

**THE DETERMINANTS OF RESIDENTIAL ENVIRONMENTAL QUALITIES
AND SATISFACTION: EFFECTS OF FINANCING, HOUSING PROGRAMS
AND HOUSING REGULATIONS**

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Abstract

As an exploratory study, an environmental evaluation model was proposed and tested. To test the model, an Analysis of Linear Structural Relationships (LISREL) was used. County housing practices (financing, housing programs, and housing regulations) were included as well as socio-demographic variables as exogenous variables. Despite some measurement error, overall model fit was concluded. There was no direct effect of exogenous variables on residential satisfaction, but they indirectly affected residential satisfaction through environmental, community/social and housing quality. Impact of housing practices on residential qualities were significant. Furthermore, although environmental quality did not have a direct influence on residential satisfaction, it affected residential satisfaction, through community/social and housing quality. Community/social and housing quality were significant factors on residential satisfaction, with housing quality being the more significant factor.

Introduction

In a classic study, Davies (1938) gave a perspective boundary for housing researchers by introducing the terms "home surroundings" and "neighborhood qualities" to assess housing standards. Other research has established that neighborhood, community, and natural environment are influential to residential satisfaction (Campbell, Converse and Rogers, 1976; Gruber and Shelton, 1987; Jirovec, Jirovec and Bosse, 1985).

Davies (1938) included lot proportion to height of building, yard for children's play, location, harmony between house plan and the surroundings, landscaping, sanitary conditions, convenience and protection from animals in the definition of home surroundings. Neighborhood qualities included air quality, plan and appearance of neighborhood, location of neighborhood, street planning, and public utilities.

Campbell et al. (1976) conceptualized people's housing environment as the residential environment consisting of the housing unit, the neighborhood and the community in which the residents are located. A comprehensive model for residential satisfaction was developed. As a conceptual model of residential satisfaction, satisfaction with each domain as a whole (i.e., with the community, the neighborhood, or the dwelling unit) is conceived to depend upon assessment of various attributes of that domain. Socio-demographic characteristics such as age, race, and income appeared as significant factors related to residential qualities and residential satisfaction, and residential qualities measured as attributes affected housing, neighborhood, and community satisfaction.

Gruber and Shelton (1987) studied neighborhood satisfaction with two sets of neighborhood evaluation variables. The first set included the characteristics of neighborhood and community, which focused on attractiveness, neighborhood, public

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service, facilities and services. The second set was neighborhood attributes, which included pleasant/friendly, traffic/noise, parking/maintenance, closed space, exterior lighting/maintenance and recreation attributes. The relationship between neighborhood attributes and neighborhood satisfaction was stronger than the relationship between neighborhood characteristics and neighborhood satisfaction. These research results indicate that evaluations of neighborhood characteristics and attributes are closely related to respondents' overall satisfaction and positive assessments of their neighborhoods.

Connerly and Marans (1985) measured and compared two perceived neighborhood qualities, satisfaction and attachment, both of which are affected by social interaction in the neighborhood. Currie and Thacker (1986) studied the quality of the urban environment as perceived by residents of slow- and fast-growth cities. Satisfaction with housing, neighborhood, friendship, and family were included in Currie and Thacker's community satisfaction model, and findings indicated that city attributes were the most powerful predictors to overall satisfaction. Jirovec et al. (1985) measured residential satisfaction by combining the scores on two separate nine-point ladder scales measuring micro (housing) and macro (neighborhood) conditions. The findings indicated that, among urban elderly men, residential satisfaction is largely a function of macro environmental conditions. Quality of housing, tenure and length of residence affected housing satisfaction (Peck and Stewart, 1985).

To study residential satisfaction, it is important to define residential quality. Researchers in housing and the residential environment have used different measurements of quality to study residential satisfaction. One of the primary considerations has been the physical condition of the structure and the presence or absence of facilities. Later, assessments of residential attributes were introduced. Kain and Quigley (1970) developed a measurement of residential quality associated with individual dwelling units by using factor analysis to aggregate some 39 indexes of the quality of narrowly defined aspects of the dwelling units, structures, parcels, and microneighborhoods. Assessments of these residential attributes may differ from person to person because each individual brings different standards of comparison to bear on their perceptions of reality (Campbell et al., 1976).

