

EXPLORING HOUSING QUALITY MEASURES IN A RURAL AREA OF THE PHILIPPINES

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Abstract

Housing quality in a rural region of Leyte Province, the Philippines, was examined to develop a model to identify predictors of housing quality, one of the six housing norms within the theory of housing adjustment. Data were drawn from interviews with 150 female heads of households from ten rural villages in the upland and lowland areas near the town of Baybay, the Philippines. Logistic regression was used in the analysis. As expected, socio-economic status was significantly related to housing quality, as were the village's location, the age of the male-head of the household, and tenure. The number of stories of the house and the crowding measure were not significantly related to housing quality. This research provides documentation for evaluating both equitable distribution of housing and economic development programs and policies in developing areas.

Because of increasing population growth and limited economic resources, housing continues to be among the major social problems facing developing nations today. Substandard housing — lacking in plumbing, electricity, and structural integrity — poses tremendous health and societal risks to its residents. An important element of society's health, safety, balance, and stability, achievement of minimum quality housing standards is viewed as the most important single indicator of the success of government actions (Struyk & Turner, 1986).

Adopting housing policies, however, has often been of low priority for governments of developing nations, which view this sector as economically unproductive.

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Priority is usually given to sectors that have a direct return on an investment, such as industrial production, energy generation, and transportation. Most often, when housing and its associated services are part of a state's priorities, they coincide with urban areas that combine residences with businesses (Gilbert & Ward, 1985).

The neglect of quality standards in rural areas widens the gap between urban and rural development and can contribute to the rise of rural-to-urban migration. Cities of the developed world struggle with traffic congestion, refuse, infectious diseases, crime, and homelessness. Already overburdened due to limited resources, the cities, and especially the capitals of developing nations, strive to accommodate the migrants who arrive hoping for better jobs and an improved quality of life.

Low housing quality has been shown to have a negative effect on housing satisfaction (Fried, 1982; Galster & Hesser, 1981; Morris & Winter, 1997). Research in housing quality has been limited and should be expanded to include housing quality in the rural areas of developing nations, as an indirect measure of policy and program adequacy.

Housing quality is one of the six housing norms identified by Morris and Winter's housing adjustment and adaptation theory (Morris & Winter, 1997). According to the theory, norms are culturally derived criteria that households use to judge their own housing and that of others. A household whose housing does not meet the norms experiences normative deficits, which affect the household's housing satisfaction and lead to adjustment behavior. The theory presents a model through which adjustment behavior can be predicted. During the last two decades, the model of the housing adjustment and adaptation theory has been used primarily for the study of housing in the United States, with limited research in Mexico and Korea. A multi-cultural implementation of the theory illustrates the theory's applicability to various cultures, while at the same time it contributes to furthering the theory itself.

Drawing from the housing adjustment and adaptation theory, this paper will examine measures of housing quality and will develop a model to identify the predictors of housing quality in a rural area of the Philippines. This paper will contribute to the body of knowledge about the housing adjustment and adaptation theory, housing quality, and housing in developing nations. The identification of the predictors of housing quality in rural areas of a developing nation can serve to guide future housing policies.

Theoretical Background

Housing Norms

The housing adjustment and adaptation theory identifies six housing norms. These include space norms that prescribe the amount of space needed by a family and are dependent upon household size and composition; tenure norms that define home ownership; structure norms that prescribe the type of unit such as a single-family detached dwelling; expenditure norms that prescribe how much of its income a family should spend on housing; neighborhood norms that prescribe that the household live in a neighborhood appropriate to their social and economic status; and finally, quality norms (Morris & Winter, 1997).

Housing norms are used by the household to evaluate current housing conditions. When a household experiences housing dissatisfaction because of normative deficits, the behavioral intention of engaging in adjustment behavior by either moving or altering the present dwelling may occur (Morris & Winter, 1997).

