

Housing and Society  
Vol. 13, No. 1, 1986

*A Research Note on:*

**REPORTING ERROR AND SINGLE-FAMILY HOME OWNERSHIP NORMS  
AND PREFERENCES: A REPLICATION**

Mary Ann Sward and Earl W. Morris

**ABSTRACT**

*The purpose of this research is to further test the hypothesis that apparent differences among income classes in home ownership preferences and reported norms are due to a correctable systematic reporting error supported by Morris, Winter, and Sward in Housing and Society, Volume 11, Number 2. The data are from interviews conducted with 485 households in the Omaha-Council Bluffs area during 1977. The data were analyzed by using a four-step regression procedure. Confirming the findings of Morris, Winter, and Sward, the results indicate that housing needs and preferences for tenure and structure type do not significantly differ by income when "corrected." As in the original research, actual housing and constraints differ by income. It is the effect of these differences on the reported norms and preferences that produce the systematic measurement error.*

**PURPOSE**

The purpose of this paper is to replicate the reporting-error model tested earlier by Morris, Winter, and Sward (1984) with respect to differences among income classes in preferences and reported norms for housing tenure and structure type. They tested two hypotheses,

The first hypothesis is that households with differing levels of income have differing standards and aspirations

---

Mary Ann Sward is research assistant and Earl W. Morris is professor in the Department of Family Environment. Journal Paper No. J-12038 of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa. Project 2128, a contributing project to North Central Regional Research Project NC-128, Quality of Life as Influenced by Area of Residence, sponsored by the experiment stations of Arizona, California, Colorado, Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, Nevada, Ohio, and Texas cooperating with the Cooperative State Research Service of the United States Department of Agriculture. This specific project is a result of close cooperation between Iowa State University and the University of Nebraska. Additional funding for this project was provided by a University Research Grant from the Graduate College, Iowa State University.

for home ownership and the single-family dwelling that are culturally induced. The alternative hypothesis is that the apparent differences among income classes in housing preferences and norms are due to correctable systematic reporting error. (Morris, Winter, and Sward, 1984, p. 82)

This paper describes the results of a replication of the analysis procedures utilized by Morris, Winter, and Sward (1984). It is not intended to elaborate upon their theoretical basis, but, rather, to determine if the results that they reported are indeed confirmed by another set of data. The need for the replication arises from the fact that the original paper was based on data from small towns and cities in Iowa. The present paper includes small town and metropolitan households in the sample. The broader sample should offer more general results.

#### *PROCEDURES*

The data are taken from interviews collected from a probability sample of households in the Omaha-Council Bluffs area in 1977. Four hundred eighty-five usable interviews were collected.

##### *Analysis procedures*

Ordinary least squares regression was used to analyze the data. The dependent variables were dichotomies which presented some problems in the use of OLS regression especially when the dichotomy was skewed (Hanna and Lindamood, 1985). Numerous papers in the literature indicate that for most purposes OLS regression gives satisfactory results (Hanna and Lindamood, 1985).

##### *Operational definitions*

Three categories of variables were utilized in the analysis: 1) the exogenous or constraint variables, which included socio-economic and demographic household characteristics; 2) the intervening variables of actual tenure status and structure type; and 3) the dependent variables, preferences and norms for home ownership and structure type.

##### *Dependent variables*

Cultural norms for structure type and home ownership were the dependent variables in this analysis. The reported norms were obtained from two questions in which the respondents reported what they felt were the best type of 1) structure for the average American family and 2) ownership or rental arrangement for the average American family.

The reported structure norm was dichotomized into single-family detached and other, which included a single-family attached house (rowhouse or townhouse), a building with two or more apartments and a mobile home. Slightly more than 96 percent of the sample reported a single-family detached home as the best type of housing for the average American family.

Tenure norm was dichotomized into conventional ownership and other, which included renting, living in the dwelling without paying rent and other forms of ownership (cooperative or condominium). Over 91 percent of the respondents reported regular ownership as the best ownership arrangement for the average American family.

The combined norm variable used in the analysis was obtained by multiplying the reported norms (tenure norm x structure norm). It was dichotomized by ownership of a single-family detached home and all other. More than 89 percent of the sample reported ownership of a single-family detached dwelling as the best housing arrangement for the average American family. The three housing preference variables were constructed in the same manner. They were based on the responses to two questions about the "best type of structure for your family right now" and "the best kind of ownership or rental arrangement for your family right now." Structure preference was dichotomized into single-family detached and other. Slightly over 84 percent of the respondents reported a preference for a single-family detached structure.

