

INNOVATIVENESS AND ACCEPTANCE OF RETIREMENT HOUSING IN THAILAND

Virajada Buasri, Carmen D. Steggell, and Leslie Davis Burns

Abstract

Changing demographics and lifestyles in Thailand are eroding traditional patterns of family support for the elderly. Caring for the elderly within the family structure is no longer assured. However, the concept of living in retirement housing is unfamiliar to most senior Thai citizens. The purpose of this study was to examine the acceptance of nontraditional retirement housing by pre-retirees in Thailand. The study was based on Rogers' theory on diffusion of innovations. Personal innovativeness toward housing and acceptance of four types of nontraditional retirement housing were examined. Faculty (423) from an age-stratified sample at selected Thai universities completed a self-administered questionnaire. A positive correlation was found between personal innovativeness toward housing and acceptance of nontraditional housing types. Personal innovativeness also mediated the effect of demographic and housing characteristics on acceptance of all nontraditional retirement housing types. Of the four housing types, the universal designed single-family detached house was the most acceptable, followed by continuing care retirement housing. Acceptance was highest among males, those with higher incomes, and those with higher innovativeness scores.

Introduction

Thailand, like other developing Asian countries, is experiencing a major demographic change that is having a profound impact on its society. The extended family structure is decreasing in importance while the nuclear household is becoming more important. The age distribution of the Thai population is also in transition, shifting from a predominantly young population to one that is older (Campbell, Mason, & Pernia, 1993; National Statistical Office, Thailand, 2005).

Virajada Buasri is Deputy Dean for Academic Affairs, Faculty of Architecture, King Mongkut's Institute of Technology, Bangkok, Thailand; Carmen D. Steggell is Associate Professor and Leslie Davis Burns is Professor and Chair, Department of Design and Human Environment, Oregon State University, Corvallis, OR. This article is based on a doctoral dissertation completed by Virajada Buasri at Oregon State University.

In Thailand, public policy encourages children and family members to accommodate their elderly parents and other relatives at home. The elderly with inherited wealth or other sources of income and savings are usually well cared for. However, those with fewer resources have difficulty. Except for retired government officials and the military, there is no Social Security or other government pension and there is virtually no retirement housing.

Changing lifestyles in Thailand strongly affect traditional patterns of family support for the elderly. The purpose of this study was to examine personal innovativeness toward housing and acceptance of nontraditional retirement housing in Thailand. Four types of housing for the elderly in the U.S., perceived as new options for Thai people, were presented to faculty pre-retirees at selected Thai universities and their acceptance of these nontraditional housing types was examined.

Review of Literature

Culture and Housing Norms in Thailand

Thailand is a collective society, characterized by a traditionally structured social framework. Thai individuals place a high value on self-discipline, accepting one's position in life, honoring parents and elders, and preserving one's public image (Holmes, Tangtongtravy, & Tomizawa, 1996). The concept of gratitude is important; individuals must demonstrate appreciation for those who have done favors for them. Children are expected to show gratitude by caring for their parents as they age and become frail. In the past, with a network of strong family support, the elderly have usually lived with one of their children or in the home of another relative (Campbell et al., 1993; Holmes et al., 1996). However, during the last two decades (1980-2000) changing socio-economic conditions, the shift toward modernization and urbanization, and changes in the age distribution of the Thai population have drastically affected traditional lifestyles. In addition, certain social and cultural values and behaviors have undergone changes. Increasing contact with western countries has brought far-reaching changes in lifestyles, attitudes, and values of the Thai people (Limmanonda, 1995).

Young couples, adopting the western concepts of privacy and autonomy, are tending to leave their parents and the original family household to establish homes of their own. As a result, the traditional practice of caring for the elderly within the family structure has been affected. To survive over the next decades, the new generation of seniors, particularly those who are unmarried, widowed, or divorced, will have to adapt to these social changes and prepare to live independently. Housing units specifically designed to meet their needs may enhance their quality of life.

Most Thai citizens prefer to live in single-family detached houses (National Statistical Office, Thailand, 1998). In the past, most Thai elderly have aged in place in their own homes. Assistance was provided by the extended family living

in the home. The predominant household type today is the nuclear family (Limmanonda, 1995) and the typical housing type is a single-family detached house surrounded by fences or walls (National Statistical Office, Thailand, 1998).

The Aging in Thailand

The age distribution of the Thai population is in transition, shifting from a predominantly young population to one that is older. In 2000, 7.5% of Thailand's population was aged 60 years or older, but by 2010 nearly 10% will be elderly (Campbell et al., 1993; National Statistical Office, Thailand, 2004). This increase along with changing cultural norms will pressure the elderly into locating new housing options. However, the concept of living in retirement housing is unfamiliar to most senior Thai citizens. While there are government supported facilities for destitute elderly and some privately owned nursing homes, both with very negative associations, there are virtually no retirement housing options.