Housing Quality

According to the theory, quality norms prescribe that housing should be of a quality level congruent with the household's social status. Housing quality refers to the highly valued characteristics that a house possesses. Features such as housing materials, bathrooms, electrical service, appliances, and air-conditioning are considered to be indicators of the quality of the house. The characteristics embedded in housing quality, however, will vary with the household's reaction to those characteristics and how important it considers them to be. This subjective aspect of housing quality causes considerable debate among researchers on the issue of defining housing quality (Morris & Winter, 1997).

Measuring Housing Quality

A concept that is difficult to define is also difficult to measure, and researchers have different ways of measuring housing quality. Problems of reliability emerge when enumerators of the 1960 U.S. Bureau of the Census used subjective judgment to rate structural defects (Morris, Woods, & Jacobson, 1972). Even though it may be considered the most direct measure of the desirability of a dwelling, market value is community- and neighborhood-specific (Morris & Winter, 1997). Researchers also disagree on which items should comprise the index of housing quality so that such an index would apply to the typical household. While some researchers focus on structural items, other researchers emphasize service amenities such as a freezer, dishwasher, washer and dryer, and fireplace (Harris, 1976). Housing materials have also been used to represent housing quality (Selman, Morris, Winter, & Murphy, 1994).

Aside from contradictions in ways to define and measure housing quality, researchers agree that several criteria must be met when devising a housing quality index. One criterion is that the index should reflect the quality of the dwelling alone, and not the neighborhood or the location of the dwelling. Another criterion is that characteristics of the residents, such as household income or number of persons in the household, should be eliminated from the index. The quality of the dwelling exists irrespective of who is currently occupying the dwelling, and even though these characteristics may predict levels of quality, they are not direct measures of it. In addition, the scoring system on which to rate the quality of each dwelling should be objective, to avoid problems of subjectivity by interviewers (Morris, Woods, & Jacobson, 1972).

Predictors of Housing Quality

Housing researchers agree that housing quality is related to the socioeconomic status of the household, and that families demonstrate their status in society by owning high-quality housing (Morris & Winter, 1997). In addition, prior research has shown

that housing quality is dependent on normative conditions and on the existence of neighborhood, tenure, structure type, and space norms (Kain & Quigley, 1970; Morris & Winter, 1997). Finally, family life-cycle stage has also been linked to housing quality, but in a curvilinear relationship (Morris & Winter, 1997), so that housing quality increases in the early stages of the family life-cycle but then begins to decrease in the late stages of the family life-cycle.

Based on the literature, differences in housing quality are expected due to income, level of education, location, type of ownership, type of structure, age of head of household, and adequacy of space. Thus, one would expect that households of higher income with more years of education who own two-story detached homes in well-to-do neighborhoods would enjoy higher housing quality than would households of low income and limited education who rent apartments in poor neighborhoods. In addition, one would expect that, as the household progresses through the life cycle and the head of the household ages, housing quality would rise until retirement, after which it would begin to drop. Another expectation is that as the ratio of persons-to-room increases, housing quality decreases.

Housing Quality in Developing Nations

Housing quality differs significantly in different parts of the world, and housing characteristics will be valued differently by different nations. Amenities such as hardwood floors and air-conditioning, which are valued in the United States, may be unavailable to many people in developing nations. Low-income households seek lower housing quality due to their income constraints, and in many developing nations households' priorities lie in just getting a roof over their heads.

Defining and measuring the concept of housing quality is thus more complicated when it is applied to developing countries. Measuring housing quality requires attention to the cultural sources of the subjective reactions of families to housing characteristics. Using the criteria mentioned above, an index for measuring housing quality in Puerto Rico and other developing nations was created by a team of researchers. Their index included three sub-indexes that measure structural, service, and caretaking aspects of housing quality. Structural items include the condition of the walls, service items include the presence of toilet facilities, and caretaking items include the orderliness of rooms (Morris, Woods, & Jacobson, 1972).