Morris and Winter (1978) indicated that two criteria, family norms and cultural norms, are important indicators of housing condition. When housing does not meet these norms then deficits occur. Quality based on the concept of the normative deficit can be defined to provide a culturally meaningful way to analyze the effects of the current housing conditions (Morris, Crull and Winter, 1976). Morris and Jakubczak (1988) operationally defined a deficit as a subtraction of a number representing a norm from a number that represents the current actual state that the norm is used to evaluate (deficit=condition-norm).

Residential satisfaction research has considered the location of residence (rural versus urban) and/or community attributes with less emphasis on the detailed community housing practices such as home financing, programs, and regulations (Campbell et al., 1976; Currie and Thacker, 1986; Jirovec et al., 1985). The quality of the residential environment can be estimated on the basis of the socio-demographic variables of the household as well as on certain extraneous variables, which are the community's housing practices. The importance of socio-psychological and physical concerns for the evaluation of the residential environment has been addressed, because both aspects of environment relate to residential satisfaction. The concept of residential assessment of Campbell et al. (1976) and the deficit concept (Morris and Winter, 1978) were applicable to the measurement of residential quality. The items that were significant in previous research were introduced into the development of new indexes of residential quality measurement. Thus, comprehensive information can be added to housing related fields by studying the relationships between the quality of the residential environment, the condition of the community, and the individual response. The purpose of this study is to develop and test a model to evaluate the quality of the residential environment and sat-

isfaction with the environment. Three research questions are addressed in the present study:

1. What is the relationship between each of the endogenous variables (residential qualities and residential satisfaction) and the exogenous variables (socio-demographic variables and housing practices)?
2. What are the relationships between residential qualities and residential satisfaction?
3. What residential qualities are important determinants of residential satisfaction?

Definition of Terms

The definitions used in this study are

Rural county - county designated as non-Standard Metropolitan Statistical Areas (SMSA) according to the 1980 census.

Residential environment - the housing unit and its surroundings including neighborhoods and community (Campbell et al., 1976).

Quality - a number which represents the tangible and intangible attributes of the residence derived from the subtraction of a number representing a deficit between ideal home and present home from the number that represents the present home state: $quality = [condition - (importance - condition)] = (condition - deficit)$.

Housing practices - financing, housing regulations, and housing programs.

Housing intermediary - housing related agencies, the adopting unit or decision makers in the housing market.

Housing affordability - spending below 30 percent of income on housing.

Methodology

Sample

Household data were collected from eight rural counties, stratified geographically, and from two urban counties in Oklahoma. Approximately 300 households from each county were selected via the telephone directory using a systematic sampling method. A total of 3,031 (rural-2,431 and urban-600) questionnaires were sent to the selected households. With the response rate of 40.55 percent (rural 41.74 percent and urban 35.99 percent), a total of 1,041 (rural 842 and urban 199) responses were used for data analysis (see Ha, 1989).

Housing intermediaries in the communities of both the rural and urban counties were included in the sample. County Cooperative Extension supervisors, Farmer's Home Administration county supervisors, regional planners, realtors, lenders, and the mayor or city manager of each community were included in the survey. All intermediaries in rural areas who were listed in the telephone directory were included in the sample, and the urban sample included ten realtors and ten lenders who were randomly selected from telephone directories. A total of 123 intermediaries were mailed surveys, and 87 responses were used for data analysis (for further information, Ha, 1989).

Instrumentation

Household. Survey items were developed by the researcher in cooperation with a research project of the Agricultural Experimental Station to elicit the respondents' assessment of the physical and socio-psychological components of their residential environment. To complete a quality measurement, each item of the residential quality index was answered using two types of scales: (a) the condition of present home and (b) the importance of this item to an ideal home. The ideal home scale ranged from "important (5)," to "unimportant (1)." The present home scale ranged from "very satisfied

(5),” to “very dissatisfied (1),” and “not present in my home (0).”

