the “good” of green building even if they have a negative stereotype of environmental issues is not questioned within this study. This would require that there be a definitive association between green building and environmentalism and that the respondent have a negative stereotype of environmentalism. While both of these variables are worth further investigation, determining if the public even has a “real opinion” on green building must be established first.

In conclusion, the use of source cues as a cognitive efficiency strategy has been well documented. Whether green building is salient enough, ideologically based, or even stereotyped to the point that source cues are used is still open for debate. In Chapter 5 I will attempt to answer these questions by looking at the role source cues play when surveying public opinion on green building.

CHAPTER THREE

Green Building Experts

The objective of this chapter is to determine opinion of green building experts on two important issues. First, the research measures what industry expert's judge to be the level of public awareness of green building concepts. More specifically, the research seeks to identify if there is any regional variation in awareness of the concept of green building, as perceived by green building experts. Second, the research seeks to identify the component of the green building initiative that industry experts are most inclined to focus on when selling the idea to potential consumers. Auxiliary to this question is whether water efficiency might be the greatest focus in the South and Southwest regions of the country.

Identifying the opinions of green building industry experts is established with the use of a one-page survey instrument. Industry experts are defined as professionals working directly on green building projects. These include owners, contractors, designers/architects, engineers, manufacturers, consultants, and researchers. The survey was designed to elicit information on the two specific issues mentioned above: 1) percent of people that experts believe are aware of green building concepts and 2) which green building concept industry experts focused on when explaining green building ideals. The surveys were administered at a national conference in Portland, Oregon that was intended to promote green building construction methods. Sixty-three percent of all conference attendees who were asked to fill out the survey complied with the request.

Hypotheses

The first hypothesis, **Hypothesis 1**, references the green building experts' perception of public awareness on the subject matter of green building. Here, I predict that overall awareness of green building will be low. Specifically, it is held that most industry experts will respond that less than 50 percent of people are aware of green building initiatives. Moreover, it is hypothesized that awareness will be dependent on (or a product of) the region of the country that the industry expert calls home. Particularly, I believe that experts residing in the Northwest region of the country will perceive higher levels of awareness of green building than experts from other regions of the country. The second hypothesis is based on the relative aggressiveness of public initiatives throughout the northwest promoting, and even mandating green building practices.

Cities such as Seattle and Portland have taken the lead in green building policy by requiring businesses and citizens to comply with building code requirements that are consistent with a green building philosophy; tax incentive programs used to stimulate the adoption of green building practices; and other voluntary programs aimed at educating residents about green building through rebates and discounts on certain building materials. In addition to green building policies, the Northwest has consistently pursued other environmentally conscious policies. Portland, for example, in 1993 was the first major city in the United States putting into place a greenhouse gas reduction strategy in 1993. Since then it has approved a 10 percent reduction in greenhouse gas goal from 1990-2010 (Oregon Department of Energy). The city's

mayor was also one of the first ten to sign the 2005 US Mayors Climate Protection Agreement¹⁹ (while the agreement was the creation of Seattle Mayor Greg Nichols) (US Mayors Climate Protection Agreement 2005). Meanwhile, as of 2005, the city received 12 percent of its energy from renewable sources, including waste methane fuel cells (Oregon Department of Energy). In addition, about 25 percent of the city's fleet of vehicles runs on alternative fuels, with over 600 biodiesel vehicles (Greencar Congress 2005).

Portland's reputation as a green building leader is reflected in both policy and actual building construction. Portland is ranked number two in the nation in Leadership in Energy and Environmental Design (LEED) buildings per capita, with 78 certified and registered buildings (USGBC- Cascadia 2005). Much of this momentum can be attributed to the city's green building incentive programs. In 2002, the Portland City Council amended the city's existing green building policy to make it binding policy and directed all city bureaus and the Portland Development Commission to require that all new, city-owned facilities and construction projects meet LEED Gold certification standards.²⁰ In addition, the city required that all city-owned "*occupied-existing*" buildings must be retrofitted to guarantee LEED Silver certification. Portland went so far as to impose a requirement that design and construction of all new city-

¹⁹ On February 16, 2005 the day the Kyoto Protocol took effect in the 141 countries that ratified it; Seattle Mayor Nickels challenged mayors across the country to join Seattle in signing an agreement to take local action to reduce global warming pollution.

²⁰ LEED certifies buildings at four levels: certified, gold, silver, and platinum. The level is based on the number of points the building achieves at construction completion. Points are given based on the LEED checklist for individual practices.

owned facilities would include an ecoroof²¹ with at least 70 percent coverage and Energy Star^{TM22} -rated roof material on any remaining non-ecoroof roof surface area.

Seattle has established similar policies to promote green building initiatives. In Seattle, all buildings constructed in the city must meet certain requirements for environmental performance. These are code requirements set forth by the city and are a requirement of building permits; meaning, they are *not* optional. Code compliance of environmental-related building requirements includes the areas of stormwater, grading, drainage²³, and energy²⁴. In addition, the City has water conservation requirements and indoor air quality standards as part of its building code (Department of Planning and Development).²⁵ Moreover, Seattle's "Sustainable Building Policy" program is an integral part of the city's move toward sustainability. The program calls for new city-funded projects and renovations of over 5,000 square feet to achieve a Silver Rating using the US Green Building Council's (USGBC) LEED Rating System.²⁶ Seattle currently ranks number four in the nation for LEED buildings per capita (USGBC- Cascadia).

Lastly, Seattle also has a plethora of voluntary green building programs that offer both incentives and free resources. Programs such as the "Reach Program," offered by the Seattle

²¹ An ecoroof is a living vegetated ecosystem of lightweight soil and self-sustaining vegetation. It is biologically "alive" and as such provides a protective cover on the building by using the natural elements of sun, wind, and rain to sustain itself.

²² ENERGY STAR is a government-backed program qualifying product performance to be energy efficient.

²³ <http://www.ci.seattle.wa.us/dpd/Codes/sgdcode.htm>

²⁴ <http://www.ci.seattle.wa.us/dpd/energy/default.htm>.

²⁵ <http://www.ci.seattle.wa.us/dpd/Codes/sgdcode.htm>

²⁶ <http://www.seattle.gov/sustainablebuilding/policy.htm>

Office of Housing, offers low interest loans to qualifying residents to insulate their homes in efforts to make them more energy efficient. Likewise, the “Wash Wise” program, offered in partnership with the local utility company gives citizens rebates of \$25 to \$100 for the purchase and installation of qualified energy and water-saving clothes washers. The more energy and water the washer saves, the higher the rebate.

The programs just describe in Portland and Seattle provides grounds to speculate that the Northwest region of the country will be more familiar with the concept of green building. Both cities have among the highest percentage of LEED buildings in the country and both municipalities exercise their political muscle to inject LEED standards into building codes. Combining this with the number of publicly and privately funded green building programs in these two cities, which are the largest cities in the Northwest, causes one to speculate that industry experts from the Northwest will correctly assume that this region has the highest level of public awareness of the concept of green building.

A second, two-part hypothesis, deals directly with the focus that industry experts use when discussing green building initiatives. **Hypothesis 2A** is that energy efficiency will be the dominant focus even though the broader concept of green building involves things beyond energy efficiency such as indoor air quality and water efficiency. Survey respondents were asked to select one concept of green building that they are most likely to emphasize. In addition, **Hypothesis 2B** predicts that a focus on water efficiency will be dependent on region with experts from the South and Southwest more inclined to focus on water efficiency. This query into the focus of green building professionals is undertaken for two reasons. First, one can imagine that

industry experts concentrate on a particular green building concept because it is the component of green building that is most widely accepted by the public they interact with. Understanding the focus of industry elites should shed light on the component of green building that is most widely accepted. Second, by undertaking a regional analysis of focus one may learn how different green building concepts are accepted in different parts of the country.

