

# **Consumer Acceptance of Universal Design: A Review and Suggestions for Future Research**

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## **Abstract**

All Americans should be able to live in a home environment that is safe, comfortable, and functional. People of all ages and ability levels are striving to reach such a goal, and they desire to do so as independently as possible. Such independence requires that their living environments be free of safety hazards or functional barriers. Incorporating universal design features and products in a home enhances it by making it safer, more accessible, more adaptable, and more comfortable, thereby improving the quality of life for all residents of the home. Universal design homes would benefit everyone but are not yet widely available. Few consumers currently request universal design features in their homes. This paper reviews the research that has been done related to consumer acceptance of universal design products and suggests research related to consumer acceptance and awareness.

**Keywords:** universal design, home adaptations, home modifications, accessibility, consumer acceptance

## **Introduction**

Universal design is defined as the design of products and environments to be usable to the greatest extent possible by people of all ages and abilities (Story, Mueller & Mace, 1998). The principles of universal design are easily translated into actual features in homes. Such features include adaptations such as the addition of lever doorknobs and lever faucet controls, wider doors and hallways, and preset studs in bathroom areas to facilitate the possibility of the future installation of grab bars. Universal design in housing uses products that are readily available to the consumer through any hardware store or building supply company. Successful integration of universally usable features in products and environments makes them virtually indistinguishable from other products (Story *et al.*, 1998).

Adding universal design features as part of the initial home construction is significantly less expensive than a later attempt to retrofit a home. In 1987, the U.S. Department of Housing and Urban Development (HUD) estimated that renovation of a single-family dwelling increased the cost by as much as 21%, compared to incorporating universal design features into a new structure at a cost of only two to three percent extra (McLeister, 1987). Furthermore, McLeister (1990) reported that the basic universal design features outlined by the NAHB Research Center added only one and one-half to two percent to the cost of newly constructed homes.

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There are both supply and demand reasons behind the need to promote universal design as a priority in housing design. Current building standards are outdated and do not affirm the individual differences that exist in the U.S. population. They are designed to make homes usable for the average person, when the population is actually made up of a continuum of young to old and able-bodied to disabled people. In addition, the American population is aging, and the number of people with a disabilities is on the rise. Age and disability should be accepted as part of the fundamental forces of life rather than treated as adversities (Mueller, 1995).

As life expectancies in the U.S. increase and Baby Boomers enter their retirement years, more and more elderly people are faced with the decision of where they are going to live as they age. Americans aged 65 and older made up 12.4% of the population in the year 2000. If current rates persist, by the year 2030, 20% of the population will be 65 years of age or older (Federal Interagency Forum on Aging Related Statistics, 2000). Nursing homes, retirement communities and assisted living facilities are being developed across the country. For some elderly people these options are appealing for various reasons. But many older adults, especially those who have spent all or most of their lives in rural areas, would much prefer to stay in their own homes. In fact, the results of the National Older Adult Housing Survey (NOAHS) indicate that, even among the 75 years and older age group, adults prefer to remain in a single-family home or apartment, as opposed to moving to an assisted living home (NAHB Research Center and The Joint Center for Housing Studies of Harvard University, 2002).

Unfortunately, many elderly people live in older homes that can be accidents waiting to happen. Even newer homes often do not include adaptations that would make life not only easier, but also safer, for older adults. According to NOAHS, some older adults added safety features – grab bars, wheelchair accessibility, raised toilets, and shower seats – to their own homes. Nonetheless, relatively few homes had any safety features, including fairly inexpensive items, such as non-slip tread on stairs and lever doorknobs (NAHB, 2002).

The combination of the often less-than-ideal physical environment with the frequent physical problems and disabilities of older adults produces a situation in which many older people feel they are limited, often in important functions, in their own homes. According to a 2000 survey of civilian, non-institutionalized people by the Centers for Disease Control and Prevention, 34.7 % of adults aged 65 and over experienced an activity limitation. In other words, over one third of older adults experienced an inability to perform at least one activity considered normal for their age group due to a physical, emotional or mental problem. The percent rose to 45.1 % when only adults aged 75 and over were considered. Furthermore, 12.7 % of adults aged 65 and over experienced a limitation with an “instrumental activity for daily living” (IADL). Such activities include everyday household chores and basic mobility (National Center for Health Statistics, 2002). As adults age, if they choose to remain in their homes, it may be important to adapt their homes to help them lead happier and healthier lives.

Despite the emphasis on the elderly population, universal design products are beneficial to all residents of a home, and are especially important for disabled persons of all ages. The U.S. Census Bureau (2000) reported that 40 million Americans, or almost 15% of the nation's population over the age of five years, had a disability in the year 2000. (Disability and functional limitation statistics include those born with disabilities and those whose abilities have declined

during their lifetime due to disease, accident, aging, or a combination of these factors.) Actually, there is “no clear line between people who are categorized as ‘disabled’ and those who are not. A performance or ability distribution for a skill/ability is generally a continuous function rather than a bimodal with distinctive ‘able’ and ‘disabled’ groups” (Vanderheiden, 1990, p. 339). Everyone, at some point during his/her lifetime, is physically disadvantaged or functionally restricted, whether it is from a temporary injury or illness or even at an awkward moment with their arms full of packages. Broken bones, low back pain, flu, etc. – each causes at least minor, temporary impairment that can make even simple tasks troublesome (Mueller, 1990).

