THE RURAL ELDERLY: PERSONAL INNOVATIVENESS TOWARD HOUSING AND ACCEPTANCE OF NONTRADITIONAL HOUSING TYPES

by

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(ABSTRACT)

The major purpose of this study was to determine the factors which affect elderly individuals' innovativeness toward housing and factors which affect the acceptance of nontraditional housing type(s) by elderly individuals. The study analyzed data from the Southern Regional Research Project, S-194, "Barriers and Incentives to Affordable Housing." The sample consisted of 1,878 respondents over age 55 who resided in 28 communities in seven southern states.

A conceptual study framework was proposed to show the variables and relationships among the variables involved in this study and to test hypotheses. A theory of "diffusion of innovations" developed by Rogers (1983) was used as the theoretical background for this study. Two knowledge continuum indices of Weber, McCray, and Claypool (1985), based on the adoption process of Rogers (1983), were used to measure acceptance of nontraditional housing types: mobile homes, apartments or townhouses, solar houses, earth-sheltered houses, or a combination of these four housing types.

Descriptive analysis indicated that the majority of

elderly respondents were retired, white, married males with a mean age of 66.4 years, with less than a 12th grade education and incomes between $10,000 to $24,999 per year. They were single-family detached homeowners without a mortgage, had lived in rural areas previously, and had lived in their dwelling which was almost 32 years old for approximately 20 years.

Two statistical techniques (the ANOVA and Multiple Regression) were used to test five null hypotheses. Hypothesis testing revealed several important findings:

1) Those age 55 to 64, previous residents of larger communities, and those with higher incomes possess higher personal innovativeness toward housing;

2) Those age 55 to 64, the more educated, employed, previous residents of larger communities, current mobile home dwellers, homebuyers or renters, and with higher monthly house payment or rent are more accepting of nontraditional housing type(s). Those with higher incomes are also more accepting of nontraditional housing type(s) with the exception of mobile homes;

3) Age is a significant predictor of elderly individuals' acceptance of nontraditional housing type(s); and

4) "Experimentation and new design/ideas" and "new housing types" factors have the most significant effects on elderly individuals' acceptance of nontraditional housing type(s).

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Text Tables

Appendix Tables

CHAPTER I

INTRODUCTION

Despite substantial improvement in rural housing conditions since the 1950s, availability and quality of adequate housing at affordable levels are still critical problems in all rural regions in the United States. However, rural households in the South are even more likely to face housing problems (Lazere, Leonard, & Kravitz, 1989). That is, the households in substandard housing with severe structural defects in the rural south are greater in number than those in the north (urban or rural) or housing units in the urban south (Weber, Beamish, & McCray, 1989). The poor, the aged, and blacks occupy a disproportionate share of poor housing (Bird & Kampe, 1977).

Many elderly reside in the rural South. In fact, 21 out of the 50 states have at least 40% of their older population in rural areas (Atchley, 1975). Moreover, the older population is concentrated in the north central and southern regions of the U. S.

The rural elderly are more likely to have housing problems than other groups. In 1979, 15% of the U. S. rural elderly heads of households lived in inadequate housing compared with 8% of the urban elderly (Arnold, 1984). In addition, one out of five elderly homeowners in rural areas and about half of rural renters were unable to afford their homes (Bird & Kampe,

1977).

With regard to the rapid growth of the older population, the availability of appropriate housing at affordable levels has been recognized as one of the major issues in housing. Although it is true that the majority of older people live in traditional single-family detached dwellings, various types of housing choices or alternatives, in addition to this traditional housing type, are essential in order to meet not only their economic needs but also the unique physical, psychological, and social needs, if possible. Nontraditional housing types such as mobile homes, apartments, townhouses, solar houses, and earth-sheltered houses may be considered options for satisfying these needs of the elderly.

There has been a trend toward innovative ideas for housing in the housing industry's response to the concerns of the elderly as well as those of the general population. However, acceptance of nontraditional housing types depends upon the consumers themselves, how they think and feel about certain new ideas, and more specifically, whether or not they possess a trait of innovativeness toward housing. Also, the personal experiences and backgrounds of the consumers may affect their selection among available housing alternatives. Although the actual numbers of alternative housing types have increased, there is a lack of knowledge of elderly individuals' acceptance of and/or preference for nontraditional housing

types and attitudes and/or perceptions toward innovative and technological changes in housing. Therefore, older individuals' innovativeness toward housing and acceptance of nontraditional housing type(s) deserve attention.

Justification of the Study

The sharp increase in the number and proportion of elderly indicates growth in the current and future demand for housing designed to meet the needs of the elderly. While in 1900 only four percent of the population was over age 65, this proportion rose to slightly more than 11% in 1980 (Hancock, 1987). Since 1980, the number of older Americans has increased by 3.6 million or 14%, compared to an increase of five percent for the population under 65 (American Association of Retired Persons [AARP], 1987). Between 1980 and 2030, older individuals will more than double from 25.5 to 55 million persons, or from 25.7 to 33% of the total population (AARP, 1987; Hancock, 1987). This percentage increase in 50 years will certainly have profound effects on all aspects of housing and living environments for the elderly. Moreover, there will be a shift within the age structure of the older population itself. As the fastest growing segment among the older population, those over age 75 will comprise about 50% of the total older population in the year 2000 (Struyk & Katsura, 1987). Based on these population projections, current and

future increases in housing demand can be easily noticed.

But households, as the consuming unit, are a better predictor of housing demand than total population (Hancock, 1987; Newman, 1986). Newman (1986) stressed two major trends: First, the growth in the number of elderly households has persisted over the last three decades and is projected to continue until the year 2030 when the baby boom generation reaches age 65. Second, the ratio of elderly households to households headed by the nonelderly has grown over time. There will be 23 million elderly households in the year 2000 compared to 16 million in 1980 (Hancock, 1987). This prediction indicates that the elderly will need seven million more housing units in the year 2000 on the basis of the assumption that all households were decently housed in 1980, that the living patterns remain the same, and that the existing stock is maintained. These trends and figures clearly point out that elderly households are, and will continue to be, a substantial share of all housing consumers.

The vast majority (70%) of the elderly own their homes (U. S. Senate, 1984). In some rural communities, elderly homeowners account for a quarter or more of all homeowners. Moreover, the elderly are more likely to own their home mortgage free than are nonelderly (White House Conference on Aging, 1981).

Most elderly individuals desire to live independently in

their own home. However, chronic illness, associated disabilities, and reduced economic capabilities make this difficult. Home maintenance is considered a critical problem for elderly homeowners. Despite the fact that elderly persons are more likely to live in older and poorer housing units which need more repairs, maintenance, and modifications, they may be unable or unwilling to keep up with maintenance on their house due to economic and physical limitations (Campbell, Converse, & Rogers, 1976). Struyk and Soldo (1980) pointed out that older homeowners in general neglect or defer necessary home repairs and maintenance more often than do younger owners. For the community as a whole, large numbers of homes that are occupied for extended periods by people who are unable or unwilling to provide necessary maintenance can have a blighting influence (Merrill, 1989). Therefore, providing relatively maintenance-free housing alternatives may prohibit further deterioration of older housing, reduce maintenance costs, and ultimately enable elderly individuals to be masters of their own houses.

The housing situation should be adjusted over time as household composition and housing needs change. As people age, a house that was once adequate, comfortable, and affordable for the family may no longer be suitable. Therefore, certain types of nontraditional housing may be recognized as an adequate and affordable alternative to meet

their needs. However, in general, the most preferred housing type by American families is the traditional, single-family detached dwelling (Dillman, Tremblay, & Dillman, 1979). Furthermore, elderly heads of households are more likely to own a single-family detached dwelling unit than any other type. They are also more likely to live in a single-family detached dwelling unit than any other segment of the population. But Dillman, Tremblay, and Dillman (1979) stressed that preference for single-family home ownership declined dramatically as age increased. In their study, fewer than half of the respondents who are over the age of 65 selected single-family homeownership as their first or second preference. Many of this age group desired to rent a home in a multi-unit structure or buy a mobile home.

Federal, state, and local tax policies have major effects on the housing choices of older Americans (Turner, 1986). One of the most important tax provisions is the one-time exclusion of capital gains on the sale of homes. The capital gains provision encourages older persons to sell their home and move into less expensive housing without incurring a tax liability. This tax incentive can influence the acceptance of alternative housing by elderly people.

Whether or not innovative ideas in housing will be accepted is closely related to demographic and housing characteristics of the household residents. The level of innovativeness of

the residents toward housing can have impacts on perceptions of nontraditional housing, or more specifically, the acceptance of these housing units.

It is important to discover the factors among the personal characteristics and housing characteristics which affect older individuals' innovativeness toward housing, and the acceptance of nontraditional housing alternative(s) in elderly individuals. It is also important to identify the relationship between personal innovativeness toward housing and the acceptance of nontraditional housing alternatives in elderly individuals.

Data Base

The 1,878 respondents who are over age 55 from the total sample of 4,682 usable respondents included in the S-194 Southern Regional Housing Research Project, "Barriers and Incentives to Affordable Housing," was used as the sample for this study. This study analyzed selected data from 28 communities in seven southern states (Alabama, Arkansas, Georgia, North Carolina, Oklahoma, Tennessee, and Virginia).

Purpose of the Study

The purpose of this study was to determine the factors which affect older individuals' innovativeness toward housing and factors which affect the acceptance of nontraditional

housing type(s) by elderly individuals. Specifically, three age subgroups - 55 to 64, 65 to 74, and age 75 and older - were compared. (The respondents were collapsed into these three subgroups for comparison because of heterogeneity of the population, increased chance of frailty at later ages, and increased likelihood of acceptance at younger ages).

Objectives of the Study

The objectives of this study were:

1) To describe the demographic and housing characteristics affecting:
   a) personal innovativeness toward housing in elderly individuals.
   b) acceptance of nontraditional housing type(s) in elderly individuals.
2) To examine whether age is a significant factor in explaining:
   a) personal innovativeness toward housing.
   b) acceptance of nontraditional housing type(s).
3) To determine the differences among three age subgroups (55 to 64, 65 to 74, and age 75 and older) in explaining:
   a) personal innovativeness toward housing.
   b) acceptance of nontraditional housing type(s).
4) To identify the relationship between personal innovativeness toward housing and acceptance of

nontraditional housing type(s) in elderly individuals.

Theoretical Framework

A theory of "diffusion of innovations" developed by Rogers (1962, 1983) and Rogers and Shoemaker (1971) was used as a theoretical background of this study to help explain characteristics of elderly individuals who accept or reject new ideas in housing. Overall, this theory explains the process by which individuals become aware of and decide to accept or reject new ideas or products.

There is limited empirical research in the field of housing based on this theory in order to predict or explain the relationships between various housing characteristics and personal innovativeness or the process of diffusion of innovations. Reagor (1989) employed particular housing characteristics, such as tenure status, duration of residence, dwelling expenses, and location, type, size, and age of dwelling, as independent variables to predict the acceptance of housing alternatives, which were measured by using the adoption process that is a part of diffusion of innovations theory. Till (1988) also used similar housing variables to explain the disposition of innovativeness of households and intermediaries in four S-194 communities in Alabama. In the present study, the independent variables associated with housing characteristics were identified from an extensive

review of literature, especially studies related to housing quality, need, preference, and satisfaction.

In order to understand how a particular innovation diffuses throughout a social system, Rogers (1962, 1983) and Rogers and Shoemaker (1971) identified four essential elements in the diffusion of innovations which interrelate to produce positive or negative effects upon the individual's acceptance of an innovation. These four main elements are: (a) the innovation, (b) communication channels from one individual to another, (c) time period between the initial introduction of the innovation and its adoption, and (d) the social system into which it is introduced. Rogers (1983) stressed that an innovation is "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (p. 11). In other words, an idea, practice, or object should be considered an innovation on the basis of an individual's perception of its newness rather than by any objective measure of the lapse of time since its first use or discovery. If the idea seems new to the individual, it is an innovation. If this criterion is applied to this study, then nontraditional housing types such as mobile homes, apartments/townhouses, solar houses, and earth-sheltered houses may be classified as innovations for elderly residents in small towns in the rural South.

According to Rogers and Shoemaker (1971), when individuals are introduced to innovations, they do not immediately adopt

them. Rather they usually proceed through a series of stages before adopting any innovations. This process is described as "the adoption process" and consists of five major stages which are as follows: (a) awareness stage - the individual is exposed to the existence of the innovation but lacks complete information about it; (b) interest stage - the individual actively seeks information about the innovation; (c) evaluation stage - the individual makes mental application of the innovation to his/her present and anticipated future situation and decides whether or not to try it; (d) trial stage - the individual actually tests the innovation on a small scale in order to determine its utility in his/her own situation; and (e) adoption stage - the individual uses the innovation continuously on a full scale. This concept of gradual movement through the continuum can be applied to individual or household decisions regarding the continued use or adoption of an innovative idea.

On the basis of the adoption process, Weber, McCray, and Claypool (1985) developed two knowledge continuum indices to measure the acceptance of various innovative housing types by using the data set from the S-141 Southern Regional Housing Research project entitled "Housing for Low- and Moderate-Income Families." The first was a Housing Type Level of Knowledge Index, and was useful to measure a consumer's propensity to adopt a specific housing type. The second was

a Total Knowledge Index which was used to measure characteristics associated with consumer propensity to adopt innovative housing in general. Both indices have been tested and validated by Weber et al. These two indices were selected and modified in order to fit the present study. The modified indices measured the acceptance of elderly individuals with each of four nontraditional housing types, as well as a combination of these housing types.

Rogers (1983) and Rogers and Shoemaker (1971) identified five perceived attributes of innovations which affect likelihood of adoption and rate of adoption (i.e., the relative speed at which an individual proceeds through the adoption process). The five attributes are: (a) relative advantage - the degree to which an innovation is superior to the idea it supersedes; (b) compatibility - the degree to which an innovation is consistent with existing values, past experiences, and needs of potential adopters; (c) complexity - the degree of relative difficulty of understanding and use; (d) trialability - the degree to which the innovation may be tried on a limited basis; and (e) observability - the degree to which the results of an innovation are visible to others. Previous studies have demonstrated that perception or acceptance of an innovative idea is attributed to demographic and social characteristics of families and households (Unseld & Crews, 1981). However, LaBay and Kinnear (1981) and Ostlund

(1974) found that the above perceived attributes of the innovations were better predictors of adoption than personal characteristics.

Different types of demographic characteristics are correlated with the rate of adoption and also correlated with an individual's innovativeness. Researchers in the marketing field have defined "innovativeness" as a psychological trait underlying the adoption of new ideas, services, or products (Hirschman, 1980; Leavitt & Walton, 1974; Midgley & Dowling, 1978). According to Midgley and Dowling (1978), all people possess innovativeness, but it varies in degree from person to person. Rogers (1983) and Rogers and Shoemaker (1971) suggested adopter categories which are the classification of individuals in a system on the basis of innovativeness. These categories include innovators, early adopters, early majority, late majority, and laggards.

Much research literature on the diffusion of innovations has identified variables related to innovativeness in order to distinguish characteristics of early adopters from those of late or never adopters. Although there were some inconsistencies in the findings, characteristics of adopter categories can be divided into three major parts: (a) socioeconomic status, (b) personality variables, and (c) communication behavior. More innovative individuals are not different from less innovative individuals in age (although

findings were not always consistent). On the other hand, they are more likely to have higher levels of education, income, and social status, greater levels of empathy, rationality, and intelligence, more exposure to mass media and interpersonal channels of communication, and more contact with change agents than individuals who are less innovative (Rogers, 1983).

This diffusion of innovations theory has been used considerably in research relating to the adoption and use of innovative ideas or products in housing such as solar and other energy-efficient alternatives (i.e., energy conservation features and solar equipment) to the housing system (Leonard-Barton, 1981a, 1981b). However, there has been limited research that has attempted to measure the individual's innovativeness toward housing and its impact on the acceptance of different housing type(s), especially for specific age groups.

Proposed Study Framework

Based on a review of the literature that emphasized factors associated with the diffusion of innovation of new ideas, products, or practices, a study framework was proposed. Figure 1 shows a graphic summary of the variables and relationships among the variables involved in the study. The investigator examined the dependent and independent variables

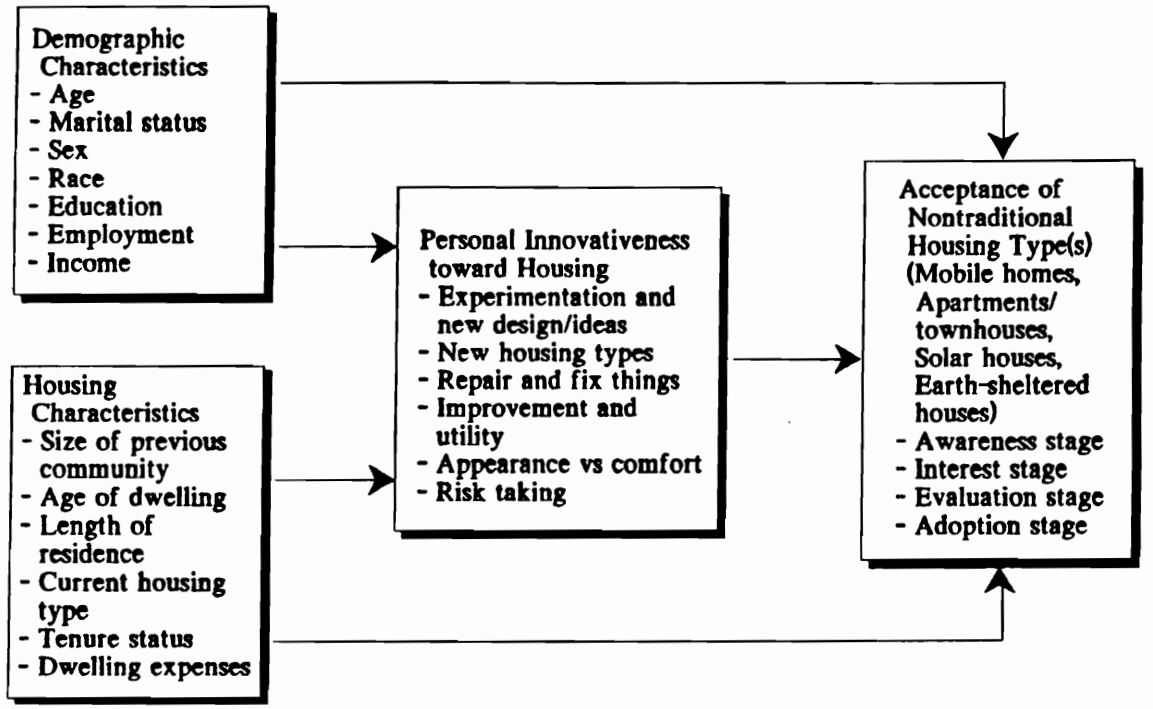

Figure 1. Proposed Study Framework

according to this study framework. This framework was divided into two major phases: the first phase of the study was designed to determine the factors which affect older individuals' innovativeness toward housing. In this phase, the independent variables were demographic characteristics and housing characteristics. Selected characteristics investigated in each of the independent variables were:

1) Demographic Characteristics
   a. age
   b. marital status
   c. sex
   d. race
   e. education
   f. employment
   g. income
2) Housing Characteristics
   a. size of previous community
   b. age of dwelling
   c. length of residence
   d. current housing type
   e. tenure status
   f. dwelling expenses

The dependent variable for phase I was elderly individuals' personal innovativeness toward housing. Personal innovativeness toward housing was categorized as follows:

1) experimentation and new design/ideas

2) new housing types

3) repair and fix things

4) improvement and utility

5) appearance versus comfort

6) risk taking

Overall, elderly individuals' personal innovativeness toward housing was considered to be a function of their demographic and housing characteristics.

The second phase of the study was designed to determine the factors which affect the acceptance of nontraditional housing type(s) by elderly individuals. The independent variables for this phase were:

1) Demographic Characteristics

   a. age

   b. marital status

   c. sex

   d. race

   e. education

   f. employment

   g. income

2) Housing Characteristics

   a. size of previous community

   b. age of dwelling

   c. length of residence

d. current housing type

e. tenure status

f. dwelling expenses

3) Personal Innovativeness toward Housing

a) experimentation and new design/ideas

b) new housing types

c) repair and fix things

d) improvement and utility

e) appearance versus comfort

f) risk taking

Demographic and housing characteristics had an impact upon acceptance of nontraditional housing type(s) in elderly individuals. Personal innovativeness toward housing also played a role as an independent variable to explain acceptance of nontraditional housing type(s) (dependent variables). The dependent variables for the second phase were the acceptance of each of four nontraditional housing types and that of a combination of those nontraditional housing types. That is, the acceptance of nontraditional housing type(s) was considered to be a function of demographic and housing characteristics, and personal innovativeness toward housing. The acceptance of nontraditional housing type(s) was measured by the propensity to adopt or accept the following housing types: mobile homes, apartments/townhouses, solar houses, and earth-sheltered houses.

Hypotheses

The null hypotheses developed to measure the objectives were:

Ho1: There is no significant relationship between the mean factor scores on personal innovativeness toward housing and each of the selected demographic and housing characteristics of the elderly respondents:

a) age,

b) marital status,

c) sex,

d) race,

e) education,

f) employment,

g) income,

h) size of previous community,

i) age of dwelling,

j) length of residence,

k) current housing type,

l) tenure status,

m) dwelling expenses.

Ho2: There is no significant relationship between the mean acceptance score of each nontraditional housing type and each of the selected demographic and housing characteristics of the elderly respondents:

a) age,

b) marital status,

c) sex,

d) race,

e) education,

f) employment,

g) income,

h) size of previous community,

i) age of dwelling,

j) length of residence,

k) current housing type,

l) tenure status,

m) dwelling expenses.

Ho3: There is no significant relationship between the mean acceptance score of a combination of nontraditional housing types and each of the selected demographic and housing characteristics of the elderly respondents:

a) age,

b) marital status,

c) sex,

d) race,

e) education,

f) employment,

g) income,

h) size of previous community,

i) age of dwelling,

j) length of residence,

k) current housing type,

l) tenure status,

m) dwelling expenses.

Ho4: Adding the age variable to other selected demographic and housing characteristics (marital status, sex, race, education, employment, income, size of previous community, age of dwelling, length of residence, current housing type, tenure status, and dwelling expenses) does not significantly increase the amount of variance for explaining:

a) personal innovativeness toward housing.

b) acceptance of each nontraditional housing type.

c) acceptance of a combination of each of the nontraditional housing types.

Ho5: There is no relationship between personal innovativeness toward housing and acceptance of:

a) each nontraditional housing type.

b) a combination of each of the nontraditional housing types.

Delimitation of the Study

The focus of this study was limited to rural households

located in four counties in each of the seven southern states participating in the S-194 regional research project. The four counties sampled in each state were limited to those in the non-MSA (Metropolitan Statistical Area) small towns with populations between 2,500 and 10,000 and those in incorporated county seats with a population ranging from 1,000 to 2,500 if they were in non-MSA counties that did not have a town with a population of 2,500 to 10,000.

Of the 5,310 households included in the original sample, 628 households were eliminated due to the following reasons:

1) lack of questions answered (households which answered less than 75% of questions were eliminated),
2) lack of demographic information, and
3) if the household was not located in the county for which the questionnaire was designated.

Of the 4,682 households included in the final sample, the sample of 1,878 respondents over age 55 were used in this study.

Limitation of the Study

The variables used in this study were restricted to those variables included in the household survey instrument (Housing Questionnaire) in the S-194 Southern Regional Research Project, "Barriers and Incentives to Affordable Housing." Thus, one limitation of this study was lack of additional

variables, such as those relative to housing satisfaction, which can influence the adoption process for innovation in housing. In terms of housing types, questions in the survey instrument did not differentiate the housing types by structure types (mobile home and apartment or townhouse) and construction types (solar house and earth-sheltered house) even though they are distinctly different types. This study defined nontraditional/innovative housing types without separating these two different aspects of dwellings.

Another possible limitation of this study was the use of 1980 census data as a means of selecting the sample counties for the regional project. It is possible that in the intervening years conditions may have changed, making the classification of counties on the basis of population size and level of housing program/activity diversity out-dated.

Another limitation was the geographical restrictions of the regional project. Only the rural south regions (which are considered more conservative than any other regions of the country) participated in the project. Thus, few generalizations of the results from this study can be made to elderly individuals and households in other regions.

Definition of Terms

The following terms have been defined for use in this study:

Adoption Stage: The final stage in the adoption process represented by full-scale acceptance and use of an innovative idea or product (Rogers, 1983).

Apartment/Townhouse: A housing unit in a building with three or more attached units with two or more stories which has a common foundation and structural system for roof and wall divisions.

Awareness Stage: The stage in the adoption process where the individual is exposed to the existence of the innovative idea or product and learns about it (Rogers, 1983).

Diffusion of Innovation: A social process in which subjectively perceived information about a new idea is communicated (Rogers, 1983).

Earth-Sheltered House: A house either partially or totally surrounded by earth which provides increased energy savings and other benefits.

Evaluation Stage: The stage in the adoption process in which the individual attempts to determine the suitability of the innovative idea or product for his/her present and future condition (Rogers, 1983).

Innovation: An idea, practice, or object that seems new to an individual (Rogers, 1983).

Innovativeness: The propensity of consumers to adopt new products (Hirschman, 1980).