To support the hypotheses regarding focus, I reference the National Association of Home Builders Research Center 2000 and 2001 study, the 2001 National Environmental Education and Training Foundation (NEETF) Report Card, and the 2001 and 2002 Green Gauge Report. The 2000 NAHBRC study reported energy efficiency features ranked the highest among values of homeowners, followed by indoor air quality and resource conservation. These standings held identical in the 2001 study. Likewise, the 2000 NEETF Report card provided data showing that individuals elected energy efficiency behavior (such as turning off lights when not in the room) as the most highly participated environmental activity in their home. Of those surveyed, 85 percent responded with energy efficient behavior in 2000, followed by an increase to 89 percent the following year. In addition, the 2001 Green Gauge Report repeated the energy efficiency trend, reporting that 65 percent of respondents thought saving electricity at home was the highest ranking environmental issue. When the issue of spending was introduced, consumers remained consistent in their responses, reporting a willingness to pay for products that conserve energy. Appliances described as using one-third less energy and electricity generated from renewable sources show an increase in support by as much as 7.6 percent (Green Gauge Report 2002).

The consistent focus on energy efficiency across varying studies affords a significant level of assurance that energy efficiency is a top concern for most people. Whether this focus is due to exposure, environment, or knowledge is beyond the scope of this study. If individuals are focused primarily on energy efficiency, then it is my prediction that this focus has either come directly from the message supplied by green building experts or these experts are using the focus to open dialogue with individuals that may otherwise be unfamiliar, and possibly unreceptive, to information about green building.

Methodology

To test these propositions, a survey instrument was designed to measure the opinion of green building industry experts (See Appendix A for a copy of the survey). The population was green building experts attending the US Green Building Council's 2004 annual green building conference called GreenBuild. The conference is the industry's premier event and introduces the latest advancements in green building design, construction, project financing and building management. The conference incorporates educational programs, exhibits, LEED workshops, green building tours, awards and networking. Greenbuild 2004 in Portland, Oregon was attended by over 8,000 professionals. The survey sample was a random segment of conference attendees who were asked to participate at the end of the lunch session on day one of the four day conference.

To measure how green building experts perceive public awareness of the issue, respondents were asked what percentage of new clients and customers they thought could define green building. The use of the words "new clients and customers" is intentionally used instead of "public." By asking the respondents about individuals they speak with presumably on a daily

basis, I can assume that the answers provided are a recollection of actual interactions as opposed to merely guessing about what the general public thinks. The decision to use this wording was intended to mitigate response bias that might occur from respondents being asked to speculate.

Next, I looked at measuring green building experts' focus when discussing green building programs. Respondents were asked to select one of six areas that receives the most emphasis when they talk about green building; energy efficiency, water conservation, technology, materials, waste removal and indoor air quality.²⁷ The survey instrument also asked respondents to identify the region where they work.

Results

The survey finds that 61 percent of all green building experts estimated that 25 percent of the public knew of the concept of green building. As evidenced in Table 3-1, there was little difference in responses based on geographic location, with the possible exception being the Northwest region. The northwest region was the only region to report any awareness at the 100 percent rate. Data from the Kruskal-Wallis test, however, produced a Chi-Square value of 2.7. This suggests that there is not a statistically significant relationship between awareness as perceived by industry experts and region. Although the statistical test found independence by region, one can note by looking at the raw data that the Northwest region was somewhat more likely than the other regions to perceive a higher level of awareness of green building. There was also a small regional difference (although it is not statistically significant) which finds at least 18 percent of experts recognizing 50 percent awareness level in all regions except the South. In the South only 7 percent of experts perceived awareness at the 50 percent level.

²⁷ For purposes of clarifying the data, technology, materials and waste removal have been collapsed into one category.

Table 3-1.

**The Percentage of People with Awareness of Green Building:
As Perceived by Industry Experts**

	Northeast No. (%)	South No. (%)	Northwest No. (%)	Southwest No. (%)	All Regions No. (%)
100 Percent	0 (00)	0 (00)	2 (04)	0 (00)	2 (02)
75 Percent	2 (10)	1 (04)	3 (07)	1 (04)	7 (06)
50 Percent	6 (29)	2 (07)	8 (18)	5 (22)	21 (18)
25 Percent	11 (52)	21 (78)	25 (56)	14 (61)	71 (61)
0 Percent	2 (10)	3 (11)	7 (16)	3 (13)	15 (13)
n	21	27	45	23	116

An overwhelming 64 percent of all industry experts selected energy efficiency as their primary focus (see Table 3-2). Water efficiency and indoor air quality were the focus of two and three percent of experts, respectively. Green building experts did rate materials as an important focus, even above water efficiency and indoor air quality, but it is far behind a focus on energy efficiency. In fact, a Chi-Square test for independence on “focus” produces a value of 109.7 suggesting I can be 99 percent certain that green building experts are more likely to focus on energy efficiency. When the data is examined by region, energy efficiency is still the most dominant focus among experts for green building concepts.

There was one support for **Hypothesis 2B**: the South was the only region to rank water efficiency as a focus. However, one should not place too much weight on this, since only two percent of green building experts from the South emphasize water efficiency. Further analysis confirms the lack of significance. Using the Kruskal-Wallis test of independence found that a focus on water efficiency was not dependent on region ($\text{Chi}^2 .55$).

Table 3-2.

Green Building Focus: As Perceive by Industry Experts

	Northeast No. (%)	South No. (%)	Northwest No. (%)	Southwest No. (%)	All Regions No. (%)
Energy Efficiency	13 (76)	10 (53)	22 (63)	14 (67)	59 (64)
Water Efficiency	0 (00)	2 (11)	0 (00)	0 (00)	2 (02)
Indoor Air Quality	0 (00)	1 (05)	2 (06)	0 (00)	3 (03)
Other*	4 (24)	6 (32)	11 (31)	7 (33)	28 (30)
n	17	19	35	21	92

* Other categories concerns for Technology, Waste Removal, and Materials

Conclusion

The findings suggest that experts perceive awareness at a consistent 25 percent across the nation. The Northwest, however, was the only region to report 100 percent awareness, as perceived by experts. However, analysis of the impact of regions produced no significant relationship between high levels of awareness and the Northwest region. Therefore, the hypothesis that green building experts in the Northwest perceive higher levels of awareness is not supported by the data.

The hypothesis that green building experts will largely focus on energy efficiency is confirmed. The results of the green building focus question revealed that energy efficiency was the primary emphasis for experts in all regions of the country. In addition, the assumption that water efficiency would be most likely focused on the South and Southwest regions was also tested with the same survey question. These regions were the only ones to make water efficiency a primary focus, however, a Kruskal-Wallis test produced an insignificant coefficient.

CHAPTER FOUR

Green Building Public Opinion

As concepts of green building have taken form in new real estate trends and planning curriculum, green building as a whole still has not garnered much attention with the public. Most of the research on public opinion of green building has focused on commercial development such as office space, public buildings, and schools. There has not been a detailed investigation of support for residential green building. This fact led to the development of a survey instrument that addressed public opinion of green building within a New Urbanist environment, defined here as a revitalizing downtown core. While the question of how the general population perceives green building concepts may be of ultimate importance, it seems that a logical starting point in trying to capture something about the nature of support for green building initiatives would be to survey people who may be more inclined to have an opinion. A general public survey on green building at this nascent stage of research would likely be confounded by the presence of non-opinions (Sharpe 1999). So this chapter will report on the opinion of people interested in buying homes in a New Urbanist environment. If something can be learned about support for green building from surveying these individuals, it may then be possible to construct a survey for the general public that is informed by this initial effort.