In Thailand, neither the government nor the private sector has shown much interest in building houses specifically for the elderly. Current housing policy emphasizes the need to provide affordable housing for the low-income population whereas the private sector focuses on housing projects for high-income and middle-income people (Campbell et al., 1993). As new housing options become available, it is important to understand how Thai pre-retirees evaluate innovative retirement housing to determine if these options will be acceptable to elderly Thai consumers.

Retirement Housing Options

In the U.S., there are many housing options available to meet the needs of the senior population. If seniors are in good health, they can live independently in their own homes or move to a community specifically designed with amenities and services for the elderly. Those needing assistance have options as well, including a universal designed home, in-home care, foster care, congregate housing, assisted living, elder cottage housing opportunity or "granny flats," skilled nursing homes, and continuing care retirement communities. Four of these options were determined to be in alignment with Thai culture and were selected for this study.

Universal designed single-family detached house. The universal designed single-family detached house (UDSD) was selected for this study because the traditional housing norm of the Thai people is the single-family detached house (Limmanonda, 1995; National Statistical Office, Thailand, 1996). This design was developed to meet needs of all people throughout the life span, regardless of abilities and disabilities. Featuring a single level plan, wide doors, and accessible facilities, the UDSD allows the occupants to move around the house safely and with ease. Universal design is an innovative concept to aging Thai residents. Thai elderly usually age in place where they have been living with other family members. To modify existing single-family detached houses with universal design features may be appropriate in providing Thai elderly with more conveniences

and safety. The concept of universal design is to simplify life for all family members by making housing accessible, adaptable, safe, and usable throughout the life span (U.S. Department of Housing and Urban Development, 1996).

Elder cottage housing opportunity. Elder cottage housing opportunity (ECHO) is another type of housing that could be useful in Thailand. The dwelling is a self-contained unit that can be attached or located close to the main house. Although installation costs may be high (Golant, 1992), ECHO homes can be easily removed when not in use. It also provides independent living for seniors who desire or need to be near their children or other relatives. Thai pre-retirees may prefer ECHO housing because it enables older people to live near children or other relatives and receive family support while maintaining their independence.

Congregate housing. Congregate housing (CH) is usually a residence that allows independent living while offering specialized services such as meals, laundry, housekeeping, and personal assistance. Unlike assisted living and skilled nursing facilities, CH does not provide medical care. CH typically consists of a mid-to-high rise building with 70 to 250 apartments, but may also take the form of clusters of detached houses, town houses, or cottages surrounding a community center. A central kitchen, dining room, social rooms, hobby rooms, exercise facilities, a beauty shop, and other services are provided. Each individual unit is furnished and personalized by the resident. CH is suitable for seniors whose physical health is declining and need personal assistance, social interaction, and social support (Golant, 1992). In many aspects, CH is an updated version of traditional residential hotels and rooming houses and may be suitable for Thai elderly who desire private living units, mutually supportive neighbors, and assistance with daily tasks.

Continuing care retirement community. The continuing care retirement community (CCRC) provides a continuum of housing options to accommodate changing needs as people age. Most CCRCs incorporate independent living, congregate housing, assisted living, and skilled nursing within the same complex. Typically, residents pay an entrance fee plus monthly charges. CCRCs are generally targeted to affluent individuals; however, many CCRCs are operated by religious or other nonprofit organizations for lower-income persons (Golant, 1992). The concept of the CCRC is to provide residents with the psychological and financial security of knowing that they can obtain increased levels of care as they need it without moving outside the complex.

Theoretical Framework

This study was based on the theory on diffusion of innovations (Rogers, 1995; Rogers & Shoemaker, 1971) and on a model of acceptance of housing alternatives for the elderly developed by Beamish and Johnson (1994). Rogers and Shoemaker (1971) first developed a model of the innovation decision-making process and the work was later expanded by Rogers (1995). Five stages in the decision-

making process were identified: (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—making use of the innovation (Kwon, 1991). Since housing cannot be expeditiously tried, the trial stage was not included in this study, following previous studies by Beamish and Johnson (1994) and Kwon (1991).

Diffusion of innovations theory has been studied extensively in such diverse disciplines as psychology, sociology, anthropology, marketing, geography, economics, business, education, apparel, and housing. Applied to housing, Rogers' theory on diffusion of innovations provides important insights to the consumer decision-making process, shelter selection, and acceptance of innovative housing (Beamish & Johnson, 1994; Beamish, Sweaney, Tremblay, & Bugg, 1987; McCray, Weber, & Claypool, 1987).

Beamish and Johnson (1994) used Rogers' theory on diffusion of innovations to study the acceptance of housing options by members of the Virginia Extension Homemaker's Council. An instrument to determine the housing innovativeness of individuals was developed. Independent variables included demographic characteristics and innovativeness measures. Dependent variables were the adoption of four housing options: an elderly cottage housing opportunity house, an accessory apartment, a shared house, and a board and care home. The adoption variables for each housing type were categorized into four stages in the adoption process: awareness, interest, evaluation, and adoption. The model for this study was based on Rogers' (1983, 1995) innovation-decision process and the findings of Beamish and Johnson (1994) (see Figure 1).