Interest Stage: The stage in the adoption process in which

the individual actively seeks information about a new idea or product (Rogers, 1983).

Mobile Home: A factory built unit constructed on a chassis and transported to its site by the cab of a truck to be used as permanent housing. Often called a manufactured house.

Nontraditional/Innovative Housing: Alternative housing types which differ from the traditional, single-family, detached house in structure and construction, such as mobile home, apartment/townhouse, solar house, and earth-sheltered units.

Rural: Nonmetropolitan statistical areas of incorporated townships/jurisdictions with populations of fewer than 10,000.

Solar House: A house that uses solar heat for the purpose of heating or cooling of the interior of the house. Usually, there are two different types of solar houses: (1) active solar houses equipped with mechanical devices which collect solar energy and transfer this energy for heating or cooling the house, and (2) passive solar houses which are dependent upon design, construction materials, landscaping, and site orientation to take advantage of solar energy without the use of solar collectors.

Traditional Housing: The most common type of housing, typically the conventionally built, single-family, detached house.

CHAPTER II

LITERATURE REVIEW

The focus of this chapter is the review of theory in diffusion of innovations, measurement of innovativeness, housing issues facing the rural elderly, demographic characteristics of the elderly, technological advances in the housing environment, and perceptions and acceptance of nontraditional housing types.

A History of Diffusion Research

The sociologist Tarde (1903) first suggested that the adoption of new ideas followed an S-shaped cumulative distribution over time. Also he indicated that the process of adoption was initiated by the behavior of opinion leaders and this behavior was imitated by the rest of the population. Since the 1940s the majority of diffusion research took place in the field of early sociology and rural sociology. Most research focused on the spread of new agricultural technology among farmers (Midgley, 1977; Robertson, 1971).

Based on the number of previous studies in diffusion research, Rogers (1962, 1983) in his book, Diffusion of Innovations, has established diffusion research as a subject of inquiry and as a generally applicable, theoretical framework. He identified the following nine major research traditions: anthropology, early sociology, rural sociology,

education, medical sociology, communication, marketing, geography, and general sociology. Rogers (1983) also identified eight main dimensions of diffusion research. These include: (a) earliness of knowing about innovations; (b) rate of adoption of different innovations in a social system; (c) innovativeness; (d) opinion leadership; (e) who interacts with whom in diffusion networks; (f) rate of adoption in different social systems; (g) communication channel usage; and (h) consequences of innovation.

Reviewing the past diffusion research, Rogers (1983) made a suggestion for future studies: "the challenge for future research is to expand the area of digging and to search for different objectives than those of the past. Perhaps there is a need to dig deeper, in directions that theory suggests" (p. 86).

Diffusion of Innovations

Rogers and Shoemaker (1971) proposed a theory of social change and adoption which consists of three sequential steps: invention, diffusion, and consequences. The invention step involves proposal of a new product or idea and does not ensure social acceptance. The diffusion step is the process by which information about the innovations is spread to other members of a social system. In many cases, a considerable time lag exists from the introduction of an invention to its widespread

adoption. Consequences, as a third step, is what happens following invention and diffusion. Is the idea or invention accepted or rejected?

Typically, an invention is not immediately adopted right after it is introduced to the members of a social system. In fact, there is the process which an invention undergoes in order to be accepted into a social system. This process may consist of a complex array of components and is known as the process of the diffusion of innovations.

According to Rogers (1983), the diffusion of innovations was defined as a social process which results from the communication of personally perceived information about a new product or idea. Simply, diffusion of innovations is a kind of social change. It is a process by which alteration occurs in the structure and function of a social system. This social change, as a result of the diffusion of an innovation, may affect positively or negatively the people in a society depending upon their own view.

Essential elements in the diffusion of innovations have been identified by several researchers (Katz, Levin, & Hamilton, 1963; Robertson, 1971; Rogers, 1962, 1983; Rogers & Shoemaker, 1971). Katz, Levin, and Hamilton (1963) defined the process of diffusion as: (a) the acceptance, (b) over time, (c) of some specific item - an idea or practice, (d) by individuals, groups, or other adopting units, linked to (e)

specific channels of communication, (f) to a social structure, and (g) to a given system of values, or culture. In the view of marketing discipline, Robertson (1971) defined the process of diffusion as: (a) the adoption, (b) of new products and services, (c) over time, (d) by consumers, (e) within social systems, (f) as encouraged by marketing activities. According to the most commonly used definition in recent diffusion research, diffusion is the process by which (a) an innovation, (b) is communicated through certain channels, (c) over time, (d) among the members of a social system (Rogers, 1962, 1983; Rogers and Shoemaker, 1971). The following sections reviewed each element of the diffusion of innovations based on the definition by Rogers (1962, 1983) and Rogers and Shoemaker (1971).

Characteristics of an Innovation

According to Rogers (1962, 1983) and Rogers and Shoemaker (1971), the first major element to the diffusion of innovations is the innovation. An innovation is an idea, practice, or object perceived as new by an individual or other unit of adoption (Rogers, 1983). Rogers pointed out that it is the individual's perception which matters, not whether the idea is objectively new or not. By some researchers, "technology" and "innovation" are used as synonyms. Uncertainty is usually produced by a technological innovation.

Therefore, an individual is motivated to seek additional information about the new product in order to reduce uncertainty about its expected consequences.

Robertson (1971) identified four definitional criteria frequently used to describe a product innovation: (1) newness from existing products, (2) newness in time, (3) newness in terms of sales penetration level, and (4) consumer newness to the product. That is, perceived newness is a major point in defining product innovation. With respect to housing, although alternative housing types such as mobile homes, apartments/townhouses, solar houses, and earth-sheltered houses have appeared in the housing market for a number of years, they can be defined as "innovative housing" especially for older consumers because of their new, nontraditional concepts and designs and their limited use in many housing markets.

Communication

Communication is the second major element in the diffusion of innovations. Robertson (1971) pointed out that the early view of communication portrayed a one-way flow of effects from sender to receiver. For instance, Shannon and Weaver (1949) defined communication as "all of the procedures by which one mind may affect another" (p. xx). However, recent researchers improved these direct effects and found the two-way flow of

communication. Rogers (1983) defined communication as a two-way interaction in which participants create and share information with one another in order to reach a mutual understanding. Diffusion is a unique type of communication in which the information that is exchanged is concerned with new ideas.

There are two communication channels in a social system: mass media channels and interpersonal channels (Midgley, 1977; Robertson, 1971; Rogers, 1983). Generally, mass media channels are the most rapid and efficient means to inform an audience of potential adopters about the existence of an innovation in order to create awareness of an innovation (Rogers, 1983). From the marketer's point of view, the mass media message is the perception of the product the manufacturer wishes to put before the individual (Midgley, 1977). Interpersonal channels involve a face to face exchange between two or more persons (Rogers, 1983). Interpersonal channels are more effective in persuading a person to adopt a new idea if the interpersonal channel links two or more persons who are near peers. Mass media channels often affect early adopters while interpersonal channels often affect later adopters in the process. Although many researchers in the field of consumer studies have demonstrated the superiority of interpersonal channels of communication, Robertson (1971) stated that interpersonal communication can be dysfunctional

in: (a) recommending against adoption, (b) being unreliable in content, and (c) being unfavorably perceived.

Heterophily and Homophily

Communication can be divided into two subfields based on the presence of the degree of difference or similarity of characteristics of individuals who interact, such as beliefs, education, and social status. Heterophily is the degree to which pairs of individuals who interact are different in certain characteristics and homophily, as the mirror opposite of heterophily, is the degree to which they are similar in certain characteristics. These two concepts were first developed by Lazarsfield and Merton (1964) and were utilized by Rogers (1983).

More effective communication occurs when individuals are homophilous because homophilous individuals usually belong to the same groups and share some interests. Therefore, the presence of the heterophily in the diffusion of innovations leads to special problems in securing effective communication (Rogers, 1983). Rogers noted that, ideally, individuals would be homophilous on all characteristics such as education and social status even though they are heterophilous regarding the innovation. Usually, however, individuals are heterophilous on all characteristics because innovation knowledge and experience are highly related to social status, education, and

the like.

Time

Time is also an important element in the diffusion of innovations. The time dimension is involved in the adoption process, the rate of adoption, and the innovativeness of an individual, and also distinguishes early adopters from later adopters (Robertson, 1971; Rogers, 1983; Rogers & Shoemaker, 1971).

The Adoption Process

Rogers and Shoemaker (1971) developed the "classical diffusion model" based on the review of the vast amount of publications related to diffusion research. In their model, the adoption process plays an important role. The adoption process or the innovation-decision process means the mental process through which an individual passes from first knowledge of an innovation through its adoption or rejection. This adoption process consists of the following five stages: (a) awareness - knowledge of the innovation; (b) interest - seeking information about the innovation; (c) evaluation - a mental trial of the innovation; (d) trial - testing the innovation on a small scale; and (e) adoption - utilization of the innovation on a full scale. In Rogers's (1983) most recent work on the diffusion of innovations, he modified this

adoption process and proposed five different stages of the process: (a) knowledge - discovering the innovation and gaining some understanding of how it functions; (b) persuasion - forming a favorable or unfavorable attitude toward the innovation; (c) decision - choice of whether to adopt or reject the innovation; (d) implementation - utilizing the innovation, and (e) confirmation - seeking reinforcement for the decision made.

If individuals are introduced to an innovation, it may be possible that they complete all steps of the adoption process. However, there may be others who skip one or more stages, recede backward, or never initiate the process. Furthermore, the characteristics of some new products or ideas can inhibit individuals from passing certain stages. For instance, consumers usually consider small scale trial before the adoption decision is made when trial of an innovation is possible. However, in the case of housing, small scale trial may be impossible. Therefore, adoption of new ideas in housing by peers may substitute for the actual trial (Weber, et al., 1985).

Rate of Adoption

Rate of adoption is the relative speed with which an innovation is adopted by members of a social system (Rogers, 1983). Rate of adoption is an aggregate measure resulting

from many separate adoption decisions. In effect it is a group average.

Rate of adoption of an innovation is highly related to individuals' perceptions of the attributes of innovations. In other words, the innovative attributes, such as relative advantage, compatibility, complexity, trialability, and observability affect the individuals' rate of adoption. The research findings revealed that the rate of adoption is positively related to relative advantage, compatibility, trialability, and observability of the innovation and is negatively related to complexity of the innovation.

Rogers and Shoemaker (1971) and Rogers (1983) indicated that there are other factors which affect rate of adoption, in addition to the perceived attributes of an innovation. These include: (a) the type of innovation decision, (b) the nature of communication channels diffusing the innovation at various stages in the innovation-decision process, (c) the nature of the social system, and (d) the extent of change agents' efforts in diffusing the innovation.

Innovativeness

Innovativeness is assumed to be a trait possessed, to a greater or lesser degree, by all members of a social system and relates to when an individual adopts the innovation as compared with when the social system as a whole adopts it

(Midgley, 1977; Midgley & Dowling, 1978). Rogers and Shoemaker (1971) also defined innovativeness as the inclination to accept innovative concepts. More specifically, innovativeness means the degree to which an individual is relatively earlier in adopting an innovation than the other members of a social system (Rogers, 1962, 1983). Here, relatively earlier means earlier in terms of the actual time of adoption, rather than whether individuals perceive they adopted the innovation relatively earlier than others in their system. Midgley (1977) pointed out that in order to understand individuals' innovativeness, two main facets must be taken into account: (a) the different demographic, socioeconomic, and psychological characteristics of the individuals, and (b) the ways in which the aggregate behavior of the more innovative individuals can affect the minds of others.

According to Midgley (1977), innovativeness is the degree to which an individual is willing to adopt without receiving favorable interpersonal information on the innovation's performance from his/her social contacts. Therefore, innovativeness is closely related to the amount of such favorable information about a new product that an individual requires before accepting the risk of adoption. An innovative individual is one who requires little or no social support and is prepared to make independent decisions on whether or not to

adopt. However, the less innovative individual is more dependent on interpersonal communication, and thus seeks additional information from others to make a decision. In short, innovativeness is the degree to which an individual makes innovation decisions independently of the communicated experience of others.

Midgley and Dowling (1978) noted that innovativeness itself is a hypothetical construct postulated to explain or predict observable phenomena, but existing only in the mind of the researcher and at a higher level of abstraction.

Adopter Categories

Adopter categories are the classifications of members of a social system on the basis of innovativeness (Rogers, 1983). Because all individuals in a social system do not adopt an innovation at the same time, they can be classified into different categories on the basis of when they first begin using an innovative product. The time is an important variable to make adopter categories and to plot diffusion curves. Past research (Rogers, 1962, 1983; Rogers & Shoemaker, 1971; Tarde, 1903) has explained the adopter distribution in both its frequency and its cumulative form. The frequency curve is shown as a normal, bell-shaped curve and the cumulative form follows an S-shape curve.

On the basis of the frequency curve, Rogers (1962, 1983)

identified the following five adopter categories which represent different levels of an individual's innovativeness: (a) innovators (venturesome), (b) early adopters (respectable), (c) early majority (deliberate), (d) late majority (skeptical), and (e) laggards (traditional). These five categories are ideal types, with conceptualization based on observations of realities and designed to make comparisons possible (Robertson, 1971; Rogers, 1983). These categories were based on the length of time required for a certain percentage of the expected number of members in a system to adopt an innovation (Rogers, 1983). Innovators consist of the first 2.5% of the population to adopt; early adopters are the next 13.5%; early majority are the next 34%; late majority are the next 34%; and laggards are the remaining 16% (Rogers, 1962). Midgley (1977) defined two adopter categories instead of five; (a) innovators, which represent 16% of the population, and (b) later adopters, which consist of the remaining 84%.

Based on an extensive literature review, Rogers (1983) divided his generalization about characteristics of adopter categories into three parts: (a) socioeconomic status, (b) personality variables, and (c) communication behavior. With respect to socioeconomic characteristics, he generalized that earlier adopters are no different in age, have more years of education, are more likely to be literate, have higher social

status, and have a greater degree of upward social mobility than later adopters. Also they are more likely to have a commercial economic orientation, and have a more favorable attitude toward credit than later adopters. Among these socioeconomic variables, age is the variable which has shown great inconsistency in research findings. Rogers (1983) reviewed 228 studies on this variable to determine the relationship of age and innovativeness. Only 48% of research studies supported his generalization. Many studies, especially in the field of marketing, have shown that the current cohort of older consumers is more likely to be the last persons to adopt a new product or idea (Gatignon & Robertson, 1986; Gilly & Zeithaml, 1985; Robertson, 1967; Robertson, 1971; Uhl, Andrus, & Polusen, 1970). Till (1988) found in her study of housing innovativeness that household respondents who were actively innovative were young, and traditional household respondents (later adopters) were older, widowed, less educated, had low incomes, were apartment and townhouse residents, renters, and previous residents of small communities.

In terms of personality variables, Rogers (1983) generalized that earlier adopters have greater empathy, are less dogmatic, have greater rationality, have greater intelligence, and have a more favorable attitude toward change than later adopters. They are also more able to cope with

uncertainty and risk, have a more favorable attitude toward education and science, are less fatalistic, have higher levels of achievement motivation and have higher aspirations than later adopters.

With respect to communication behavior, Rogers (1983) concluded that earlier adopters have more social participation, are more cosmopolitan, have more change agent contact, have greater exposure to mass media and interpersonal communication channels, seek information about innovations more actively, have greater knowledge of innovations, and are more likely to belong to a highly interconnected system than later adopters.

Social System

The social system is the last essential element to the diffusion of innovations. Social system is defined as a set of interrelated units that are engaged in joint problem solving to accomplish a common goal (Rogers, 1983). According to Robertson (1971), the social system is the boundaries within which diffusion occurs. For example, in terms of housing, the entire market segment can be viewed as a social system in a broad sense, and the housing market segment can be considered as a social system in a narrower sense.

A system has structure which gives stability and regularity to individual behavior. Thus, the structure of a social

system can facilitate or impede the diffusion of innovations in the system (Rogers, 1983; Rogers & Shoemaker, 1971). System norms are important factors which affect an individual's innovation-adoption behavior. System norms are the established behavior patterns for the members of a given social system (Rogers & Shoemaker, 1971). In other words, they define a range of tolerable behavior and serve as a guide or a standard for the members of a social system.

Rogers and Shoemaker (1971) conceptualized two system norms, as ideal types, which are most relevant for innovation diffusion: traditional and modern. Traditional social systems are characterized by less favorable orientation to change, a less developed technology, a relatively low level of education and understanding of the scientific method, affective and emotional personal relationships, and little communication with outsiders. In contrast, a modern social system is more change oriented, technologically developed, scientific, rational, and cosmopolitan. Rogers (1962) reported that innovations tend to develop at a faster rate in modern social systems and the economic conditions of these social systems have a greater influence on the diffusion of innovations than do those of more traditional social systems. These two ideal types are actually the end points of a continuum on which actual social system norms may range. That is, most social systems are combinations of the two.

The four major elements of the diffusion of innovations which were reviewed in this chapter are useful to explain the diffusion process of many new products, ideas, or concepts in a society. Among these elements, this study was focused on socioeconomic characteristics of adopter categories, innovativeness, and the adoption process. These selected elements were helpful in explaining or identifying the factors which influence older individuals' innovativeness toward housing and their acceptance of nontraditional housing types.

Measurement of Innovativeness

There have been empirical studies of the adoption of new products and the innovativeness of individuals, especially in the consumer and marketing fields. Innovativeness is a personality trait which is possessed by all members of a society and viewed as a continuum from high to low (Leavitt & Walton, 1975; Midgley & Dowling, 1978). Here, a personality trait means one of the characteristics or dispositions by which one individual can be distinguished from another. More specifically, the trait of innovativeness distinguishes early adopters of new ideas, services, or products from individuals who are later or newer adopters (Rogers & Shoemaker, 1971).

There are four techniques which are commonly used to measure innovativeness in rural sociology and marketing research (Robertson, 1971; Rogers & Shoemaker, 1971): (a)

ratings by judges or sociometric choices, (b) self-designated measures, (c) longitudinal measures, and (d) cross-sectional measures. In a method of ratings by judges or sociometric choices, the judgement of others are used to identify the innovators in a social system. Possibly, the judgmental nature of others can create problems which impact on the effectiveness of these methods. The self-designated method asks the individuals to indicate whether they perceive themselves to be innovators. The longitudinal method, as the most widely used method for classifying innovators, identifies a certain percentage of individuals who adopt a new product in a certain period of time. The cross-sectional method employs a continuum of the number of new products an individual purchases rather than a time continuum.

Leavitt and Walton (1975) designed a scale to measure the trait of innovativeness by utilizing a model of a psychometric methodology, which has demonstrable power in personality scale construction. They found that their scale is a reliable assessment to distinguish innovators from non-innovators.

Price and Ridgway (1982) reported that exploratory behavior in a consumer context can be divided into three main types: (a) exploratory purchase behavior, (b) vicarious exploratory behavior, and (c) use innovativeness. Exploratory purchase behavior means variety seeking with respect to innovative product purchase and brand switching. Vicarious exploratory

behavior involves information seeking by engaging in reading, talking with others, or shopping for new and unfamiliar products. Finally, use innovativeness involves the use of a previously adopted product in a single novel way or the use of a currently owned product in many different ways. According to Price and Ridgway (1982), there are five factors which constitute use innovativeness: (a) creativity and curiosity - the desire to use innovative products in ways that are different than the norm, (b) voluntary simplicity - the desire for material simplicity and recycling of old products, (c) risk preference - the willingness to take a chance on application of the products, (d) creative reuse - the ability to find alternative use potential of products, and (e) multiple use - ability to find multiple uses for a single product.

Price and Ridgway (1982) also developed a Likert-type scale to measure use innovativeness of students with a hand calculator by ranking the innovativeness factors. They found that students who scored higher on the use innovativeness scale engaged in significantly more innovative behaviors with a hand calculator than those who had lower scores on the use innovativeness scale.

Gruber, Beamish, Carter, Shelton, and Weber (1990) developed a housing innovativeness scale in order to measure personal innovativeness. Because no innovativeness scale

toward housing existed, they developed the scale by adapting items from two existing scales which measure different aspects of personal innovativeness. These two scales were "use innovativeness" (Price & Ridgway, 1982), and "trait innovativeness" (Leavitt & Walton, 1974). Items were reworded to reflect a housing orientation. The housing innovation scale developed by Gruber et al. (1990) was utilized in this study to determine personal innovativeness factors affecting the acceptance of nontraditional housing types in elderly individuals.

Housing Issues Facing the Rural Elderly

Over the past several decades, considerable attention has been directed toward many aspects of the housing of the elderly from scholars, policy-makers, and service providers. However, it is still undeniably the case that the problems and needs of specific subgroups of the elderly - such as the frail elderly, isolated elderly, the elderly in certain ethnic minorities, and the rural elderly - have received less attention (Bylund, 1985; Coward & Lee, 1985; Lee, 1986; Rowles, 1984). Although the elderly who reside in rural areas and small towns comprise almost one-third of all persons over age 65, and head about one out of every five households in their communities, their housing problems in general are less visible than those of their urban counterparts (Bylund, 1985).

The major topics discussed in this section include the importance of housing to the elderly and housing characteristics of elderly households, especially rural elderly households.

The Importance of Housing to the Elderly

Housing provides the individual with shelter, privacy, location, environmental amenities, and investment capacity for homeowners (Smith, 1970). Based on Maslow's "hierarchy of needs" (1970), it is said that housing plays a role in contributing to the fulfillment of needs at each level of the hierarchy. For instance, physiological needs, as the most basic level of needs, are met in part by the provision of shelter. At the top of the hierarchy, ego needs can be accomplished by the decor and style of the housing.

Housing is an integral part of everyone's total life situation. Especially, for the elderly, housing takes on added importance (Bylund, 1985; Golant, 1982; Montgomery, 1972). Montgomery (1972) stated that many elderly tend to be more confined in their life space, making housing a "major variable physically, socially, and psychologically in the lives of older persons" (p. 37). This statement makes sense when it is realized that the elderly spend 85 to 90% of their time in the immediate home environment (Hansen, 1971).

Lawton (1980) stated the "environmental docility

hypothesis" which says that "the less competent the individual, the greater the impact of environmental factors on that individual." Based on this hypothesis, it can be said that the greater the health and/or mobility problems, the more likely elderly individuals are to be affected by the environment.

The rural elderly usually experience a relative shortage of services in their communities. Thus, rural elderly are especially dependent upon their neighborhood and their dwelling. In other words, housing seems to be more important to rural elderly than to any other age group unless it be small children (Montgomery, Stubbs, & Day, 1980; Taietz & Milton, 1979).

Issues related to housing are closely connected with other aspects of the lives and lifestyles of the elderly. Research has revealed that housing satisfaction is a strong predictor of total life satisfaction (Campbell, Converse, & Rogers, 1976; Golant, 1982). The elderly report higher levels of housing satisfaction than do other age groups even though they may live in dwellings which are considered to be unsuitable in terms of objective standards of quality and dwellings which may even be detrimental to their health (Lawton, 1978; Struyk, 1977).

Housing Characteristics of the Elderly

The following sections describe the housing characteristics of elderly households. The specific characteristics include tenure, types of dwelling, dwelling expenses, length of residence, and age of dwelling.

Tenure

According to AARP (1987), of the 18.6 million households headed by older persons in 1986, 75% were owners and 25% were renters. Also, the elderly are much more likely than nonelderly to own their homes mortgage free (almost three times as likely) (White House Conference on Aging, 1981). For the rural elderly, approximately 90% of rural elderly farm families and 82% of nonmetropolitan household heads were homeowners (Ecosometrics, 1981). However, the higher rates of home ownership mean the rural elderly are more likely to encounter problems of maintenance, repair, and upkeep of the dwelling as well as rising property tax (Bylund, 1985; Krout, 1986).

There is some question whether home ownership is a strong need or preference for older people. Sherman (1972) found that many retirees feel it is a mistake to buy a home at their time of life. Although everyone had a strong preference for home ownership, the strength of that preference decreased with age (Dillman, Tremblay, & Dillman, 1979). Newman, Zais, and

Struyk (1984) also noted that there is a shift from owning to renting as age increases. Among owners who move, about 40% shift to rental units while only 15% of renters shift to ownership. As a result, the size of the elderly renter population increases. In particular, the increasing number of widows can be a major reason for the percentage increase of renters as age increases from 55 to 75. This mobility from one category of tenure to another may influence acceptance of housing alternatives of the elderly.

Types of Dwelling

The elderly choose many different types of living arrangements. Lawton (1978) reported that 67% live in single-family detached dwellings, seven percent in units with four or more floors, five percent in apartments with 50 or more units, five percent in mobile homes and another five percent in institutional settings. In addition, the remaining 11% occupy townhouses, group homes, accessory apartments, and granny flats. The rural elderly are more likely to live in single-family detached dwellings (approximately 86% compared to 54% for the metropolitan elderly) (Krout, 1986). That is, most elderly individuals live in single-family detached dwellings while a small proportion of the elderly population tends to live in planned housing for the elderly and other innovative housing alternatives. This dramatic difference in percentage

between the occupancy of the single-family detached dwellings and that of other types of dwellings may reflect the desire of the elderly to live in single-family detached dwellings, but it may be a result of the lack of other adequate alternatives available, especially in rural areas (Bylund, 1985; Krout, 1986). Furthermore, the high occupancy rate of single-family detached dwellings implies the likelihood of the increase in housing repair and upkeep costs for the elderly.