Tenure preference was dichotomized into conventional ownership and all other. Over 79 percent of the sample preferred conventional ownership. The combined preference variable was obtained by multiplying the two preference variables (structure preference x tenure preference). The combined preference variable was dichotomized into ownership of a single-family detached dwelling and other. Of the sample, 76.1 percent reported a preference for ownership of a single-family detached dwelling.

#### *Intervening variables*

The actual type of structure was dichotomized into single-family detached and other. Nearly 81 percent of the sample currently live in single-family detached structures. Actual tenure status was dichotomized into conventional ownership and other. More than 73 percent of the sample own their homes.

The combined actual structure type and tenure (actual structure x actual tenure) was dichotomized into ownership of a single-family detached dwelling and other. The other category included ownership of any other type of structure and any ownership arrangement other than conventional ownership. Over 70 percent of the sample reported conventional ownership of single-family detached dwellings.

#### *Constraint variables*

The employment status of the head of household was dichotomized into full-time employment (35 hours or more per week) and other. Other includes employed part-time, unemployed looking for work, unemployed not looking for work, and unable to work due to age or disability. Over 78 percent of the sample reported full-time employment of the household head.

Education of the head of household was divided into three classes: Less than 12 years (26.8 percent), 12 years (35.1 percent), and over 12 years (38.1 percent). Age of the head of the household was divided into three classes: Up to and including 39

years (37.1 percent), 40-59 years (31.3 percent), and 60 or more years (31.5 percent).

Number of household members was divided into three classes: One member (18.4 percent), two-three members (50.1 percent), and four or more members (31.5 percent). The type of household was divided into three classes: Male head (5.8 percent), female head (23.5 percent), and couple (70.7 percent). Income (measured as total household income) was divided into three classes: Less than \$9,000 (31.5 percent), \$9,000-14,999 (24.5 percent), and \$15,000 and over (44 percent).

#### ANALYSIS AND FINDINGS

The data are analyzed by using multiple regression in four steps. Dummy variables for the exogenous variables Income <\$9,000, Income \$9,000-14,999, Age low-39, Age 40-59, Male head-of-household, Female head-of-household, Household size small (one person), Household size medium (two-three persons), Education of the head <12 years, and Education of the head=12 years are entered into the regression equation.

In the second step, dummy variables are entered into the regression equation for the interaction of income and the other exogenous variables. In the third step, the nonsignificant ( $\alpha=0.05$ ) income interaction dummy variables added in the second step are removed from the regression equation. Dummy variables for the interaction of age of household head and the other exogenous variables are added to the regression equation. In the fourth step, the nonsignificant age interaction dummy variables from the second step are removed. The intervening variable, actual housing, is then entered into the regression equation.

A somewhat more conservative procedure would be to include all interactions that are significant at the ten percent level. That procedure would result in a somewhat larger number of variables with little gain in knowledge. It is worth noting, however, that our conclusions might have been somewhat less clear cut using that procedure.

The four-step procedure is needed to provide an orderly means of testing the interaction variables. Because of the large number of interactions, a means is needed to reduce the number of variables analyzed simultaneously. It is not feasible to test all possible interactions simultaneously and still have reliable results.

Tables 1 through 3 present the analysis. In each table, the coefficients represent deviations of the indicated class from a base class. For example, the negative coefficient of -0.069 for the <12 years of education class indicates that the predicted (adjusted) mean of the dependent variable is .069 less than that of the omitted class. In this case, the omitted class is the group with more than 12 years of education.

Table 1 indicates that size of household (small), the interaction of age of head and income (<39 x <\$9,000 and 40-59 x <\$9,000), and the interaction of size of household and age of head (medium x <39) are

Table 1. Regression analysis of single-family home ownership on education, age, type of household, household size and income.