Method

The purpose of this study was to examine personal innovativeness toward housing and the acceptance of nontraditional retirement housing of faculty pre-retirees in selected Thai universities. Relationships between demographic characteristics and personal innovativeness toward housing and acceptance of nontraditional housing types were examined. In addition, the relationships between housing characteristics and personal innovativeness toward housing and acceptance of nontraditional housing types were investigated. Specifically, the research questions were as follows.

1. Is there a relationship between personal innovativeness and demographic characteristics?
2. Is there a relationship between acceptance scores of nontraditional housing types and demographic characteristics?
3. Is there a relationship between acceptance of nontraditional housing types and current housing characteristics?

4. Is there a relationship between personal innovativeness toward housing and acceptance of nontraditional housing types?
5. Does personal innovativeness toward housing mediate the effect of demographic characteristics on acceptance of nontraditional housing types?
6. Does personal innovativeness toward housing mediate the effect of nontraditional housing types?

Sample

The respondents of this study were faculty pre-retirees from two Thai universities: one located in a metropolitan area (Srinakarinwirot University [SWU], Bangkok) and the other in a non-metropolitan area (Burapha University [BU], Chonburi). The faculty pre-retirees were selected because they may serve as

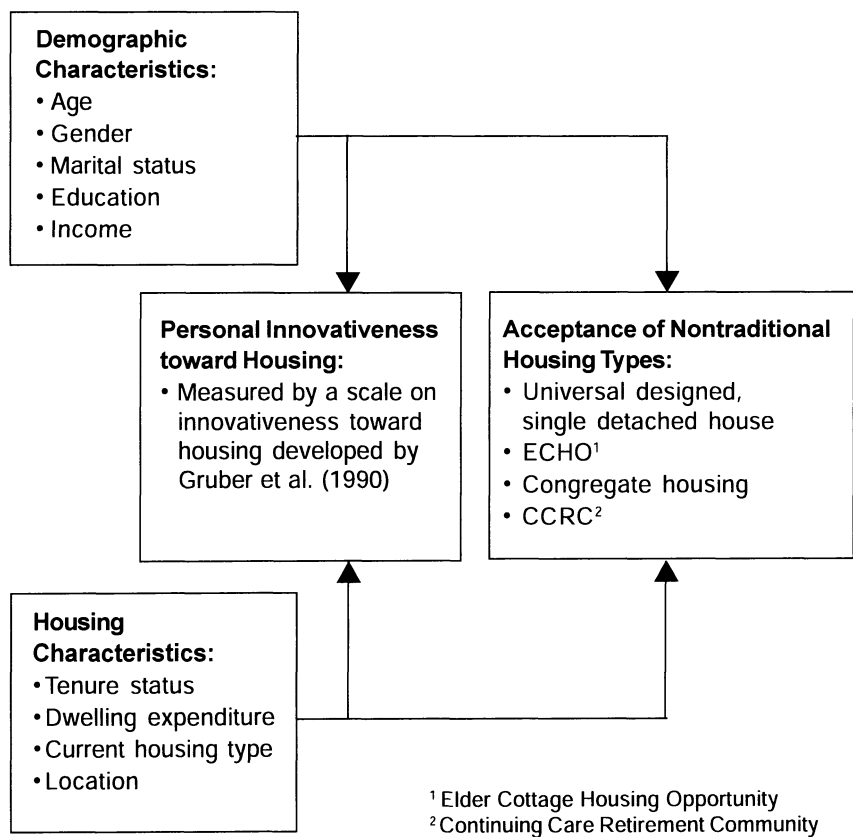


Figure 1. Theoretical Model of the Diffusion of Housing Innovations

“opinion leaders” in the adoption of nontraditional retirement housing in Thailand. Rogers (1995) suggested that in trying to promote the adoption of an innovation, opinion leaders must be identified. If opinion leaders adopt the innovation, they will influence others in the social system to adopt. He described opinion leaders as people who are respected in their social system and have strong interpersonal networks. In Thailand, university faculty are respected—they are well educated, affluent, and have strong interpersonal communication networks. Thus, they have the characteristics of opinion leaders. If they decide to adopt nontraditional housing, they may influence other members in Thai society.

The sample was randomly selected from a list of male and female faculty members who were between 40 and 59 years of age. The targeted age range was based on previous research and the fact that the Thai retirement age is 60 years. The sample was rather homogeneous in educational level and socioeconomic background. Of the 1,137 faculty members of SWU, 676 were in the targeted age range. Of the 517 faculty members of BU, 255 were in the targeted age range. Using Yamene’s (1967) sample size calculation with a 95% confidence level, the sample consisted of 465 faculty pre-retirees, with 280 from SWU and 185 from BU.