Housing Intermediary. Data of housing intermediaries were collected using a Housing Practice questionnaire which had been developed by the S-194 Southern Regional Housing Research Committee (Beamish and Weber, 1989; see Appendix A of this paper). The questionnaire provided local housing market information concerning financing, housing regulations, and housing programs. The finance index included seven items having three response levels of “not available (0),” “limited availability (.5),” and “general availability (1).” Existence of local housing programs and regulations within communities included six items and seven items, respectively, having two response levels of “no (0)” and “yes (1).”

Data Collection

Dillman’s (1978) Total Design Method for a mailed survey was used. The survey packet, which included a questionnaire, a cover letter, and a return envelope, was mailed to each intermediary and each household in the sample. A follow-up post card and follow-up survey packet were sent at two-week intervals to non-respondents.

Characteristics of the Sample

Females constituted 46.3 percent and males 53.7 percent of the household sample. The respondents’ mean age was 50.9 and the mean level of education was 13.2 years. The mean household size was 2.5 persons. The mean age of the house was 28 years (rural-29 and urban-25 years). The mean house value was \$55,070 (rural-\$45,440 and urban-\$96,745), with a median value of \$43,000. The mean monthly housing cost was \$616 (rural-\$565 and urban-\$777) and the mean income category was between \$25,000 and \$29,000. Eighty-three percent of the respondents were owners. Seventy-six percent of respondents spent less than 30 percent of their income for housing, which was interpreted as living in affordable housing.

Residential Quality Evaluation Model

As an exploratory study to develop a comprehensive residential quality evaluation model, socio-demographics and housing practices variables were introduced as co-determinants of residential quality and residential satisfaction (see Figure 1).

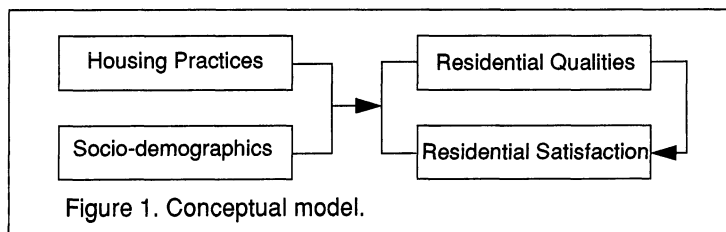


Figure 1. Conceptual model.

Variables that cause changes in other variables and the variability of which is assumed to be determined by other factors outside the model are called exogenous variables; while variables whose variation is explained by exogenous variables or other variables in the system are called endogenous (Dillion and Goldstein, 1984). According to this model, housing practices and a resident’s socio-demographic characteristics affect residential qualities and residential satisfaction; and at the same time, residential qualities are themselves having a compounding effect on residential satisfaction. Housing practices are community attributes of financing, housing programs, and housing regulations and are assumed to be independent from household socio-demographics.

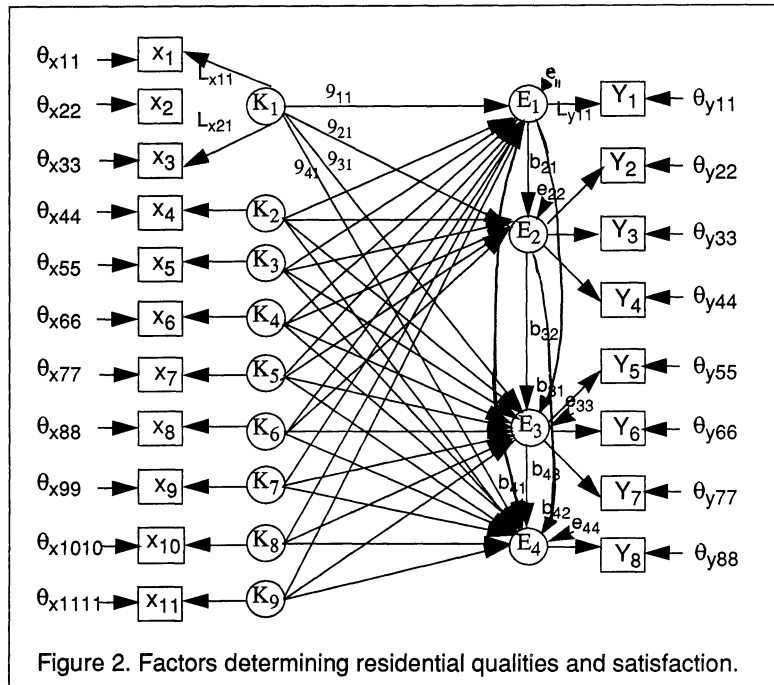
The general model tested in this study was defined by the following equations (see