The current housing situation can influence the personal innovativeness of the elderly toward housing and the acceptance of innovative housing types by elderly individuals. If people perceive their current housing does not meet their needs and preferences, they could be more likely to alter or modify their existing housing situation, to make technological changes to their housing that would enhance the independence of elderly individuals, or to adopt new housing alternatives. In particular, when there is a change in tenure status, the elderly may be more receptive to different housing alternatives.

Dwelling Expenses

Consistent with the high rates of poverty among the elderly (over 21% of the elderly were poor or near-poor in 1986), many elderly spend a relatively high proportion of their income on dwelling costs (AARP, 1987). Struyk and Soldo

(1980) reported housing costs by using data from the 1976 Annual Housing Survey. They used the standard (30% of total income devoted to housing) set by the Department of Housing and Urban Development. They found that housing costs consume an excessively large share of monthly income for almost two out of every five older renters and one of three older homeowners. The elderly living on fixed incomes are selectively disadvantaged in terms of the rising costs of maintenance and energy. The percentage of income spent on housing (excluding maintenance and repair) in 1983 was higher for elderly households than for nonelderly households among homeowners without a mortgage (15% versus 10%), homeowners with a mortgage (24% versus 20%), and renters (32% versus 28%) (AARP, 1987).

According to Newman, et al. (1984), other research indicates that as the pre-old age cohort enters old age, its housing cost to income ratio rises. In 1980, those who were 65 to 74 had housing cost to income ratios between 6 and 12 percentage points higher than they had had a decade earlier. These increases continue after age 75, although they are less sharp. There is no question that elderly individuals desire to remain in their homes as long as possible, but it may be possible that in order to remain in their homes elderly people cut back on consumption of basic necessities which is directly related to their health and well-being.

The impact of high utility costs on older Americans has been great. One major reason for high utility costs is that many older people, particularly homeowners, live in older houses that may not be well insulated and that may have old and inefficient heating systems (Newman, et al., 1984). Utility costs for owners increase with increases in age. In 1980, owners who were in the 65 to 74 age category experienced nearly a $200 increase in utility costs over what they paid in 1970 after adjusting for inflation. This may suggest that energy conservation measures are not being adopted by the elderly or that their homes are not well suited to retrofitting.

Length of Residence and Age of Dwelling

There is a large difference in the length of residence and age of dwelling between the elderly people's housing and that of other segments of the population. Elderly homeowners have lived in their homes longer than the nonelderly (Soldo, 1980). Typically, one-third of the elderly population in the U. S. have lived in their homes 20 years or more (Struyk & Soldo, 1980). In terms of age of dwelling, the longer the tenure for the elderly in general, and for the rural elderly in particular, the older the housing of the elderly. Forty-eight percent of the elderly's housing was built prior to 1940 compared with 35% for all dwellings. The percentage reaches

60% for rural elderly (Atchley & Miller, 1975).

Older housing and longer residence in the current dwelling can suggest several important implications. The older dwellings of the elderly and especially the rural elderly are less suitable due to poor insulation, less maintenance and repair, and many physical deficiencies (Soldo, 1980). In addition, these older homes are worth less money (Soldo, 1980). Atchley and Miller (1975) argued that the homes of rural elderly have lower values because of their age and their more deteriorated condition.

The five housing characteristics reviewed in this section were used in this study as part of the independent variables to identify the relationship between housing characteristics and personal innovativeness toward housing. They were also used to determine the relationship between housing characteristics and acceptance of nontraditional housing type(s) by elderly individuals.

Demographic Characteristics of the Elderly

Changes in age structure in the U. S. population have been, and will continue to be, dramatic over this century. In 1986, the elderly population represented 12.1% of the total population. That is, about one in every eight Americans was 65 years or older (AARP, 1987). Approximately 21% of the total population of the U. S. is 55 years and over. The most

dramatic increase in the elderly population has been among the very old. Over the last two decades, the population 85 and older has doubled. By 2010, those 75 and older (the "old-old") will constitute more than 40% of the elderly population. Those over age 55 will represent approximately a quarter of the population when the postwar baby boom generation reaches retirement age (Newman, et al., 1984). All of the basic demographic processes (fertility, mortality, and migration) and medical advances contributed to this expansion in the number and proportion of elderly population (Clifford, Heaton, Voss, & Fuguitt, 1985).

This general information on population change suggests an important implication for housing and living environments: there is an increasing need for more housing and supportive services for the elderly, especially for the very old with low incomes and poor health. Thus, the increasing needs for housing for the older population based on major demographic changes will be a great challenge for this society.

The following section focuses on demographic characteristics which influence living arrangements and which must be considered when assessing housing needs, housing demand, or the acceptance of housing alternatives of the elderly. Specific demographic characteristics include age, marital status, sex, race, education, employment status, and income.

Age and Marital Status

The literature on demographic trends has revealed that in increasing number and proportion, people are surviving to age 65 and beyond. With regard to marital status, older men (77%) were twice as likely to be married as older women (40%) (AARP, 1987; Krout, 1986). In 1986, half of the older women were widows, and there were over five times as many widows (8.1 million) as widowers (1.5 million). Divorce rates of the elderly population comprised only four percent. However, this number increased nearly four times as fast as the elderly population as a whole in the preceding 10 years (AARP, 1987).

In rural areas, elderly populations of both sexes are more likely to be married and fewer widowed than in urban areas (Clifford, et al., 1985; Krout, 1986). Therefore, they can receive support from their spouses if they need personal care and feel protection from physical and psychological risk (Krout, 1986). Divorce and separation occurred least frequently in the rural farm population.

Age and marital status are frequently cited as predictors of housing and living arrangements (Sweaney, Pittman, & Montgomery, 1984). As people age, the dependence on their environments increases and widowhood frequently requires new life adjustments for the surviving spouse. Sweaney, Pittman, and Montgomery (1984) investigated the influence of these two variables on the housing behavior of older southern women.

The subjects of their study (227 widowed females and 227 married females living with their spouses) were part of a larger sample of 1,804 households living in nonmetropolitan areas in the S - 141 Southern Regional Housing Project "Housing for Low- and Moderate-Income Families." The subjects were further divided into three age groups: 50-64, 65-74, 75 and over. Six parts of the dependent variables were examined: current housing situation, housing costs, geographical mobility, housing satisfaction, decision making, and consumer acceptance of housing alternatives.

The results of their study demonstrated that age and widowhood are both relatively important predictors of housing behavior and attitudes. Age appeared to be the best determinant of mobility, housing costs, and several attitudes about housing alternatives. Older respondents were more likely to have lower utility costs, to report fewer energy conservation measures and to be less mobile. Attitudes toward housing alternatives of older respondents tended to be negative: they were less interested in conventional, retrofitted, and active solar houses than younger respondents. In terms of marital status, widowhood proved to be a more significant predictor of the housing situation, housing satisfaction, and several attitudes toward housing alternatives. Widows were more apt to live in smaller houses with poor conditions and to be less satisfied with their

housing. They were also more interested in apartment living but less interested in earth-sheltered houses than married respondents.

Dillman, Tremblay, and Dillman (1979) examined the influence of personal characteristics on housing preferences. In their study, age and marital status appeared to be the most important variables when examining housing preferences. Older respondents were more likely to express a preference for renting a duplex, renting an apartment, and owning a mobile home on rented space. Also, widows in their study tended to prefer the multi-family dwelling options such as renting a duplex and renting an apartment.

Typically, old age results in lower levels of residential mobility. However, Mercier (1987) noted that there are two age periods that show increasing rates of mobility: 60 to 69 and beyond age 75 because many older people have a need for assistance caused by losses associated with their later years of life. According to Mercier, the elderly have high housing satisfaction as well as more security in regard to their health when they are provided with housing alternatives.

Sex and Race

It is generally recognized that the problems of the elderly population in the U. S. are largely the problems of women. In 1980, 6 out of 10 older Americans were females and females

outnumbered males by nearly five million (Clifford, et al., 1985; Krout, 1986). The sex ratio differences within the urban areas are relatively small (63.0), but the ratio is much higher (82.6) for rural areas as a whole (Krout, 1986). Elderly women are less likely to reside in rural or nonmetropolitan areas; however, for elderly men, the opposite pattern is true. This sex imbalance among the elderly reflects different patterns of migration for men and women. Elderly widowers are more likely to remain on farms, but farm widows most frequently move to towns (Clifford, et al., 1985; Krout, 1986). This sex difference is noticeable because of significant impacts on the living arrangements of the elderly.

In terms of racial background, in general, the vast majority (90%) of those 65 and older were white, eight percent were black, and only two percent were other races in 1986. However, there are large differences in the ratio of racial composition between urban and rural areas. A greater percentage of black elderly live in urban areas (68.1% for black versus 58.4% for white), while a larger percentage of white elderly live in rural areas (26.2% for white versus 19.4% for blacks) (Clifford, et al., 1985; Krout, 1986).

Education, Employment, and Income

The educational level of the elderly population in the U. S. has been steadily increasing. Between 1970 and 1986,

their median level of education increased from 8.7 years to 11.8 years and the percentage who had completed high school rose from 28% to 49% (AARP, 1987). In 1986, approximately 10% had four or more years of college.

About three million elderly (11%) were working or actively seeking work in 1986 (AARP, 1987). They included 1.8 million men and 1.3 million women. They constituted 2.6% of the U. S. labor force.

Income status is an important determinant of housing consumption not just for the elderly but for all individuals. Limited financial resources restrict necessary adjustments in housing and living arrangements in response to major life changes of the elderly (Struyk & Soldo, 1980). The median income of the elderly in 1986 was $11,544 for men and $6,425 for women (AARP, 1987). About one of every seven (15%) families with an elderly head had incomes less than $10,000.

It has been clearly noted that the incomes of the rural elderly are substantially lower than those of the elderly living in urban areas. The median income of the rural elderly was 20% below that of urban elderly and 40% of the rural elderly reported incomes of fewer than $5,000 (Krout, 1986). The studies on the factors which contribute to the rural elderly housing disadvantage have indicated that lower income and lower educational levels of the rural elderly could be important factors which are associated with poor housing

quality (Atchley & Miller, 1975).

These seven socioeconomic characteristics reviewed in the section were chosen to be the part of independent variables in this study in order to determine the relationship between these characteristics and personal innovativeness toward housing. A second reason for including them is to examine the relationship between these characteristics and acceptance of nontraditional housing type(s) by elderly individuals.

Technological Advance in the Housing Environment

The technological change in modern society had an impact on the well-being of the elderly population as well as on the population in general. The elderly population is especially vulnerable to problems associated with technological change at the same time that their quality of life can be enhanced by technology. In general, the impact of technological advances on the elderly varies between the more or less developed regions of the countries, among nations, and between urban and rural areas within nations (Robinson & Birren, 1983).

Brickfield (1983) conducted an extensive study to examine the attitudes and perceptions of the elderly toward technology. His study revealed that the current cohort of elderly people has less positive views toward a variety of technologies than does the current cohort of younger people. Also, they are less likely to use the new products of

technology. With regard to demographic characteristics, those who have higher education, have higher status of employment, have higher income, and are males are more likely to accept selected technological products, such as calculators, cable TV, computers, video recorders, automatic teller machines, and video games. The elderly are most interested in products that meet their basic personal needs and enhance their capability for independent living.

Lawton (1983) stressed that environmental familiarity is important for the elderly in order to accept a technological innovation in the living environment. Typically, a technological innovation has some elements of unfamiliarity. Previous research has shown that the current cohort of elderly people relies heavily on previous learning, and thus they prefer what is familiar (Botwinick, 1978). They are more cautious to accept new products and new types of living environments than current cohort of younger people (Lawton, 1983). Also, they become familiar with the innovation at a slower rate.

A special case of preference for the familiarity can be seen in attachment to personal possessions, residence, or neighborhood. Those people who reported having such an attachment were higher in life satisfaction than those who did not (Sherman & Newman, 1977-78). People who wished to move expressed less attachment to their homes (Howell, 1982).

However, despite elderly consumers' lack of knowledge about and resistance to unfamiliar products or new housing types, these innovations have become acceptable to them (Lawton, 1983). For instance, an increasing number of people are living in mobile homes or planned housing. In order to increase older people's acceptance of technological innovations, the ability or competence of older people to learn about technologies should be recognized and appropriate training opportunities and experimentation with different methods for such training must be provided (Lawton, 1983).

Perceptions and Acceptance of Nontraditional Housing Types

Homeownership of conventional, single-family, detached housing is an important "American dream" for everyone. However, the cost of homes has continued to rise due to increasing costs of construction, energy, financing, and home maintenance. According to Sternlieb and Hughes (1986), the median sales price of a new single-family dwelling was $23,000 in 1970, but it had increased to $80,000 by the end of 1985. Therefore, the need for more affordable housing is recognized by many people. In particular, elderly with low income, physical inabilities, or major life changes may be in need of more adequate, affordable, and enriching housing environments. While innovative, nontraditional housing alternatives are becoming available, their appeal seems to be limited to a

small proportion of the elderly population. In general, few consumers have considered nontraditional housing as an acceptable alternative to obtain adequate housing. The lack of consumer knowledge and available information, concern about resale value, nontraditional design and appearance, high construction and financing costs, uncertainty about maintenance and life-span costs, and uncertainty about the livability of the house affect the negative perception of innovative, nontraditional housing and also restrict acceptance of this housing by consumers (Beamish, Sweaney, Tremblay, & Bugg, 1987; Grubb & Phares, 1972; Wedin, 1979).

Lawton (1981) defines alternative housing as "whatever is not in the traditional group" (p. 66). He urged that two major determinants of housing alternatives should be considered: enablement and preferences. Enablement includes income, geography of residence, organizational membership, and supply of housing. Preference is based on a variety of needs including independence, privacy, security, and an appropriate social milieu. In order to increase elderly consumers' acceptance of alternative housing, some balance between consumers' needs and preferences, price, and quality must be achieved (Blackie, 1983).

Beamish, Sweaney, Tremblay, and Bugg (1987) investigated consumers' perceptions of the energy-efficient housing alternatives among southern households. Results of their

study revealed that the three housing types under study (active solar, passive solar, and earth-sheltered house) were generally perceived as energy-efficient, but the "design/appearance" of these housing types was a major factor that limited consumer acceptability. There was a high percentage of "uncertain/do not know" or "nothing" responses, suggesting that many consumers do not have adequate information about the energy-efficient housing alternatives to make a decision.

Day, Lentner, Beamish, Crisco, and Dyer (1985) examined factors that are associated with the consumers' acceptance of energy-efficient housing alternatives. They analyzed data obtained from 312 Virginia households in the Southern Regional Housing Research project (S-141) entitled "Housing for Low- and Moderate-Income Families."

The results of the study revealed that a majority of the respondents (56% to 98%) had heard about the six alternatives to the conventional house (manufactured/mobile home, apartment/multifamily, retrofitted home, passive solar home, active solar home, and earth-sheltered/underground home) but only a small proportion of the respondents had sought information or had lived in these alternative types, other than manufactured/mobile home or apartment/multifamily. Although the respondents had limited knowledge or experience with the alternative housing types, they indicated their

perceptions (likes and dislikes) for each housing type. In a ranking of preference, a conventional house was the best-liked house followed by retrofitted, passive solar, active solar, apartment/multifamily, earth-sheltered/underground and manufactured/mobile home.

Day et al. (1985) also concluded that lack of availability and lack of experience with alternative housing types may have hindered the respondents' willingness to accept these housing types. McCray and Weber (1981) pointed out that a lack of consumer knowledge is an important constraint to the acceptance of energy-efficient housing alternatives.

Williams (1971) investigated the respondents' preference and acceptance for single-family detached housing and five multifamily housing types (townhouse, duplex, four-plex, walk-up apartment, and high-rise apartment). Data in his study were obtained from low-income families in a southwestern city. In rank of preference, it was clear that single-family detached housing was the most preferred housing type for most of the respondents (95%) and only a small percentage of them preferred multifamily housing types. However, when the respondents were asked to indicate whether each housing type would be acceptable to them as a place to live, 29% stated the townhouse would be acceptable, followed by duplex (26%), four-plex (21%), walk-up apartment (13%) and high-rise apartment (8%). Of course, single-family detached housing (98%) was the

most acceptable housing type.

In summary, because increasing costs are likely to continue to decrease the availability and affordability of traditional housing (single-family detached housing) in the moderate price range, consumers may have an increasing need for acceptable alternative housing types. In recent years, nontraditional, innovative housing types have been available, but many of these housing alternatives have not been adopted by consumers. Typically, younger, more educated, and higher income people tend to adopt nontraditional, innovative housing types. For the elderly, with the process of growing old, single-family detached housing may not be the most desirable place to live due to potential major physical and life changes. Thus, they are an important segment of the population who are more likely to seek out other housing alternatives which are more convenient, safe, adequate, and affordable. Generally, many older people are resistant to accept new or untried products (Brickfield, 1983). Therefore, education of the elderly about the various housing alternatives and increase in the availability of housing alternatives within a given community can be critical issues to make these housing types more acceptable to the elderly.

Summary

By a theory of "diffusion of innovations" which was

established by Rogers, diffusion research became a subject of inquiry and provided a general applicable theoretical framework for this study. The process of diffusion is explained on the basis of the four main elements: (a) innovation, (b) communication, (c) time factors including the adoption process, rate of adoption, innovativeness, and adopter categories, and (d) social system.

Innovation is defined as "an idea, practice, or object that is perceived as new by an individual." When perceived newness, as a major point of defining a product innovation, is considered, nontraditional housing types selected in this study seem to be defined as "innovative housing" because they differ from the traditional, conventionally-built houses.

Communication types are divided into two subfields: homophily and heterophily. Most effective communication generally occurs between homophilous individuals who belong to the same group and share many interests. On the other hand, the most effective diffusion of innovation takes place between heterophilous individuals who are dissimilar in personal characteristics.

Potential adopters of an innovation undergo the process of adoption before adopting the innovation. This process includes five different stages: (a) awareness, (b) interest, (c) evaluation, (d) trial, and (e) adoption. However, individuals proceed through these stages at various rates.

This relative speed of adoption is related to the perceived attributes of the innovation such as relative advantage, compatibility, complexity, trialability, and observability as well as the type of innovation decision, the communication networks, the nature of social system, and change agent involvement.

Innovativeness is the degree to which an individual is willing to adopt a new product, service, or idea. In order to measure the extent of innovativeness of individuals, five adopter categories were classified: innovators, early adopters, early majority, late majority, and laggards. The characteristics of adopter categories are explained by socioeconomic status, personality variables, and communication behavior.

Diffusion of innovations is also influenced by the social system. Two social system norms (traditional and modern) are most relevant for diffusion of innovations. Innovations tend to develop at a faster rate in modern social systems than do those of more traditional social systems.

Some techniques to measure innovativeness have been developed in marketing research, but there have been limited attempts to develop a scale to measure housing innovativeness. A Housing Innovativeness Scale (a five point Likert-type scale) was developed by Gruber et al. (1990) in order to measure personal innovativeness toward housing, and was based

on the combination of two marketing scales (use innovativeness and trait innovativeness). This scale will be used in the proposed study to determine personal innovativeness factors affecting the acceptance of nontraditional housing types in elderly individuals.

Elderly individuals in rural areas and small towns face more housing problems than do their urban counterparts. Little attention, however, has been directed toward them. Although housing is an integral part of everyone's life, it has more importance for the elderly because housing is a major life space -- physically, socially, and psychologically.

Elderly households have housing characteristics which are different from nonelderly households. The housing characteristics of elderly households which were selected in this study were reviewed: tenure, types of dwelling, dwelling expenses, length of residence, and age of dwelling. Although the majority of older people are homeowners, the preference for home ownership decreases as age increases. Single-family detached dwellings are the most typical type of dwelling for the elderly, especially for the rural elderly. The proportion of the elderly population who live in other types of housing alternatives is relatively small, probably because of the lack of other adequate alternatives available. Not only older renters but also older homeowners spend an excessively large share of monthly income for housing. Because older people

have lived in their homes for a longer period of time and also have lived in older housing than the nonelderly, their homes may have many physical deficiencies and require more maintenance and repair. Therefore, they spend a relatively large proportion of their fixed income for maintenance and energy.

With respect to demographic changes, the dramatic increase in the elderly population in the U. S. has a great impact on the need for housing and living environments for the elderly. Specific demographic characteristics that influence living arrangements, housing needs and demands, and the acceptance of housing alternatives of the elderly were discussed: age, marital status, sex, race, education, employment status, and income. Age and marital status are important predictors of housing and living arrangements, and attitude about and preference for housing. As people age, the dependence on their environments increases and widowhood frequently requires new life adjustments for the surviving spouse. The large sex differences in the older population (older women outnumber older men) also have significant impacts on the living arrangements for the elderly. Income is a critical determinant of housing consumption. The low incomes of many elderly frequently restrict necessary adjustments in housing and living environments. For the rural elderly, low incomes and low educational levels are associated with poor housing

quality.

The elderly population is especially vulnerable to technological change, while their quality of life can be enhanced by technology. They may be more resistant to accept new or untried products than are younger people. Those elderly who have higher income, have higher education, have higher status of employment, and are males are more likely to accept technological products. Environmental familiarity is also an important factor for the elderly in order to accept a technological innovation in the living environment.

There is an increasing need for more adequate and affordable housing, but only a few elderly consumers seem to consider nontraditional housing as an acceptable alternative. The lack of consumer knowledge and available information, concern about resale value, nontraditional design and appearance, high construction and financing costs, uncertainty about maintenance and life-span costs, and uncertainty about the livability of the house affect the negative perception of innovative, nontraditional housing and also restrict acceptance of this housing by consumers. In order to increase elderly consumers' acceptance of alternative nontraditional housing, some balance between consumers' needs and preferences, price, and quality must be achieved.

CHAPTER III

METHODOLOGY

The primary purpose of this study was to determine the factors that affect older individuals' innovativeness toward housing and the acceptance of nontraditional housing type(s) by elderly individuals. Specifically, three age subgroups - 55 to 64, 65 to 74, and age 75 and older - were compared.

The methodology to be utilized is described in the following sections: (a) source of data; (b) community selection; (c) description of the instrument; (d) sample selection; (e) data collection; (f) treatment of the data; and (g) data analysis.

Source of Data

Data for this study were obtained from the "Household Survey" developed for the Southern Regional Research Project, S-194, "Barriers and Incentives to Affordable Housing." The S-194 project began October 1, 1984, and terminated September 30, 1990. The project was a cooperative effort of the Agricultural Experiment Stations and/or the Research Divisions of seven land-grant universities in Alabama, Arkansas, Georgia, North Carolina, Oklahoma, Tennessee, and Virginia.

The overall purpose of the S-194 project was to determine the barriers and incentives to community acceptance of alternative housing and innovations in housing design,

construction, and finance in small rural communities in the South. The two major objectives of the S-194 project were to:

1. assess institutional and infrastructural barriers and incentives to community acceptance of innovations in housing design, construction, and financing, and
2. develop a conceptual model that delineates the interrelationships and interactions of the various barriers and incentives.

Community Selection

The selection of communities for the S-194 project involved several steps. Eligible communities were selected from non-MSA small towns with populations between 2,500 and 10,000 based on the 1980 census data. In addition, incorporated county seats with a population ranging from 1,000 to 2,500 were included if they were in non-MSA counties that did not have a town with a population of 2,500 to 10,000. All communities that were located within MSA counties were eliminated. Four hundred eighty three eligible communities were identified in the seven participating states (see Table 1).

Twenty-eight communities used in the S-194 project were selected on the basis of two major variables: degree of housing diversity and population size. A housing practice

Table 1. Number of Eligible Communities in each S-194 State

State	Number 2,500 to 10,000	Number County Seat	Total (483)
Alabama	50	6	56
Arkansas	51	16	67
Georgia	64	23	87
North Carolina	79	19	98
Oklahoma	61	6	67
Tennessee	49	17	66
Virginia	32	10	42

survey was conducted in order to determine the degree of housing diversity within all of the communities. The respondents to the survey were representatives from various agencies, housing related professionals, and local officials in each eligible community. Specifically, these included: County Cooperative Extension supervisors, Farmers Home Administration county supervisors, regional planners, a representative realtor and lender in each community, and the mayor or city manager. A total of 48 questions were included in the mail survey. Respondents were asked if (a) alternatives financing practices, (b) housing programs, (c) local regulations, and (d) alternative housing types were available or present in their communities.

Thirty items on the questionnaire were utilized to develop a Diversity Index. The items were assigned one point for each "yes" response. Totals were then calculated and divided by

the number of valid responses to determine mean scores of community diversity and innovativeness. The mean scores were ranked to classify the communities along a continuum from low diversity to high diversity.

Size of community was also used to divide the communities within a state into high and low population communities based on a median split of the communities' 1980 Census population. Community size and level of housing diversity were used to create a quadrant of four community types. These types were: low population/low diversity; high population/low diversity; low population/high diversity; and high population/high diversity. An extreme score in each quadrant was selected to identify a potential study community in each of the seven participating states. The potential communities were examined to determine similarities in geographic features. Researchers made final decisions about the selection of the communities after visiting each of them to verify the level of diversity. (For details on community selection, refer to Hanna, McManus, Beamish, and Goss, 1991).