Instrument

A self-administered questionnaire was used to measure personal innovativeness toward housing and the acceptance of nontraditional retirement housing. Personal innovativeness toward nontraditional retirement housing was measured using a scale adapted from a measurement of housing innovativeness developed by the S-194 Regional Research Technical Committee (Gruber, Beamish, Carter, Shelton, & Weber, 1990). The measure of acceptance of nontraditional housing was modified from Kwon’s (1991) and Beamish and Johnson’s (1994) research.

The questionnaire consisted of four sections: (a) personal innovativeness toward housing scale, (b) acceptance of nontraditional retirement housing measures, (c) questions asking respondents’ demographic characteristics, and (d) housing characteristics. Because the study was supervised in the U.S., the questionnaire was first developed in English, translated into the Thai language, and then back translated from Thai into English by three experts in English-Thai translation to ensure the equivalency of English and Thai versions. The Thai version of the questionnaire was pre-tested with 20 faculty pre-retirees to ensure the clarity of the language used.

Innovativeness toward housing. In this study, *innovativeness toward housing* refers to a psychological construct that underlies an individual’s propensity to adopt a new housing type before others in the social system. A scale of personal innovativeness toward housing was used to measure innovativeness toward housing of the faculty pre-retirees and was utilized to determine personal innovativeness toward housing which may influence the acceptance of nontraditional housing by

the respondents. Respondents rated their responses on a five point Likert-type scale ranging from strongly disagree (1) to strongly agree (5).

Acceptance of nontraditional retirement housing. Measures of *acceptance of nontraditional retirement housing* were based on the adoption process of diffusion theory (Rogers & Shoemaker, 1971; Rogers, 1983) and on Kwon's (1991) scale on acceptance of nontraditional housing types. The nontraditional retirement housing types were (a) universal designed single-family detached house (UDSD), (b) elder cottage housing opportunity (ECHO), (c) congregate housing (CH), and (d) continuing care retirement community (CCRC).

Acceptance scores for each of the four nontraditional housing types and a combination of scores for all four housing types were dependent variables for this study. For each housing type, participants responded to a set of questions measuring the four stages of the adoption process: awareness of the retirement housing type, interest in the retirement housing type, evaluation/desire to know more, and adoption/willingness to live in the retirement housing type. Each stage was scored 0 (no) or 1 (yes). A sum (0-4) of the acceptance scores for each stage in the adoption process was calculated for each housing type. These scores were used to measure the respondents' propensity to accept a specific housing type. In addition, a total acceptance score for all of the four nontraditional housing types was calculated (range 0-16). The mean score represented overall acceptance.

Demographic characteristics. Five demographic characteristics were selected for the study: age, gender, marital status, education level, and income. Demographic characteristics of the respondents were analyzed by descriptive statistics.

Housing characteristics. Information concerning tenure status, dwelling expenditure, current housing type, and current housing location was collected. Housing characteristics were analyzed by descriptive statistics.

Data Collection and Analysis

All data for the study were collected by mail survey between February 1, 2002 and March 15, 2002. The survey instrument was mailed to each member of the sample of both universities along with a return envelope. Data collection was guided by Dillman's (1978) Total Design Method. Of the 465 faculty pre-retirees in the sample, 423 questionnaires were returned, a 91% response rate.

The Statistical Package for Social Science (SPSS, ver. 10.0) was used for computation of statistics: frequencies, *t* test, ANOVA, multiple linear regression with forward stepwise multiple regression procedure, and non-parametric correlation. Descriptive statistics of demographic and housing characteristic variables generated a demographic and housing characteristic profile of respondents. ANOVA, multiple linear regression, forward stepwise multiple regression, and non-parametric correlation were used as appropriate. Significance was set at the .05 level.

Results

Description of Respondents

Of the 423 respondents, 248 (58.6%) were from SWU in Bangkok and 175 (41.4%) were from BU in Chonburi. Ages ranged from 40-59, with a mean age of 53 years. The percentage of female respondents (51.6%) was nearly equal to male respondents (48.4%). The majority (73.5%) were married. The overwhelming majority had completed graduate degrees (master's degree, 66.2%; doctorate, 30.5%), while 3.3% held only a bachelor's degree (Table 1).

Faculty members in Thailand are regarded as middle class. Only 10.2% of respondents' income level was in the lower range (<B20,000/U.S. \$520 per month). The largest percentage (75.2%) owned their homes, 16.3% were renters, and the remainder (8.5%) lived with parents or friends. Older respondents were most likely to be homeowners. The majority (63.4%) paid less than B10,000/U.S. \$260 per month for housing.

The majority of respondents (59.0%) lived in single-family detached houses, and the next largest group (25.8%) lived in town houses and condominiums. About 9.5% lived in university housing units, and most of these were from BU where free housing is provided to some faculty members to attract academicians from the city. All respondents lived in the same city as their work place.