Figure 2):

Structural Equation Model: $E = BE + GK + e$
 $E_4 = f(E_3, E_2, E_1, K_1, K_2, K_3, K_4, K_5, K_6, K_7, K_8, K_9)$
 $E_3 = f(E_2, E_1, K_1, K_2, K_3, K_4, K_5, K_6, K_7, K_8, K_9)$
 $E_2 = f(E_1, K_1, K_2, K_3, K_4, K_5, K_6, K_7, K_8, K_9)$
 $E_1 = f(K_1, K_2, K_3, K_4, K_5, K_6, K_7, K_8, K_9)$

Measurement Model for Y: $Y = L_y E + \theta_y$

Measurement Model for X: $X = L_x K + \theta_x$



The latent dependent (E_i) and latent independent (K_i) variables were not directly observed but appeared as underlying causes of the observed variables (Y and X). The measurement model specifies how the latent variables were measured in terms of the observed variables. The structural equation model is iterative and specifies the relationships among the latent variables (Joreskog and Sorbom, 1986). For model testing, computer analysis of Linear Structural Relationships by the Method of Maximum Likelihood (LISREL), developed by Joreskog and Sorbom (1986), was used.

Exogenous Variables

Through maximum R^2 improvement stepwise procedure, eight socio-demographic variables were introduced into the model. Tenure (rent or own), house value estimation, respondent's age, sex, race, household income, housing affordability, and age of house were selected based on R^2 improvement, MSE (mean square error), $C(P)$ (total squared error), and entrance significance level.

Operationally, the mean scores of each index of financing, housing programs, and

housing regulations were used as an observed value. The community housing practices scores were used for each household's housing practice score for each community. Before the LISREL analysis, one factor with an eigen value above 1.00 was identified and named "housing practice" through principal component factor analysis (see Table 1). "Housing practice" was introduced as a latent exogenous variable into the model.

The selected exogenous variables were as follows:

- Housing Practice = K1
- Financing = X1
- Housing Programs = X2
- Housing Regulations = X3
- Tenure = K2 (= X4)
- House Value = K3 (= X5)
- Respondent's Age = K4 (= X6)
- Respondent's Sex = K5 (= X7)
- Respondent's Race = K6 (= X8)
- Household Income = K7 (= X9)
- Affordability = K8 (= X10)
- House's Age = K9 (= X11)

Table 1. Factor analysis for housing practices: By principal component method (n=87).

	Factor 1
Financing	.895
Housing Programs	.757
Housing Regulations	.845
Eigen Value	2.007

Endogenous Variables

The seven dimensions of residential quality introduced into the model as observed variables were (a) quality of environmental safety, (b) public services quality, (c) planning/landscaping quality, (d) housing policy quality, (e) socio-cultural quality, (f) housing economics quality, and (g) physical housing quality. The seven dimensions of residential quality received a mean score and were used as the observed value.

The seven dimensions of residential quality were factor analyzed in advance to the LISREL analysis (see Table 2), and three factors were found: (a) housing quality (planning/landscaping, housing economics, and interior/structural house quality), (b) community/social quality (public services, housing policy, and socio-cultural environment), and (c) quality of environmental safety. These three factors were introduced as latent endogenous variables into the model.