The Filipino Context

In Southeast Asia, the Philippines rank second to Indonesia in terms of urban population, and Manila ranks as the 18th largest metropolitan area in the world (Constantino-David & Valte, 1994). In the Philippines, the scarcity of acceptable housing for expanding urban populations is a severe problem since a large proportion of the existing housing stock is deficient. In metro Manila, only 20% of the population is serviced by the sewage network and over 35% of the city's residents live outside the water distribution system (Constantino-David & Valte, 1994). Squatting is the primary source of housing supply for low-income households, approximately a third of the

city's population, while 21 million people are estimated to be homeless nationwide (Constantino-David & Valte, 1994).

Even though the urban sector faces major housing problems, 68% of the housing needs are in rural village areas, where most of the Filipino population lives (Castillo, 1977). Because urban areas are given higher priority in development, urban centers and their surrounding areas are more developed and receive more public investments than do rural areas (Limcaoco, 1989). Differential access to services such as education, health, electricity, and cooking fuel account for the differences between the urban and rural areas, with the urban sector having more access to these amenities (Castillo, 1977).

Housing Quality in the Philippines

Three aspects have been identified as important for housing quality in the Philippines: 1) the quality of the unit to meet minimum standards, such as having a roof; 2) the associated infrastructure, with water supply and human waste disposal being the most prominent elements; and 3) the use of the unit for income generation, either for a business or by renting part of the unit (Struyk & Turner, 1986). The first two aspects are related to basic health issues; and the third is related to potential changes in the household's economic circumstances. The combination of health and economic issues can be a powerful incentive for expanding the resources allocated to the housing sector and therefore can have direct policy implications.

Predictors of Housing Quality Within the Filipino Context

As discussed previously, housing quality has been shown to be predicted by socio-economic status, neighborhood, tenure, structure and space norms, and family life-cycle stage. However, one should be careful to view the housing quality predictors identified in the literature within the Filipino context.

Socio-economic status. Socio-economic status can be difficult to measure and identify in the Philippines and other developing countries in general. In less-developed societies, various subgroups that form the informal sector are not fully integrated into the economy and do not participate in both obligations and benefits - this sector does not pay taxes or enjoy fringe benefits. Without the provisions of formal housing financing, the informal sector depends on other sources that are difficult to measure (Gilbert & Ward, 1985).

Typically, a Filipino family's socio-economic status is determined by the employment of the male-head of the household. The years of education of the male-head of the household have been shown to have the highest effect on income, followed by occupation, and location (Castillo, 1977). Therefore, in the Philippines one would expect that households whose male-heads are educated and have high-earning occupations would have high quality-housing. For example, since farmers are among the least educated and poorest people (Pineda-Ofreneo, 1991), they are expected to have low-quality housing.

Neighborhood. This idea of differential access and proximity to services between urban and rural areas can also be transferred to differences among rural areas such as

lowland and upland rural locations in the Philippines. Lowland villages are those closer to the sea, while upland villages are those in the mountain areas. Being closer to port cities and having better transportation and communication systems, the lowland areas are more developed and modernized than are the upland regions (Castillo, 1977). The differences between upland and lowland areas affect the opportunities to attain schooling and employment which, in turn, affect income. For this reason, people in the upland areas are expected to have occupations with lower incomes and to have fewer years of education than do people in the lowland areas. Thus, housing quality in the upland areas is expected to be lower than in the lowland areas.

Tenure. The traditional concept of tenure (home ownership) cannot be applied to developing nations because of squatters and the informal housing sector. In the Philippines, owners with clear title to their property enjoy the best housing conditions, while squatters, those who own their dwellings but do not have clear title to the land, are generally the worst off (Struyk & Turner, 1986). Although home ownership is high in rural areas, much of that housing is "makeshift" housing (Castillo, 1977) and, thus, ownership may not be related to housing quality. Squatters, then, could make the measure of the tenure variable biased and the results invalid.

Structure type. In the housing adjustment and adaptation theory, structure type typically differentiates housing units according to building types which include single-family detached dwellings, duplexes, townhouses, and apartments. Because in these Filipino villages, all dwellings are single-family detached structures, a further delineation of structure type has been adopted - the number of stories. In the Philippines, two-story homes are usually owned by higher income households (Castillo, 1977) and we would expect that these houses would be of higher quality.