Specifically, in this chapter I attempt to isolate basic understanding about who in this relevant sub-population is most inclined to support green building initiatives. The research examines support for green building initiatives while controlling for awareness, gender, and age. The specific hypotheses and the justification for the research is outlined below. Moreover, a primary contention is that support will be highest among those who are aware of these initiatives.

Because cost savings associated with green building initiatives, both immediate and long term are likely to materialize, it has been argued that a primary obstacle to green building programs is the lack of public awareness.

Hypotheses

My first hypothesis, **Hypothesis 1**, predicts that support for green building is dependent on individual awareness of the topic. Specifically, awareness of green building ought to be positively associated with support. This presumption is based on the understanding of an individual's cognitive ability to recognize and then support. Subsequently, I use the theory of cognitive response to assert that individuals use outside influences to determine their opinions. Public awareness has long been associated with creating support for causes and policies. Advocates for health issues such as AIDS, colon cancer and mental depression have all used the power of raising public awareness to improve support for their issue. Awareness and education are often given credit for increased levels of support, although there is only incomplete evidence produced that awareness alone is responsible for increased support. Irwin (1993) proposes that public awareness is comparable to publicity. Here, the advocate states that "publicity is often used to develop an awareness of the public, which in turn determines the level of support in the community" (Irwin 1993, 73).

To further investigate the merits of awareness, I introduce the sociological aspect of awareness through the idea of cognitive response theory (Coursey 1992; Sternthal, Phillips and Dholakia 1978). This theory suggests that attitudes may shift when people learn of others' views because knowing the opinions of others induces people to think of arguments that might explain those others' positions. By reviewing these arguments, people engage in a process of self-

persuasion whereby their own attitudes move in the direction of the arguments that have been primed by others' views, arguments that would not otherwise have come to mind (Burnstein and Sentis 1981; Burnstein and Vinokur 1975; Burnstein, Vinokur and Trope 1973). To clarify, "others' views" are not restricted to an individual's verbal opinions, but can include other outlets such as media coverage and educational information. Cognitive response theory does not, however, present a unidirectional outcome. Respondents can move support toward or away from the issue at hand.

To support the theory that awareness of green building leads to support, the issue of momentum must be inserted. Mutz (1997), using the issue of strategic voting, asserts that "movement in the direction of mass opinion is most likely to occur among primary voters when levels of information and involvement are low" (107). To be clear, the Mutz argument of momentum is used to link awareness to support, and not to suggest that support for green building will be universal. Here, awareness is equated with Mutz's description of having information, but also having low levels of involvement. Respondents to the green building survey that are considered aware and supportive are believed to have both elements; some information but little involvement. The tendency for these individuals to be supportive of green building as opposed to unsupportive of the concepts is supported using Mutz's momentum argument. **Hypothesis 2** proposes that women are more likely than men to be supportive of green building programs. Differences between men and women on various issues of public policy have been the target of much research over the past thirty years. In 1971, Erskine produced a report studying opinion differences by gender on women's role in politics and society from the 1930s to the 1970s. According to Erskine, until the 1960s, women were more

supportive than men in expanding women's participation in economic and political matters. Moving into the 1960s and 1970s, differences between men and women on the topic began to shrink and eventually reversed completely (Erskine 1971). This concept of a gender gap has increasingly become a topic of interest for researchers with regards to a variety of public opinion issues, including environmental differences. Research has suggested that by the 1980s, five percent more women than men supported spending for the environment. In addition, 20 percent more women than men have expressed opposition to nuclear power plants (Shapiro and Mahajan 1986). Research on toxic waste activism has also shown that women constitute the majority of both leadership and membership of these organizations (Brown and Mikkelsen 1990; Cable 1992; Edelstein 1988).

Hypothesis 3 predicts that respondents age 50 and older are more likely to support green building. To support this theory, I draw from three areas: the difference in home purchasing behavior between the young and old, the polarization among younger generations on specific environmental issues, and the modest gap between teens (ages 13-18) and baby boomers in their opinions on environmental responsibility.

The first point of support for the age hypothesis factors in home ownership. I expect that those individuals aged 50 and over have a more informed approach to the overall investment of home ownership. Older persons are likely to have purchased a home previously and possess the knowledge of financial matters associated with ownership, such as maintenance issues and resell values. The experience of prior home ownership allows this age group to consider features within a home that will help mitigate operating costs and provide a positive return on investment. These individuals are more likely to be supportive of green building concepts since the presence

of these features within a home can lead to lower energy bills and less repair costs due to higher quality building materials. When combined, both of the two factors contribute to a potential positive resale value based solely on the condition of the home (excluding issues of interest rates and location depreciation). But this is only one part to the homeownership claim.

Purchasing a home is, generally speaking, done with the intention of providing shelter. However, real estate is also a financial investment. Assuming that there are multiple motives for buying a home, I consider the idea that older potential home buyers are more likely to purchase a home as an investment as opposed to a primary residence. To support the theory that older home buyers are more likely to apply past home ownership lessons to new home buying decisions, there is empirical data to suggest that investment returns on home purchases are more likely to be seen by older home owners than younger. By returns I refer to receiving services such as renting the home. Simply put, younger homeowners are less likely to rent out the new home than older home buyers (Lee 1994).

The largest differences in age, with regards to environmentalism, are found in support for specific issues within the environmental movement, generally. Based on a study of political elites, only 10 percent of the oldest class oppose expansion of nuclear energy (3 percent strongly), but almost 40 percent of the youngest cohort opposed nuclear power (Dalton 1987). However, a look into differences among political elites shows polarization within the youngest age group. According to Dalton's study of European political elites, younger persons are more divided. For example, despite the fact that support against nuclear energy is decisively low among younger respondents, it is also sharply divided on issues of environmental protection. Conversely, older persons are less polarized on issues of the environment (Dalton 1987). Using

this data, I assume that the issue of green building, which can easily be associated with the environmental movement, may produce less cohesive support among younger respondents.

Finally, I use the EarthView survey, conducted by Fleishman-Hillard Research (2002) to conclude that the difference in environmental responsibility between teenagers and baby boomers is relatively minor. The survey reports 71 percent of teens and 67 percent of baby boomers agree that corporations are not concerned about the environmental impact of their activities or products. Likewise, 63 percent of teens and 64 percent of baby boomers agree that government leaders are not concerned with the future impact of today's environmental problems. This moderate difference in opinion on environmental responsibility combined with home ownership and evidence of polarization among younger cohorts on certain environmental issues is used to support the hypothesis that older home buyers are more likely to support green building.

Methodology

I examine the hypotheses with the use of a survey conducted in the Downtown Orlando area. Respondents were pre-qualified as potential homebuyers in neighborhoods destined to be developed under a New Urbanism philosophy. The survey had a response rate of 50 percent, allowing for a comfortable level of confidence in generalizing about public opinion on green building among this particular sub-population. The survey instrument focused on three alternative concepts of green building: energy efficiency, indoor air quality and water efficiency. Respondents were asked to answer, with a "yes" or "no," whether they supported the initiative being discussed. The operational definition of support for green building is a "yes" response (see Appendix B for a copy of the survey instrument employed). One is forced to question whether a

“yes” response to any one concept truly measures support for green building. To address this concern I also created a composite category, which scores surveys “1” if the respondent supported all three concepts. This coding is believed to best capture support for the amorphous concept of green building.