Table 1. Frequency Distribution of Respondents by Selected Demographic Characteristics (N = 423)

	Frequency	Percent
Age		
40-49	191	45.2
50-59	232	54.8
Gender		
Male	205	48.4
Female	218	51.6
Marital Status		
Married	311	73.5
Non-married	112	26.5
Education Level		
Bachelor level	14	3.3
Master level	280	66.2
Doctoral level	129	30.5
Income (monthly)		
Less than B20,000 / U.S. <\$520	43	10.2
B20,001 – B35,000 / U.S. \$521 – \$913	121	28.6
B35,001 – B50,000 / U.S. \$914 – \$1,304	138	32.6
More than B50,000 / U.S. >\$1,305	121	28.6

Table 2. Mean and Standard Deviation of Items on the Personal Innovativeness toward Housing Scale (N = 423)

Item	M	SD
The unusual house is often a waste of time.	3.57	1.08
I like to experiment with new ways of doing things.	3.78	.83
I like to take a chance.	3.40	.99
I enjoy looking at new housing design in magazines.	3.98	.87
Some contemporary housing is stimulating.	3.87	1.09
I like to spend time with new ideas even if they turn out to be a waste of time.	3.80	.93
When it comes to taking chances, I would rather be safe than sorry.	1.59	.78
Changing technology, especially in housing, is a waste of money.	3.26	1.16
If builders would quit wasting their time to create new housing types, they could build more affordable housing.	2.98	1.04
I would rather not waste my time with some new ideas.	3.87	.89
I like to try new and different things.	3.49	.94
I like a house that is a little different.	2.86	1.04
I often try to find out more about new housing types.	3.62	.98
Buying a new housing type that is not widely available is a waste of money.	3.07	1.07
I would like a house that does not require me to learn new ways of doing things.	2.58	1.09
I am less interested in the appearance of a house than in its comfort.	3.80	1.02
As long as the refrigerator works well and meets my needs, I do not really care how it works.	2.70	1.10
I am very curious about how new things work.	4.04	.70
I like to build things for my home.	3.56	1.05
I never take anything apart because I know I will never be able to put it back together.	3.45	1.21
I like to fix things around the house.	3.55	1.21
I would rather make repairs around the house myself than to have someone else make them.	3.35	1.18
The outside appearance of the house is not important.	3.25	1.15
I do not enjoy any product unless I can use it to its fullest capacity.	4.11	.91
It is always possible to improve upon a house by adding new features.	3.77	.90
I try to keep up with new products and ideas that could improve my home.	3.76	.89

Note: Some items were reverse coded. Scale: 1 = strongly disagree to 5 = strongly agree

Personal Innovativeness toward Housing

The Personal Innovativeness toward Housing Scale (PITHS) was adapted from Gruber et al. (1990) and consisted of 26 items. Responses ranged from 1 (strongly disagree) to 5 (strongly agree) with total possible scores ranging from 26 to 130. Respondents' scores ranged from 55 to 111, with 89.56 mean, 90 median, and 7.22 standard deviation (see Table 2 for mean scores and standard deviations on each item).

Personal innovativeness was examined by selected demographic variables. Respondents' ages were categorized as age 40-49 or age 50-59. Using *t* tests, no significant differences between age categories were found. This is consistent with findings by Kwon (1991) and Beamish and Johnson (1994). However, when categorized by gender, males had higher personal innovativeness mean scores (male, 90.55; female, 88.65; $p < .01$). Married respondents had higher personal innovativeness mean scores than did non-married respondents (married, 90.14; non-married, 88.00; $p < .01$). Again, this finding is consistent with previous research.

The ANOVA procedure revealed that respondents with higher incomes had higher personal innovativeness scores ($p < .03$). Mean scores of personal innovativeness toward housing also varied by tenure status. Renters had higher personal innovativeness scores than other types of tenure ($p < .01$). There were no significant differences on mean scores of personal innovativeness by current housing type, location, dwelling expenditures, or education.

Acceptance of Nontraditional Housing Types

The acceptance of the UDSD, ECHO, CH, and CCRC housing types, and of all types combined were measured. Possible and actual scores ranged from 0 to 4 for each housing type and from 0 to 16 for acceptance of all housing types combined. As shown in Table 3, the mean acceptance score of all housing types combined was 8.54, suggesting a medium to high level of acceptance. The acceptance levels for each housing type varied from 1.84 to 2.35.