### **Current “State of the Art”**

As the need for adaptive home environments has become more prominent in the U.S., more research has been conducted on consumers’ perceptions of universal design products and other home modifications. In general, research has demonstrated that the majority of the population refrains from planning for future needs in their home environment (Filion, Wister, & Coblenz, 1992). This attitude is particularly characteristic of older people, who have gradually, and somewhat effectively, adapted to their present environments (Sohn, 1997). Consumers tend to show a propensity to make do with their current environment rather than adjust to something unfamiliar, especially when the alterations are related to aging or disability (Filion *et al.*, 1992; Gilderbloom & Markham, 1996).

Gilderbloom and Markham (1996) observed that consumers were apprehensive about ruining the appearance of their homes and therefore reducing the market value or resale price of their home. In addition to these reasons, Wolford (2000) stated that many homeowners feared that addition of universal design features would render their homes more institutional-looking. Older homeowners also had a fear of unethical workmen and shoddy workmanship (Wolford, 2000).

Sohn (1997) studied older consumers’ perceptions of residential universal design features. He found that when consumers actually tried out universal design features and products, their perceptions that these features were useful and attractive increased. However, their new, positive views of the universal design products failed to overcome their perceptions that the products were too expensive.

McFadden and Brandt (1993) studied a large sample of pre-retirees to ascertain their views of environmental modifications and how such adaptations might aid them in their desire to age in place. The researchers tested the relationships between selected demographic characteristics of the respondents and their evaluations of their current homes to: 1) accommodate a wheelchair or 2) be adapted to wheelchair use. Health status, age, gender and educational level all proved to have no significant relationship with the possibility of adapting a home to accommodate a wheelchair. Using multiple regression analysis, only being married and having multiple sources of retirement income were found to be related to making changes in the home environment.

Mannion (1992) polled Kansas homeowners between the ages of 40 and 60 to assess their perceptions of universal design features in a home. She tested the independent variables of the homeowner’s gender and income and the age of the homeowner’s residence. The dependent variable was the respondent’s measured perception of attractiveness and likelihood to purchase

eight universal design housing features. None of the variables was significant, and most respondents were neutral about the attractiveness, of and desire to include, the items in their homes.

Hare (1992), while observing frail elders in suburban neighborhoods, observed that adaptations made to enhance life for the elderly were often readily accepted by younger persons as being convenient.

Nunn (2003) mailed a questionnaire to a national random sample of U. S. households to measure the relationship between the characteristics of the residents and the dwelling and each of two dependent variables: 1) the number of universal design features in their present homes and 2) the level of desire for universal design features in a future home. Respondents where the household head was under 60 years of age most desired the following five features in a future home: one full bedroom and bath on the main floor, adjustable shelves in wall cabinets, under cabinet task lighting, base cabinets with pull-out shelves, and adjustable closet rods and shelves. The households with the principal owner or renter 60 years or older expressed the strongest preferences for the following items in a future home: one bedroom and full bath on the main floor, base cabinets with pull-out shelves, grab bars in the tub or shower, adjustable shelves in wall cabinets, and lever controls on faucets. The least-preferred features for both groups were: removable base cabinets, open-front space below the sink and dishwasher elevated off of the floor. By far, the most important difference between the two groups was the desire for grab bars in a future home. While this feature ranked third on the list of those owners or renters over 60 years of age, grab bars were listed as seventeenth in the order of preference for the younger respondents. The older households also rated the desire for handrails on both sides of the stairs and lever-controlled faucets as a more preferred items, as compared to the younger households.

On the other hand, the younger households desired hand-held showerheads, rocker light switches, and base cabinets with lazy-susan features more often than the older group of respondents. Overall, when evaluating the desire for universal design features in a future home, the age of the principal owner or renter, the presence of a person with a mobility impairment, and plans to move were all positively related to a greater desire for universal design features.

Sweaney, Brock, Meier, & Manley (2001) developed a survey to measure consumers' willingness to use innovative housing products. Focus groups were used to start the process. The preliminary survey was developed and pilot tested. Changes were made accordingly, and a final survey was recommended.

### **Future Research Directions**

Given the fact that universal design remains a type of product not well known by most American consumers but at the same time is an innovation that could prove helpful to millions of Americans, more research should be conducted. Following are some research directions that should be considered:

- ?? Research needs to focus on what consumers know about universal design products and how they perceive those products.

- ?? Since universal design is a consumer driven product research could seek ways that consumers could be better educated about the potential benefits of universal design products.
- ?? Building on the work of Sweaney et al (2001) a survey could be adapted to measure consumers' willingness to use universal design features in their homes. This survey could include willingness to pay for the features.
- ?? Studies need to be conducted to measure the interaction effects of the built environment features and functional ability of residents to reduce the likelihood of relocation.
- ?? How can we create ways of extending the amount of time people can live safely in their own homes?

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