To measure awareness, respondents were simply asked; “Have you ever heard of green building?” This question is intended to tap awareness specifically, but more generally, the respondent’s level of sophistication concerning environmental initiatives. Respondents were also asked to identify their gender and their age in one of five categories. Due to a lack of responses in two of the categories, the data were collapsed and ultimately age was measured in one of three categories; 18 to 34, 35-50, and those over 50. This manipulation gave more equality in the number of respondents in each age category which allows for more legitimate statistical testing of whether support for green building initiatives is dependent upon age.

The population is defined as individuals wanting to live in a New Urbanist environment. The target individuals had already narrowed their choices of areas to live and presumably have selected an environment designed in the theme of New Urbanism, even if the individual does not know the label given to describe the area. However, I wanted as diverse a population, within that, as possible. This prerequisite called for a more urban environment as opposed to a newly created town or city (such as other local New Urbanist designs like the Town of Celebration or Baldwin Park). For this reason, Downtown Orlando potential home buyers became the non-probability sample. With the Downtown area revitalizing and creating a boom in urban housing, the buzz surrounding this new residential area (combined with record low interest rates) allowed for a rare opportunity to utilize downtown brokerage houses to survey individuals inquiring

about living in Downtown Orlando. Utilizing the most centrally located brokerage house, a seven-question survey was administered as the instrument to measure support for green building. The survey was given to every individual that walked into the brokerage house showrooms (reducing the overall response bias). The survey technique was intended to target potential home buyers and the answers to the surveys were, perhaps, more thought out than if I had randomly given out the survey on the street.

I do, however, acknowledge that the research is open to the criticism of external validity or generalizability. However, the fact is, the respondents have independently selected the downtown area. Threats to external validity could include rising oil prices, advertisements for lawn watering conservation, or seasonality (since energy and water bills can vary quite dramatically in Florida's winter and summer months). Again, the expectation is that by using the selected sample, the opinions given will be more reflective of a predetermined thought. In all, when using individuals as the unit of analysis, there can be no completely reliable or valid measure.

Results

The survey produced a 50 percent return rate. Overall the results indicate that 69 percent of respondents supported green building concepts. Looking at the three questions individually, indoor air quality provided the strongest support with 73 percent of respondents supporting this particular green building concept. Energy efficiency also had a high level of support with 72 percent of respondents supporting these efforts. Support for water efficiency was surprisingly lower than the other green building concepts, although still positive with a 64

percent approval. Overall, support for green building was strong among individuals wanting to live in a New Urbanist environment.

To analyze the identity of individuals supporting green building, I used logit regression analysis to elucidate the dichotomous consideration of support. The data measured “1” as supportive and “0” if respondents were not supportive. Awareness is scored as “1” if the respondent was aware of green building concepts and “0” if the respondent was not aware. The coefficients from the logit analysis were converted into predicted probabilities to facilitate substantive discussion.

As indicated in Table 4-1, four models with four independent variables were used. It is seen here that awareness of green building is most strongly associated with support when considering the question of indoor air quality.

The predicted probability that a respondent will support the indoor air quality initiative grew from .50 to .73 if they were aware of the concept of green building (all other variables held constant at their modal value); a net increase in support of 23 percent. Recall, overall that 73 percent of those aware of green building supported it. The predicted probability that a respondent will support green building or all three initiatives grew from .50 to .67 if they were informed of the concept (all other variables held constant at their modal value); a net increase in support of 17 percent. **Hypothesis 1** is confirmed, individuals who are aware of green building (those that answered “yes” to the question “Have you ever heard of green building?”) were more supportive of green building as a whole than those that were not informed. The additional support received for indoor air quality was not anticipated and will need to be further investigated to understand the importance placed on this specific green building concept.

Table 4-1.

Support for Select Green Building Initiatives and Overall Support for Green Building: By Age, Gender, and Awareness

Variable	Exp. Sign	Energy Efficiency Coefficient (Robust s.e.)	Indoor Air Quality Coefficient (Robust s.e.)	Water Efficiency Coefficient (Robust s.e.)	Support All Three Coefficient (Robust s.e.)
Awareness	+	.39 (.40)	.99* (.46) ^a	.61 ^t (.41)	.73* (.38) ^c
Females	+	.39 (.38)	.46 (.38)	.22 (.36)	.24 (.34)
50+ years old	+	.51 (.48)	.60 (.55)	.83* (.49) ^b	.63 ^t (.43)
18-34 years old	-	.23 (.42)	-.25 (.42)	-.56 ^t (.40)	-.28 (.40)
Constant		.47 (.36) ^t	.49 (.38)	.30 (.37)	-.53 (.35) ^t
Wald Chi ²		3.24	10.33*	11.78**	10.25*
Pseudo R ²		.02	.06	.07	.05
N		153	151	153	153

** $p < .01$, * $p < .05$, ^t $p < .10$ (one-tailed tests)

^a The predicted probability that a respondent will support the Indoor Air Quality initiative grows from .50 to .73 if they are aware of the concept of green building (all other variables held constant at their modal value); a net increase in support of 23%.

^b The predicted probability that a respondent will support the Water Efficiency initiative grows from .50 to .70 if they are over 50 years of age (all other variables held constant at their modal value); a net increase in support of 20%.

^c The predicted probability that a respondent will support green building or all three initiatives grows from .50 to .67 if they are aware of the concept of green building (all other variables held constant at their modal value); a net increase in support of 17%.

The gender of respondents proved to be of no significance in terms of support for green building. Therefore, the hypothesis that women are more supportive of green building is not supported by the data. Females were no more likely to support green building than males, which leads me to acceptance of the null hypothesis for **Hypothesis 2**. Possible explanations for the lack of a gender gap are not explored at any length; however, as noted in the research on gender differences the gap between men and women on environmental issues has been closing in the last

two decades with some instances of no gender gap. Perhaps we are reaching a point where gender is no longer a factor in support for environmental programs.

Hypothesis 3 claimed that support for green building concepts would be highest among older individuals aged over 50. Table 4-1 shows positive association for the older age bracket and a negative association for the group aged 18-34. Here, the relationship operates as hypothesized. Respondents aged 50 and over more likely to support green building overall. In addition, much like the unexpected support of indoor air quality by aware individuals, those aged 50 and over were highly supportive of water efficiency. The predicted probability (denoted by “b” on Table 4-1) that a respondent, aged over 50, supports the water efficiency initiative grew from .50 to .70 (all other variables held constant at their modal value); a net increase in support of 20 percent.

Conclusion

Measuring public opinion of green building through a survey instrument provides some insight into support for green building initiatives. With 69 percent of the survey sample supporting green building, I am confident that individuals desiring to live in a New Urbanist environment, such as Downtown Orlando, are also in favor of green building concepts. Within this group of supporters, I have been able to identify key qualities of the types of individuals that are most likely to support green building. Awareness of green building acts as an essential component of an individual’s likelihood to support green building. While gender is of no consequence, age does play an important role. Specifically, older individuals (those over 50) are more likely to support green building concepts than younger persons. Understanding the significance of prior knowledge and demographic differences in support for green building will

inform future research on the topic of support for green building independent of other environmental issues.