| Variable                           | Coefficient | Beta   | S.E.  | t      |
|------------------------------------|-------------|--------|-------|--------|
| Education of head                  |             |        |       |        |
| <12 years                          | -0.007      | -0.007 | 0.050 | 1.37   |
| 12 years                           | -0.089      | -0.093 | 0.049 | -1.82  |
| Age of head                        |             |        |       |        |
| <39 years                          | -0.102      | -0.107 | 0.083 | -1.23  |
| 40-59 years                        | 0.022       | 0.022  | 0.067 | 0.32   |
| Type of household                  |             |        |       |        |
| Male head                          | -0.102      | -0.052 | 0.285 | -0.36  |
| Female head                        | 0.172       | 0.159  | 0.127 | 1.35   |
| Household size                     |             |        |       |        |
| Small (1)                          | -0.565      | -0.477 | 0.134 | -4.23* |
| Medium (2-3)                       | -0.018      | -0.019 | 0.060 | -0.29  |
| Income                             |             |        |       |        |
| <\$9000                            | -0.036      | -0.036 | 0.075 | -0.48  |
| \$9000-14999                       | -0.057      | -0.053 | 0.058 | -0.98  |
| Interaction variables              |             |        |       |        |
| Age of head x Income               |             |        |       |        |
| <39 x <\$9000                      | -0.325      | -0.210 | 0.099 | -3.29* |
| 40-59 x <\$9000                    | -0.299      | -0.123 | 0.123 | -2.43* |
| Education x Income                 |             |        |       |        |
| 12 x \$9000-14999                  | 0.172       | 0.105  | 0.090 | 1.91   |
| Household size x Age of head       |             |        |       |        |
| Medium x <39                       | -0.237      | -0.190 | 0.080 | -2.95* |
| Type of household x Household size |             |        |       |        |
| Male head x Small                  | 0.460       | 0.174  | 0.325 | 1.41   |
| Male head x Medium                 | 0.207       | 0.067  | 0.311 | 0.67   |
| Female head x Medium               | -0.282      | -0.144 | 0.147 | -1.91  |
| Constant                           | 0.928       |        |       | 11.33* |
| R-squared                          | .275        |        |       |        |
| R-squared adjusted                 | .249        |        |       |        |
| F                                  | 10.44       |        |       |        |
| df                                 | 17 and 467  |        |       |        |

\*significant at  $p < .05$ ; additional interaction variables that were marginally significant ( $p > .05$  and  $< .10$ ) include age of the head (<39) by Income (\$9000-14999), household size (small) by age (<39), and type of household (female head) by household size (medium). Those variables were dropped at the step on which they were entered if they did not attain significance at the 5 percent level.

variables with significant effects in the regression equation predicting actual tenure and structure type.

In other words, small households are significantly less likely to be single-family owners than are large families. Households with young or medium-age group heads and low incomes are significantly

less likely to own than are households headed by a person in the oldest group with low income or with heads in the young and medium-age groups and with medium or high incomes. Medium-size households with a young head are significantly less likely to own than other groups.

Table 2, the regression for housing preferences, shows that actual housing is the key variable in the prediction of housing preferences. Other significant variables are young or medium age of head, female head, low income, and the interaction of age and income (40-59 x <\$9,000). When households own a single-family dwelling, they are likely to have higher preferences than nonowners and owners of other types of structures. Families with young and medium-aged heads are more likely to prefer ownership than those with older household heads. Female-headed households are less likely to prefer ownership of a single-family dwelling than are households headed by males or couples. Families with low income are less likely to prefer ownership than are families with medium or high income. Families with heads in the young or medium-age groups are less likely to prefer ownership than other age and income groups. There are plausible combinations of the values of the independent variables that could produce predicted values of preferences greater than one. This is a consequence of using OLS regression, but it does not alter the meaning of the findings.

Table 3, the regression for reported norms, indicates that the only significant predictor of single-family home ownership norms is housing preferences. Actual housing conditions is not a significant predictor of housing ownership norms when controlling on preferences. Households with strong ownership preferences are more likely to report ownership norms than are households with low ownership preferences. None of the interaction terms is significant in any of the steps. For some plausible cases, the predicted value of norms may be greater than one. That does not alter the main interpretation of the findings.

#### CONCLUSIONS

The results of this replication support the conclusion (Morris, Winter and Sward, 1984) that neither the literature nor the data analyzed provide any support for the hypothesis that the low-income class has different home ownership and structure-type norms or aspirations from other income groups. There are, thus, no grounds for assuming that lower-income groups have less strong ownership and single-family dwelling aspirations. The differences that do exist between income groups in actual housing are primarily explained by age of the household head and household size.

There are some potential interactions involving household size, income, age of the head and household type that need to be analyzed with larger samples. In particular, in the norms analysis, the interaction of female head with low income and the interaction of mid-sized household with low income may be important variables to explore further.