The selected endogenous variables were as follows:

- Environmental Safety Quality = E1 (= Y1)
- Community/Social Quality = E2
- Public Services = Y2
- Housing Policy = Y3
- Socio-cultural Environment = Y4

Housing Quality = E3
 Planning/Landscaping = Y5
 Housing Economics = Y6
 Interior/Structural Quality of House = Y7
 Residential Satisfaction = E4 (= Y8)

Table 2. Factor analysis for residential quality index: By varimax prerotation method (n=1041).

	Factor 1 Housing	Factor 2 Comm./Social	Factor 3 Environment
Planning/Landscaping	.635	.302	.411
Housing Economics	.834	.208	.011
Interior/Structural Quality	.844	.080	.187
Public Services	.013	.845	.095
Housing Policy	.318	.597	.375
Socio-cultural	.468	.689	-.008
Environmental Safety	.127	.107	.939
Eigen Value	2.147	1.700	1.237

Model Fit

The proposed model that presents the path diagram is depicted in Figure 2. Results of the initial test of measurement models are reported in Table 3. This table shows the path coefficients from each latent variable to the observed measures presented.

Demonstration of an evaluation of the measurement model was suggested in advance of testing the existence of significant relationships among the theoretical constructs in the structural model (Fornell and Larcker, 1981; Dillion and Goldstein, 1984). The relatively high value of all coefficients (λ) indicates that these measures were good indicators of the intended latent concepts. Each of these coefficients were significant beyond the .001 level (see Table 3).

The squared multiple correlation of financing, housing programs, and housing regulations were .99, .21, and .46, respectively, which suggests that the underlying construct of housing practice explains 99 percent of variability in financing, 21 percent in housing programs, and 46 percent in housing regulations. Community/social quality explains 30 percent of variability in public services, 45 percent of housing policy, and 53 percent of socio-cultural environment. Housing quality explains 54 percent of variability of planning/landscaping, 52 percent of housing economics, and 62 percent of physical quality of housing.

The "average variance extracted" which Fornell and Larcker (1981) introduced was used for evaluation of construct validity. The average variance extracted for the construct "E", denoted by $P_{Vc(E)}$, was calculated as:

$$P_{Vc(E)} = \frac{\sum_{i=1}^p \lambda_i^2}{\{\sum_{i=1}^p \lambda_i^2 + \sum_{i=1}^p \text{Var}(\theta_i)\}}$$

The average variance of each measurement model of housing practice, community/social quality, and housing quality were .66, .56, and .74, respectively. Construct validity

has been established according to Fornell and Larcker’s suggestion of the average variance over .5.

Table 3. Standardized parameters for indicators of latent variables: Measurement model (n=744)^c.

	Lamda ^a	θ	R ²
Housing Practices			
Financing	1.000 ^b	.010	.990
Housing Programs	.492	.787	.213
Housing Regulations	.722	.541	.459
Environmental Safety Quality			
Environmental Safety Quality	1.000 ^b	.000	1.000
Community/Social Quality			
Public Services	.551 ^b	.699	.301
Housing Policy	.671	.553	.447
Socio-cultural	.729	.473	.527
Housing Quality			
Planning/Landscaping	.733 ^b	.461	.539
Housing Economics	.720	.480	.520
Interior/Structural Quality	.786	.382	.618
Residential Satisfaction	1.000 ^b	.000	1.000

^a In the process of estimating the model, the sampling variance of one indicator must be constrained and the regression coefficient set at a value of 1.0. When that latent variable has only one indicator that path coefficient remains 1.0. No t-test was possible for these constrained variables. All other coefficients were significant at the .001 level.

^b Constrained or Fixed parameter, not estimated.

^c Observations with missing values were deleted from analysis.

Table 4 presents the analysis of the full model. Housing practices, respondent’s tenure, house value, and sex were significantly related to environmental, community/social, and housing quality level.

Twenty-one of the forty-two proposed paths were not significant. All exogenous variables did not directly influence residential satisfaction. Race and affordability were not significant predictors of the respondent’s residential qualities in the present model, and this may be interpreted to be an effect of multi-collinearity. The respondent’s age and house age were not related to respondent’s environmental and community/social quality. Environmental quality did not significantly predict the respondent’s residential satisfaction.