CHAPTER FIVE

Source Cues within Public Opinion of Green Building

The purpose of this chapter is to examine how the language used to describe green building initiatives affects support for these initiatives. Specifically, is public support of green building initiatives dependent on the way in which the topic is framed? The success and growth of New Urbanism, throughout the country, supports the belief that the concepts of efficient and resourceful living environments are not only accepted, but also desired by the public. As mentioned earlier, these are the same concepts embraced by green building. Nonetheless, the term “green building” leaves itself open to interpretation, and more pointedly, association. I hypothesize that there is support for green building when explained using the concepts such as energy efficiency, indoor air quality, and water efficiency. Conversely, I presume that when green building is framed as an environmental issue or as a government initiative support for green building will decrease.

Using survey data taken from a New Urbanist environment, I test whether the introduction of source cues, into questions intended to tap support for green building initiatives will affect public support. Within this chapter data will be presented that begins to unravel some of the lack of support for green building concepts. Specifically, why is a practice that is financially beneficial to homeowners, beneficial to the environment, and provides healthier living spaces not recognized by the public as an obvious choice for design and construction of residential buildings? A preliminary answer to this question is found in the pages ahead.

Hypotheses

For the purpose of this analysis, I use a question on energy efficiency (the primary concept associated with green building programs) to test the importance of source cues. When industry elites were asked to identify their focus when discussing green building initiatives (see Chapter 3) they overwhelmingly chose energy efficiency. Arguably this is the concept that resonates best with the public. I propose in **Hypothesis 1A** that support for energy efficiency will be the strongest when the question is framed with no mention of this being either a program intended to protect the environment or a government sponsored program. Moreover, I posit that when the energy efficiency initiative is asked in a question that provides a “government program” source cue that the initiative will receive the least support. In sum, I expect that support for energy efficient building practices (a primary component of a green building philosophy) will be strongest when there is no mention of this being either an environmental or a government initiative and that a question worded with a government cue will receive the least support.

To support the claim that survey respondents are less likely to support green building initiatives when source cues are included, two points must be made. First, the use of source cues is a valid and well documented method used to help individuals make decisions about their support for a myriad of things. To emphasize this point I will review the substantial literature that illustrates, generally, the affect of source clues on support for public policy initiatives. Second, I will look at the affect government source cues have had on public support for public initiatives. The general conclusion is drawn that support will wane because a government source cue invokes a fundamental mistrust of government that is part of the American ethos.

The use of efficiency strategies such as heuristic processing or source cues has been well documented over the last three decades (Downs 1957; Mondak 1993, 1997; Mondak and McCurley 1994; Chaiken 1987; Kuklinski and Hurley 1994; Hurwitz and Peffley 1997; Iyenger 1990; Peffley, Hurwitz and Sniderman 1997; Ottati 1990; Jennings 1992). Heuristic processing, specifically, is a method of information processing that uses cues to more easily evaluate information in order to arrive at a judgment. Speculation of the accuracy of polling measures, has long since enticed researchers to scrutinize the results of public opinion surveys. It may be said that the study of public opinion began with Converse's (1974) famous report on non-attitudes. It is here that researchers truly began to question the accuracy of public opinion on an individual level opening the door to questions of heuristic processing. To jump ahead, today research has established not only that heuristic processing is used, but that it is rational means for individuals to make decisions (Downs 1957). Zaller (1992) supports this theory using political elites and noting that individuals use political elite's reputations as contextual information to analyze specific issues; leading to the theory that elite consensus generally speaking, produces mass consensus (Zaller 1992).

According to other scholars, the most powerful criterion driving decision-making is not necessarily the most important cue, but often the one most accessible or recently primed to the "top of the head" (e.g. Zaller 1992; Iyengar and Kinder 1987; Riker 1986; Barker 2002; Jones 1994). In addition, considerable political science scholarship has argued that "gut level" heuristic processing (Popkin 1991) often produces outcomes that are virtually indistinguishable from those produced under settings of complete information (e.g. Downs 1957; Nisbett and Ross

1980; Lupia 1994). By this I mean biological reactions that can not be voluntarily controlled or modified, resulting in almost impulsive decision making.

Kuklinski and Hurley (1994) note the fact that people use cue-taking should not be the sole concern. The issue, supported by their research findings, is that absorption of the message does not appear to be as relevant as the messenger of the message, and secondly; that this disregard for the context should make us question whether the opinions we have garnered thus far, are in fact, based on real opinions or merely reflective of where individuals heard the message. This theory is one that is taken into consideration with the green building survey. Are the opinions I have assembled on green building, to date, based on support for green building concepts or are they simply reflective of the messenger?

The power of source cues in public opinion surveys can be seen most clearly in Mondak's (1993) study of support for the political agenda of President Ronald Reagan. The research examined policy issues of military power, foreign affairs, and domestic social programs. By comparing statements with and without a source cue, Mondak determined that respondents changed their opinions based on the source cue provided. The key to these findings is that when public opinion is analyzed at the aggregate level "heuristic processing allows the individual to conserve cognitive resources while still constructing relatively well grounded judgments. However, at the collective level, mass reliance on heuristic processing may undermine the role of opinion surveys in the process of representation "(Mondak 1993, 206). The green building survey falls prey to this same outcome. As individuals use source cues to guide them in their decision making process, the collective results may lead to a misrepresentation of what public opinion really is towards green building initiatives.

To assume that respondents are less likely to support green building initiatives when faced with a government program source cue, I cite research on American's high levels of cynicism. To begin, Americans have consistently shown over the past 40 years a distrust of the national government (Miller and Borelli 1991). Speculation has long proclaimed that the Watergate scandal disenchanting many Americans from the dream of a father figure watching over them. Author Miller has been one of the most dedicated researchers of this topic of American distrust, using national data provided by the Center for Political Studies' and their measure of "political trust." Miller (1974) found that Americans trust in government has declined and left many feeling alienated and cynical. Despite varying views of what this distrust means or who exactly it is pointed at (Citrin 1974; Caddell 1979; Easton 1975) it is argued that the mass public is suspicious of the national government's motives for action and that people fear that the public's best interest is not always the top priority.

Local government has not fared much better than the national government in terms of public confidence. In the 1973 Louis Harris and Associates poll of American attitudes towards government and politics, citizens responded with low levels of confidence for elected leaders within local government. Even for individuals reporting an "excellent" understanding of political knowledge, distrust of leaders and lack of confidence in those running the executive branch of the government was rampant.

The fact that source cues are a noted method for cognitive efficiency and are known to impact policy support, allows the assumption that source cues will influence respondents of the green building survey. In addition, the American populations' general distrust of the American government, both nationally and locally, provides support for the hypothesis that respondents

will be less likely to support green building when it is framed with a government program source cue.

Hypothesis 1Ai expects that all age groups will utilize the source cues equally and will be less likely to support green building initiatives when the question includes either the environmental cue or government program cue. Researchers have suggested differences in opinions between older and younger individuals, with no conclusive evidence that one group is more likely to hold opinions or utilize source cues. Krosnick and Milburn (1990) find that younger cohorts are more likely to form opinions than older cohorts. However, Gimpel and Wolpert (1996) note that at least politically, “older voters, having been exposed to more information, are more likely to be politically aware, involved, and attentive than younger voters” (Gimpel and Wolpert 1996, 167). A study by Gimpel and Wolpert (1996) found that age was not a factor determining the use of the source cue on the question of presidential approval. This back and forth between age and opinion combined with the results from the Gimpel and Wolpert study supports the hypothesis that there will be no difference between the age groups when it comes to the use of source cues on green building.