Table 3. Mean Acceptance Scores for Each Nontraditional Housing Type and a Combination of All Nontraditional Housing Types (N = 423)

Housing Type	<i>M</i>	<i>Median</i>	<i>SD</i>
Universal designed single-family detached housing*	2.32	2.00	1.15
Elder cottage housing opportunity*	2.35	2.00	1.24
Congregate housing*	1.84	1.84	1.10
Continuing care retirement community*	2.03	2.00	1.19
Combined**	8.54	9.00	3.11

*Scale: 0 - 4
 Mean for each housing type:
 < 2 – Low level of acceptance
 = 2 – Medium level of acceptance
 > 2 – High level of acceptance

**Scale: 0 - 16
 Mean for combined housing types:
 < 8 – Low level of acceptance
 = 8 – Medium level of acceptance
 > 8 – High level of acceptance

Table 4. Respondents' Levels of Acceptance of Nontraditional Housing Types (N = 423)

	UDSD		ECHO		CH		CCRC	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Awareness	204	48.2	280	66.2	276	65.2	161	38.1
Interest	152	35.9	220	52.0	234	55.3	137	32.4
Evaluation	306	72.3	255	60.3	175	41.4	309	73.0
Adoption	321	75.9	238	56.3	94	22.2	251	59.3

Respondents' awareness, interest, evaluation, and adoption levels of nontraditional housing types were examined. Respondents were aware of ECHO and CH housing and interested in knowing more. Fewer were familiar with UDSD and CCRC, and were likewise less interested in them. However, nearly 75% wanted to evaluate UDSD and CCRC, and 60% wanted to evaluate ECHO housing. Overall, the majority were willing to consider living in all housing types except CH, while UDSD had the highest possibility of adoption (Table 4).

Results Answering the Research Questions

Is there a relationship between personal innovativeness and demographic characteristics? Stepwise multiple regression was performed to determine whether demographic characteristics were related to personal innovativeness toward housing. As shown in Table 5, gender, income, and education level were significantly related to personal innovativeness toward housing. Controlling for other variables, males, respondents whose income was below B10,000, and respondents with doctoral degrees tended to have higher mean personal innovativeness scores.

Table 5. Stepwise Multiple Regression Analysis of the Relationship between Personal Innovativeness toward Housing and Each of the Demographic Characteristics of Respondents (N = 423)

Variable	β	SE	<i>t</i>	<i>p</i>
(Constant)	90.06	1.76	51.11	<.001
Gender	1.78	.69	2.57	<.01
Income	.96	.36	2.67	<.01
Education	-1.78	.68	-2.63	<.01

Note: Adjusted $R^2 = .04$

Is there a relationship between acceptance scores of nontraditional housing types and demographic characteristics? There was no across-the-board acceptance of a particular nontraditional housing type and there were no significant relationships between UDSD or CH and demographic variables. However, significant relationships were found for mean acceptance scores of ECHO housing, CCRCs, and combined housing types. Stepwise multiple regression revealed weak but statistically significant relationships between acceptance of ECHO housing, education level, and income (Adjusted $R^2 = .03$, $p < .01$). Those with a master's degree and those whose incomes ranged from B20,000-B35,000 were more likely to accept ECHO housing. There was also a weak but statistically significant relationship between acceptance of CCRC housing and gender (Adjusted $R^2 = .01$, $p < .03$). Females were more likely to accept CCRC housing. There was also a statistically significant relationship between mean acceptance scores for combined housing types with income and gender (Adjusted $R^2 = .02$, $p < .04$).

Is there a relationship between acceptance of nontraditional housing types and current housing characteristics? Multiple linear regression with forward stepwise procedure was used to examine this question. Although no relationships were found for UDSD nor for CH, there were statistically significant relationships between acceptance scores of ECHO (Adjusted $R^2 = .01$, $p < .05$) and CCRC housing (Adjusted $R^2 = .01$, $p < .05$) and the housing characteristics of respondents. Respondents who currently lived in single-family detached houses were more likely to accept ECHO housing and those who lived in Bangkok were more likely to accept CCRC housing. For combined housing types (Adjusted $R^2 = .01$, $p < .05$) respondents who had higher dwelling expenditures had higher acceptance scores.

Is there a relationship between personal innovativeness toward housing and acceptance of nontraditional housing types? Non-parametric correlation analysis revealed that there was a statistically significant positive correlation between personal innovativeness toward housing and acceptance of combined nontraditional housing types, UDSD, and ECHO housing (Table 6).

Table 6. Correlation of Personal Innovativeness toward Housing and Acceptance of Nontraditional Housing Types (N = 423)

	UDSD	ECHO	CH	CCRC	Combined Housing	Innovativeness
UDSD	1.00	.30***	.17**	.22***	.62***	.12*
ECHO	—	1.00	.33***	.13**	.68***	.15**
CH	—	—	1.00	.29***	.63***	.03
CCRC	—	—	—	1.00	.60***	-.01
Combined Housing	—	—	—	—	1.00	.09*
Innovativeness	—	—	—	—	—	1.00

Note: Two-tailed significance levels: * $p < .05$, ** $p < .01$, *** $p < .001$

Does personal innovativeness toward housing mediate the effect of demographic characteristics on acceptance of nontraditional housing types?