Description of the Instrument

An instrument to survey households was developed, evaluated, pre-tested, and revised by the S-194 Regional Research Technical Committee (Appendix A). In order to test clarity of the survey instrument's design, a pilot test was

performed in one selected community in each state. The revised instrument was composed of 10 major sections: (a) innovativeness (questions 1 through 26); (b) housing value (questions 27 through 32); (c) knowledge of nontraditional/ innovative housing (questions 33 through 48); (d) future housing demand (questions 49 through 51); (e) consumer perceptions of community housing and intermediaries (questions 52 through 56); (f) housing characteristics (questions 57 through 73); (g) community attitudes (questions 74 through 81); (h) adequacy of community services (questions 82 through 91); (i) barriers and incentives (questions 92 through 123); and (j) demographic characteristics (questions 124 through 132).

Among responses obtained from these 10 sections of the survey instrument, only responses in four sections were selected for use in this study:

(1) Innovativeness. A set of 26 questions was developed to measure innovativeness toward housing. The 26 questions were adopted and reworded from other questionnaires designed to measure personal innovativeness. Questions in this section pertained to new housing types; information about housing; fixing and repairing things; new products for the house; and housing features and comfort. Respondents indicated their response on a five point Likert-type scale (1=strongly disagree to 5=strongly agree).

(2) Knowledge of nontraditional/innovative Housing. Four sets of questions were included in this section. Each set of questions measured the respondent's knowledge, interest, or acceptance of selected housing types: mobile homes, apartments/townhouses, solar houses, and earth-sheltered houses.

(3) Housing characteristics. Questions in this section solicitated information regarding size of previous community, age of dwelling, length of residence, types of current housing, number of rooms, plumbing facilities, tenure status, dwelling expenses, perception of affordability, resale value of current house, and mobility intention.

(4) Demographic characteristics. Nine questions related to respondent's marital status, age, sex, race, educational level, employment status, household income, information about other household members, and location of personal residence were included in this section. Specific questions on the instrument used in this study have been starred (*) in Appendix A.

Sample Selection

One member of each household who was listed in the 1987-1988 telephone directories was randomly selected from 28 communities in seven southern states participating in the regional project. Before random selection, nonresidential

listings, second listings, listings with no address, and those from other communities or areas outside the selected community were eliminated.

A total of 5,310 household surveys were returned, 628 of which were ineligible because an inadequate percentage (less than 75%) of questions had been answered, demographic information were lacking, or the respondent lived outside the study community. Of the remaining 4,682 respondents, 1,878 who were over age 55 were selected as the final sample in this study.

Data Collection

All data for the S-194 project were collected by mail survey between November, 1987 and February, 1988. The survey procedure used was the Total Design Method (Dillman, 1978). The survey instrument was mailed to households with an accompanying cover letter, which explained the purpose of the research, and an enclosed self-addressed, stamped envelope. A prize drawing of $25 was offered as an incentive to households to complete the surveys. A follow-up postcard was mailed after 10 days to those who had not returned the surveys. After an additional 10 days, a second survey instrument was mailed to all non-respondents. Names and addresses of all respondents were kept secure in order to protect confidentiality.

Treatment of the Data

In this study, some of the variables were reconstructed because of recoding and/or collapsing categories for the analysis of variance procedure. This section explains the variables and the coding system in detail. However, for multiple regression, the original categories in the variables were used.

Demographic and Housing Characteristics

Several demographic questions were selected for analysis:

Age. The actual month and year of birth were asked. This variable was recoded to make the following categories: (1) 55 to 64, (2) 65 to 74, and (3) 75 and older.

Marital status. The five response choices (never married, married, separated, divorced, and widowed) were collapsed into two categories: (1) married and (2) not married.

Sex. Each respondent was asked to indicate his/her sex: (1) male and (2) female.

Race. The five choices of ethnic backgrounds (black, white, hispanic, American Indian, and other) were recoded: (1) white and (2) non-white.

Educational level. Respondents were asked to indicate the one answer which described their highest educational attainment. The original nine choices were collapsed into four categories : (1) no or some school, (2) completed high

school, (3) some college or vocational school beyond high school, and (4) complete college and/or a graduate or professional degree.

Employment status. The six response options in the original instrument were used: (1) full-time, (2) part-time, (3) retired, (4) homemaker, (5) unemployed, and (6) other.

Household income. Respondents were asked the household's total annual income by nine categories. The following four new categories were created: (1) less than $10,000, (2) $10,000 to $24,999, (3) $25,000 to 49,999, and (4) $50,000 or greater.

Six variables were selected to analyze housing characteristics. The housing characteristics included characteristics of community as well as characteristics of dwelling:

Size of previous community. Respondents were asked to indicate the size of the largest community in which they have lived. The six response choices were collapsed into four categories: (1) less than 10,000, (2) 10,000 to 49,999, (3) 50,000 to 499,999, and (4) 500,000 or greater.

Age of dwelling. The actual year which the current housing was built was asked. This variable was calculated by subtracting the year the house was constructed from 1987 (the year most of the data were collected). Categories included: (1) less than 10 years, (2) 10 to 24, (3) 25 to 35, and (4)

more than 35 years.

Length of residence. The actual year which respondents moved into the current dwelling was asked. The number of years was calculated by subtracting the year respondents moved in from 1987. The following four categories were created: (1) less than 10 years, (2) 10 to 20, (3) 21 to 30, and (4) more than 30 years.

Current housing type. The four response choices (house, mobile home, apartment/townhouse, and other) in the original instrument were used in this study.

Tenure status. The four categories in this question were used in this study: (1) own (paid for), (2) own (buying), (3) rent, and (4) other.

Dwelling expenses. Respondents were asked the actual monthly expenditure on their dwelling (either monthly house payment or rent). Four categories were derived from the frequencies: (1) $0 to $49, (2) $50 to $99, (3) $100 to $299, and (4) $300 or greater.

Personal Innovativeness toward Housing

Twenty-six questions were included in the original instrument to measure personal innovativeness toward housing of household respondents using a five point Likert-type scale. Responses from elderly respondents who were 55 years of age and older were factor analyzed by principal-component factor

analysis using varimax rotation in the Statistical Analysis System (SAS) program.

A principal-component factor analysis is the most important and commonly used type of factor analysis. Varimax rotation is one of the most conservative procedures, especially since there is no a priori reason to believe that there is not a linear relationship between and among variables. Missing values were handled by the pairwise deletion option in the SAS program. The pairwise deletion option included only cases for a given variable which had a nonmissing value and excluded cases with missing and nonvalid responses. The number of cases included in the analysis for elderly respondents in this study were presented in Appendix B. Factor solutions computed were based on factors with eigenvalues equal to or greater than 1.0.

The results of the factor analysis based on the responses from elderly respondents are shown in Table 2. Only variables that loaded .50 or greater were identified for each factor except two variables (#21 and #26). Although the factor loadings for these two items were just under .50 (.46 for #21 and .49 for #26), they were clearly associated with each factor respectively (Factor I for #21 and Factor V for #26). In other words, factor loadings on these two variables in any other factors were relatively very small.

Six factors including all 26 questions were produced as

Table 2. Factor Pattern of the Innovativeness Toward Housing Scale for Elderly Respondents (55+) in the Household Data Set

Factor	Var No.	Item Name	Variance Explained	Factor Loading
I	5	Experiment with New Ways of Doing Things	14.0 %	.71
	14	Try New and Difficult Things		.67
	15	Like Housing that Is a Little Different		.63
	9	Fool Around with New Ideas Even If a Waste of Time		.62
	6	Take Chances		.62
	8	Some Contemporary Housing Is Stimulating		.58
	7	Enjoying Looking at New Housing Designs in Magazines		.57
	16	Find Out about New Housing Types		.57
	21	Curious about How Things Work		.46
II	12	Builders Do Not Waste Time Building New Housing Types	9.8 %	.71
	11	Changing Technology, Especially in Housing, Is Not Waste of Money		.63
	4	The Unusual House Is Not a Waste of Time		.61
	17	Buying A Housing Type Not Widely Available Is Not Waste of Money		.60
	13	New Ideas Are not a Waste of Time		.55
	18	Do Not Mind a House that Requires Learning New Ways of Doing Things		.55
III	25	Make Own Repairs	9.1 %	.79
	24	Fix Things around the House		.77
	22	Like to Build Things for Home		.70
	23	Like to Take Things Apart		.57
IV	28	Always Possible to Improve a House by Adding New Features	6.0 %	.74
	27	Only Enjoy a Product When Can Use It to Its Fullest Capacity		.63
	29	Keep Up with New Products and Ideas that Could Improve the House		.55
V	19	More Interested in the Comfort of a House than Its Appearance	5.7 %	.70
	20	Interested in How the Heating System in the House Work		.67
	26	Outside Appearance of a House Is Important		.49
VI	10	Like to Take a Risk	4.9%	.59

Total Variance Explained = 49.4%

Factor I - Experimentation & New Design/Ideas
Factor II - New Housing Types
Factor III - Repair & Fix Things
Factor IV - Improvement & Utility
Factor V - Appearance Versus Comfort
Factor VI - Risk Taking

a result of the analysis. These factors were named as follows:

Factor	Factor name
I	Experimentation and New Design/Ideas
II	New Housing Types
III	Repair and Fix Things
IV	Improvement and Utility
V	Appearance Versus Comfort
VI	Risk Taking

Gruber, Beamish, Carter, Shelton, and Weber (1990) analyzed responses from household respondents by using factor analysis procedure of Statistical Package of the Social Science (SPSS-X) program. Throughout the two levels of factor analyses, the three variables (#10, #15, and #21) were eliminated and the following six factors were identified: Factor I - new housing types; Factor II - repair and fix things; Factor III - chance taking/experimentation; Factor IV - housing design and ideas; Factor V - improvement and utility; and Factor VI - Appearance versus comfort. Among these six factors, four factors (Factor I, II, V, and VI) were identical to the factors which were produced in this study (Factor II, III, IV, and V), and Factor III and IV in the analysis by Gruber et al. were combined and became Factor I in this study.

Acceptance Scores

For this study, the acceptance of nontraditional housing types was measured by modifying the Housing Type Level of Knowledge Index and the Total Knowledge Index developed by Weber et al. (1985) based on the stage in the adoption process of the diffusion theory of Rogers (1963, 1983) and Rogers and Shoemaker (1971). The two modified measures were referred to as Mean Acceptance Scores for each housing type (mobile homes, apartment/townhouses, solar houses, and earth-sheltered houses) and for the combination of housing types in order to fit the present study.

Respondents were categorized into four of the stages in the adoption process (awareness, interest, evaluation, and adoption) for each of the nontraditional housing types on the basis of answers from question 33 through 36 and 41 through 48 in the instrument. In the first stage (awareness), the respondents were asked about their prior knowledge and exposure to each housing type. The second stage (interest) involved questions on respondents' experiences to look for information about each housing type. In the third stage (evaluation), the respondents were asked their willingness to consider living in each housing type. The fourth and final stage (adoption), required the respondents to indicate whether they currently have lived in any of four housing types.

Weber et al. (1985) developed two weighting schemes, Weight

A and Weight B, for measuring the stage in the adoption process and the development of the Total Knowledge Index. Two indices, Index I and Index II, were developed from information gathered using these two weighting schemes. Weber et al. found problems with weighting scheme A and concluded that Weight A was less precise than Weight B. Thus, they judged Weight B to be the preferred weighting scheme to measure the propensity to adopt housing alternatives. In this study, however, only one weighting scheme was used with the Mean Acceptance Scores. The Housing Type Level of Knowledge Index by Weber et al. measured the respondent's knowledge of each of the four housing types. The range of scores by Weber et al. was from 0 to 7 for each housing type but it was modified in this study in order to be appropriate for using questions in the S-194 project instrument. The modified Mean Acceptance Scores ranging from 0 to 4 for each housing type were calculated. These scores are useful to measure consumers' propensity to adopt a specific housing type. The Total Knowledge Score by Weber et al. was developed by the summation of the scores for all housing types obtained in the Housing Type Level of Knowledge Index. The scores ranged from 0 to 28 for both weighting schemes and these were categorized into low, medium, and high acceptance levels. In this study, Mean Acceptance Scores for the combination of all housing types ranged from 0 to 16 (4 points x 4 housing types = 16) and also

were categorized into low, medium, and high acceptance levels. These scores could not predict preferences for individual housing types, but were useful in assessing the likelihood of consumers to adopt nontraditional housing types in general.

For each housing alternative a score of four was possible. Twelve questions (#33 through #36, and #41 through #48) were used to calculate the Mean Acceptance Scores. Questions 33 through 36 asked if the respondents had never heard of/didn't know about, seen/read/heard about, or lived in each housing type. If the respondents did not respond (missing value), or checked "never heard/don't know" then a score of 0 was recorded. If the respondent indicated "seen/read/heard", one point was assigned. If the respondents have actually lived in one of the housing types, the highest possible score of four was recorded. In questions 41 through 44, the respondents were asked to indicate whether they had ever looked for information about each of the housing alternatives. If the respondents checked "yes" then two points were assigned. Questions 45 through 48 asked if the respondents had ever considered living in each of the housing types. If the respondents answered "yes," then three points were recorded.

Each of the responses represents a single stage in the adoption process based on the acceptance level of the respondents. Level 1 represents an awareness stage; Level 2 represents an interest stage; Level 3 represents an evaluation

stage; and Level 4 represents the adoption stage of each housing type.

Because of the wide range of possible Mean Acceptance Scores for the Combination of all Housing Types, the frequencies were grouped into three categories: low, medium, and high. The breakpoints were 0-4 (low acceptance level), 5-8 (medium acceptance level), and 9-16 (high acceptance level).

Data Analysis

The SAS (Statistical Analysis System) was used to obtain descriptive and inferential analyses of the data. Frequency distributions and percentages were used for the descriptive analyses of the data. Several inferential analyses of the data were utilized to test the hypotheses in this study.

The analysis of variance procedure was used to examine hypotheses 1 to 3, and multiple regression was performed to examine hypotheses 4 and 5.

Ho1: There is no significant relationship between the mean factor scores on personal innovativeness toward housing and each of the selected demographic and housing characteristics of the elderly respondents.

Ho2: There is no significant relationship between the mean acceptance score of each nontraditional housing type and each of the selected demographic and housing characteristics of the elderly respondents.

Ho3: There is no significant relationship between the mean acceptance score of a combination of nontraditional housing types and each of the selected demographic and housing characteristics of the elderly respondents.

Ho4: Adding the age variable to other selected demographic and housing characteristics does not significantly increase the amount of variance for explaining:

a) personal innovativeness toward housing.

b) acceptance of each nontraditional housing type.

c) acceptance of a combination of each of the nontraditional housing types.

Ho5: There is no relationship between personal innovativeness toward housing and acceptance of:

a) each nontraditional housing type.

b) a combination of each of the nontraditional housing types.

As an additional analysis of data, where analysis of variance revealed a significant difference in the mean scores of either personal innovativeness toward housing or acceptance of nontraditional housing type(s), the Tukey's studentized range test (HSD) for comparison of means was used to detect which groups are different (SAS Institute Inc, 1985). A confidence level of $p<.05$ was chosen by the researcher as the criterion for rejection of the null hypotheses.

CHAPTER IV

SAMPLE DESCRIPTION

The sample consisted of 1,878 elderly respondents (55 years and older) in 28 communities in seven southern states. The data were summarized using the entire sample and three subsamples: 55 to 64, 65 to 74, and 75 and older.

This chapter includes the descriptive analysis of demographic characteristics and housing characteristics of the respondents. Percentages were computed based on the total responses for each variable.

Demographic Characteristics of Respondents

Selected demographic characteristics analyzed in this study were age, sex, race, marital status, educational level, employment status, and income level and are presented in Table 3 and 4.

Age

The age of the respondents used in this study ranged from 55 to 87 years (see Table 3). The mean age for the respondents was 66.4 years. Within the three age subgroups, the highest percentage (45.3%) was in the 55 to 64 age group, followed by the 65 to 74 group (37.5%). Only 17.2% of the respondents were 75 and older.

Table 3. Age Categories of Respondents

Age	N	%
Entire Sample (55 and older)	1878	100.0
55-64	850	45.3
65-74	705	37.5
75 and Older	323	17.2

Sex

The proportion of male respondents (61.2%) was much higher than female respondents (33.8%) (see Table 4). However, there was a steady increase in the percentage of female respondents with increases in age.

Race

The vast majority of the respondents (90.1%) was white. Nonwhites including Blacks, Hispanics, American Indians, and those who identified themselves in the category "Other" represented only 9.9% of the sample.

Marital Status

Almost all of the respondents (97.7%) were married. Only 2.3% of the sample were not married (i.e., separated, divorced, widowed, or never married). There were no changes in ratio between married and unmarried among the three age subgroups.

Educational Level

The educational level of the respondents was described by the number of years of education they had completed. The largest percentage of the respondents (33.8%) had less than a 12th grade education. However, a fairly large percentage of the respondents (29.1%) had graduated from some form of higher

Table 4. Demographic Characteristics of Respondents by Age Group

Variable	Entire N	Entire %	55-64 N	55-64 %	65-74 N	65-74 %	75+ N	75+ %
Sex								
Male	1141	61.2	542	64.1	432	61.8	167	52.0
Female	724	38.8	303	35.9	267	38.2	254	48.0
	1865	100.0	845	100.0	699	100.0	321	100.0
Race								
White	1685	90.1	764	90.9	637	90.7	284	88.8
Non-white	185	9.9	84	9.1	65	9.3	36	11.3
	1870	100.0	848	100.0	702	100.0	320	100.0
Marital Status								
Married	1806	97.7	821	97.9	679	97.8	306	97.1
Not Married	42	2.3	181	2.2	15	2.2	9	2.9
	1848	100.0	839	100.0	694	100.0	315	100.0
Education								
No or Some School	633	33.8	221	26.0	266	37.8	146	45.3
Completed High School	415	22.1	218	25.7	143	20.3	54	16.8
Some College	281	15.0	134	15.8	112	15.9	35	10.9
College Graduate	546	29.1	276	32.5	183	26.0	87	27.0
	1875	100.0	849	100.0	704	100.0	322	100.0
Employment								
Full-time	498	26.6	430	50.8	54	7.7	14	4.3
Part-time	90	4.8	48	5.7	38	5.4	4	1.2
Retired	1070	57.2	257	30.3	562	80.2	251	77.7
Homemaker	110	5.9	46	5.4	29	4.1	35	10.8
Unemployed	38	2.0	26	3.1	3	0.4	9	2.8
Other	65	3.5	40	4.7	15	2.1	10	3.1
	1871	100.0	847	100.0	701	100.0	323	100.0
Annual Income								
Less than $10,000	489	26.9	145	17.6	202	29.8	142	45.2
$10,000-$24,999	726	39.9	303	36.7	308	45.4	115	36.6
$25,000-$49,999	450	24.8	269	32.6	141	20.8	40	12.7
$50,000 or Greater	153	8.4	108	13.1	28	4.1	17	5.4
	1818	100.0	825	100.0	679	100.0	314	100.0

NOTE: Total percentages may not add to 100 percent because of rounding.

education (i.e., vocational school, two- or four-year college, or graduate school). In a comparison of the three age subgroups, each successively older group had a larger percentage reporting "No or Some School."

Employment Status

Well over one-half of the respondents (57.2%) were retired. Full-time employment comprised the next largest portion (26.6%) of the reported employment status. Only two percent of the respondents reported being unemployed at the time of the survey. Among the three age subgroups, much higher percentages were retired in either the 65 to 74 age group (80.2%) or the 75 and older group (77.7%) than in the 55 to 64 group (30.3%). On the other hand, there were large differences in the proportion of full-time employment between the 55 to 64 age group (50.8%) and the other two groups: the 65 to 74 group (7.7%) and the 75 and older group (4.3%). In other words, more than one-half of the respondents (50.8%) in the 55 to 64 age group were full-time employees.

Income Level

Of the total 1,818 respondents who reported total annual household income, 26.9% had annual incomes of less than $10,000. The largest percentage (39.9%) reported incomes within the range of $10,000 to $24,999. Only 8.4% earned

incomes of $50,000 or greater. The median total annual household income was within the range of $10,000 to $24,999.

As age of the subgroup increased, the proportion of the respondents included in the lowest income range of less than $10,000 increased greatly, while the percentage included in the higher income ranges of either $25,000 to $49,999 or $50,000 or greater decreased.

In summary, in the sample of this study, typical elderly respondents were white married males with a mean age of 66.4 years. They were retired, had less than a 12th grade education, and had incomes between $10,000 to $24,999 per year. Most of the data for demographic characteristics showed consistent results with the literature. In terms of educational level, however, a higher percentage of older people in the sample had some form of higher education than is typically reported in the literature.

Housing Characteristics of Respondents

Selected housing characteristics used in this study were size of previous community, age of dwelling, length of residence, current housing types, tenure status, and dwelling expenses and are presented in Table 5.

Size of Previous Community

The largest proportion of the respondents (38.9%)

indicated that the largest community in which they had previously resided had a population of less than 10,000 (see Table 5). Those residing in a community with a population between 10,000 and 24,999 comprised 26.2% of the sample, followed by those residing in communities with a population between 50,000 and 499,999 (20.7%). There was little difference among the three age subgroups.

Age of Dwelling

Of the total 1,878 respondents, the highest percentage (33.4%) reported that the age of their dwelling was more than 35 years, followed by 10 to 24 years category (27.8%). Less than one-fifth of the respondents (16.2%) reported that their dwellings were less than 10 years old. The mean age of the dwelling for the sample was 31.8 years.

As age increased, the percentage of the respondents whose dwelling were more than 35 years old increased. A higher percentage (44.6%) of the 75 and older age group reported that the age of their dwelling was more than 35 years old as contrasted to 24.8% in the 55 to 64 group and 38.7% in the 65 to 74 group.

Length of Residence

About one-third of the respondents (32.0%) had lived in their present dwelling for less than 10 years, while 23.1% had

Table 5. Housing Characteristics of Respondents by Age Group

Variable	Entire N	Entire %	55-64 N	55-64 %	65-74 N	65-74 %	75+ N	75+ %
Size of Previous Community								
Less than 10,000	705	38.9	281	34.1	287	42.2	137	44.1
10,000-49,999	476	26.2	229	27.8	167	24.6	80	25.7
50,000-499,999	376	20.7	181	21.2	135	19.9	60	19.3
500,000 or greater	257	14.2	132	16.0	91	13.4	34	10.9
	1814	100.0	823	100.0	680	100.0	311	100.0
Age of Dwelling								
Less than 10 yrs	304	16.2	150	17.7	103	14.6	51	15.8
10-24 yrs	522	27.8	273	32.1	166	23.6	83	25.7
25-35 yrs	424	22.6	216	25.4	163	23.1	45	13.9
More than 35 yrs	628	33.4	211	24.8	273	38.7	144	44.6
	1878	100.0	850	100.0	705	100.0	323	100.0
Length of Residence								
Less than 10 yrs	600	32.0	289	34.0	210	29.8	101	31.3
10-20 yrs	426	22.7	220	25.9	138	19.6	68	21.1
21-30 yrs	419	22.3	227	26.7	143	20.3	49	15.2
More than 30 yrs	433	23.1	114	13.4	214	30.4	105	32.5
	1878	100.0	850	100.0	705	100.0	323	100.0
Current Housing Types								
House	1657	88.6	761	89.6	631	90.0	265	82.8
Mobile Home	82	4.4	42	5.0	25	3.6	15	4.7
Apt/Townhouse	102	5.5	33	3.9	36	5.1	33	10.3
Other	29	1.6	13	1.5	9	1.3	7	2.2
	1870	100.0	849	100.0	701	100.0	320	100.0
Tenure Status								
Own (paid for)	1287	67.0	532	63.3	516	75.4	239	75.9
Own (buying)	343	18.6	229	27.2	95	13.9	19	6.0
Rent	188	10.2	69	8.2	66	9.7	53	16.8
Other	22	1.2	11	1.3	7	1.0	4	1.3
	1840	100.0	841	100.0	684	100.0	315	100.0
Dwelling Expenses								
Less than $50	1401	74.6	571	67.2	568	80.6	262	81.1
$50-$99	83	4.4	36	4.2	27	3.8	20	6.2
$100-$299	291	15.5	178	20.9	79	11.2	34	10.5
$300 or greater	103	5.5	65	7.7	31	4.4	7	2.2
	1878	100.0	850	100.0	705	100.0	323	100.0

NOTE: Total percentages may not add to 100 percent because of rounding.

lived there for more than 30 years. The length of residence in the present dwelling increased with the advancing age of the respondents. A much higher proportion had lived in their dwelling for more than 30 years in either the 65 to 74 age group (30.4%) or the 75 and older group (32.5%) than in the 55 to 64 group (13.4%). The mean for length of residence in the present dwelling for the sample was 20.3 years.

Current Housing Types

The most commonly reported current house type was the single-family detached houses (88.6%), followed by apartments or townhouses (5.5%) and mobile homes (4.4%). In a comparison of the three age subgroups, there was little difference in the number of respondents who lived in single-family detached houses and mobile homes. However, a higher percentage in the 75 and older age group (10.3%) had lived in apartments or townhouses than in either the 55 to 64 group (3.9%) or the 65 to 74 group (5.1%).