Table 2. Regression analysis of single-family home ownership preferences on current ownership, education, age, type of household, household size and income.

| Variable              | Coefficient | Beta   | S.E.  | t      |
|-----------------------|-------------|--------|-------|--------|
| Education of head     |             |        |       |        |
| <12 years             | 0.059       | 0.061  | 0.039 | 1.53   |
| 12 years              | -0.065      | -0.073 | 0.038 | -1.73  |
| Age of head           |             |        |       |        |
| <39 years             | 0.111       | 0.126  | 0.043 | 2.57*  |
| 40-59 years           | 0.161       | 0.175  | 0.046 | 3.47*  |
| Type of household     |             |        |       |        |
| Male head             | -0.015      | -0.008 | 0.068 | -0.22  |
| Female head           | -0.105      | -0.104 | 0.051 | -2.03* |
| Household size        |             |        |       |        |
| Small (1)             | -0.115      | -0.104 | 0.068 | -1.69  |
| Medium (2-3)          | 0.010       | 0.012  | 0.035 | 0.29   |
| Income                |             |        |       |        |
| <\$9000               | 0.093       | 0.101  | 0.045 | 2.07*  |
| \$9000-14999          | 0.005       | 0.005  | 0.044 | 0.12   |
| Interaction variables |             |        |       |        |
| Age of head x Income  |             |        |       |        |
| 40-59 x <\$9000       | -0.186      | -0.085 | 0.084 | -2.21* |
| Education x Income    |             |        |       |        |
| 12 x \$9000-14999     | 0.044       | -0.085 | 0.069 | -2.21  |
| Actual housing        | 0.573       | 0.615  | 0.035 | 16.53* |
| Constant              | 0.288       |        |       | 4.44*  |
| R-squared             | .505        |        |       |        |
| R-squared adjusted    | .492        |        |       |        |
| F                     | 36.99       |        |       |        |
| df                    | 13 and 471  |        |       |        |

\*significant at  $p < .05$ ; one additional interaction variable with significance between .05 and .10 is type of household (female head) by income (<\$9000). That variable was dropped at the step it was added because it was not significant at the 5 percent level.

Preferences are somewhat related to age of the household head, type of household head and income, but are primarily related to actual housing conditions. In this replication, reported norms are only significantly related to preferences. There is no direct effect of income on conditions or norms.

There is no evidence to suggest that housing needs for tenure and structure type differ by income. Only constraints and preferences differ. Lower-cost housing programs that neglect home ownership and single-dwelling options for families must be justified on other grounds than cultural saliency and concern for income-differentiated needs.

Table 3. Regression analysis of single-family home ownership norms on preferences, current ownership, education, age, type of household, household size and income.

| Variable           | Coefficient | Beta   | S.E.  | t      |
|--------------------|-------------|--------|-------|--------|
| Education of head  |             |        |       |        |
| <12 years          | -0.032      | -0.046 | 0.038 | -0.85  |
| 12 years           | 0.014       | 0.022  | 0.032 | 0.44   |
| Age of head        |             |        |       |        |
| <39 years          | 0.032       | 0.050  | 0.042 | 0.75   |
| 40-59 years        | 0.016       | 0.024  | 0.042 | 0.37   |
| Type of household  |             |        |       |        |
| Male head          | 0.053       | 0.040  | 0.066 | 0.80   |
| Female head        | -0.030      | -0.042 | 0.050 | -0.61  |
| Household size     |             |        |       |        |
| Small (1)          | 0.086       | 0.107  | 0.066 | 1.30   |
| Medium (2-3)       | 0.018       | 0.029  | 0.034 | 0.52   |
| Income             |             |        |       |        |
| <\$9000            | 0.013       | 0.019  | 0.040 | 0.32   |
| \$9000-14999       | 0.013       | 0.019  | 0.035 | 0.38   |
| Actual housing     | 0.003       | 0.005  | 0.042 | 0.08   |
| Preferences        | 0.240       | 0.331  | 0.045 | 5.37*  |
| Constant           | 0.667       |        |       | 10.49* |
| R-squared          | .105        |        |       |        |
| R-squared adjusted | .082        |        |       |        |
| F                  | 4.61        |        |       |        |
| df                 | 12 and 472  |        |       |        |

\*significant at  $p < .05$ ; additional variables that were significant at ( $p > .05$  and  $< .10$ ) include household size (medium) by income ( $< \$9000$ ), type of household (female head) by income ( $< \$9000$ ), household size (small) by education (12 years), and type of household (female head) by education (12). Those variables were dropped at the step they were entered if they did not attain significance at the 5 percent level.

#### REFERENCES

- Morris, E. W., Winter, M. and Sward, M. A. Reporting error and single-family home ownership norms and preferences. *Housing and Society*, 1984, 11, 82-97.
- Hanna, S. and Lindamood, S. Ownership and ownership preference: A comparison of OLS and Logit regression. *Housing and Society*, 1985, 12, 133-146.