Stepwise multiple regression was used to examine this question. Personal innovativeness toward housing had a mediating effect on demographic characteristics and on overall acceptance of housing types. The mean acceptance score of UDSD was related to personal innovativeness toward housing (Adjusted $R^2 = .02$, $p < .00$). The mean acceptance score of ECHO housing depended on personal innovativeness toward housing, education level, and income (Adjusted $R^2 = .05$, $p < .01$). Respondents with higher personal innovativeness and higher income tended to have higher acceptance of ECHO housing. However, those with higher educational levels had lower acceptance. The mean acceptance score of CCRC housing was related only to gender (Adjusted $R^2 = .01$, $p < .03$). Personal innovativeness toward housing mediated the effect of gender and income on acceptance of combined housing types (Adjusted $R^2 = .04$, $p < .03$). Females had higher acceptance than males provided that both had the same level of innovativeness and income.

Does personal innovativeness toward housing mediate the effect of nontraditional housing types? Stepwise multiple regression suggested that personal innovativeness toward housing does mediate the effect of nontraditional housing types. Respondents with higher personal innovativeness scores and higher monthly dwelling expenditures were more likely to have higher acceptance of combined housing types (Adjusted $R^2 = .03$, $p < .04$).

Summary of Results

Analysis of the data on housing acceptance revealed that respondents showed more awareness and interest in ECHO and CH than in UDSD or CCRC. They wanted to find out about the advantages and disadvantages of ECHO and UDSD. However, when asked whether they would consider living in any of these nontraditional retirement housing types, respondents indicated their preference for UDSD and CCRCs, in spite of the fact that they were not quite as familiar with these housing options. This may be because they wanted to try something new. These findings support the results of previous research by Beamish and Johnson (1994), who found that although most respondents were not very aware of the housing types in the study or had looked for information, they expressed their willingness to live in these houses. The mean acceptance score for combined nontraditional housing types indicated that faculty pre-retirees had a medium to high level of acceptance of the nontraditional retirement housing types presented to them.

The results pertaining to personal innovativeness toward housing of faculty pre-retirees indicated that in general, respondents displayed a medium level of housing innovativeness. In this study, personal innovativeness toward housing was

found to be positively correlated with acceptance of nontraditional housing types. This was contradictory to Kwon's (1991) finding which indicated that the elders' personal innovativeness toward housing was not a good predictor in explaining the acceptance of nontraditional housing types. The results of the present study are consistent with the theoretical model (see Figure 1).

Implications and Recommendations

The results of this study have implications with respect to innovative housing for the elderly. The communication system to diffuse innovations is the most important factor contributing to adoption of innovative housing (Ha & Weber, 1991). People from different cultural orientations may need different approaches in communication of innovations. For example, in Thailand model homes built to exhibit furnished interiors to prospective consumers are used to introduce new housing projects. Thus, mass media and publications of nontraditional housing options should be widely employed to diffuse innovative housing ideas to the general public.

Although respondents expressed more awareness and interest in ECHO and CH, the nontraditional housing types that were most acceptable to Thai respondents were UDSD and CCRC housing. In particular, since the majority of respondents already live in single-family detached houses, it may be more convenient for them to have their houses modified or refurbished with universal design than to move to another kind of retirement housing which is unfamiliar to them. This finding is similar to the results of research conducted in the U.S. Thus, universal designed homes and products should be brought to the attention of housing contractors, housing project developers, and the elderly themselves in order to promote innovative ideas related to retirement housing. CCRC was the housing type that Thai respondents were least familiar with, yet the majority of respondents would consider living in it. In the U.S., CCRCs have been well known among affluent and active pre-retirees who seek the best amenities and services they can possibly afford. In the future, the private sector in Thailand may want to explore the development of CCRC projects for affluent Thai elderly.

Respondents who were receptive to innovative retirement housing were the younger group (40-49 years) of faculty pre-retirees, especially women faculty with bachelor's degrees and moderate incomes. This younger group may be willing to take risks and try something new, but they need more information on the advantages and disadvantages of nontraditional housing types. This suggests that additional communication channels are needed to inform potential adopters about housing innovations to create more awareness and interest in the innovations. Diffusion of innovations theory suggests that mass media channels often affect early adopters while interpersonal channels affect later adopters in the process

(Rogers, 1983). Thus, in order to succeed in the diffusion of housing innovations, plans should be made on how to use mass media and interpersonal channels to influence the opinion leaders as well as potential adopters.

If younger (40-49 years) people are more willing to accept nontraditional housing, marketing efforts to this age group should provide information on nontraditional housing so that by the time they become seniors they will already be familiar with innovative housing options and perhaps be more willing to accept it. Housing alternatives should be introduced before people reach old age. Because the universal designed single-family detached house was the most acceptable to respondents in this study it should be introduced first. When the new ideas gain acceptance, additional housing options should be promoted to prospective adopters.