Tenure Status

The majority (85.6%) of the respondents were homeowners and only 10.2% were renters. More than two-thirds of the respondents (67.0%) owned and had paid for the housing in which they resided, while 18.6% were in the process of buying their housing.

The percentages of homeowners who had paid for their housing increased with increases in age. There were higher percentages of these homeowners in the 65 to 74 age group (75.4%) and the 75 and older group (75.9%) than in the 55 to 64 group (63.3%). The same was true for renters where the percentage in the 75 and older age group (16.8%) was almost double the percentages in either the 55 to 64 group (8.2%) or the 65 to 74 group (9.7%).

Dwelling Expenses

Of 75% of the respondents which reported their monthly house payment or rent in the range of less than $50, 67% were homeowners without a mortgage and eight percent paid less than $50 for their monthly house payment or rent. Only 5.5% reported monthly dwelling expenses of $300 or greater. The mean dwelling expense for the sample except homeowners without a mortgage was $210.68.

Within the three age subgroups, dwelling expenses for a majority of the respondents in both the 65 to 74 age group (80.6%) and the 75 and older group (81.1%) were less than $50. A higher percentage of those in the 55 to 64 age group (7.7%) spent $300 or more for their monthly house payments or rent than in either the 65 to 74 group (4.4%) or the 74 and older group (2.2%).

In summary, with regard to housing characteristics, the

typical elderly respondents had lived in rural areas previously, were a single-family detached homeowner without a mortgage, and spent an average of $210.68 for the monthly house payments or rent. They also had lived in their dwelling which was almost 32 years old for approximately 20 years.

Community Characteristics

The twenty-eight communities used in this study were selected on the basis of degree of housing diversity and size of community. The level of housing diversity, as representative of community housing development, was classified along a continuum from low diversity to high diversity. Size of community was also divided into low and high based on the 1980 Census of Population. As a result, the following four community types were produced by these community selection procedures: low population/low diversity, low population/high diversity, high population/low diversity, and high population/high diversity.

The largest percentage of the respondents (27.8%) in this study lived in a community with high population/high diversity (see Table 6). However, in general, the 1,878 elderly respondents were almost evenly distributed among four community types.

Table 6. Frequencies of Each Community Type

Community Type	N	%
Low Population/Low Diversity	399	21.2
Low Population/High Diversity	494	26.3
High Population/Low Diversity	463	24.7
High Population/High Diversity	522	27.8
	1878	100.0

CHAPTER V

FINDINGS AND DISCUSSION

The purpose of this study was to determine the factors which affect older individuals' innovativeness toward housing and factors which affect the acceptance of nontraditional housing type(s) by elderly individuals. The results and discussion of the data analyses, accompanied by supporting tables, are presented in two sections: description of the dependent variables and testing of hypotheses. The SAS (Statistical Analysis System) was used to obtain the inferential results for this study. The major statistical techniques involved in this study were the ANOVA (Analysis of Variance) and the GLM (General Linear Models) procedures. The ANOVA procedure was appropriate because it was a method to accommodate classification variables. A series of one-way analysis of variance tests were computed: a) to compare both mean factor and mean acceptance scores by selected respondent characteristics; and b) to compare mean acceptance scores of each of the four nontraditional housing types and a combination of these four types by four different types of communities. The GLM procedure was utilized for the multiple regression computations since it could handle classification variables as well as continuous variables.

Description of the Dependent Variables

Basically, this study was divided into two distinctive phases. The first phase was designed to determine the factors affecting older individuals' innovativeness toward housing. In this phase, personal innovativeness toward housing was the dependent variable. In the second phase, the factors affecting the acceptance of nontraditional housing type(s) by elderly individuals were determined. The dependent variables for this phase were the acceptance of nontraditional housing type(s). The following section describes these two sets of dependent variables.

Personal Innovativeness Toward Housing

A series of factor analyses were used as a data reduction technique and to determine if the 26 items in personal innovativeness toward housing were sufficiently related to construct composite variables. The following six factors were determined as the result of the factor analysis; Factor I - experimentation and new design/ideas; Factor II - new housing types; Factor III - repair and fix things; Factor IV - improvement and utility; Factor V - appearance versus comfort; and Factor VI - risk taking (see Table 2).

"Experimentation and new design/ideas" best described Factor One. This classification indicated the presence of a tendency and willingness to actively respond to or be involved

in new things. Factor Two, "new housing types," indicated a positive attitude to adopt new or unusual housing types and technologies in housing. Factor Three, "repair and fix things," described the interest in problem-solving through self-involvement in labor-related activities. Factor Four, "improvement and utility," described a positive attitude to search for new things to improve housing with a hesitancy toward risk. "Appearance versus comfort," Factor Five, indicated an interest in comfort, appearance of the house, and the function of the heating system in the house. Factor Six, "risk taking," indicated an active willingness to take chances.

Six factors were used as dependent variables in the analysis of variance procedure. The relationships between each of the six factors and each of the selected demographic and housing characteristics were tested.

Acceptance of Nontraditional Housing Type(s)

Acceptance of each of four nontraditional housing types (mobile homes, apartments or townhouses, solar houses, and earth-sheltered houses) and a combination of these four housing types was another dependent variable for this study. Acceptance scores obtained on each of the four nontraditional housing types were calculated. Scores ranged from 0 to 4 for each housing type and are summarized in Table 7. The results

Table 7. Frequencies of Acceptance Level in Each Nontraditional Housing Type

Housing Type	Scores 0		1		2		3		4	
	N	%	N	%	N	%	N	%	N	%
Mobile Home	132	7.0	940	50.1	216	11.5	193	10.3	397	21.1
Apt/Townhouse	173	9.2	662	35.3	98	5.2	324	17.3	621	33.1
Solar House	393	20.9	696	37.1	104	5.5	674	35.9	11	0.6
Earth-Sheltered House	540	28.8	772	41.1	99	5.3	430	22.9	37	2.0

NOTE: 0: No Stage (missing value or never heard/don't know)
1: Awareness Stage (seen/read/heard)
2: Interest Stage (ever looked for information)
3: Evaluation Stage (ever considered living)
4: Adoption Stage (lived in)

showed that the acceptance levels of respondents for all nontraditional housing types were low. The score which had the highest percentage for each of four housing types was one. Very few respondents scored four (adoption stage) for all housing types except apartments or townhouses (33.1%). The means of the scores for all housing types ranged from a low of 1.28 (earth-sheltered houses) to a high of 2.30 (apartments or townhouses) (See Table 8). In a comparison of the three age subgroups, the mean acceptance score for each of the four housing types decreased with advancing age. Generally, when compared to the adoption process developed by Rogers (1983) and Rogers and Shoemaker (1971), the respondents were located between the awareness and interest stage.

A summation of acceptance scores from the combination of the four nontraditional housing types was calculated (see Table 9). The possible scores ranged from 0 to 16. From this range the levels of low, medium, and high acceptance of the combination of the four housing types were assigned based on frequency distributions. The breakpoints were determined to be 0-4 for low acceptance level; 5-8 for medium acceptance level; and 9-16 for high acceptance level. The results showed that there was little difference in percentages among the three levels of acceptance. The highest percentage of the respondents (39.2%) were in the medium acceptance level, followed by the highest acceptance level (32.3%). The lowest

Table 8. Mean Scores of Acceptance Level in Each Non-traditional Housing Type and Combination of Four Housing Types

Housing Type	Entire (n=1878)	55-64 (n=850)	65-74 (n=705)	75+ (n=323)
Each Housing Type[a]				
Mobile Home	1.88	2.00	1.82	1.71
Apt/Townhouse	2.30	2.43	2.19	2.17
Solar House	1.58	1.76	1.47	1.33
Earth-Sheltered Home	1.28	1.40	1.22	1.18
Combination of 4 Types[b]	7.05	7.59	6.72	6.33

NOTE: [a]1: Awareness Stage
2: Interest Stage
3: Evaluation Stage
4: Adoption Stage

[b]1-4: Awareness Stage (Low Acceptance Level)
5-8: Interest Stage (Medium Acceptance Level)
9-12: Evaluation Stage (High Acceptance Level)
13-16: Adoption Stage (High Acceptance Level)

Table 9. Frequencies of Acceptance Level in Combination of Four Nontraditional Housing Types

Scores[a]	N	%
Low		
0	38	2.0
1	42	2.2
2	65	3.5
3	83	4.4
4	308	16.4
Subtotal	536	28.5
Medium		
5	234	7.1
6	208	11.1
7	211	11.2
8	182	9.7
Subtotal	735	39.2
High		
9	118	6.3
10	158	8.4
11	105	5.6
12	95	5.1
13	50	2.7
14	78	4.2
15	0	0.0
16	3	0.2
Subtotal	607	32.3
Total	1878	100.0

NOTE: [a]1-4: Awareness Stage (Low Acceptance Level)
5-8: Interest Stage (Medium Acceptance Level)
9-12: Evaluation Stage (High Acceptance Level)
13-16: Adoption Stage (High Acceptance Level)

percentage (28.5%) was in the low acceptance level. The mean acceptance level for the entire sample in the combination of the four types was 7.05 which was located in the medium acceptance level, and it represented the interest stage in the adoption process (see Table 8). Among the three age subgroups, there was a steady decrease in the mean score as age increased. The 55 to 64 age group reported the highest mean score (7.59) for the acceptance of the combination of the four housing types.

Testing of Hypotheses

Five null hypotheses were tested in this study. A series of one-way analysis of variance tests were used to test hypotheses 1, 2, and 3. If the analysis of variance revealed significant differences, the Turkey's HSD test for comparisons of means was conducted to detect which groups were different.

Testing of Hypothesis One

The first hypothesis stated that there is no significant relationship between the mean factor scores on personal innovativeness toward housing and each of the selected demographic and housing characteristics of the elderly respondents.

The following demographic and housing characteristics were analyzed with each of the six factors using the analysis

of variance techniques. The results were mean factor scores which identified the relationships between the various levels of personal innovativeness toward housing and demographic and housing characteristics of the elderly respondents.

Age

As Table 10 indicates, respondent age was found to be significantly related to scores in the four factors, "experimentation and new design/ideas," "new housing types," "repair and fix things," and "appearance vs comfort." Therefore, the null hypotheses corresponding to these four factors were rejected. Although Rogers (1983) and Rogers and Shoemaker (1971) found that there was no clear difference in innovativeness in different ages, this study found that there were significant differences in "experimentation and new design/ideas in housing," "new housing types," "repair and fix things," and "appearance vs comfort" by age group. The pattern of differences indicated younger respondents reported a greater level of that personal innovativeness toward housing than did older respondents.

Marital Status

Mean factor scores of personal innovativeness toward housing by marital status of elderly respondents are presented in Table 11. Marital status was significantly related to the

Table 10. Mean Factor Scores of Personal Innovativeness Toward Housing by Age

Factor Name	Age 55-64 (n=707)	65-74 (n=555)	75+ (n=249)	p-value
Experimentation & New Design/Ideas	.04[ab]	-.04[abc]	-.14[bc]	.0367*
New Housing Types	.15[a]	-.05[bc]	-.14[bc]	.0001*
Repair & Fix Things	.08[ab]	.01[abc]	-.15[bc]	.0056*
Improvement & Utility	-.04	.04	.07	.2550
Appearance vs Comfort	.07[ab]	.01[ab]	-.26[c]	.0001*
Risk Taking	-.01	.04	-.07	.3270

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

Table 11. Factor Scores of Personal Innovativeness toward Housing by Marital Status

Factor Name	Marital Status Married (n=1456)	Unmarried (n=30)	p-value
Experimentation & New Design/Ideas	-.02	-.03	.9855
New Housing Types	.03	.33	.1028
Repair & Fix Things	.03	-.36	.0339*
Improvement & Utility	-.03	.00	.8977
Appearance vs Comfort	-.01	-.08	.6893
Risk Taking	.01	-.41	.0222*

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

two factors: "repair and fix things" and "risk taking." Therefore, the null hypotheses corresponding to these two factors were rejected. Nonmarried (widowed, divorced, separated, or never married) respondents gave lower factor scores for "repair and fix things" (-.36) and "risk taking" (-.41) than did married respondents. Till (1988) revealed that the widowed people were more likely to be less innovative in housing. The results of this study also showed that nonmarried elderly people including widowed were less innovative than married for these two factors.

Sex

The effect of sex of the elderly respondents upon housing innovativeness was studied. Table 12 illustrates that respondent's sex was significantly related to the "repair and fix things," "improvement and utility," and "risk taking" factors. Therefore, the null hypotheses corresponding to these three factors were rejected. Males reported significantly higher factor score for "repair and fix things" (.23). Females gave significantly higher scores for "improvement and utility" (.07) and "risk taking" (.10). This pattern of differences shows that males were more likely to be innovative toward instrumental actions to change things, while females were more likely to be innovative toward products and ideas for improvement or change in their housing,

Table 12. Mean Factor Scores of Personal Innovativeness toward Housing by Sex

Factor Name	Sex		p-value
	Male (n=950)	Female (n=550)	
Experimentation & New Design/Ideas	-.04	.01	.3521
New Housing Types	.05	-.01	.2465
Repair & Fix Things	.23	-.34	.0001*
Improvement & Utility	.08	.07	.0051
Appearance vs Comfort	.01	-.04	.2818
Risk Taking	.06	.10	.0037*

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

and had more active responsiveness for taking chances.

Race

Mean factor scores of personal innovativeness toward housing by race are presented in Table 13. Three factors, "experimentation and new design/ideas," "repair and fix things," and "appearance vs comfort" were identified to indicate the significant relationships with race. The null hypotheses related to these three factors were rejected. Nonwhite respondents were more inclined to be innovative in "experimentation and new design/ideas" (.22), "repair and fix things" (.16), and "appearance vs comfort" (.35).

Education Level

The effect of the education level of elderly respondents on personal innovativeness toward housing was investigated. Significant relationships with education level were obtained for the three factors, "experimentation and new design/ideas," "new housing types," and "improvement and utility" (see Table 14). The null hypotheses related to these three factors were rejected. Literature reveals that more innovative individuals are more likely to have higher levels of education than those who are less innovative (Rogers, 1983; Till, 1988). The results of this study, however, did not concur with the findings in the literature. Depending on the factors, the

Table 13. Mean Factor Scores of Personal Innovativeness toward Housing by Race

Factor Name	Race		p-value
	White (n=950)	Non-white (n=550)	
Experimentation & New Design/Ideas	.04	.22	.0025*
New Housing Types	.02	.14	.1994
Repair & Fix Things	.04	.16	.0315*
Improvement & Utility	.04	.10	.1143
Appearance vs Comfort	.04	.35	.0001*
Risk Taking	.01	.09	.2620

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

Table 14. Mean Factor Scores of Personal Innovativeness toward Housing by Education Level

Factor Name	Education Level: No or Some School (n=468)	Completed High School (n=339)	Some College (n=232)	College Graduate (n=471)	p-value
Experimentation & New Design/Ideas	-.10[ab]	-.13[ab]	.11[cd]	.08[cd]	.0014*
New Housing Types	-.22[ab]	-.10[ab]	.18[cd]	.30[cd]	.0001*
Repair & Fix Things	.01	.04	.08	.01	.6799
Improvement & Utility	.16[ab]	.12[abc]	-.07[bc]	-.29[d]	.0001*
Appearance vs Comfort	.07	.02	.01	.03	.4170
Risk Taking	.03	.04	.12	.00	.2397

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

patterns of relationship with education level by elderly respondents were different in this study. Elderly respondents with some college education indicated the highest mean factor score in "experimentation and new design/ideas" (.11), while those with completed high school education reported the lowest mean factor score (-.13). For "new housing types," a continuum began with respondents with the least education (less than a 12th grade education) having the lowest mean factor score (-.22) and following through to those with the most education (college graduate or more) having the highest mean factor score (.30). For "improvement and utility," the reverse pattern existed: respondents with less than a 12th grade education had the highest mean factor score (.16) following through to those with a college education with the lowest mean factor score (-.29).

Employment Status

The relationship between personal innovativeness toward housing and employment status of the elderly respondents (full-time, part-time, retired, homemaker, unemployment, and other) was explored. The "repair and fix things" and "appearance vs comfort" factors were significantly related to employment status (see Table 15). Therefore, the null hypotheses corresponding to these two factors were rejected. Homemakers were found to be the least innovative (-.37), while

Table 15. Mean Factor Scores of Personal Innovativeness toward Housing by Employment Status

Factor Name	Employment Status: Full-time (n=416)	Part-time (n=65)	Retired (n=855)	Home-maker (n=82)	Un-employed (n=32)	Other (n=55)	p-value
Experimentation & New Design/Ideas	.03	.07	-.01	-.27	-.12	-.12	.1478
New Housing Types	.13	-.03	.00	-.08	.16	-.08	.1778
Repair & Fix Things	.12[abcef]	.18[abcef]	.00[abcef]	-.37[def]	-.06[abcdef]	-.12[abcdef]	.0015*
Improvement & Utility	-.00	.01	-.03	.09	-.20	-.21	.5102
Appearance vs Comfort	.12[abcf]	.09[abcdef]	-.05[cd]	-.24[cd]	-.16[abcdef]	.00[abcdef]	.0113*
Risk Taking	-.03	-.01	.03	-.12	-.41	.17	.1071

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

those with part time jobs were the most innovative (.18) in "repair and fix things." For "appearance vs comfort," homemakers also reported the least innovativeness (-.24), while those who were employed on a full-time basis showed the most innovativeness (.12). The results relative to employment status agree with the findings in the literature. Rogers (1983) and Rogers and Shoemaker (1971) showed that persons with higher social status including employment status were more innovative than those with lower social status.

Income Level

Mean factor scores by income level of elderly respondents are presented in Table 16. Significant relationships with income level were found in the four factors: "new housing types," "repair and fix things," "improvement and utility," and "appearance vs comfort." The null hypotheses related to these four factors were rejected. The general pattern of relationships suggests that elderly respondents with higher annual household incomes were more likely to report higher mean factor scores. However, one factor, "improvement and utility" did not follow this pattern. The mean factor scores for four income levels in this factor suggest that respondents with lower annual household incomes were more likely to be innovative toward basic ideas and products related to housing, while those with higher incomes were more innovative toward

Table 16. Mean Factor Scores of Personal Innovativeness toward Housing by Annual Income Level

Factor Name	Annual Income Level: Less than $10,000 (n=363)	$10,000 -$24,999 (n=590)	$25,000 -$49,999 (n=380)	$50,000 or Greater (n=133)	p-value
Experimentation & New Design/Ideas	-.11	-.03	.07	.05	.0741
New Housing Types	-.25[a]	-.02[b]	.20[cd]	.38[cd]	.0001*
Repair & Fix Things	-.21[ad]	.12[bcd]	.08[bcd]	.00[abcd]	.0001*
Improvement & Utility	.28[a]	.02[b]	-.19[cd]	-.39[cd]	.0001*
Appearance vs Comfort	-.13[ab]	.03[abcd]	.08[bcd]	.14[bcd]	.0071*
Risk Taking	.04	.02	-.03	-.09	.5257

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

new ideas and concepts in housing. This result may be relevant to the findings in the literature. Rogers and Shoemaker (1971) found that individuals with higher levels of incomes are more willing to challenge or experiment with innovations because they are more able to take financial risks with the innovations. Till (1988) also found that people with lower incomes were associated with less innovativeness toward housing.

Size of Previous Community

The relationship between personal innovativeness toward housing and the size of the largest community in which the respondents had previously lived is shown in Table 17. The five factors, "experimentation and new design/ideas," "new housing types," "repair and fix things," "improvement and utility," and "risk taking," were identified to indicate the significant relationships with size of previous community. The null hypotheses related to these five factors were rejected. A continuous pattern existed for the three factors, "experimentation and new design/ideas," "new housing types," and "repair and fix things": the personal innovativeness toward housing increased with increasing size of previous communities. However, the other two factors ("improvement and utility" and "risk taking") exhibited a reverse pattern of the relationships: the higher mean factor scores were associated

Table 17. Mean Factor Scores of Personal Innovativeness toward Housing by Size of Previous Community of Residence

Factor Name	Size of Previous Community: Less than 10,000 (n=555)	10,000 -49,999 (n=377)	50,000- 499,999 (n=319)	500,000 or Greater (n=221)	p-value
Experimentation & New Design/Ideas	$-.15^{ab}$	$-.02^{abcd}$	$.12^{bcd}$	$.11^{bcd}$	.0002*
New Housing Types	$-.02^{abc}$	$-.04^{abc}$	$.12^{abcd}$	$.20^{cd}$	.0052*
Repair & Fix Things	$-.05^{abd}$	$-.04^{abd}$	$.18^{cd}$	$.10^{abcd}$	.0026*
Improvement & Utility	$.04^{abd}$	$.03^{abcd}$	$-.16^{bcd}$	$-.12^{abcd}$	.0110*
Appearance vs Comfort	-.03	.04	.01	.02	.8339
Risk Taking	$.00^{abcd}$	$.12^{abc}$	$-.04^{abcd}$	$-.15^{acd}$	.0158*

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

with smaller sizes of previous communities. The results of the study are somewhat consistent with the literature. Till (1988) found that less innovative individuals were previous residents of small communities.

Age of Dwelling

Mean factor scores of personal innovativeness toward housing by age of present dwelling are presented in Table 18. Age of the dwelling was significantly related to the two factors: "experimentation and new design/ideas" and "new housing types." Therefore, the null hypotheses corresponding to these two factors were rejected. The results showed that decreases in age of present dwelling were associated with the higher innovativeness in "experimentation and new design/ideas." This pattern indicates that respondents who lived in older housing were less willing to actively respond to new ideas or things. For "new housing types," respondents who reported their dwellings were in the range of 10 to 24 years had the most innovativeness (.14) in this factor, while those reporting more than 35 years of age for their dwelling showed the least innovativeness (-.03).

Length of Residence

With regard to length of present residence, "new housing types" was the only factor with a significant relationship

Table 18. Mean Factor Scores of Personal Innovativeness toward Housing by Age of Dwelling

Factor Name	Age of Dwelling: Less than 10 years (n=241)	10-24 years (n=430)	25-35 years (n=343)	More than 35 years (n=497)	p-value
Experimentation & New Design/Ideas	.06[abcd]	.05[abcd]	.00[abcd]	-.13[acd]	.0208*
New Housing Types	.01[abcd]	.14[abcd]	-.01[abcd]	-.03[acd]	.0465*
Repair & Fix Things	.03	.08	-.01	-.03	.4073
Improvement & Utility	-.04	.04	-.09	-.02	.3370
Appearance vs Comfort	.06	.06	-.07	-.05	.1445
Risk Taking	-.07	-.04	.07	.02	.2792

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

(see Table 19). The null hypothesis related to this factor was rejected. The respondents who had lived in their dwelling for 10 to 20 years reported the highest innovativeness (.15) in the factor, "new housing types," followed by those reporting 21 to 30 years (.09). This pattern demonstrates that elderly respondents who had lived in their dwelling for 10 to 30 years had more positive attitudes toward adopting new and unusual housing types and technologies in housing. The respondents who had lived in their dwelling for the longest period (more than 35 years) showed the lowest innovativeness (-.11) in this factor.

Current Housing Types

The relationship between various current housing types (conventional houses, mobile homes, apartments or townhouses, and other) in which elderly respondents lived and personal innovativeness toward housing was explored. Two factors, "new housing types" and "repair and fix things," were significantly related to current housing types (see Table 20). Therefore, the null hypotheses corresponding to these two factors were rejected. Elderly respondents living in apartments or townhouses were shown to be the least innovative for the two factors, "new housing types" (-.19) and "repair and fix things" (-.72), while those living in mobile homes were found to be the most innovative in housing for these two factors

Table 19. Mean Factor Scores of Personal Innovativeness toward Housing by Length of Residence

Factor Name	Length of Residence: Less than 10 years (n=479)	10-20 years (n=346)	21-30 years (n=339)	More than 30 years (n=347)	p-value
Experimentation & New Design/Ideas	.01	.02	.01	-.12	.2207
New Housing Types	-.00[abc]	.15[abc]	.09[abcd]	-.11[ad]	.0024*
Repair & Fix Things	-.00	.06	.07	-.04	.4327
Improvement & Utility	-.03	-.02	-.02	-.03	.9987
Appearance vs Comfort	.04	-.05	.06	-.09	.1148
Risk Taking	-.09	-.04	.03	.06	.1093

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

Table 20. Mean Factor Scores of Personal Innovativeness toward Housing by Current Housing Types

Factor Name	Current Housing Types: House (n=1340)	Mobile Home (n=65)	Apt/ Townhouse (n=77)	Other (n=24)	p-value
Experimentation & New Design/Ideas	-.02	-.13	.00	.23	.4925
New Housing Types	.05	.25	-.19	.02	.0207*
Repair & Fix Things	.05[abd]	.31[ab]	-.72[cd]	-.35[acd]	.0001*
Improvement & Utility	-.04	.04	.07	.11	.6068
Appearance vs Comfort	-.01	-.21	.04	.28	.1797
Risk Taking	.02	-.27	-.09	-.16	.0900

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

(.25 and .31 respectively). The results demonstrated that present apartment or townhouse dwellers possessed negative attitudes toward adopting new or unusual housing types and also had the least interest in problem-solving through self-involvement in labor-related activities. For present mobile home dwellers, a reverse pattern existed. These results are consistent with the findings in other studies. Till (1988) notes that apartment or townhouse dwellers were the most traditional in housing innovativeness and mobile home dwellers were the most likely to possess the trait of craftsmanship.