Space. Space norms can be measured by square feet, persons-per-room, persons-per-sleeping room, or bedroom need (Morris & Winter, 1997). In a developing nation, a cross-sectional study such as this one may underestimate or overestimate the persons-per-room and persons-per-sleeping room ratios.

In the Philippines, for example, in rural areas the number of people living in a house changes over time, as extended family members move into and out of the unit (Castillo, 1977). In addition, the counting of the actual number of rooms may be biased. In these dwellings, rooms can be defined by curtains instead of walls, and may change during the course of the day, which makes it difficult to know how the space is actually used and how privacy is achieved. The notion of bedroom as a room devoted to sleeping may not have the same interpretation in different parts of the world, and a space used as a living room during the day may be a sleeping area at night.

Using the persons-per-room ratio has also been criticized as culturally irrelevant, because it does not account for either the type or size of the rooms or the age, sex, and relationships of household members (Morris & Winter, 1997). Bedroom need, a measure of the number of bedrooms needed by a family in order to conform to the cultural norms of bedroom sharing, may be a more appropriate measure of crowding. This measure is especially appropriate for international research, in which, to determine bedroom need, the cultural rules concerning bedroom sharing should be known (Mor-

ris & Winter, 1997). In this study, the square footage of dwellings and the knowledge of which family members shared sleeping areas were not available. While the number of bedrooms was identified by the research associates, the number of rooms used for sleeping was not known, so that the total number of rooms identified and the number of persons per household were used to calculate a persons-per-room ratio as a measure of crowding.

Life-cycle stage. Households in the Philippines move infrequently and tend to make incremental improvements in the quality of their units (Struyk & Turner, 1986). Since Filipino households may remain in their homes for many years, it would be expected that, as they move through the life-cycle stages, their housing quality would increase. Since moving through the life-cycle implies that one is getting older, it would be expected that as the age of the head of the household increases, so would housing quality.

Methods

Research Question

Based on the literature review, this study assessed the following proposition: housing quality is related to the village's location, the household's socio-economic status, the age of the male-head of the household, tenure, structure type, and crowding.

Housing quality was a dummy variable that included, on the one hand, the existence of electricity and/or an indoor or attached comfort room¹ and, on the other hand, neither of these amenities. The village's location was defined as an upland or a lowland village. Socio-economic status was measured by an index that included the years of education of the male-head of household and the primary occupation of the household. The age of the male-head of household was measured by the actual age in years. Tenure was defined as owning or not owning the home. Structure type was defined as a one-story house or a two-story house. And, finally, crowding was the ratio of persons per room. Because housing quality was a dichotomous variable, logistic regression was used to test the above relationships and identify the influence of these factors on housing quality. Housing quality was the dependent variable. The independent variables were the location of the village, the household's socioeconomic status, the age of the male-head of the household, the number of stories of the house, tenure, and crowding. Therefore, the regression equation was:

$$Y = a_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e, \text{ where:}$$

Y = housing quality,

X₁ = village location,

X₂ = household's socio-economic status,

X₃ = age of the male-head,

X₄ = number of stories of the house,

X₅ = tenure, and

X₆ = crowding.

Based on the theory, the following hypotheses were tested:

- H 1: Lowland village households have houses of higher quality than those of upland village households.
- H2: The higher the socio-economic status, the higher the housing quality.
- H3: The older the male-head of the household, the higher the housing quality.
- H4: Houses that are owned are of higher quality than houses that are not owned.
- H5: Two-story houses are of higher quality than one-story houses.
- H6: The higher the persons-per-room ratio, the lower the housing quality.

Study Design

Data were collected by interview as part of a larger study of energy use during the month of November of 1990, from households in villages near the town of Baybay, Leyte Province, the Philippines. This region of the Eastern Visayas is one of the poorer areas in the Philippines (Sison & Valera, 1991). Five upland and five lowland villages (15 households in each village) were part of the sample with a total of 150 households surveyed and documented.