Rogers (1995) noted that the structure of a social system could facilitate or impede the diffusion of an innovation. Since traditional practice in Thai society dictates that elderly parents should be looked after by their children in their family homes, a large number of Thai elderly are not prepared to live separately from their children in old age. And like the U.S., the limited availability of affordable in-home care cannot be considered as a widespread alternative to family care. Social norms dictate that people should age in place, but elders are not prepared to face the hardship of housing maintenance and repairs of their deteriorating older houses. Thai elders need assistance in planning for life after retirement and coping with housing problems. They will need to understand and accept the reality of social changes before they can accept nontraditional retirement homes with supporting services and facilities.

Further research is recommended. Different sample groups in the socioeconomic strata along with additional demographic variables may yield more useful information. Additional knowledge is needed in understanding other kinds of housing innovations that have been created in the west and introduced into Thai culture, such as new technologies like the smart house, factory-built housing, and new building materials and methods. There is also a dearth of information on existing housing for Thai elderly. Assessments would yield better definitions of housing types and the severity of elderly housing needs.

Personal innovativeness toward housing includes a variety of factors. A factor analysis of items in the Measurement of Housing Innovativeness scale (Gruber et al., 1990) may provide more meaningful interpretation of housing innovativeness. According to Rogers (1995), some innovations may be harmful and uneconomical for the society. Before assuming that nontraditional housing is desirable for Thai elderly, further studies should be conducted to determine the effects of proposed housing types on the Thai social system.

References

- Beamish, J. O., & Johnson, M. K. (1994). Acceptance of housing alternatives for the elderly: Consumer perspectives. *Housing and Society*, 21(3), 17-26.
- Beamish, J. O., Sweaney, A. L., Tremblay, K. R., Jr., & Bugg, C. (1987). Perceptions of energy-efficient housing alternatives among southern households. *Housing and Society*, 14(1), 6-19.
- Campbell, B. O., Mason, A., & Pernia, E. M. (1993). *The economic impact of demographic change in Thailand, 1980-2015: An application of the HOMES household forecasting model*. Honolulu, HI: University of Hawaii Press.
- Dillman, D. A. (1978). *Mail and telephone surveys: The total design method*. New York: Wiley.
- Golant, S. M. (1992). *Housing America's elderly: Many possibilities, few choices*. Newbury Park, CA: Sage Publications.
- Gruber, K., Beamish, J., Carter, E., Shelton, G., & Weber, M. (1990). *Measuring innovativeness toward housing: Development of an innovativeness toward housing scale* (S-194 Southern Regional Monograph Series, S-194-90-003). Greensboro, NC: North Carolina A&T State University, Charles Moore Housing Research Facility.
- Ha, M., & Weber, M. J. (1991). Innovative housing adoption model for households. *Housing and Society*, 18(1), 37-48.
- Hirschman, E. C. (1980). Innovativeness, novelty seeking, and consumer creativity. *Journal of Consumer Research*, 7, 283-295.
- Holms, H., Tangtongtavy, S., & Tomizawa, R. (1996). *Working with the Thais*. Bangkok, Thailand: White Lotus Co., Ltd.
- Kwon, O. J. (1991). *The rural elderly: Personal innovativeness toward housing and acceptance of non-traditional housing types*. Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University, Blacksburg, VA.
- Limmanonda, B. (1995). Families in Thailand: Beliefs and realities. *Journal of Comparative Family Studies*, 1(26), 67-83.
- McCray, J. W., Weber, M. J., & Claypool, P. L. (1987). A housing-decision framework: Development and application. *Housing and Society*, 14(1), 51-69.
- National Statistical Office, Office of the Prime Minister, Thailand. (1996). *Report on housing survey 1996, 1986, and 1976*. Retrieved May 17, 2001, from www.nso.go.th/eng/stat/house/house.htm/stat/stat.htm

- National Statistical Office, Office of the Prime Minister, Thailand. (1998). *Report on housing survey 1998*. Retrieved May 17, 2001, from www.nso.go.th/eng/stat/house/house.htm/stat/stat.htm
- National Statistical Office, Office of the Prime Minister, Thailand. (2004). *Key statistics of Thailand*. Retrieved April 28, 2005, from www.nso.go.th
- Rogers, E. M. (1983). *Diffusion of innovations*. New York: The Free Press.
- Rogers, E. M. (1995). *Diffusion of innovations* (3rd ed.). New York: The Free Press.
- Rogers, E. M., & Shoemaker, F. F. (1971). *Communication of innovations: A cross-cultural approach*. New York: The Free Press.
- U.S. Department of Housing and Urban Development. (1996). *Residential remodeling and universal design* (1604-PDR). Washington, DC: U.S. Department of Housing and Urban Development.
- Yamane, T. (1967). *Statistics: Introduction to analysis*. New York: Harper and Row.