Although the analysis of variance test showed a significant relationship between the factor "new housing types" and current housing types, Tukey's HSD test for comparisons of means of four categories in current housing types did not detect any differences between categories. This result was probably caused by the big differences in sample sizes between conventional houses and the other housing types. However, on the basis of mean factor scores, it can be recognized that some difference existed between mobile homes (.23) and apartments or townhouses (-.19).

Tenure Status

Mean factor scores of personal innovativeness by tenure status of elderly respondents are presented in Table 21. There were significant relationships between respondent's

Table 21. Mean Factor Scores of Personal Innovativeness toward Housing by Tenure Status

Factor Name	Tenure Status: Own (Paid for) (n=1050)	Own (Buying) (n=279)	Rent (n=137)	Other (n=18)	p-value
Experimentation & New Design/Ideas	-.03	.04	-.06	.17	.5366
New Housing Types	.03[abcd]	.15[abd]	-.13[acd]	-.21[abd]	.0289*
Repair & Fix Things	.08[abd]	.04[abd]	-.49[abcd]	-.14[cd]	.0001*
Improvement & Utility	-.04[abd]	-.05[abcd]	.21[bcd]	-.36[abcd]	.0161*
Appearance vs Comfort	-.04	.06	.05	.22	.2281
Risk Taking	.04	-.08	-.09	-.23	.1465

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

tenure status and the three factors, "new housing types," "repair and fix things," and "improvement and utility." The null hypotheses related to these three factors were rejected. Respondents buying their homes (homebuyers) were shown to be the most innovative (.15) in "new housing types." In other words, they were most willing to respond or adopt new or unusual housing types and technologies in housing. Respondents who own their homes reported the most innovativeness (.08) in "repair and fix things." This result indicated a presence of the highest interest in self-involvement for problem-solving by labor-related activities for those who owned their homes. Renters possessed the most innovativeness (.21) in "improvement and utility." They were most likely to have positive attitudes to search for new products or ideas to improve their housing with a hesitancy toward risk.

Dwelling Expenses

The effect of respondent's dwelling expenses (monthly house payments or rent) on personal innovativeness toward housing was studied. Table 22 illustrates that dwelling expenses of the elderly respondents were significantly related to the three factors, "experimentation and new design/ideas," "new housing types," and "appearance vs comfort." Respondents who spent $300 or greater for their monthly house payment or

Table 22. Mean Factor Scores of Personal Innovativeness toward Housing by Dwelling Expenses

Factor Name	Dwelling Expenses: Less than $50 (n=1133)	$50-$99 (n=64)	$100-$299 (n=226)	$300 or Greater (n=88)	p-value
Experimentation & New Design/Ideas	-.05[abc]	.12[abc]	-.03[abcd]	.31[bd]	.0059*
New Housing Types	.02[abcd]	-.22[abc]	.06[abcd]	.26[acd]	.0237*
Repair & Fix Things	.05	-.23	.10	.13	.0621
Improvement & Utility	-.03	.14	.05	-.21	.1008
Appearance vs Comfort	-.03[abcd]	-.21[abc]	.08[abcd]	.23[acd]	.0138*
Risk Taking	.02	.09	.05	-.24	.0860

NOTE: *Significance level $p < .05$
Higher factor scores are associated with greater innovativeness.
Mean factor scores with same superscripts are not significantly different from each other (Tukey's HSD).

rent were found to be the most innovative in the three factors, "experimentation and new design/ideas" (.31), "new housing types" (.26), and "appearance vs comfort" (.23). The results showed that elderly respondents who spent the most on house payment or rent possessed the most innovativeness in housing.

Testing of Hypotheses Two and Three

Hypotheses two and three stated that there is no significant relationship between each of the selected demographic and housing characteristics and the mean acceptance score of: Ho2) each nontraditional housing type; and Ho3) a combination of nontraditional housing types.

The following demographic and housing characteristics were analyzed with each of four housing types and a combination of four housing types using the analysis of variance techniques. The results were presented by mean acceptance scores in order to identify the relationships between the acceptance level of nontraditional housing types and demographic and housing characteristics of the respondents.

Age

The effect of age of elderly respondents on acceptance level of nontraditional housing types was explored.

Significant relationships with age were obtained for each housing type (mobile homes, apartments or townhouses, solar houses, and earth-sheltered houses) and for a combination of these four types (see Table 23). Therefore, the null hypotheses related to all five housing types were rejected. There was a clear pattern of relationships indicating the decrease in acceptance level with higher age: respondents in the 55 to 64 age group reported the highest mean acceptance scores for all four housing types and for the combination of these four types.

Significant differences existed between the 55 to 64 age group and the other two groups (the 65 to 74 age group and the 75 and older age group) for all housing types. In other words, the acceptance level of the 55 to 64 age group for nontraditional housing type(s) was significantly different from the acceptance levels of either the 65 to 74 age group or the 75 and older age group. On the basis of adoption process developed by Rogers (1983) and Rogers and Shoemaker (1971), the respondents in the 55 to 64 age group were in higher stages of the adoption process than those in either the 65 to 74 age group or the 75 and older age group. Although Rogers (1983) noted that there was no difference in adopter categories by age, the result of this study found the presence of differences between different age groups.

Table 23. Mean Acceptance Scores of Nontraditional Housing Types by Age

Housing Type	Age 55-64 (n=850)	65-74 (n=705)	75+ (n=323)	p-value
Mobile Home	2.00[a]	1.82[bc]	1.71[bc]	.0008*
Apt/Townhouse	2.43[a]	2.19[bc]	2.17[bc]	.0012*
Solar House	1.76[a]	1.49[bc]	1.33[bc]	.0001*
Earth-Sheltered House	1.40[a]	1.22[bc]	1.11[bc]	.0002*
Combination of 4 Types	7.59[a]	6.72[bc]	6.32[bc]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

Marital Status

The relationship between acceptance level of nontraditional housing type(s) and marital status of elderly respondents was investigated. As Table 24 indicates, mobile homes were the only housing type which was significantly related to marital status. Therefore, the null hypothesis related to mobile homes was rejected. Married respondents were found to be more accepting of mobile homes than nonmarried ones. The literature notes that widows were more interested in multi-family dwelling options than living in mobile homes (Dillman, 1979; Sweaney, 1983). The results of this study support this finding in the literature.

Sex

Mean acceptance scores of nontraditional housing type(s) by sex of elderly respondents were presented in Table 25. The sex of the respondents was significantly related to the three housing types; apartments or townhouses, solar houses, and earth-sheltered houses. Therefore, the null hypotheses corresponding to these three housing types were rejected. Females were shown to be more likely to accept apartments or townhouses (2.41), while males were more likely to accept on solar (1.67) and earth-sheltered houses (1.39).

Table 24. Mean Acceptance Scores of Nontraditional Housing Types by Marital Status

Housing Type	Marital Status: Married (n=1806)	Marital Status: Unmarried (n=42)	p-value
Mobile Home	1.89	1.43	.0235*
Apt/Townhouse	2.30	2.31	.9535
Solar House	1.58	1.33	.1780
Earth-Sheltered House	1.29	1.00	.2963
Combination of 4 Types	7.06	6.17	.0942

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

Table 25. Mean Acceptance Scores of Nontraditional Housing Types by Sex

Housing Type	Sex		p-value
	Male (n=1141)	Female (n=724)	
Mobile Home	1.87	1.90	.7001
Apt/Townhouse	2.22	2.41	.0052*
Solar House	1.67	1.45	.0001*
Earth-Sheltered House	1.39	1.10	.0001*
Combination of 4 Types	7.15	6.86	.0722

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

Race

The relationship between acceptance level of nontraditional housing type(s) and race of elderly respondents is shown in Table 26. Solar houses and earth-sheltered houses were significantly related to race. The null hypotheses related to these two housing types were rejected. White respondents were found to be more inclined to accept solar (1.61) and earth-sheltered houses (1.30).

Education Level

The effect of the education level of elderly respondents upon acceptance of nontraditional housing type(s) was explored. All housing types except mobile homes and a combination score were found to be significantly related to education level (see Table 27). Therefore, the null hypotheses corresponding to three housing types (apartments or townhouses, solar houses, and earth-sheltered houses) and the combination score were rejected. Respondents with the highest education level (college graduate or more) reported the highest acceptance levels on these four variables. Literature reveals that elderly individuals who have higher education are more likely to accept new products of technology (Brickfield, 1983). The result of this study concurs with findings in the literature, indicating clear differences within the elderly population with regard to acceptance of innovative ideas in

Table 26. Mean Acceptance Scores of Nontraditional Housing Types by Race

Housing Type	Race: White (n=1685)	Race: Non-white (n=185)	p-value
Mobile Home	1.88	1.95	.5090
Apt/Townhouse	2.29	2.34	.6791
Solar House	1.61	1.32	.0016*
Earth-Sheltered House	1.30	1.07	.0097*
Combination of 4 Types	7.09	6.68	.1214

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

Table 27. Mean Acceptance Scores of Nontraditional Housing Types by Education Level

Housing Type	Education Level: No or Some School (n=633)	Completed High School (n=415)	Some College (n=281)	College Graduate (n=546)	p-value
Mobile Home	1.96	1.94	1.80	1.80	.0826
Apt/Townhouse	2.00[ab]	2.14[ab]	2.47[cd]	2.68[cd]	.0001*
Solar House	1.26[a]	1.52[b]	1.77[cd]	1.91[cd]	.0001*
Earth-Sheltered House	1.11[ab]	1.20[abc]	1.41[bcd]	1.48[cd]	.0001*
Combination of 4 Types	6.33[ab]	6.80[abc]	7.46[bcd]	7.87[cd]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance. Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

housing by education level. However, the current cohort of elderly people has less positive views toward innovative ideas or products than does the current cohort of younger people (Brickfield, 1983; Lawton, 1983).

Employment Status

Relationships between the acceptance level of nontraditional housing types and employment status of elderly respondents existed on the following variables: apartments or townhouses, solar houses, earth-sheltered houses, and a combination of the four types (see Table 28). The null hypotheses related to these four variables were rejected. Respondents who were employed (whether it was full-time or part-time) were shown to be the most accepting of apartments or townhouses, solar houses, earth-sheltered houses, and a combination of the four types. Homemakers were found to be the least accepting of apartments or townhouses (1.95), earth-sheltered houses (0.97), and the combination of the four types (6.15). Unemployed respondents were the least accepting of solar houses (1.13). Brickfield (1983) found that elderly individuals who have higher status of employment are more apt to accept innovative products, and the results of this study agrees.

Table 28. Mean Acceptance Scores of Nontraditional Housing Types by Employment Status

Housing Type	Employment Status: Full-time (n=498)	Part-time (n=90)	Retired (n=1070)	Home-maker (n=110)	Un-employed (n=38)	Other (n=65)	p-value
Mobile Home	1.92	1.99	1.83	1.85	1.92	2.20	.2641
Apt/Townhouse	2.35[abcdef]	2.68[abcef]	2.28[abcdef]	1.95[acdef]	2.21[abcdef]	2.34[abcdef]	.0222*
Solar House	1.80[ab]	1.96[ab]	1.51[cdef]	1.38[cdef]	1.13[cdef]	1.14[cdef]	.0001*
Earth-Sheltered House	1.44[abef]	1.38[abcdef]	1.24[bcdef]	0.97[bcdef]	1.37[abcdef]	1.08[abcdef]	.0007*
Combination of 4 Types	7.51[abcf]	8.00[abcf]	6.87[cdef]	6.15[cdef]	6.63[abcdef]	6.75[abcdef]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

Income Level

Mean acceptance scores by income level of elderly respondents are presented in Table 29. Significant relationships with income level were explored in all four housing types and the combination of these housing types. Therefore, all five null hypotheses were rejected. The general pattern of relationships shows that higher incomes were associated with higher acceptance of apartments or townhouses, solar houses, earth-sheltered houses, and a combination of the four housing types, while the lower incomes were associated with higher acceptance of mobile homes.

Size of Previous Community

There were significant relationships between acceptance of all four nontraditional housing types and a combination of the four types and the size of the largest community in which the elderly respondents had previously lived (see Table 30). Therefore, the null hypotheses related to four housing types and the combination of these housing types were rejected. A clear pattern of relationship was found: There was a continuous increase in mean acceptance scores as size of previous community increased regardless of housing types.

Age of Dwelling

The relationships between acceptance of nontraditional

Table 29. Mean Acceptance Scores of Nontraditional Housing Types by Annual Income Level

Housing Type	Annual Income Level: Less than $10,000 (n=489)	$10,000 -$24,999 (n=726)	$25,000 -$49,999 (n=450)	$50,000 or Greater (n=153)	p-value
Mobile Home	1.97[ab]	1.99[ab]	1.73[cd]	1.60[cd]	.0002*
Apt/Townhouse	2.16[abd]	2.23[abd]	2.50[cd]	2.48[abcd]	.0007*
Solar House	1.19[a]	1.61[b]	1.84[cd]	1.99[cd]	.0001*
Earth-Sheltered House	1.05[a]	1.27[bd]	1.51[cd]	1.50[bcd]	.0001*
Combination of 4 Types	6.37[a]	7.09[bcd]	7.58[bcd]	7.58[bcd]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

Table 30. Mean Acceptance Scores of Nontraditional Housing Types by Size of of Previous Community of Residence

Housing Type	Size of Previous Community: Less than 10,000 (n=705)	10,000 -49,999 (n=476)	50,000-499,999 (n=376)	500,000 or Greater (n=257)	p-value
Mobile Home	1.72^{ab}	1.83^{abc}	2.02^{bcd}	2.23^{cd}	.0001*
Apt/Townhouse	1.84^{a}	2.24^{b}	2.70^{c}	3.11^{d}	.0001*
Solar House	1.32^{a}	1.54^{b}	1.92^{cd}	1.93^{cd}	.0001*
Earth-Sheltered House	1.11^{ab}	1.22^{ab}	1.50^{cd}	1.60^{cd}	.0001*
Combination of 4 Types	5.99^{a}	6.83^{b}	8.14^{c}	8.86^{d}	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

housing type(s) and age of present dwelling was explored. As Table 31 shows, significant relationships existed between age of dwelling and two housing types (mobile homes and apartments or townhouses) and a combination of the four types. Therefore, the null hypotheses related to these three variables were rejected. Elderly respondents who lived in relatively new housing (less than 10 years of age) reported the highest acceptance on mobile homes (2.29), apartments or townhouses (2.52), and the combination score (7.60). Elderly respondents who lived in dwellings from 25 to 35 years of age were shown to have the lowest acceptance of mobile homes (1.63) and the lowest combination score (6.71). Apartments or townhouses were the least acceptable (2.12) to those with dwellings more than 35 years of age.

Length of Residence

When respondents were classified according to the length of residence in present dwelling, significant relationships between length of residence and acceptance of nontraditional housing type(s) were identified (see Table 32). Mobile homes, apartments or townhouses, and a combination of the four types were significantly related to length of residence. That is, the null hypotheses corresponding to these three variables were rejected. Elderly respondents who had lived in their dwelling for less than 10 years indicated the highest

Table 31. Mean Acceptance Scores of Nontraditional Housing Types by Age of Dwelling

Housing Type	Age of Dwelling: Less than 10 years (n=304)	10-24 years (n=577)	25-35 years (n=424)	More than 35 years (n=628)	p-value
Mobile Home	2.29[a]	2.00[b]	1.63[cd]	1.76[cd]	.0001*
Apt/Townhouse	2.52[abc]	2.40[abc]	2.28[abcd]	2.12[cd]	.0003*
Solar House	1.53	1.69	1.55	1.54	.1313
Earth-Sheltered House	1.26	1.29	1.25	1.30	.9100
Combination of 4 Types	7.60[ab]	7.38[ab]	6.71[cd]	6.72[cd]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

Table 32. Mean Acceptance Scores of Nontraditional Housing Types by Length of Residence

Housing Type	Length of Residence: Less than 10 years (n=600)	10-20 years (n=426)	21-30 years (n=419)	More than 30 years (n=433)	p-value
Mobile Home	2.19[a]	1.96[b]	1.59[cd]	1.67[cd]	.0001*
Apt/Townhouse	2.56[ab]	2.40[abc]	2.15[bcd]	1.98[cd]	.0001*
Solar House	1.59	1.62	1.65	1.46	.0824
Earth-Sheltered House	1.29	1.34	1.31	1.19	.2890
Combination of 4 Types	7.62[ab]	7.32[ab]	6.71[cd]	6.30[cd]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

acceptances of mobile homes (2.19), apartments or townhouses (2.56), and the combination of the four types (7.62). In general, a continuous pattern was detected for those two types and the combination of four types: there was a decrease in acceptance with increasing length of residence in present dwelling.

Current Housing Types

The relationships between current housing types (conventional houses, mobile homes, apartments or townhouses, and other) in which elderly respondents lived and acceptance of nontraditional housing type(s) were investigated. All five acceptance scores for nontraditional housing type(s) were significantly related to current housing types (see Table 33). Therefore, the null hypotheses related to these five variables were rejected. It was not surprising that elderly respondents who had lived in mobile homes reported the highest acceptance of mobile homes (3.95) and those who had lived in apartments or townhouses also indicated the highest acceptance of apartments or townhouses (3.60). Elderly respondents who had lived in a conventional house were shown to have the highest acceptance of solar houses (1.62) The earth-sheltered house was more acceptable to current mobile home dwellers (1.38) and conventional house dwellers (1.32). In terms of the general acceptance of nontraditional house types, mobile home dwellers

Table 33. Mean Acceptance Scores of Nontraditional Housing Types by Current Housing Types

Housing Types	Current Housing Types: House (n=1651)	Mobile Home (n=82)	Apt/ Townhouse (n=102)	Other (n=29)	p-value
Mobile Home	1.79[acd]	3.95[b]	1.81[acd]	2.03[acd]	.0001*
Apt/Townhouse	2.21[abd]	2.44[abd]	3.60[c]	2.83[abd]	.0001*
Solar House	1.62[abd]	1.61[abd]	1.14[cd]	1.31[abcd]	.0006*
Earth-Sheltered House	1.32[abd]	1.38[abd]	0.73[cd]	1.17[abcd]	.0001*
Combination of 4 Types	6.93[acd]	9.38[b]	7.28[acd]	7.35[acd]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance. Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

were found to have the highest acceptance (9.38), while conventional house dwellers were shown to have the lowest acceptance (6.93).

Tenure Status

The effect of tenure status of elderly respondents (whether one owns or rents a dwelling unit) on acceptance of nontraditional housing type(s) was studied. Significant relationships with tenure status existed for all four housing types and a combination of these housing types (see Table 34). That is, the null hypotheses related to acceptance of each of the four housing types and a combination of the four types were rejected. Elderly respondents buying their homes were shown to be the most accepting of mobile homes (2.11), solar houses (1.78), and a combination of the four types (7.82). Also, elderly respondents renting their dwelling units were the most accepting of apartments or townhouses (3.13), followed by those buying their homes (2.57).

Dwelling Expenses

As Table 35 indicates, dwelling expenses (monthly house payments or rent) were found to be significantly related to acceptance of each of the nontraditional housing types and a combination of the four housing types. The general pattern of relationships shows that elderly respondents who spent the

Table 34. Mean Acceptance Scores of Nontraditional Housing Types by Tenure Status

Housing Type	Tenure Status: Own (Paid for) (n=1287)	Own (Buying) (n=343)	Rent (n=188)	Other (n=22)	p-value
Mobile Home	1.80[acd]	2.11[bcd]	2.04[abcd]	1.77[abcd]	.0002*
Apt/Townhouse	2.13[abd]	2.57[abd]	3.13[c]	1.77[abd]	.0001*
Solar House	1.59[ad]	1.78[bd]	1.30[cd]	1.41[abcd]	.0001*
Earth-Sheltered House	1.32[abd]	1.37[abd]	0.93[ad]	1.59[abcd]	.0001*
Combination of 4 Types	6.83[acd]	7.82[bcd]	7.40[abcd]	6.55[abcd]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

Table 35. Mean Acceptance Scores of Nontraditional Housing Types by Dwelling Expenses

Housing Type	Dwelling Expenses: Less than $50 (n=1401)	$50-$99 (n=83)	$100-$299 (n=291)	$300 or Greater (n=103)	p-value
Mobile Home	1.80[abd]	2.07[abd]	2.19[bcd]	2.00[abcd]	.0001*
Apt/Townhouse	2.14[a]	2.80[bcd]	2.68[bcd]	2.94[bcd]	.0001*
Solar House	1.57[ac]	1.18[b]	1.63[acd]	1.95[cd]	.0002*
Earth-Sheltered House	1.29[abc]	1.17[abc]	1.17[abc]	1.63[d]	.0049*
Combination of 4 Types	6.80[ab]	7.22[abc]	7.67[bcd]	8.52[cd]	.0001*

NOTE: *Significance level $p < .05$
Higher mean acceptance scores are associated with greater acceptance.
Mean acceptance scores with same superscripts are not significantly different from each other (Tukey's HSD).

most on housing were more likely to accept four housing types. Also, there was a steady increase in acceptance of a combination of the four housing types with increasing dwelling expenses.

Testing of Hypothesis Four

Hypothesis four stated that adding the age variable to other selected demographic and housing characteristics does not significantly increase the amount of variance for explaining: a) personal innovativeness toward housing; b) acceptance of each nontraditional housing type; and c) acceptance of a combination of each of the nontraditional housing types.

Multiple regression analyses were conducted in two stages in order to assess the contribution of the age variable to the prediction of each dependent variable. First, each of the dependent variables (personal innovativeness toward housing, acceptance of each nontraditional housing type, and a combination of acceptance of each of the nontraditional housing types) was regressed on all independent variables except age (marital status, sex, race, education, employment, income, size of previous community, age of dwelling, length of residence, current housing type, tenure status, and dwelling expenses). This formed model 1 for the multiple regression analyses.

Second, each of the same dependent variables was regressed on the same independent variables as in the first model and the age variable was added last to the equation. This formed model 2 for the multiple regression analyses.

The increase in R^2 resulting from the addition of the age variable was tested to determine if age was a significant variable to increase prediction of each of the dependent variables. Measuring the R^2 change allowed for quantifying the effect of the age variable on each of the dependent variables, given the other independent variables used.

The regression equation contained both continuous and categorical independent variables. Since the categorical variables such as marital status, race, employment, current housing type, and tenure status have no natural scale of measurement, dummy coding was used in the regression analyses for these categorical independent variables. Dummy coding was the simplest method for coding categorical variables because this method allowed for generating a number of vectors in which membership in a given category was assigned "1," while nonmembership in the category was assigned "0" to distinguish the relative effects of each response in one variable (Pedhazur, 1982).

When six factors indicating personal innovativeness toward housing (dependent variables) were regressed on selected demographic and housing characteristics (independent

variables), the usable sample size was 1,311 due to missing values. Among the six factors, "new housing types" was the only factor that produced significant results (see Table 36). Therefore, only one null hypothesis related to this factor was rejected. The addition of age to the other independent variables did significantly add to the amount of variance in the "new housing types" factor. In other words, age of elderly respondents was a significant variable to predict the "new housing types" factor.

The R^2 obtained for the two models in acceptance of nontraditional housing type(s) and the R^2 changes when age is added are presented in Table 37. There were 1,596 usable elderly respondents. The significance of the addition of the age variable to other independent variables to explain the changes in the amount of variance in the acceptance of nontraditional housing type(s) was explained. The results of the analyses found that the addition of age to the model significantly increased the amount of variance in the acceptance of mobile homes (.0004), apartments or townhouses (.0210), solar houses (.0007), earth-sheltered houses (.0312), and a combination of each of the housing types (.0001) that could be explained by the chosen variables. Therefore, all null hypotheses were rejected.

Sweaney et al. (1984) found that age is an important predictor of housing behavior and attitudes. Age had a

Table 36. R^2 Change in the Model for Personal Innovativeness toward Housing (n=1311)

Model	R^2	Statistical Significance	R^2 Change Significance
Experimentation & New Design/Ideas			
Model 1 (Without Age)	.0280	.0002	--
Model 2 (With Age)	.0293	.0002	.1718
New Housing Types			
Model 1 (Without Age)	.0643	.0001	--
Model 2 (With Age)	.0724	.0001	.0008*
Repair & Fix Things			
Model 1 (Without Age)	.1116	.0001	--
Model 2 (With Age)	.1123	.0001	.3185
Improvement & Utility			
Model 1 (Without Age)	.0725	.0001	--
Model 2 (With Age)	.0727	.0001	.5898
Appearance vs Comfort			
Model 1 (Without Age)	.0466	.0001	--
Model 2 (With Age)	.0490	.0001	.0744
Risk Taking			
Model 1 (Without Age)	.0262	.0005	--
Model 2 (With Age)	.0267	.0008	.4226

NOTE: *Significance level $p < .05$
The change in R^2 was measured using the test statistics for increment in proportion of variance accounted for (Pedhazur, 1982, p. 62).