Table 4. Standardized parameters of full model: Structural model (n=744).

Exogenous Variables	Endogenous Variables(g)			
	Environment	Community Social	Housing	R. Sat.
Housing Practices	-.075*	.125***	-.189***	.037
Tenure0=rent 1=own	.095**	.114***	.183***	-.022
House Value	.117**	.042*	.061*	.044
Age	-.022	-.023	.154***	-.007
Sex 0=female 1=male	.105**	.054*	.047*	-.021
Race 0=white 1=other	.010	-.011	-.035	-.027
Income	.113**	.022	.109***	-.044
Affordability 0=Not Afford 1=Afford	-.033	.017	-.040	-.014
House's Age	-.034	-.006	-.075***	.026
Endogenous Variables	b	b	b	b
Environment		.175***	.051*	.008
Community/Social			.881***	-.400*
Housing				1.089***
R ²	.062	.289	.764	.407
Total Coefficient of Determination for Structural Equations				.582
Goodness of Fit Index				.939
Adjusted Goodness of Fit Index				.893
Root Mean Square Residual				.044
Chi Square with 93 df				474.87***

* p<.05 ** p<.01 *** p<.001

All paths that were not significant at the .05 level were deleted in a theory trimming approach (Dillion and Goldstein, 1984) in the exploratory stage. All the significant paths in the previous model remained significant when rerunning the LISREL program without the non-significant paths. Table 5 presents the reduced model. This model was tested against the first model by comparing the difference in Chi-square and degree of freedom as follows:

	Chi-square	df	
Revised Model	494.90	114	
Original Model	<u>474.87</u>	<u>93</u>	
	20.03	21	p>.50

The null hypothesis that the revised model fits the data failed to be rejected. This result indicates that the variance explained by the revised model did not differ significantly from that explained by the original model. Since the revised model was more parsimonious, it was retained as the better model (Samdahl and Robertson, 1989).

The squared multiple correlation for environmental quality and community/social quality structural equations were not satisfactory (.06 and .28). However, the coefficient of determination for all the structural equations jointly was .55, which suggests a reasonable fit according to Dillion and Goldstein's (1984) suggestion of over .5. Because the Chi-square test is very sensitive to sample size (Dillion and Goldstein, 1984), Goodness of Fit Index, Adjusted Goodness of Fit Index, and Root Mean Square Residual from LISREL analysis were used to conclude overall model fit. These values suggest a reasonable fit.

Discussion

The standardized solution for the revised model is shown in Table 5. Environmental safety quality was significantly related to community/social quality ($b=.33$, $p<.001$) and housing quality ($b=.07$, $p<.05$). Community/social quality has a very strong relationship to housing quality ($b=.65$, $p<.001$) and is also negatively related to residential satisfaction ($b=-.16$, $p<.05$). This negative relationship might be explained by the lower residential satisfaction level of urban areas than of rural (Ha, 1989). Community/social quality, which includes socio-cultural, public services and housing policies, were higher in urban areas than in rural areas. Even though urban residents' community/social quality is higher, their residential satisfaction level is lower than in rural. Housing quality has a significant direct affect on the residential satisfaction ($b=.74$, $p<.001$).

Table 5. Standardized parameters of reduced model: Structural model ($n=744$).

Exogenous Variables	Endogenous Variables(g)			
	Environment	Community Social	Housing	R. Sat.
Housing Practices	-.078*	.236***	-.261***	-
Tenure0=rent 1=own	.097**	.205***	.253***	-
House Value	.114***	.094*	.091**	-
Age	-	-	.202***	-
Sex 0=female 1=male	.103**	.098*	.065*	-
Race 0=white 1=other	-	-	-	-
Income Affordability	.110**	-	.134***	-
0=Not Affordable 1=Affordable	-	-	-	-
House's Age	-	-	-.098***	-
Endogenous Variables	b	b	b	b
Environment Quality		.325***	.073*	-
Community/Social Quality			.652***	-.161*
Housing Quality				.735***
R ²	.060	.283	.750	.407
Total Coefficient of Determination for Structural Equations				.552
Goodness of Fit Index				.936
Adjusted Goodness of Fit Index				.893
Root Mean Square Residual				.044
Chi Square with 114 df				494.90***