The sample selected for this project was based on the geographic location of villages within a radius of 20 km of Visayas State College of Agriculture, Baybay, and on the accessibility by land transportation. The villages were selected by a random method from among eight villages identified in each upland and lowland area. The individual households in this study were selected with the help of the Barangay (village) Captains who made lists that identified the households in the villages. From these lists, 15 households were randomly selected from each of the ten villages.

Interviews were conducted with the female head of each household by Filipino research associates trained at the Center for Social Research at Visayas State College of Agriculture, the Philippines. The interview instrument was translated into the regional dialect by a member of the faculty of the Department of Home Science, Visayas State College of Agriculture. The information collected on each household included demographic characteristics, energy consumption characteristics, and housing characteristics. Floor plans of the houses were drawn by the research associates and included room identification and out-buildings, illustrating the relative sizes of each but not including actual dimensions.

Housing Quality Index

Given that researchers view the availability of plumbing facilities as the single measure applicable under most conditions and agree that dwellings are rated substandard if they lack plumbing fixtures (Morris, Woods, & Jacobson, 1972), the index of housing quality in the present study included only service items. Other possible measures such as structural features, materials, and caretaking data were not available. The presence of amenities such as a refrigerator and radio was available, but these items were not used in the index because they were not significantly related to other items in the index and therefore were not likely to measure the same concept.

Based on the criteria devised by Morris, Woods, & Jacobson (1972), the items that comprised the index of housing quality in this study were the presence of an indoor or attached comfort room and the presence of electricity. These items meet the above criteria in that they measure only the quality of the dwelling and can be objectively measured. The two variables were significantly correlated ($r = .2395$, $p = .003$) and thus could be used to measure housing quality.

Low-income households in Manila were willing to pay more to have a toilet attached to their dwelling (Danieri, 1994). The location of the comfort room signals housing quality, as houses with an indoor/attached comfort room would be connected to a drainage system and would utilize a bucket flush or a flush with a water seal (Struyk & Turner, 1986). Without plumbing, the comfort room would be located away from the main dwelling because of odors and for other health reasons. Of the households in the study, only 20.7% had an indoor or attached comfort room.

The second aspect of housing quality was the presence of electricity, measured by the type of energy used for lighting. Electric lights are an indication of housing quality because of the necessary infrastructure. According to a study of rural electrification of the Philippines (Mandel, Allgeier, Wasserman, Hickey, Salazar, & Alviar, 1980), the social and economic position of a household determines whether it will benefit from electrification. Since most of the rural poor are not able to invest in electricity (wiring their homes and buying appliances and light bulbs), electricity is most often found in the homes of those who can afford it. Among the households in the study, 64.7% had electric lights; the rest used some other type of fuel for lighting.

Based on this index of housing quality, 32.7% of the households were classified as low quality because they did not have either of the amenities; 49.3% were classified as medium quality and had one or the other of the amenities; and finally, 18.0% were classified as high quality and had both amenities. Housing quality in this study is a dummy variable that separates the houses of low quality, having none of the amenities (32.7%), from those that are medium or high quality, having either one or both of the amenities (67.3%).

Household Characteristics

Of the 150 households in the sample, 50% were located in upland villages and 50% in lowland villages. Household size ranged from 1 to 10 members, $M = 4.83$, $SD = 1.82$. Ages of household members ranged from under one year to 86 years. The ages of the male-heads of households ranged from 23 to 79 years, $M = 45.5$, $SD = 12.5$. Years of education of the male-heads ranged from 0 to 14 years, $M = 6.7$, $SD = 2.7$.

In terms of household composition, most of the households (42%) had children who were at least five years old. Only eight percent of the households had members over 45 years old and no children. Although most of the households had both a male- and a female-head, 12.6% did not have a male-head. Of the households that did not have a male-head, half of those female-heads lived in an extended household. Forty households (26.6%) were extended households; twelve of these households had as head

a person over the age of fifty, while six of them had an elderly person who was not considered as head.