Hypothesis 1Aii predicts that men and women will utilize the source cue equally and provide less support for green building initiatives when presented with either the environmental source cue or the government program source cue. There is no conclusive evidence to either support or deny this statement. Research to date can not verify that gender alone is responsible for differences between men and women’s utilization of source cues. My assumption for this hypothesis is based on the lack of empirical data identifying gender as a variable that produces disparity between men and women with regards to use of source cues.

Hypothesis 2 speculates that when awareness among respondents of green building is high support will not be as dependent on source cues. Mondak (1993) predicts that heuristic processing is widespread and used for a range of decisions. He notes, however, that where substantive information is limited or the subject is of low or no personal interest to the individual heuristic processing is most evident. Mondak points out that the use of cues is directly related to efficiency. Expressly, individuals with a low need for information were less likely to be satisfied with cues. Likewise, individuals with a high need for information were more likely to respond to cues to assist them with their opinion. In short, access to information reduces the need for an efficiency strategy.

Efforts to prescribe this theory to education have been attempted (Mondak and McCurley 1994). Examining the frequency of coattail voting found that voters with the lowest levels of education utilized source cues more than those with higher levels of education. However, Koch (1998) disputes these results, finding the opposite to be true. For the purposes of the green building survey, the attempt is not to suggest that awareness is parallel to education. In fact, the research presented has been careful to position awareness as little more than an individual's consciousness about the topic.

Methodology

To determine the dependence of the source cues on public support for green building, three separate survey instruments were designed. The idea was to create three surveys that were indistinguishable from one another, with the exception of the introduction of source cues into two of the surveys. The survey contained three forms (see Appendix "B"). Questions one through four of the surveys was the same on all three versions and functioned as indicators of

individual identity. These included questions on age and gender. To determine sophistication, Question 2 asked respondents if they had ever heard of green building. The remaining questions targeted three main concepts of green building: energy efficiency, indoor air quality, and water efficiency.

The baseline survey was worded with very direct questions about support for energy efficient homes, recycled water techniques and improving indoor air quality. This survey served as the control variable. The environmental source cue survey used words such as “conservation” and “environmentally sensitive” within the questions. The government program source cue survey proposed hypothetical governmental initiatives or programs. The three surveys were mixed and distributed randomly over a thirty day period.

As detailed in Chapter Four, the population for this research was individuals wanting to live in a New Urbanist environment. The target individuals had already narrowed their choices of areas to live and presumably has selected an area operating on the theme of new urbanism. Again, to create as diverse of a population within that sample as possible. I utilized the most centrally located real estate brokerage house. The survey was given to every individual that walked into the selected real estate showroom.

Results

Using a cross tabulation table (Table 5-1) it is evident that support for the energy efficiency concept was stronger among respondents that did not receive either the environmental or government program source cue. Eighty-two percent of respondents that received the baseline survey supported the energy efficiency concept. Those respondents that received a survey with a source cue were less likely to support the energy efficiency concept by as much as 20 percent.

As hypothesized, the survey containing the government program source cue received the lowest level of support (62 percent). The statistically significant Chi Square test suggests that support for the energy efficiency concept is “dependent” upon the source cue. Based on these findings, **Hypothesis 1A** holds true; support for the energy efficient concept is strongest when there is no mention of either the environmental or a government program.

Table 5-1.

Support for Energy Efficiency Concept by Source Cue ^a

	Baseline % (No.)	Environmental Cue % (No.)	Government Cue % (No.)
Energy Efficiency	82 (42)	73 (38)	62 (31)
N	51	52	50

^a Chi² = 5.21 (*p* < .02 two-tailed).

Hypothesis 1Ai presumed that all age groups would utilize the source cue equally and be less likely to support green building initiatives when the question include either the environmental cue or government program cue. However, the data revealed that the three age groups produced slightly different outcomes with regards to use of the source cues. First, respondents aged 18-34 show only a minor divergence in support for energy efficiency despite the introduction of source cues. The pattern does show a decline from the baseline survey to the environmental cue survey to the government program cue survey, although the difference in support under all three surveys is not statistically significant. The statistically insignificant Chi Square test suggests that among respondents aged 18-34 that support for energy efficiency is “independent” (or not dependent) on the source cue.

Table 5-2.

Support for Energy Efficiency Concept by Source Cue and Age

	Baseline			Environmental Cue			Government Cue		
	18-34 ^a % (No.)	35-49 ^b % (No.)	50+ ^c % (No.)	18-34 % (No.)	35-49 % (No.)	50+ % (No.)	18-34 % (No.)	35-49 % (No.)	50+ % (No.)
Energy	74	80	100	71	73	75	69	55	64
Efficiency	(14)	(16)	(12)	(15)	(11)	(12)	(11)	(11)	(9)
N	19	20	12	21	15	16	16	20	14

^a Chi² = .10 (*p* < .75 two-tailed). ^b Chi² = 2.87 (*p* < .09 two-tailed). ^c Chi² = 4.63 (*p* < .03 two-tailed).

Second, respondents aged 35-49, similar to the younger cohorts, produced only modest differences in support for energy efficiency even when receiving a source cue. The marginally significant Chi Square test suggests that among respondents aged 35-49 that support for energy efficiency may be somewhat dependent upon the source cue. It is worth noting that, respondents displayed less support for the energy efficiency concept when given the environmental cue survey as opposed to the government program source cue as hypothesized.

Finally, the oldest demographic, respondents' aged 50 and older, followed the expected hypothesis by providing the greatest support when there was no mention of a source cue. As seen in Table 5-2, respondents 50 years of age and older supported the energy efficiency concept by 100 percent when no source cue was offered. This support decreased to 80 percent under the environmental source cue and fell to 64 percent when the government program source cue was included. The significant Chi Square test suggests that among respondents 50 years of age and older that support for energy efficiency is dependent upon the source cue.

Table 5-3 illustrates the results of the test of gender and support for the energy efficiency concept. Here, as predicted, there is no significant difference between men and women in their support for the concept that is dependent on a source cue. Both men and women show stronger

support for the energy efficiency concept with no mention of the environmental or government program source cue. Both genders are also the least supportive of energy efficiency when given the government program source cue. The marginally significant Chi Square test suggests that among females, support for energy efficiency may be somewhat dependent upon the source cue. Likewise, the marginally significant Chi Square test suggests that among males, support for energy efficiency may be somewhat dependent upon the source cue. However, neither produced values to suggest a significant relationship, therefore, **Hypothesis 1Aii** is supported.

Table 5-3.

Support for Energy Efficiency Concept by Source Cue and Gender

	Baseline		Environmental Cue		Government Cue	
	Female ^a % (No.)	Male ^b % (No.)	Female % (No.)	Male % (No.)	Female % (No.)	Male % (No.)
Energy Efficiency	85 (22)	80 (20)	78 (18)	69 (20)	65 (13)	60 (18)
N	26	25	23	29	20	30

^a Chi² = 2.31 (*p* < .13 two-tailed). ^b Chi² 2.50 (*p* < .11 two-tailed).

Table 5-4.

Support for Energy Efficiency Concept by Source Cue and Awareness

	Baseline		Environmental Cue		Government Cue	
	Aware ^a No. (%)	Not Aware ^b No. (%)	Aware No. (%)	Not Aware No. (%)	Aware No. (%)	Not Aware No. (%)
Energy Efficiency	11 (85)	31 (82)	14 (88)	24 (67)	13 (65)	18 (60)
N	13	38	16	36	20	30

^a Chi² = 2.23 (*p* < .14). ^b Chi² = 3.88 (*p* < .05).