* $p<.05$ ** $p<.01$ *** $p<.001$

Housing practices significantly affect quality of environmental safety ($g=-.08$, $p<.05$), community/social ($g=.24$, $p<.001$), and housing quality factors ($g=-.26$, $p<.001$). Hous-

ing practices appeared as having a negative effect on environmental quality. Previous research (Beamish and Weber, 1989) indicated that housing practices score was higher in more populated areas. This result might explain why environmental quality in a better housing practices area appeared to be lower. Housing practices also appeared to have a negative relationship with quality of housing. Housing practices relate primarily to programs and financing for the improvement of housing, whereas housing quality refers to quality of the structure. Households living in lower structural quality housing might benefit from the programs available to improve their quality of housing.

Owners in this study live with a higher environmental safety quality ($g=.10$, $p<.01$), higher community/social quality ($g=.21$, $p<.001$), and better housing quality ($g=.25$, $p<.001$) than renters. Higher house value is positively associated with environmental safety quality ($g=.11$, $p<.001$), higher community/social quality ($g=.09$, $p<.05$), and housing quality ($g=.09$, $p<.01$). The older residents appear to have better housing quality than younger residents ($g=.20$, $p<.001$). Male respondents have higher environmental quality ($g=.10$, $p<.01$), higher community/social quality ($g=.10$, $p<.05$), and higher housing quality ($g=.07$, $p<.05$) than females. Income is positively related to higher environmental quality ($g=.11$, $p<.01$) and higher housing quality ($g=.13$, $p<.001$). An older house has significantly lower housing quality ($g = -.10$, $p<.001$).

Conclusion

As an exploratory study, an environmental evaluation model was proposed and tested. Despite some measurement error, the overall model fit was acceptable. All of the exogenous variables (socio-demographics and housing practices) did not have a significant direct effect on residential satisfaction, but indirectly affected residential satisfaction through environmental, community/social, and housing quality factors. This result supports previous research results of which Lord and Rent (1987) on neighborhood satisfaction indicated neighborhood satisfaction was not significantly related to any of the demographic characteristics of the residents. Campbell et al. (1976) indicated that most of the linkages for the personal characteristics are to the assessments of environmental characteristics, rather than direct links to satisfaction measures. Marans and Wellman (1978) indicated that evaluation of specific housing characteristics was more important than the characteristics themselves in explaining overall housing satisfaction.

Environmental safety quality did not have a direct influence on residential satisfaction; but through community/social and housing quality, it affected residential satisfaction. Community/social and housing quality were direct significant factors on residential satisfaction, with housing as the most influential factor. This result differs from previous research results (Jirovec et al., 1985; Gruber and Shelton, 1987). In their research, evaluation of neighborhood characteristics and attributes were more influential to overall satisfaction than the residents' homes. However, researchers used different instruments and scale for their measurement. Jirovec et al. (1985) used two indexes of housing and neighborhood to evaluate residential satisfaction, and Gruber and Shelton's (1987) major emphasis was on the neighborhood characteristics and attributes, while this study utilized seven dimensions of residential qualities which finally aggregated in three factors.

Research results indicate that housing quality is the most influential factor on residential satisfaction, while environmental safety and community/social factor are also influential. Housing planners and developers should consider these factors when facing decision-making situations. Also, they should consider the effect of housing practices in their communities on residential qualities. Policy-makers' decisions on housing finance, housing regulation, and housing programs have direct effects on residents' residential qualities. Further research is needed from a larger geographic area to determine whether the relationships found in this study are unique. Quality scores were measured based on the comparison of present home condition and personal standards of each residential quality attribute in this study. However, condition of attributes was only measured

based on the respondents' evaluation. Inclusion of an outside specialist's measurement would increase the validity for the application of this residential quality index and evaluation model. Future studies on residential satisfaction might be approached with an observed quality measure as well as the subjective measure.

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