Table 37. R^2 Change in the Model for Acceptance of Nontraditional Housing Type(s) (n=1596)

Model	R^2	Statistical Significance	R^2 Change Significance
Mobile Home			
Model 1 (Without Age)	.1050	.0001	--
Model 2 (With Age)	.1121	.0001	.0004*
Apt/Townhouse			
Model 1 (Without Age)	.1641	.0001	--
Model 2 (With Age)	.1669	.0001	.0210*
Solar House			
Model 1 (Without Age)	.0820	.0001	--
Model 2 (With Age)	.0886	.0001	.0007*
Earth-Sheltered House			
Model 1 (Without Age)	.0550	.0001	--
Model 2 (With Age)	.0578	.0001	.0312*
Combination of 4 Types			
Model 1 (Without Age)	.1312	.0001	--
Model 2 (With Age)	.1414	.0001	.0001*

NOTE: *Significance level $p < .05$
The change in R^2 was measured using the test statistics for increment in proportion of variance accounted for (Pedhazur, 1982, p. 62).

negative effect on consumer acceptance in six out of seven housing alternatives in their study. Dillman et al. (1979) found that age appeared to be an important variable to examine housing preferences. They provided evidence that many of the elderly desired to rent a home in a multi-unit structure or buy a mobile home. The mean acceptance scores of nontraditional housing types in this study already indicated that acceptance levels decreased with advancing age within older respondents (see Table 8). Based on the testing of hypothesis and those mean acceptance scores in this study, it would be expected that age had a significant, but negative, effect on explaining acceptance of nontraditional housing type(s).

With regard to the R^2 obtained, the set of independent variables (demographic and housing characteristics) used in this study only explained very small to small percentages of the variance (approximately 3% to 17%) in each of the dependent variables (personal innovativeness and acceptance of nontraditional housing type(s)). The literature notes that only 15 to 16% of the variance in satisfaction as a subjective measure, could be explained by factors such as age, tenure, income, and health status (Whiteford & Morris, 1986). Therefore, when dependent variables in this study were considered subjective measures, the results of the analysis are somewhat consistent with the literature.

Testing of Hypothesis Five

The fifth hypothesis stated that there is no significant relationship between personal innovativeness toward housing and acceptance of: a) each nontraditional housing type; and b) a combination of each of the nontraditional housing types. Multiple regression analyses were carried out for testing this hypothesis.

Acceptance of each nontraditional housing type and a combination of each of the housing types was regressed on personal innovativeness toward housing ("experimentation and new design/ideas," "new housing types," "repair and fix things," "improvement and utility," "appearance vs comfort," and "risk taking"). The effect of each of six factors in explaining acceptance of nontraditional housing type(s) was explored. The total usable sample size was 1,511 for testing this hypothesis.

As Table 38 indicates, there was a significant and positive effect of "repair and fix things" on acceptance of mobile homes. That is, the factor "repair and fix things" was a significant variable which contributes to the prediction of acceptance of mobile homes by elderly respondents. Therefore, the null hypothesis related to "repair and fix things" was rejected.

The effects in the regression model for acceptance of apartments or townhouses were tested. The results of the

Table 38. Effect of Each Factor on Acceptance of Mobile Home (n=1511)

Variable	B Value	T	p-value
Experimentation & New Design/Ideas	.0616	1.79	.0731
New Housing Types	-.0003	-0.01	.9937
Repair & Fix Things	.0918	2.72	.0066*
Improvement & Utility	.0040	0.12	.9072
Appearance vs Comfort	-.0380	-1.10	.2696
Risk Taking	-.0308	-0.91	.3625
	R^2 = .08		

NOTE: *Significance level $p < .05$
Probability given is for the null hypothesis that the coefficient does not differ from zero.

analyses showed that the effects of the two factors, "experimentation and new design/ideas" and "new housing types" were statistically significant (see Table 39). Also, these two factors were positively related to acceptance. The null hypotheses related to these two factors were rejected.

For acceptance of solar houses, there were significant effects in the four factors, "experimentation and new design/ideas," "new housing types," "repair and fix things," and "improvement and utility" (see Table 40): the null hypotheses corresponding to these four factors were rejected. The factor "improvement and utility" had a negative effect on the acceptance. It is concluded that these four factors were significant predictors in explaining acceptance of solar houses by elderly respondents.

The effects of each of six factors on acceptance of earth-sheltered houses are shown in Table 41. Significant effects existed in the four factors, "experimentation and new design/ideas," "new housing types," "repair and fix things," and "improvement and utility." The null hypotheses related to these four factors were rejected. These four factors were significant variables which contributed to the prediction of acceptance of earth-sheltered houses. All except "improvement and utility" had positive effect on the acceptance.

For acceptance of a combination of each of the nontraditional housing types, "experimentation and new

Table 39. Effect of Each Factor on Acceptance of Apartment/ Townhouse (n=1511)

Variable	B Value	T	p-value
Experimentation & New Design/Ideas	.2427	6.52	.0001*
New Housing Types	.1979	5.30	.0001*
Repair & Fix Things	-.0443	-1.21	.2259
Improvement & Utility	-.0654	-1.76	.0780
Appearance vs Comfort	.0637	1.71	.0883
Risk Taking	.0179	0.49	.6249
	R^2 = .05		

NOTE: *Significance level $p < .05$
Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 40. Effect of Each Factor on Acceptance of Solar House (n=1511)

Variable	B Value	T	p-value
Experimentation & New Design/Ideas	.2107	7.09	.0001*
New Housing Types	.2393	8.03	.0001*
Repair & Fix Things	.1430	4.90	.0001*
Improvement & Utility	-.0680	-2.30	.0217*
Appearance vs Comfort	.0457	1.54	.1249
Risk Taking	.0262	-0.90	.3702
	R^2 = .10		

NOTE: *Significance level $p < .05$
Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 41. Effect of Each Factor on Acceptance of Earth-Sheltered House (n=1511)

Variable	B Value	T	p-value
Experimentation & New Design/Ideas	.1640	5.57	.0001*
New Housing Types	.1618	5.48	.0001*
Repair & Fix Things	.1619	5.60	.0001*
Improvement & Utility	-.0696	-2.38	.0175*
Appearance vs Comfort	-.0298	-1.01	.3120
Risk Taking	-.0547	-1.89	.0592
	R^2 = .07		

NOTE: *Significance level $p < .05$
Probability given is for the null hypothesis that the coefficient does not differ from zero.

design/ideas," "new housing types," "repair and fix things," and "improvement and utility" have significant effects (see Table 42). Therefore, the null hypotheses corresponding to these four factors were rejected. "Improvement and utility" factor was the only factor which present a negative effect on acceptance of a combination of nontraditional housing types. It can be said that these four factors were significant predictors in explaining acceptance of a combination of nontraditional housing types.

Table 42. Effect of Each Factor on Acceptance of the Non-traditional Housing Types in General (n=1511)

Variable	B Value	T	p-value
Experimentation & New Design/Ideas	.6789	7.92	.0001*
New Housing Types	.5987	6.96	.0001*
Repair & Fix Things	.3523	4.18	.0001*
Improvement & Utility	-.1989	-2.33	.0199*
Appearance vs Comfort	.0416	0.48	.6288
Risk Taking	-.0938	-1.11	.2670
	R^2 = .10		

NOTE: *Significance level $p < .05$
Probability given is for the null hypothesis that the coefficient does not differ from zero.

CHAPTER VI

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

A summary of the study including procedures and findings is presented in this chapter. Conclusions and implications from the findings of the study are discussed and recommendations for further study are suggested.

Summary

The purpose of this study was to determine the factors which affect older individuals' innovativeness toward housing and the factors which affect the acceptance of nontraditional housing type(s) by elderly individuals. A subsample of 1,878 household respondents who were over age 55 from the total sample of 4,682 household respondents included in the S-194 Southern Regional Housing Research Project, "Barriers and Incentives to Affordable Housing" was used. The households were located in 28 small non-MSA towns in seven participating states. The project was conducted between 1984 and 1990, and the data used in the present study were collected by mail survey between November, 1987 and February, 1988.

A theory of "diffusion of innovations" developed by Rogers (1962, 1983) and Rogers and Shoemaker (1971) was used as the theoretical background of this study. Among the major elements of the diffusion of innovations, socioeconomic characteristics of adopter categories were used to explain

elderly individuals' innovativeness toward housing. Also, the adoption process, in addition to socioeconomic characteristics was used to measure elderly individuals' acceptance of the four nontraditional housing type(s). On the basis of the adoption process, two knowledge continuum indices developed by Weber, McCray, and Claypool (1985) were adopted and modified to measure the acceptance of each of the four nontraditional housing types and a combination of these four types in elderly individuals.

Based on an extensive review of the literature, a conceptual study framework was proposed to show variables and relationships among variables involved in this study. The investigator examined the dependent and independent variables according to this study framework.

Demographic and housing characteristics of the respondents were described by descriptive analyses of the data. With regard to demographic characteristics, the age of the respondents ranged from 55 to 87, with a mean of 66.4 years. The majority of the respondents were retired, married, white, males. The largest percentage had less than a 12th grade education and a median annual household income in the range of $10,000 to $24,000.

The largest percentage of the respondents had lived in rural areas previously and were single-family detached homeowners without a mortgage. The number of renters

increased with advancing age. A mean age of the dwelling was 32 years, and an average length of residence in the present dwelling was approximately 20 years. Many elderly respondents had no monthly house payments or rent. All demographic and housing characteristics were also described and discussed by the three specific age subgroups (55 to 64, 65 to 74, and 75+) and some age variations existed for several characteristics.

The factor analysis procedure was applied to the 26 questions in personal innovativeness toward housing in order to identify the factors which indicate the relatedness among variables. The following six factors were produced as a result of the factor analysis: experimentation and new design/ideas; new housing types; repair and fix things; improvement and utility; appearance vs comfort; and risk taking.

Two major statistical techniques were used to test hypotheses. The ANOVA procedure was used to test hypotheses 1, 2, and 3 and the GLM procedure in the SAS was utilized for hypotheses 4 and 5. This study was divided into two distinctive phases, and each phase involved different dependent and independent variables. For the first phase, six factors representing personal innovativeness toward housing were dependent variables, and demographic and housing characteristics of the elderly respondents were independent variables. In the second phase, acceptance of nontraditional

housing type(s) was the dependent variable, and demographic and housing characteristics and personal innovativeness toward housing were independent variables.

The first hypothesis was designed to test the significant relationships between the mean factor scores on personal innovativeness toward housing and each of the selected demographic and housing characteristics of the elderly respondents. Although Rogers (1983) indicated that age does not affect the level of innovativeness, age was found to be significantly related to the "experimentation and new design/ideas" factor, indicating younger respondents (55 to 64 age group) were more likely to possess a tendency to actively respond to or be involved in new things. Also, the respondents who were nonwhite, highly educated, previous residents of larger communities, present residents of relatively new housing units, and who had higher monthly house payments or rent were found to be more innovative in this factor.

The respondents who were relatively young, more educated, previous residents of larger communities, present residents of relatively new housing units, homebuyers, and mobile home dwellers were more innovative in the "new housing types" factor. Those who had more incomes and higher monthly house payments or rent, and had lived in their dwelling for 10 to 30 years were also more innovative in this factor. These results

indicated that those with the above characteristics had more positive attitudes toward adopting new or unusual housing types and technologies in housing.

Respondents who were relatively young, married, males, nonwhite, employed either part-time or full-time, homeowners, and currently mobile home dwellers were more innovative in the "repair and fix things" factor. Respondents who earned a medium level of annual income and had previously lived in larger communities were also more innovative in this factor. These results suggested that respondents with these characteristics had more interest in problem-solving through self-involvement in labor-related activities.

Females, less educated, lower income respondents, respondents who were previous residents of smaller communities, and renters were found to be more innovative in the "improvement and utility" factor. In other words, respondents with these characteristics had a positive attitude to search for new things to improve their housing with a hesitancy toward risk.

Respondents who were younger, nonwhite, and employed, earned higher annual incomes, and spent more on their monthly house payments or rent were more innovative in the "appearance vs comfort" factor, indicating higher levels of interest in comfort and appearance of the house, and the function of a heating system in the house.

Married, female respondents and respondents from smaller communities were the most innovative in the "risk taking" factor. That is, respondents with these characteristics possessed a willingness to take chances when they come.

The second and third hypotheses were developed to determine the significant relationships between each of the selected demographic and housing characteristics and the mean acceptance scores of: a) each of the four nontraditional housing types; and b) a combination of those nontraditional housing types. In the case of mobile homes, younger, married, lower income, homebuyers, current mobile home dwellers, and previous residents of larger communities indicated a higher acceptance of mobile homes. Also, respondents who lived in newer houses, had lived in their current house for a short period of time, and had monthly house payments or rent at the medium level ($50-$299) were more accepting of mobile homes.

With regard to apartments or townhouses, respondents who were more likely to accept apartments or townhouses were young, female, more educated, employed, previous residents of larger communities, current apartment or townhouse dwellers, and renters. Also, respondents who earned higher incomes, had lived in their dwelling for a short period of time, and had higher monthly house payments or rent were more accepting of apartments or townhouses.

Respondents who were more likely to be accepting of solar

houses were young, male, white, more educated, employed, previous residents of larger communities, current dwellers of a conventional house, and homebuyers. Respondents who had higher incomes and higher monthly house payments or rent were also more likely to accept solar houses.

In terms of the acceptance of earth-sheltered houses, respondents who were young, males, white, more educated, employed, previous residents of larger communities, current mobile home dwellers, and homebuyers were more likely to accept earth-sheltered houses. Also, respondents who had higher incomes and higher monthly house payments or rent were more accepting of earth-sheltered houses.

Respondents who were young, more educated, employed, previous residents of larger communities, current mobile home dwellers, and homebuyers were more likely to accept nontraditional housing types in general. Respondents who had higher incomes and higher monthly house payments or rent, had lived in a new house, and had lived in their dwelling for a short period of time were also found to be more accepting of nontraditional housing types in general.

The fourth hypothesis was designed to test whether adding the age variable to a given set of independent variables would explain more variance in: a) personal innovativeness toward housing; b) acceptance of each of the four nontraditional housing types; and c) acceptance of a combination of the

nontraditional housing types. Two prediction models with and without the age variable were tested. With respect to personal innovativeness toward housing, the addition of the age variable to the set of predictors did significantly change R^2 in only one factor "new housing types." In other words, age was a significant predictor to explain elderly respondents' positive attitudes to adopt new or unusual housing types and technologies in housing.

The addition of the age variable to the set of predictors (demographic and housing characteristics) did significantly change R^2 in all housing types: mobile homes, apartments or townhouses, solar houses, earth-sheltered houses, and a combination of the four types. These results indicated that age was a significant predictor of acceptance of nontraditional housing type(s) in elderly respondents.

Hypothesis five stated that significant relationships would exist between personal innovativeness toward housing and acceptance of: a) each nontraditional housing type; and b) a combination of the nontraditional housing types. The "repair and fix things" factor was the only significant factor to predict acceptance of mobile homes in elderly respondents. For acceptance of apartments or townhouses, "experimentation and new design/ideas" and "new housing types" were significant predictors. Four factors in personal innovativeness toward housing were significant predictors of elderly individuals'

acceptance of solar houses, earth-sheltered houses, and a combination of the four nontraditional housing types: "experimentation and new design/ideas," "new housing types," "repair and fix things," and "improvement and utility."

Conclusions

Based on the data gathered in this study and the literature reviewed, the investigator reached several conclusions. The findings of this study, however, may not be generalizable to the entire elderly populations throughout the U.S. because the data were collected only from rural elderly who resided in seven participating southern states.

The theoretical framework used in this study explained the process by which individuals become aware of and decide to accept or reject new ideas or products. If individuals are introduced to innovations they usually proceed through a series of stages (awareness, interest, evaluation, trial, and adoption stage) before adopting any innovations. When nontraditional housing types were considered as innovative products for the rural elderly population in this study, the findings showed low acceptance levels (between awareness and interest stages) for each nontraditional housing type and for the combination of the four nontraditional housing types. This indicates that diffusion of information about many of these housing types has not been complete or few elderly

individuals seem to consider nontraditional housing types as acceptable alternatives. Therefore, in order to increase acceptance levels in the elderly population, information about nontraditional housing types must be disseminated to the public, and educational programs for the elderly about various nontraditional housing types should be provided. Also, an increase in availability of these housing types within a given community would be required.

Rogers (1983) stated that innovativeness was influenced by the individuals' personal characteristics, such as education, income, social status, communication interactions, and contact with change agents. In examining the relationships between elderly respondents' characteristics and their personal innovativeness toward housing, the findings of this study revealed that elderly individuals' personal innovativeness toward housing was affected by respondents' personal characteristics including demographic and housing characteristics. Age, annual income level, and size of previous communities were the most significant characteristics which affected elderly individuals' personal innovativeness toward housing. Therefore, it is concluded that younger individuals (55 to 64 age group), previous residents of larger communities (except the "improvement and utility" and "risk taking" factors), and those with higher incomes (except the "improvement and utility" factor) possess the highest personal

innovativeness toward housing.

Unseld and Crews (1981) noted that acceptance of an innovative idea was attributed to demographic and social characteristics of families or individuals. The relationships between elderly respondents' demographic and housing characteristics and acceptance of nontraditional housing types were examined in this study. The findings indicated that acceptance of nontraditional housing type(s) (mobile homes, apartments or townhouses, solar houses, earth-sheltered houses, and a combination of those four housing types) was affected by the elderly respondents' characteristics. Age, educational level, employment status, annual income level, size of previous communities, current housing types, tenure status, and dwelling expenses were the most significant variables affecting acceptance of nontraditional housing type(s). One conclusion relative to these findings can be made: elderly individuals who were relatively young (55 to 64 age group), more educated, employed, previous residents of larger communities, current mobile home dwellers, homebuyers or renters, and had higher incomes (except for acceptance of mobile homes) and higher monthly house payments or rent are the most accepting of nontraditional housing type(s).

Personal innovativeness toward housing was predicted by selected demographic and housing characteristics of elderly individuals. The R^2 change after adding the age variable to

the set of demographic and housing characteristics chosen for this study was significant for the "new housing types" factor. Therefore, it can be concluded that age is a significant predictor to explain elderly individuals' positive attitudes toward adopting new or unusual housing types and technologies in housing. Acceptance of nontraditional housing type(s) was also predicted by the same characteristics of the elderly. Based on the R^2 changes in the prediction equation, it is concluded that age is a significant predictor of elderly individuals' acceptance of nontraditional housing type(s).

In determining the effect of personal innovativeness toward housing on acceptance of nontraditional housing type(s), the findings of this study indicate that different factors were important in explaining acceptance of different housing types. For acceptance of mobile homes, the "repair and fix things" factor had a significant effect on explaining the acceptance. The "experimentation and new design/ideas" and "new housing types" were significant factors to explain acceptance of apartments or townhouses. Also, the following four factors had significant effects on explaining acceptance of solar houses, earth-sheltered houses, and a combination of the four types: "experimentation and new design/ideas," "new housing types," "repair and fix things," and "improvement and utility." One conclusion relative to these findings can be made: "experimentation and new design/ideas" and "new housing

types" factors have the most significant effects on elderly individuals' acceptance of nontraditional housing type(s).

The R^2 obtained for the effect of personal innovativeness toward housing on acceptance of nontraditional housing type(s) was very small (5% to 10%). Therefore, in general, it can be concluded that elderly individuals' personal innovativeness toward housing is not a good predictor in explaining elderly individuals' acceptance of nontraditional housing type(s), although testing of hypothesis six demonstrated that certain factors in personal innovativeness toward housing had significant effects. With respect to the R^2 obtained from selected demographic and housing characteristics and elderly individuals' personal innovativeness toward housing, selected demographic and housing characteristics were better factors than personal innovativeness toward housing to predict elderly individuals' acceptance of nontraditional housing type(s).

Implications

As the size of the older population increases, the need for appropriate housing at affordable levels becomes increasingly important. Regardless of increasing availability of nontraditional housing types as an alternative in the housing market, the acceptance of these housing types depends upon the consumers themselves, and how they feel and think about certain new ideas in housing. The findings of this

study indicate that the acceptance levels of elderly individuals for nontraditional housing types are in the early stages of the adoption process. It seems that many elderly are less receptive and more skeptical toward a variety of innovative ideas in housing. These findings can be used by researchers, extension agents, and those in the building industry to provide background knowledge about current status of rural elderly persons' acceptance level for nontraditional housing alternatives. In order to increase the elderly consumers' awareness and, ultimately, their acceptance of nontraditional/innovative housing and innovative technologies in housing, extended research and improved educational efforts, specifically aimed at older persons, are essential.

This study only focused on innovative concepts in selected housing types, but the findings from this study may be applied to elderly persons' perceptions or attitudes toward other innovative products at home such as computers, video recorders, or microwave ovens and other types of innovative housing including smart house technology. Especially, smart house technology introduces several innovative concepts in housing, and recently has received increasing attention from the public and the housing industry. On the basis of the findings from this study, however, the acceptance of this housing type by the elderly population would be expected to be very low.

Home builders for retirement housing can also utilize the findings from this study. The investigator observed great differences in personal innovativeness toward housing and acceptance of nontraditional housing types between young-old (55 to 64 age group) and the other two age groups (65 to 74 and 75+ groups). If home builders desire to use some innovative ideas or products for developing retirement housing, they should realize this age difference and then define the specific age target groups.

Recommendations for Further Research

This study provides important background information and insight into the questions of what factors might affect elderly individuals' personal innovativeness toward housing and elderly individuals' acceptance of nontraditional housing type(s). However, since this study only focuses on the rural elderly who resided in 28 non-MSA small towns in seven southern states, generalizations of the findings are limited to the southern rural elderly.

This study should be repeated for a sample of the general population including those less than age 55 in order to determine whether results are consistent with the findings of this study. Especially, comparative research on personal innovativeness toward housing and acceptance of nontraditional housing type(s) between elderly individuals and nonelderly

individuals would be beneficial to clarify the differences between the two age groups.

The sample population for this study was geographically confined to non-MSA small towns. Therefore, further studies are needed to repeat this study with the samples obtained from metropolitan statistical areas or from other rural regions of the U.S.

Only 13 selected demographic and housing characteristics were used to examine the relationships of these characteristics with personal innovativeness toward housing and acceptance of nontraditional housing type(s). Further studies may include some additional characteristics related to housing values, size of dwelling unit, stage in family life cycle, desire for a change in tenure status, housing quality, or housing satisfaction.

Literature noted that perceived attributes of innovations (i.e., relative advantage, compatibility, complexity, trialability, and observability) affect the likelihood of adoption of innovations (Rogers, 1983; Rogers & Shoemaker, 1971) and these perceived attributes of innovations were the better predictors of adoption than personal characteristics of families or individuals (LaBay & Kinnear, 1981). Therefore, in future studies, it would be beneficial to examine those perceived attributes of innovative housing as well as personal characteristics to determine which is better predictor of

acceptance of nontraditional/innovative housing alternatives.

Four nontraditional housing types (mobile homes, apartments or townhouses, solar houses, and earth-sheltered houses) were selected to examine acceptance level of these housing types in elderly individuals. Further studies may examine the acceptance level for other housing types such as retrofitted houses, modular houses, active solar and passive solar houses, or institutional settings for the elderly.

This study found clear evidence that age is an important factor which affects elderly individuals' acceptance of nontraditional housing types, although there has been no conclusive evidence in the literature in the role of age in the adoption of innovations. Therefore, additional studies are needed to confirm whether or not this finding is generalizable.

Factor analysis based on 26 items using a housing innovativeness scale for measuring personal innovativeness toward housing showed that total amount of variance explained was only 49.4%. Therefore, further tests of the effectiveness of this scale are needed and the housing innovativeness scale should be utilized in various housing studies in order to examine and improve the scale.

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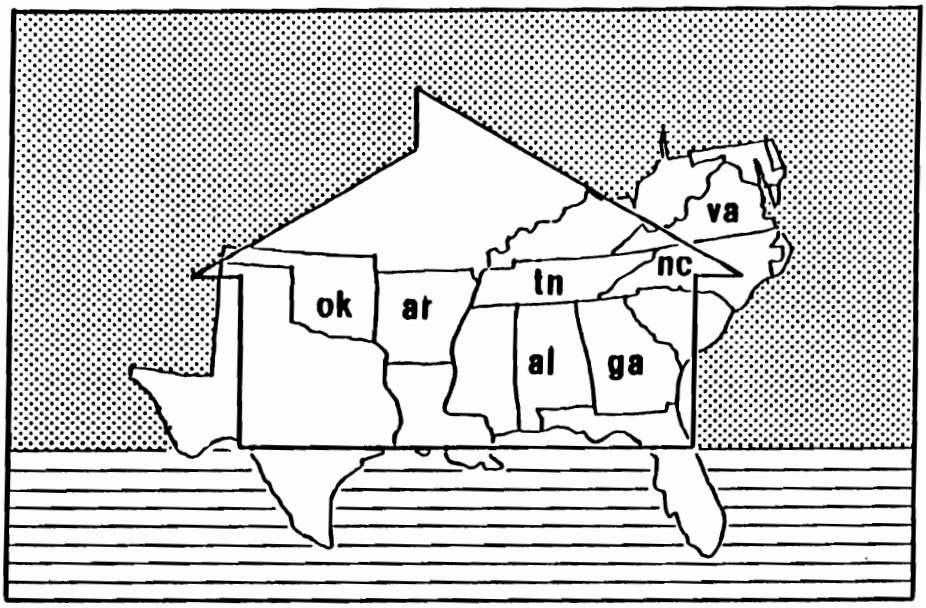
APPENDICES

Appendix A

Household Survey Instrument



APPOMATTOX

Housing Questionnaire

Throughout this questionnaire you are asked questions about various topics including different housing choices. As you answer the questions, try to think about the different types of housing in Appomattox. For example, when you are asked to consider a mobile home, try to base your answer on a typical mobile home, not a fancy double-wide mobile home on a beautifully landscaped lot or a run-down 20 year-old model. If you are not familiar with a particular issue, simply circle the "Don't Know" category.