The occupations of the households in the sample were defined by the primary occupation of the household. Filipino families survive by multiple sources of income; farming and fishing are partial means of livelihood for more than half of the population, while the more rural and agricultural the community, the greater the diversity of income sources (Castillo, 1977). The primary occupations of the people in this sample included rice farming, fishing, store ownership, tailoring, government employment, and other sources of income, such as from children. For statistical purposes, the variable 'occupation' was grouped into five categories: farmers and animal raisers, sales, services and skills, government jobs, and other. The frequency distribution was as follows: 49.2% were farmers, 16.9% had other occupations, 14.6% had government jobs, 10.8% worked in service/skills occupations, and 8.5% were in sales.

Socio-economic status was measured by an index that included the education level of the male-head of household and the primary occupation of the household. Education was coded in four categories, ranging from a male-head of a household with no formal education (coded as "0"), one to six years of education (coded as "1"), seven to twelve years of education (coded as "2"), and university education (coded as "3"). Occupation was also coded in four categories, including a household that lacked a primary occupation (coded as "0"), a primary occupation of farming (coded as "1"), a primary occupation of sales, services/skills, and other (coded as "2"), and a primary occupation of government employment (coded as "3"). These categories were created according to expected income, and households with no primary occupation were expected to have the lowest income, while households with government employment were expected to have the highest income. Based on this index, socio-economic status ranged from a low value of one to a high value of six. Most of the households (68.7%) were of a medium-to-low socio-economic level, values of three to one. The two variables of education and occupation were significantly related and could be used to measure the same concept ($r = .2414, p = .005$).

Of the households in the sample, 86% owned their home. Regarding the structure type of the homes, all were single-family detached dwellings, 92% of which were one-story.

While the square footage of the dwelling and the number of rooms in which family members sleep were not available, the house plans with rooms labeled were available. From these plans, the number of rooms per dwelling was assessed. The number of rooms in the home ranged from one to six rooms, $M = 4.3, SD = 1.11$. The counting of the number of rooms excluded comfort rooms, detached kitchens, storerooms, porches, and sari-sari stores - small convenience stores located at the front of a house. The number of bedrooms identified by the research associates on the house plans of the sample ranged from one to five bedrooms, $M = 1.7, SD = 0.79$. The crowding measure ranged from a low of 0.33 to a high of 4.50 persons-per-room, $M = 1.5, SD = 0.73$.

Many of the houses were a simple rectangular structure, while many others had extensions resulting in a more complex shape. These extensions of a porch, kitchen or comfort room could be additions for incremental improvements (see Figure 1).