Hypothesis 2 assumed that individuals that are not aware would be more likely to utilize a source cue. Table 5-4 reveals that respondents who are aware were less likely than those who

are unaware to be influenced by the source cues. Respondents who are not aware consistently supported the energy efficiency concept less when a source cue was offered. The marginally significant Chi Square test suggests that among those who are aware of green building concepts that support for energy efficiency may be somewhat dependent upon the source cue. The significant Chi Square test suggests that among those who are not aware of green building concepts that support for energy efficiency *is* dependent upon the source cue.

Conclusion

Focusing on energy efficiency as the primary green building concept, support was determined to be dependent upon the introduction of a source cue. As expected, support for energy efficiency was the strongest when there was no mention of either the environmental or agovernment program source cue. Individual characteristics such as age and gender appeared to play an insignificant role in the utilization of either source cue. The exception to this was potential home buyers aged 18-34 and 35-49. These two age groups were not significantly impacted by the inclusion of either source cues. However, all age groups showed the highest levels of support for the energy efficiency concept when there was no source cue.

In addition, those who were aware of green building concepts were not dependent on either source cues. From this data it can be determined that when green building concepts, such as energy efficiency, are framed as an environmental issue, support is lessened. Likewise, as hypothesized, when green building is framed within government programs, support is reduced even further. These findings suggest that public support for green building concepts exists when explained without an association to other public policy issues. It is from these results that we can

begin to establish a framework from which to accurately talk about support for green building initiatives.

CHAPTER SIX

Conclusion

Green building is defined as design and construction methods utilized to minimize environmental impact. The objective of this type of construction is to create buildings that maximize operating efficiency while simultaneously mitigating the impact to the existing environment. By focusing on areas of site design for example, energy efficiency; water conservation; indoor air quality; and waste removal, green building provides a means to minimize human consumption and conservation of natural resources, all while constructing buildings that are healthier and more efficient. Ironically, perhaps, green building has not been widely discussed in America. While trends illustrate that this building method is gaining acceptance among real estate and construction professionals, the mass public has yet to establish real opinions on the subject.

On the contrary, other real estate development practices have transcended conventional thinking, allowing for new design approaches to planning and building communities. New Urbanism is one method that has received mainstream acceptance; the concept involves recreating existing neighborhoods as well as launching entirely new towns and cities. The New Urbanism philosophy advocates walkable cities with a focus on town centers and public parks. The success of New Urbanism has made this environmentally conscious initiative a part of contemporary thinking in urban planning. The irony of the acceptance of New Urbanism is the fact that the end results of the concept runs parallel to green building; providing more efficient use of space and materials, while minimizing pollution and consumption. The directions may appear different on paper, but the objective is the same. For example, New Urbanism strives to

reduce the number of hours individuals spend in automobiles by designing communities that are more pedestrian friendly and contain more multi-use buildings. The outcome is less automobile pollution and thus cleaner air. Green building endorses the use of non-emitting building materials such as low-VOC paints. The objective is to reduce the amount of gases given off by materials, thus creating cleaner air.

The history of green building is one of wavering achievements. The birth of the environmental movement in the 1970s acted as a starting point for research and advocacy in the field of designing and constructing environmentally sound buildings. However, decades lapsed without any substantial policy taking shape. Under the Clinton administration, three Executive Orders were passed aimed at restructuring government agencies to be more environmentally conscious. The acts focused on using recycled content materials in procurement practices and retrofitting old building fixtures with more energy and water efficient features. Efforts to “Green the Whitehouse” were financially beneficial, but garnered little attention in the public.

In contrast, New Urbanism was not a topic of public concern for a long period of time, however examples of such communities are seen throughout the country. In Central Florida alone, there are over four recently new communities developed that prescribe to the New Urbanism philosophy. There have also been revitalization efforts of existing areas within Central Florida that use New Urbanist concepts in planning and building design. Areas such as Downtown Orlando have insisted on new development that provides grocers within walking distance of homes and residences and homes and residences within walking distances of workplaces.

New Urbanism has acquired several labels over the past few years; Neotraditional Design, Transit Oriented Development, and Traditional Neighborhood Design. All of the labels represent the same goal; mitigate urban sprawl with efficient and sustainable design. The research presented within this paper attempts to examine the power of labels and explain whether a concept such as New Urbanism with its unassuming descriptions of “design” and “transit,” have described a more open-minded approach to building construction in comparison to a similar concept termed “green building.” Hence, the objective of this paper became an issue of semantics. Does the way in which we send messages about green building, and perhaps even the name itself, affect support for green building and its concepts?

To test my theory that support for green building is dependent on how the issue is framed, I examined two groups: green building industry experts and potential home buyers in a New Urbanist environment. Industry experts were surveyed about their focus when describing green building, while a public survey was used to gauge support for green building while using alternative source cues. The elite survey found energy efficiency was the most emphasized concept among industry experts. In addition, the research had the hypothesis that industry experts in the Northwest would perceive the public to be more aware of green building initiatives, but this was not confirmed. While there was some difference between awareness in the Northwest and other regions, all regions reported that only 25 percent of the public are aware of green building concepts.

Public opinion of green building was measured with a survey of a random sample of potential home buyers interested in a New Urbanist environment in Downtown Orlando. While measuring public opinion on green building was the goal, identifying those that support green

building was key. In addition, determining what specific green building concepts the individuals support was seen as complimentary to understanding the rationale behind their support. As a result of this inquiry, it was determined that individuals that are aware of green building concepts are more supportive of these initiatives than those that were not aware. Aware respondents also placed particular emphasis on indoor air quality (99 percent support) and overall green building (73 percent support).

Moreover, the survey found there was little difference between men and women in regard to support for green building concepts. Age, on the other hand, did offer some insight into acceptance of green building. Respondents aged 50 and over were 63 percent more likely to support green building, overall. In addition, much like the unexpected support of indoor air quality by aware individuals, those aged 50 and over were highly supportive of water efficiency.

The research on public opinion of green building also examined the use of source cues; assuming that how green building questions are framed is critical to support for the topic. The public opinion survey included an examination of the influence of source cues on public opinion for a particular green building initiative; energy efficiency. Sixty-three percent of respondents supported green building concepts, although once a source cue that framed the initiatives as an environmental or government program was included, support decreased. Using an environmental source cue and a government initiative source cue, respondents were less likely to support the green building concept by as much as 20 percent. Respondents that received the baseline survey supported green building initiatives by 83 percent. Those given the environmental source cue survey supported green building 74 percent and support for green building from individuals receiving the government program cue was only 63 percent. As

predicted, the respondents that completed a survey containing the government initiative source cue offered the lowest level of support for the green building concept.

The most lucid relationship between dependency on source cues and support for green building came with an analysis of those individuals who are knowledgeable of green building. Among people who were aware of green building initiatives, the source cue had the least impact.

Future Research

The research reported here is offered as a starting point for the study of public opinion on green building. As noted, there has been survey research prior to this paper; however there is a lack of in-depth analysis of the nature of support. To simply ask what people's preferences are assumes that a given question is an accurate assessment of opinion. Undoubtedly error occurs as the result of question wording. Support for green building should be explored with a series of questions. The absence of a common characterization of green building has left the door open for misinterpretation of green building concepts. Further research that uses source cues to frame green building initiatives would help clarify how the mass public views green building concepts. To date, efforts at opinion polling are incomplete.

Has green building been narrowly defined by industry experts to create a communication starting point for communication with the public by focusing on familiar topics? Or, perhaps more maliciously, are certain professionals emphasizing some green building concepts and not others because of financial gain? Do design and construction disciplines focus on the high cost practices of green building to increase service fees? To understand the motives behind the different explanations of green building, research must question the source more thoroughly.