Your name will never be revealed in any way. Please DO NOT write your name on the questionnaire. Thank you for your help! Please return this questionnaire in the enclosed stamped envelope to:

Dr. Savannah S. Day
Professor
203 Human Resources Annex Building
Virginia Tech
Blacksburg, VA 24061

Respondent Number: _____

** For each of the following statements, indicate the extent to which you agree or disagree with the statement.
(circle only one answer for each question)

	Strongly Disagree				Strongly Agree
1. The unusual house is often a waste of money.	1	2	3	4	5
2. I like to experiment with new ways of doing things.	1	2	3	4	5
3. I like to take a chance.	1	2	3	4	5
4. I enjoy looking at new housing designs in magazines.	1	2	3	4	5
5. Some contemporary housing is stimulating.	1	2	3	4	5
6. I like to fool around with new ideas even if they turn out to be a waste of time.	1	2	3	4	5
7. When it comes to taking chances, I'd rather be safe than sorry.	1	2	3	4	5
8. Changing technology, especially in housing, is a waste of money.	1	2	3	4	5
9. If builders would quit wasting their time trying to create new housing types, they could build more affordable housing.	1	2	3	4	5
10. I would rather not waste my time with some new ideas.	1	2	3	4	5
11. I like to try new and different things.	1	2	3	4	5
12. I like housing that is a little different.	1	2	3	4	5
13. I often try to find out more about new housing types.	1	2	3	4	5
14. Buying a new housing type that is not widely available often costs more than it's worth.	1	2	3	4	5
15. I would like a house that does not require me to learn new ways of doing things.	1	2	3	4	5
16. I am less interested in the appearance of a house than in its comfort.	1	2	3	4	5
17. As long as a heating system works well and meets my needs, I do not really care how it works.	1	2	3	4	5
18. I am very curious about how new things work.	1	2	3	4	5
19. I like to build things for my house.	1	2	3	4	5
20. I never take anything apart because I know I will never be able to put it back together again.	1	2	3	4	5
21. I like to fix things around the house.	1	2	3	4	5
22. I would rather make repairs around the house myself than to have someone else make them.	1	2	3	4	5

Housing Questionnaire

* Question used in study
** Section used in study

	Strongly Disagree				Strongly Agree
23. The outside appearance of a house is not important.	1	2	3	4	5
24. I do not enjoy any product unless I can use it to its fullest capacity.	1	2	3	4	5
25. It is always possible to improve upon a house by adding new features.	1	2	3	4	5
26. I try to keep up with new products and ideas that could improve my house.	1	2	3	4	5

Look at each pair of value questions below and circle the number for the value that is most important in that pair to you. It may be difficult to decide, but you should make a choice for each pair.

27. 1. Social standing and formal social life are important to me.
    2. Personal enjoyment, self expression and beauty are important to me.

28. 1. Physical and mental health and the well-being of my family are important to me.
    2. Durability and economy are important to me.

29. 1. Personal enjoyment, self expression and beauty are important to me.
    2. Physical and mental health and the well-being of my family are important to me.

30. 1. Durability and economy are important to me.
    2. Social standing and formal social life are important to me.

31. 1. Personal enjoyment, self expression and beauty are important to me.
    2. Durability and economy are improtant to me.

32. 1. Physical and mental health and the well-being of my family are important to me.
    2. Social standing and formal social life are important to me.

* Which of the following housing types and arrangements have you heard about, read about, seen, or lived in? (circle only one answer for each question)	Don't know/ Never heard	Seen/ Read/ Heard	Lived In
33. Mobile home	1	2	3
34. Apartment/Townhouse	1	2	3
35. Solar house	1	2	3
36. Earth-sheltered house	1	2	3

Housing Questionnaire

Do any of the following housing types exists in your town ?
(circle one answer for each question)

	Yes	No	Don't Know
37. Mobile home	1	2	9
38. Apartment/Townhouse	1	2	9
39. Solar house	1	2	9
40. Earth-sheltered house	1	2	9

* Have you ever looked for information about any of these housing types?
(circle one answer for each question)

	Yes	No
41. Mobile home	1	2
42. Apartment/Townhouse	1	2
43. Solar house	1	2
44. Earth-sheltered house	1	2

* Based on the information you now have, would you consider living in any of these housing types?
(circle one answer for each question below)

	Yes	Maybe	No	Don't Know
45. Mobile home	1	2	3	9
46. Apartment/Townhouse	1	2	3	9
47. Solar house	1	2	3	9
48. Earth-sheltered house	1	2	3	9

Of the following housing types, which do you think will be in the greatest demand in your community in the next five years? Please place a "1" by the housing type you think will be in the greatest demand and a "2" by the housing type in the second greatest demand.

49. _____ Houses

50. _____ Mobile homes

51. _____ Apartments/Townhouses

Please circle the number of your answer to indicate the extent to which you "agree" or "disagree" with the following statements.
(circle only one answer for each question)

	Strongly Disagree				Strongly Agree
52. People are open to new and different housing ideas in my town.	1	2	3	4	5
53. I think housing lenders are easy to deal with in my town.	1	2	3	4	5
54. People can get just about any type of housing they can afford in my town.	1	2	3	4	5
55. Leaders are concerned about the quality of housing in my town.	1	2	3	4	5
56. Leaders have used state and federal programs to improve housing in my town.	1	2	3	4	5

For each of the following questions, please circle the number of your answer or write in the blank provided.

* 57. What is the size of the largest community in which you have lived?
(circle the number of your answer)

1. Fewer than 10,000 population
2 10,000 to 24,999 population
3 25,000 to 49,999 population
4 50,000 to 99,999 population
5 100,000 to 499,999 population
6 Greater than 500,000 in population

* 58. When was your current housing built? _____ (estimate the year)

* 59. When did you first move into this unit? _____ (estimate the year)

* 60. Which of the following best describes this housing unit?

1 House
2 Mobile home
3 Apartment/Townhouse

4 Other, describe _____

61. How many major rooms are there in your housing unit? Do not count bathrooms, utility rooms, unfinished basements, etc.? _____

62. Does this housing unit have complete plumbing, that is hot and cold piped water, a flush toilet, and a bathtub or shower?

1 No [If NO, go to question 065]
2 Yes [If YES, continue]

If yes, how many bathrooms does the housing unit have? (Please complete by writing in the number in the space provided.)

63. _____ Complete baths (flush toilet, basin and tub or shower)

64. _____ Half-baths (flush toilet and basin)

*65. Do you own or rent this housing unit?

1 Own (paid for) [Go to question 869]
2 Own (buying)
3 Rent
4 Other, specify: _____

*66. Approximately how much is your monthly house payment or rent? $_____

	Not Affordable				Very Affordable
67. To what extent do you feel your housing unit is affordable for your household's income and size ?	1	2	3	4	5

68. If you own or are buying this housing unit, how much do you think this housing unit would sell for "if" it was for sale? $_____

69. Do you have plans to look for new or different housing within the next twelve months?
(circle the number of your answer)

1 No [If NO, go to question 873]
2 Yes [If YES, continue]

70. If yes, where do you plan to move?
(circle the number of your answer)

1 Within the town
2 Outside the town limits

71. Which of the following are you likely to do?
(circle the number of your answer)

1 Rent
2 Buy

72. Which of the following housing types are you likely to look for? (circle one)

1 Ordinary house
2 Mobile home
3 Apartment/Townhouse
4 Other, specify: _____

73. Do people of different racial or ethnic background live in your neighborhood? (circle the number of your answer)

1 No
2 Yes

If a family moved in the housing unit next to yours, would you mind if the family was: (Circle one answer for each question.)

	Strongly Disagree				Strongly Agree
74. Of another race	1	2	3	4	5
75. Of another religion	1	2	3	4	5
76. Of another nationality	1	2	3	4	5
77. Physically disabled	1	2	3	4	5
78. Mentally disabled	1	2	3	4	5
79. A female head with children	1	2	3	4	5
80. Elderly	1	2	3	4	5
81. Of lower economic status	1	2	3	4	5

Please rate the adequacy of the following services that are in your community. (Circle one answer for each question.)

	Not Adequate				Superior
82. Schools	1	2	3	4	5
83. Police protection	1	2	3	4	5
84. Fire protection	1	2	3	4	5
85. Public water service	1	2	3	4	5
86. Public sewer service	1	2	3	4	5
87. Paved roads and streets	1	2	3	4	5
88. Hospitals	1	2	3	4	5
89. Libraries	1	2	3	4	5
90. Recreation facilities	1	2	3	4	5
91. Shopping areas	1	2	3	4	5

We want you to think about the incentives and barriers facing households in your town in obtaining adequate and affordable housing. For each statement please indicate (by circling one number) the degree to which the situation described "restricts" or "promotes" individuals and families in obtaining adequate and affordable housing in your town. Also, please give reasons for your responses.

	Barrier (Restricts)			Incentive (Promotes)		Don't Know	Reason(s)
92. Availability of a wide range of building products for home construction in my community.	1	2	3	4	5	9	

	Barrier (Restricts)	Incentive (Promotes)	Don't Know	Reason(s)
93. Availability of quality home builders and developers in my community.	1 2 3 4 5		9	
94. Supply of affordable housing	1 2 3 4 5		9	
95. Availability of water and sewer	1 2 3 4 5		9	
96. Availability of housing for people of different racial minorities and and ethnic backgrounds	1 2 3 4 5		9	
97. Attitude of local finance institutions toward financing newer types of housing	1 2 3 4 5		9	
98. Attitude of local finance institutions toward financing multi-family housing	1 2 3 4 5		9	
99. Attitude of local finance institutions toward financing mobile homes	1 2 3 4 5		9	
100. Availability of government assisted housing programs in my community	1 2 3 4 5		9	
101. Building codes which affect the construction of certain types of housing	1 2 3 4 5		9	
102. Local enforcement of zoning regulations	1 2 3 4 5		9	
103. Consumer acceptance of new types of housing such as solar or earth-sheltered housing	1 2 3 4 5		9	
104. Builders' acceptance of newer types of housing in my community	1 2 3 4 5		9	
105. Approval process for acquiring a building permit	1 2 3 4 5		9	
106. Local enforcement of building codes	1 2 3 4 5		9	
107. Residents' concern for the improvement of housing quality in my community	1 2 3 4 5		9	
108. Availability of a wide range of skilled labor for home construction	1 2 3 4 5		9	
109. Availability of rental housing for large families or for families with small children or infants	1 2 3 4 5		9	
110. Consumer knowledge about new types of housing	1 2 3 4 5		9	
111. Supply of vacant housing units in my community	1 2 3 4 5		9	

	Barrier (Restricts)			Incentive (Promotes)		Don't Know	Reason(s)
112. Presence of natural features (e.g., high water table, mountainous terrain) which affect the construction of of certain types of housing	1	2	3	4	5	9	
113. Attitude of community officials in my community toward newer types of housing	1	2	3	4	5	9	
114. Attitude of community officials in my community toward multi-family housing	1	2	3	4	5	9	
115. Attitude of community officials in my community toward mobile homes	1	2	3	4	5	9	
116. Supply of available land for housing in my community	1	2	3	4	5	9	
117. Zoning regulations which control multi-family or zero lot line housing	1	2	3	4	5	9	
118. Approval process for rezoning land for multi-family housing	1	2	3	4	5	9	
119. Availability of housing for people with low or limited incomes	1	2	3	4	5	9	
120. Availability of market information on the housing needs of the residents in my community	1	2	3	4	5	9	
121. Availability of financing for housing in my community	1	2	3	4	5	9	
122. Zoning regulations which affect the placement of certain types of housing	1	2	3	4	5	9	
123. Community officials' concern for the improvement of housing quality in my community	1	2	3	4	5	9	

The next set of questions pertain to personal data. Because we have asked your attitudes on certain issues, we how want to ask you a few questions about yourself. Again, we would like to remind you of the confidential nature of this questionnaire and that neither your name nor any other identifying information will <u>not</u> be revealed in reporting the findings.

* 124. Your marital status: (circle one)

1 Never married
2 Married
3 Separated
4 Divorced
5 Widowed

125. Please list all members of your household living at home. List yourself first. (Do NOT list persons who are away at college or in the armed forces; do NOT list persons at home only on vacation.) Print each person's first name, indicate the month and year born, their sex, and their relationship to you.

	first name	Month and Day of Birth: mth	year *	Sex: M *	F	Relationship To You: Child	Parent	Other
Yourself:	_____	___	___	___	___			
Spouse:	_____	___	___	___	___			
Other Household Members:	_____	___	___	___	___	___	___	___
	_____	___	___	___	___	___	___	___
	_____	___	___	___	___	___	___	___
	_____	___	___	___	___	___	___	___
	_____	___	___	___	___	___	___	___
	_____	___	___	___	___	___	___	___

* 126. Your race: (circle one)

1 Black
2 White
3 Hispanic
4 American Indian
5 Other: _____

* 127. Highest education level you achieved: (circle one)

1 Never went to school
2 Some grade school (grades 1 through 8)
3 Some high school (grades 9 through 12)
4 High school graduate or equivalent
5 Some college or vocational school beyond high school
6 Completed a vocational training program beyond high school
7 Completed a 2-year college degree
8 Completed a 4-year college degree
9 Completed a graduate or professional degree

* 128. Your employment status: (circle one)

1 Full-time
2 Part-time
3 Retired
4 Homemaker
5 Unemployed
6 Other: _____

129. Do you have a second or part-time occupation?

1 No
2 Yes (Specify: _____)

* 130. Which of the following ranges of income represents your household's total annual income? (please consider all sources of income from all contributing adults, such as wages, salaries, tips, social security, retirement income, investment income, child support, alimony, welfare, etc. (circle one)

1 Less than $ 5,000
2 $ 5,000 to $ 9,999
3 $ 10,000 to $ 14,999
4 $ 15,000 to $ 19,999
5 $ 20,000 to $ 24,999
6 $ 25,000 to $ 29,999
7 $ 30,000 to $ 39,999
8 $ 40,000 to $ 49,999
9 $ 50,000 or greater

131. If you were asked "What town do you live in?", would it be Appomattox ? (circle the number of your answer)

1 No
2 Yes

132. Is your personal residence located within the city/town limits of Appomattox ? (circle the number of your answer)

1 No
2 Yes

133. Please write any additional comments you might have regarding community acceptance of housing programs and building techniques in your community. Feel free to use the back of the questionnaire for additional space.

_____

_____

_____

_____

_____

_____

Thank you for your help!

Housing Questionnaire

Appendix B
Number of Cases Per Variable Included in the Factor Analyses of the Elderly Respondents

Number of Cases	Variable No.	Variable
1843	4	The Unusual House Is Not a Waste of Money
1853	5	Experiment with New Ways of Doing Things
1844	6	Take Chances
1853	7	Enjoy Looking at New Housing Design in Magazine
1832	8	Some Contemporary Housing Is Stimulating
1848	9	Fool around with New Ideas Even if a Waste of Tome
1869	10	Like to Take a Risk
1850	11	Changing Technology, Especially in Housing, Is Not Waste of Money
1848	12	Builders Do Not Waste Time Building New Housing Types
1858	13	New Ideas Are Not a Waste of Time
1843	14	Try New and Different Things
1831	15	Like Housing that Is a Little Different
1835	16	Find Out about Ne Housing Types
1842	17	Buying a Housing Type Not Widely Available Is Not a Mistake
1853	18	Do Not Mind a House that Requires Learning New Ways of Doing Things
1872	19	More Interested in the Comfort of a House than in Its Appearance
1872	20	Interested in How the Heating System in the Home Works
1864	21	Curious about How Things Work
1827	22	Like to Build Things for Home
1863	23	Like to Take Things Apart
1870	24	Fix Things around the House
1870	25	Make Own Repairs
1874	26	Outside Appearance of a House Is Important
1862	27	Only Enjoy a Product When Can Use It to Its Fullest Capacity
1866	28	Always Possible to Improve a House by Adding New Features
1860	29	Keep Up with New Products and Ideas that Could Improve the Home

Appendix C

Regression Coeficients in Prediction Model

Table 43. Regression Coefficients in the Entire Sample (55+) for the "Experimentation and New Design/Ideas" Factor

Parameter	Estimated Coefficient	p-value
Intercept	0.3754	0.3066
Marital Status	-0.1085	0.1664
Sex	-0.0070	0.9236
Race	-0.2092	0.0311
Educational Level	0.0610	0.2581
Employment Status	-0.0379	0.5892
Income Level	0.0128	0.4049
Size of Previous Community	0.0457	0.0026
Age of Dwelling	-0.0031	0.0326
Length of Residence	0.0002	0.9245
Current Housing Types	0.0397	0.7066
Tenure Status	0.0553	0.6344
Dwelling Expenses	0.0002	0.2400
Age	-0.0057	0.1718

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 44. Regression Coefficients in the Entire Sample (55+) for the "New Housing Types" Factor

Parameter	Estimated Coefficient	p-value
Intercept	0.5716	0.1112
Marital Status	-0.0265	0.7295
Sex	0.0369	0.6020
Race	-0.1947	0.0398
Educational Level	0.0591	0.0001
Employment Status	-0.1163	0.0901
Income Level	0.0501	0.0009
Size of Previous Community	0.0088	0.5502
Age of Dwelling	0.0008	0.5505
Length of Residence	-0.0035	0.1236
Current Housing Types	0.0931	0.3665
Tenure Status	-0.0148	0.8967
Dwelling Expenses	-0.0002	0.0832
Age	-0.0137	0.0008

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 45. Regression Coefficients in the Entire Sample (55+) for the "Repair and Fix Things" Factor

Parameter	Estimated Coefficient	p-value
Intercept	0.3698	0.3055
Marital Status	0.2464	0.0014
Sex	-0.4349	0.0001
Race	0.0900	0.3445
Educational Level	-0.0161	0.2491
Employment Status	0.0957	0.1654
Income Level	-0.0495	0.0011
Size of Previous Community	0.0478	0.0013
Age of Dwelling	0.0006	0.6987
Length of Residence	-0.0009	0.6939
Current Housing Types	0.1089	0.2936
Tenure Status	0.0359	0.0019
Dwelling Expenses	-0.0001	0.6824
Age	-0.0041	0.3158

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 46. Regression Coefficients in the Entire Sample (55+) for the "Improvement and Utility" Factor

Parameter	Estimated Coefficient	p-value
Intercept	0.0413	0.9089
Marital Status	0.1212	0.1154
Sex	0.1275	0.0732
Race	0.0370	0.6971
Educational Level	-0.0654	0.0001
Employment Status	0.2250	0.0011
Income Level	-0.0649	0.0001
Size of Previous Community	0.0040	0.7887
Age of Dwelling	-0.0025	0.0787
Length of Residence	0.0019	0.4086
Current Housing Types	0.0811	0.4337
Tenure Status	-0.0028	0.9804
Dwelling Expenses	-0.0000	0.7914
Age	0.0022	0.5898

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 47. Regression Coefficients in the Entire Sample (55+) for the "Appearance vs Comfort" Factor

Parameter	Estimated Coefficient	p-value
Intercept	0.6175	0.0919
Marital Status	0.2202	0.0049
Sex	0.0837	0.2465
Race	-0.4507	0.0001
Educational Level	-0.0002	0.9892
Employment Status	0.0359	0.6082
Income Level	0.0352	0.0223
Size of Previous Community	-0.0046	0.7678
Age of Dwelling	-0.0014	0.3238
Length of Residence	0.0009	0.6917
Current Housing Types	-0.0387	0.7129
Tenure Status	-0.1392	0.2299
Dwelling Expenses	0.0003	0.0286
Age	-0.0074	0.0744

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 48. Regression Coefficients in the Entire Sample (55+) for the "Risk Taking" Factor

Parameter	Estimated Coefficient	p-value
Intercept	-0.4116	0.2751
Marital Status	0.0660	0.4124
Sex	0.2215	0.0030
Race	0.0855	0.3900
Educational Level	0.0038	0.7941
Employment Status	-0.0292	0.6856
Income Level	-0.0293	0.0643
Size of Previous Community	-0.0129	0.4087
Age of Dwelling	-0.0013	0.3685
Length of Residence	0.0036	0.1335
Current Housing Types	0.1684	0.1204
Tenure Status	0.2193	0.0665
Dwelling Expenses	-0.0001	0.5284
Age	-0.0034	0.4226

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 49. Regression Coefficients in the Entire Sample (55+) for the Acceptance of Mobile Home

Parameter	Estimated Coefficient	p-value
Intercept	3.8346	0.0001
Marital Status	0.0610	0.4957
Sex	-0.0853	0.3043
Race	-0.0857	0.4670
Educational Level	-0.0113	0.4967
Employment Status	0.0226	0.7869
Income Level	-0.0944	0.0001
Size of Previous Community	0.0972	0.0001
Age of Dwelling	0.0004	0.8247
Length of Residence	-0.0078	0.0039
Current Housing Types	-0.9641	0.0001
Tenure Status	0.5935	0.0001
Dwelling Expenses	0.0003	0.0562
Age	-0.0172	0.0004

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 50. Regression Coefficients in the Entire Sample (55+) for the Acceptance of Apartment/Townhouse

Parameter	Estimated Coefficient	p-value
Intercept	3.1641	0.0001
Marital Status	-0.2330	0.0162
Sex	0.0566	0.5285
Race	-0.0567	0.6349
Educational Level	0.0782	0.0001
Employment Status	-0.1400	0.1212
Income Level	0.0309	0.1097
Size of Previous Community	0.1982	0.0001
Age of Dwelling	-0.0021	0.2564
Length of Residence	-0.0009	0.7592
Current Housing Types	-0.4312	0.0011
Tenure Status	-0.5745	0.0001
Dwelling Expenses	0.0005	0.0137
Age	-0.0120	0.0210

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 51. Regression Coefficients in the Entire Sample (55+) for the Acceptance of Solar House

Parameter	Estimated Coefficient	p-value
Intercept	1.5979	0.0001
Marital Status	0.0907	0.2716
Sex	0.0326	0.6700
Race	0.1213	0.2344
Educational Level	0.0540	0.0004
Employment Status	-0.0157	0.8381
Income Level	0.0330	0.0451
Size of Previous Community	0.0893	0.0001
Age of Dwelling	0.0013	0.4026
Length of Residence	-0.0013	0.6027
Current Housing Types	0.1064	0.3428
Tenure Status	0.0148	0.9023
Dwelling Expenses	0.0002	0.2823
Age	-0.0150	0.0007

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 52. Regression Coefficients in the Entire Sample (55+) for the Acceptance of Earth-Sheltered House

Parameter	Estimated Coefficient	p-value
Intercept	1.1302	0.0041
Marital Status	0.1425	0.0845
Sex	-0.0621	0.4175
Race	0.1658	0.1047
Educational Level	0.0211	0.1691
Employment Status	0.0105	0.8918
Income Level	0.0167	0.3123
Size of Previous Community	0.0759	0.0001
Age of Dwelling	0.0020	0.2123
Length of Residence	-0.0014	0.5619
Current Housing Types	0.1059	0.3454
Tenure Status	0.1401	0.2463
Dwelling Expenses	0.0001	0.4315
Age	-0.0096	0.0312

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

Table 53. Regression Coefficients in the Entire Sample (55+) for the Acceptance of Nontraditional Housing Types in General

Parameter	Estimated Coefficient	p-value
Intercept	9.7268	0.0001
Marital Status	0.0611	0.7906
Sex	-0.0582	0.7852
Race	0.1497	0.5992
Educational Level	0.1429	0.0009
Employment Status	-0.1227	0.5676
Income Level	-0.0138	0.7635
Size of Previous Community	0.4606	0.0001
Age of Dwelling	0.0016	0.7219
Length of Residence	-0.0114	0.0999
Current Housing Types	-1.1830	0.0002
Tenure Status	0.1728	0.6078
Dwelling Expenses	0.0011	0.0144
Age	-0.0538	0.0001

NOTE: Probability given is for the null hypothesis that the coefficient does not differ from zero.

VITA

Oh-Jung Kwon

Personal Data

Born in Seoul, South Korea, September 19, 1963; daughter of Young-Gil Kwon and Soon-Oak Kim; Married to Sigon Kim in 1988.

Education

Graduated Sacred Heart High School in Seoul, Korea, 1982; Bachelor of Science degree in Housing and Interior Design, Yonsei University, Seoul, Korea, 1986; Master of Science degree in Housing, Oregon State University, Corvallis, Oregon, 1988; Ph.D. in Housing, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, December, 1991.

Professional Experience

Research assistant, Oregon State University, 1987; Graduate assistant, Oregon State University, 1987 - 1988; Graduate assistant, Virginia Polytechnic Institute and State University, 1988 - 1991; Research assistant, Housing Research Center, Virginia Polytechnic Institute and State University, 1990.

Honors and Awards

Tessie Agan Scholarship, American Association of Housing Educators.

Professional Organizations

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