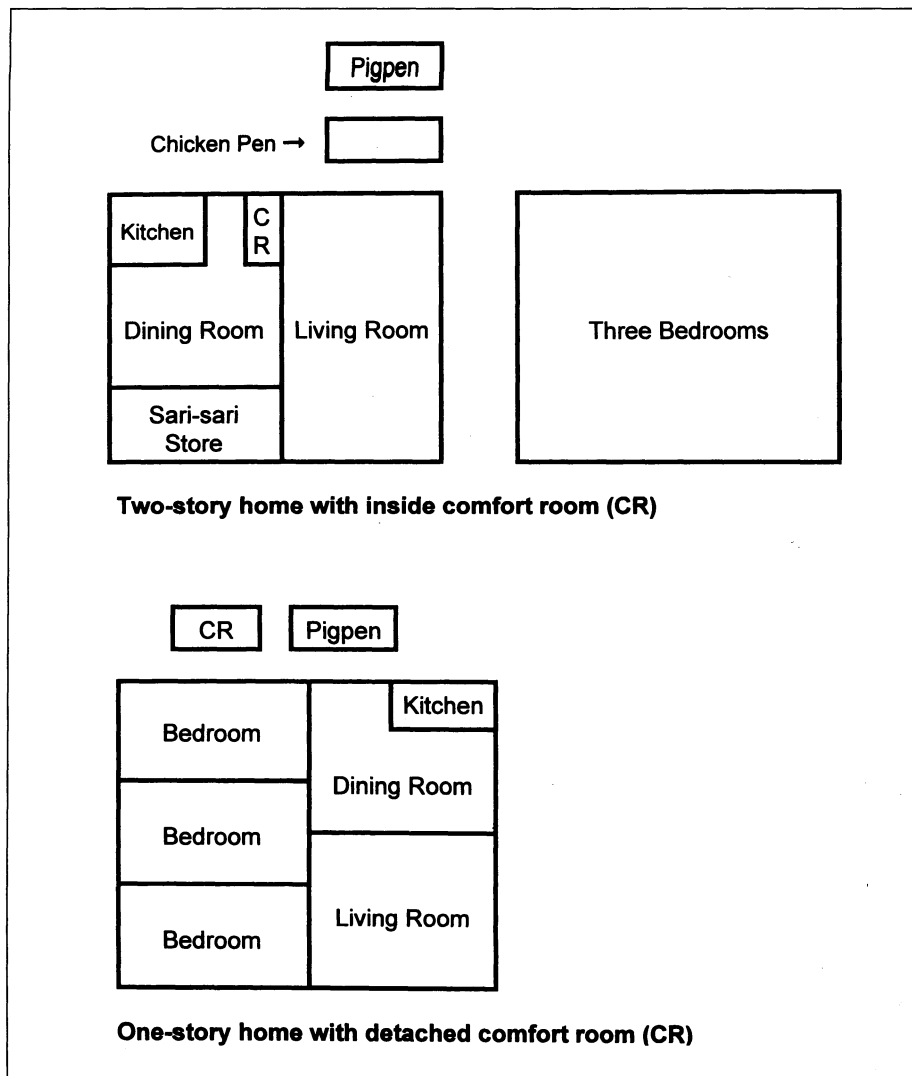


Figure 1. Typical structure types.

Results

Logistic regression was conducted to determine the significant factors in explaining the quality of the dwellings in the rural Philippines. The logistic regression results were significant ($\chi^2 = 25.60$, $p = .0003$). As expected, the relationships between the dependent variable of housing quality and four of the independent variables were significant: the village's location ($\beta = -.6244$, $p = .0048$); the household's socio-economic status ($\beta = .5594$, $p = .0228$); the age of the male-head of the household ($\beta = .0451$, $p = .0143$), and tenure ($\beta = -.6282$, $p = .0404$). Contrary to previous research, the house's number of stories ($\beta = -1.1691$, $p = .0582$) and crowding ($\beta = .1061$, $p = .7263$) were not significantly related to housing quality and therefore cannot be used as predictors (Table 1). Thus, according to the logistic regression, hypotheses H1 through H4 were accepted, H5 and H6 were rejected.

Discussion

Housing quality was measured in this study using two simple and objective amenities that are critical to quality of life - the existence of a toilet attached to or within the house structure and electricity. This study contributed to the body of literature on housing quality by showing that its results are applicable to the rural areas of other developing nations.

Confirming prior research, housing quality was predicted by a family's socio-economic status, life-cycle stage, neighborhood, and tenure. This research showed that the village's location, the household's socio-economic status, the age of the male-head of the household, and tenure affected housing quality. The poorer upland areas had housing of lower quality than that of the lowland areas; the households whose heads had low income occupations, such as farming, and/or few years of education had housing of lower quality than that of households with heads of higher income occupations, such as government employment, and/or more years of education. Households whose heads were older and had lived in the house longer had housing of higher quality; and houses that were owned were of higher quality than houses that were not owned.

Three findings of this research, however, are contrary to the literature. The first finding is about the linear relationship, rather than a curvilinear one, found between the age of the head of the household and housing quality. This finding can be explained by the fact that housing quality in this research was measured by the presence of electricity and an indoor or attached comfort room. Once acquired, these two amenities would always be present in a house, regardless of the passage of time or maintenance. Because Filipino households make incremental improvements to their homes, as a male-head's age increases, a household is more likely to invest in electricity and an indoor/attached comfort room.