The research within this paper reported on the opinion among people interested in buying homes in a New Urbanist environment. Research should move towards constructing a survey for the general public that is informed by this initial effort. Measuring public opinion with a more mass random sample will show support for green building in mainstream America. In addition, this level of research will permit the study of different aspects of green building. Specifically, which green building concepts are more palatable to the public, and why? Is energy efficiency the most supported green building concept because of media exposure, or is indoor air quality less supported because people only associate air quality issues with the outdoors?

From this research we find different levels of support depending on age— why? Moreover, it is important to further investigate the issue of knowledge or awareness. Once the public becomes more aware of the topic, why do they become more supportive. In the interim, understanding how and why only certain concepts of green building are supported may shed some light on the lack of momentum surrounding this movement.

In sum, research from this paper supports that energy efficiency is the primary focus among green building experts. Regional analysis of industry experts' perceptions suggests no statistically significant difference in awareness of green building by regions; however, a more complete assessment may find otherwise. An analysis of demographics suggests that people that are aware of green building and individuals 50 and older are more supportive of green building initiatives. Moreover, environmental and government source cues do influence support for green building, but when people are aware of green building initiatives source cues are not as likely to alter support.

APPENDIX A: IRB APPROVAL FORM



Office of Research & Commercialization

February 3, 2005

Christina Webb
College of Arts & Sciences
Department of Political Science
Environmental Politics
University of Central Florida
4000 Central Florida Blvd.
Orlando, FL 32816-1400

Dear Ms. Webb:

With reference to your protocol entitled, "Green Building in New Urbanism: Framing Public Opinion" I am enclosing for your records the approved, full board approved document of the UCFIRB Form you had submitted to our office.

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur. Further, should there be a need to extend this protocol, a renewal form must be submitted for approval at least one month prior to the anniversary date of the most recent approval and is the responsibility of the investigator (UCF).

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

A handwritten signature in cursive script that reads 'Barbara Ward'.

Barbara Ward, CIM
IRB Coordinator

Copies: IRB File

APPENDIX B: GREEN BUILDING EXPERTS SURVEY

The survey below was administered to green building professionals at the U.S. Green Building Council's annual conference, Greenbuild. Respondents were randomly selected by handing out the survey at the end of a lunch session which was open to all registered attendees of the conference. Respondents were asked to voluntarily complete the survey and return to the researcher.

USGBC MEMBERS SURVEY



SPONSORED BY:
THE UNIVERSITY OF CENTRAL FLORIDA
&
USGBC CENTRAL FLORIDA



The following survey is designed to gauge support for Green Building initiatives. As professionals within the Green Building industry, your input is greatly appreciated.

Please place an X next to the appropriate category.

1. My clients/work are predominantly located in what region?
 Northeast South Northwest Southwest
2. What professional group do you most closely identify with?
 Owner Contractor Designer/Architect Engineer
 Manufacturer Consultant Researcher/Professor Other
3. When defining Green Building to someone with no prior knowledge of the concept(s), which ONE area do you focus on the most?
 Environmental Sustainability Healthy Homes
 Energy/Water Efficiency Life-Cycle Cost Savings
4. In your professional experience, what percent of new clients/customers can accurately define Green Building?
 100% 75% 50% 25% 0%
5. In your professional experience, most colleagues tend to emphasize which of the following areas when referring to Green Building:
 Energy Efficiency Water Conservation Technology
 Materials Waste Removal Indoor Air Quality
6. What do you believe is the best approach for explaining Green Building to new clients or potential customers?

THANK YOU FOR YOUR TIME AND ASSISTANCE.

APPENDIX C: GREEN BUILDING PUBLIC OPINION SURVEY

The survey instruments below were administered over a thirty day time period to individuals entering a Downtown Orlando real estate showcase. Respondents were asked to voluntarily complete the survey. There are three different surveys to measure green building support for public opinion. The three surveys, identified only to the researcher, consisted of a baseline survey with no source cue, a baseline survey with an environmental source cue, and a baseline survey with a government initiative source cue. Below, the surveys are labeled; however, respondents were not informed of any distinction between the surveys.

“BASELINE SURVEY”

**DOWNTOWN ORLANDO
POTENTIAL BUYER SURVEY**

The following voluntary survey is designed to gauge support for additional home features. Please complete and return this anonymous survey to your Sales Associate before leaving. Your input is greatly appreciated.

Please place an X next to the appropriate category.

1. In what area of Downtown Orlando are you currently interested in buying a home?
 Central Business District (S. of SR 50) Central Business District (N. of SR 50)
 Lake Eola Heights South Eola Thornton Park
2. Have you ever heard of Green Building?
 Yes No
3. What is your gender?
 Male Female
4. What is your age?
 18-34 35-49 50-64 65-74 Over 75
5. When purchasing your home, would you be willing to pay an additional \$1/sq. ft. for a more energy efficient home?
 Yes No
6. Would you pay a premium to improve Indoor Air Quality in your new home?
 Yes No
7. Would you be interested in a water system that uses recycled water for non-drinking water throughout your home?
 Yes No

THANK YOU FOR YOUR TIME AND ASSISTANCE.

“BASELINE SURVEY WITH ENVIRONMENTAL CUE”

**DOWNTOWN ORLANDO
POTENTIAL BUYER SURVEY**

The following voluntary survey is designed to gauge support for additional home features. Please complete and return this anonymous survey to your Sales Associate before leaving. Your input is greatly appreciated.

Please place an X next to the appropriate category.

1. In what area of Downtown Orlando are you currently interested in buying a home?
 Central Business District (S. of SR 50) Central Business District (N. of SR 50) Lake Eola Heights South Eola Thornton Park
2. Have you ever heard of Green Building?
 Yes No
3. What is your gender?
 Male Female
4. What is your age?
 18-34 35-49 50-64 65-74 Over 75
5. When purchasing your home, would you be willing to pay an additional \$1/sq. ft. to conserve energy resources and make your home more energy efficient?
 Yes No
6. Would you consider paying a premium for the use of environmentally sensitive materials that improve Indoor Air Quality in your new home?
 Yes No
7. Would you be interested in a water conservation system that uses recycled water for non-drinking water throughout your home?
 Yes No

THANK YOU FOR YOUR TIME AND ASSISTANCE.

“BASELINE SURVEY WITH GOVERNMENT INITIATIVE CUE”

**DOWNTOWN ORLANDO
POTENTIAL BUYER SURVEY**

The following voluntary survey is designed to gauge support for additional home features. Please complete and return this anonymous survey to your Sales Associate before leaving. Your input is greatly appreciated.

Please place an X next to the appropriate category.

1. In what area of Downtown Orlando are you currently interested in buying a home?
 Central Business District (S. of SR 50) Central Business District (N. of SR 50) Lake Eola Heights South Eola Thornton Park
2. Have you ever heard of Green Building?
 Yes No
3. What is your gender?
 Male Female
4. What is your age?
 18-34 35-49 50-64 65-74 Over 75
5. Would you support a government program that utilizes public funds and pays developers \$1/sq. ft. for constructing more energy efficient homes?
 Yes No
6. The state of Florida has an “Indoor Air Quality” incentives program; would you support this initiative for new home construction?
 Yes No
7. Would you support a Central Florida publicly funded “Recycled Water Program” for residential homes that uses recycled water for non-drinking water throughout your home?
 Yes No

THANK YOU FOR YOUR TIME AND ASSISTANCE.

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