The second finding, the number of stories, was not a predictor of housing quality, even though the relationship is very close to being significant ($\beta = -1.1691$, $p = .0582$). [This finding may have resulted from the predominance of one-story housing (92%) in the sample]. Further research using the number of stories as part of the structure norm could illustrate the relevance of this measure in predicting housing quality. The third

Table 1. Logistic Regression Analysis of Housing Quality

Independent variable	Beta	S.E.	Sig
Location of village	-0.6244	0.2211	0.0048
Socio-economic index	0.5594	0.2456	0.0228
Male-head age	0.0451	0.0184	0.0143
Number of stories in the house	-1.1691	0.6172	0.0582
Tenure	-0.6282	0.3065	0.0404
Crowding	0.1061	0.3032	0.7263
Intercept		1.4122	0.0799

$p = .0003$
 $\chi^2 = 25.600$

finding, the crowding measure, was not a predictor, perhaps because of the unreliability of the persons-per-room ratio.

The importance of the results of this research lies in extending the housing adjustment and adaptation theory to another international setting and in showing that it has relevance to support public policy. The primary policy implications of this research refer to the first two findings, the relationship of housing quality to the village's location and to the household's socio-economic status. As expected, the village's location proved to be a predictor of housing quality, and the difference in the development between upland and lowland villages may be responsible. Even though no significant difference was found between lowland and upland villages in terms of the existence of an indoor or attached comfort room, there was a significant difference between the village's location and the presence of electricity, with the lowland villages having more houses with electricity than did the upland villages (78.7% versus 58.2%). This result would be expected because the lowland areas are more developed than are the upland areas and have increased accessibility to electric distribution lines. This finding also indicates the need to develop the infrastructure in upland areas.

The village's location was also significantly related to socio-economic status, and lowland villages were expected to have households of higher socioeconomic status than those of upland villages ($r = .1786$, $p = .041$). Differential access to employment opportunities between the two areas may account for that result, as well as for differences in the households residing in these areas. The age of the male-head of household was significantly related to the village's location; upland villages are expected to have older heads of households ($r = -.1885$, $p = .031$). Younger heads would migrate to the lowlands or to more developed urban areas (Table 2).

Table 2. Correlation Analysis for Regression Variables

	Village location	Socio-economic index	Male-head age	Number of stories	Tenure	Crowding
Housing quality	.213*	.176*	.127	.100	.128	-.008
Village location		.178*	-.188*	-.049	.057	.006
Socio-economic index			-.268*	-.026	-.156	.076
Male-head age				.027	.091	-.016
Number of stories					-.164*	-.263*
Tenure						.121

* $p < .05$

The lesser development of upland areas prevents villagers from improving their homes to match the standards of more-developed rural areas. Upland farmers would be most deprived of quality housing since they face the most problems, have the lowest incomes, and are the least educated (Pava, Arances, Magallanes, Mugot, Manubag, & Sealza, 1989).

This study contributed to the housing adjustment and adaptation theory by showing that housing quality is dependent on economic development, and that by improving social and economic conditions, housing quality may also be improved. Further research will need to examine the relationship between housing quality, satisfaction, and the intent to migrate to areas with more economic opportunity. The disproportionate allocation of housing resources and programs exacerbates the poor quality of life of upland village households. The negative effect of low housing quality on satisfaction (Fried, 1982; Galster & Hesser, 1981) could provide these households with the incentive to migrate, making the demand for resources in urban centers such as Manila even more severe. This finding supports the need for fair allocation of resources for the enhancement of housing conditions in upland areas. By improving education, income opportunities, and infrastructure, housing quality will also be improved and, through that, life quality.

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Footnotes

¹ In the Philippines, 'comfort room' is the term used to describe the amenity of a toilet in a room, i.e., a water-closet.