

EXPLORING ASSOCIATIONS BETWEEN SUBJECTIVE AND OBJECTIVE ASSESSMENTS OF HOUSEHOLD MEMBERSHIP

Laurie Schwede and Yukiko Ellis¹, U.S. Bureau of the Census
Laurie Schwede, U.S. Bureau of the Census, Washington, DC 20233-9150

KEY WORDS: Census, Roster Research, Residence rules

INTRODUCTION

In censuses and surveys researchers often ask one respondent to list the people living or staying in the residence, referring to the group as a “household” and the individuals as “household members” or “usual residents.” These data form the basis of census counts as well as periodic reports on household and family composition. The quality and completeness of these data and reports depend, in part, on whether respondents read, understand, and apply the rules when deciding whom to list. We assume that one household respondent can and will accurately classify everyone attached to the household, according to our residence rules. However, respondents may use other criteria in deciding who is a household member or a usual resident, particularly when a person’s residence status is not clear, is in transition, or differs from common patterns.

Recognizing this, the Census Bureau and Research Triangle Institute (RTI) developed the Living Situation Survey (LSS), in part, to explore factors respondents use in determining usual residence and household membership and to identify unusual living situations that could have coverage implications.² In the interview, we asked respondents direct subjective questions about whether they considered themselves and others to be household members. We also asked questions about objective social attachments identified in previous cognitive research as associated with residence status decisions.

The aim of this paper is to use the LSS data to compare subjective and objective assessments of household membership and discuss the implications for questionnaire design and for coverage improvement. We compare the consistency of the household respondents’ subjective assignment of membership status with the rostered individuals’ subjective assessments of their own membership statuses, identifying inconsistencies that could lead to coverage errors. We then examine associations between the household respondents’ subjective assessments of household membership status and twelve objective measures of each person’s social attachments to the household, using loglinear analysis. Finally, we discuss the implications of these findings for survey research and for coverage improvement.

THE LIVING SITUATION SURVEY

The Living Situation Survey was a national probability sample of households conducted in 1993 with oversampling of minorities and renters at high risk of census undercoverage. The design included both household and individual level interviews. Nine hundred ninety-nine respondents completed a household questionnaire on the people associated with the housing unit during the most recent two to three month reference period, and individual questionnaires on themselves. Individual level data only were provided by 452 other rostered persons. Our analysis is based on these 1451 respondents for whom both household and individual level data are available.

For each rostered person, the household respondent was asked, “Do you consider (NAME) to be a member of this household?” Each individual respondent was asked “At which of the places we have listed did you consider (yourself/NAME) to be a household member?” The individuals, or in some cases, proxies familiar with their living situations, were also asked to identify the places they had stayed in and answer questions about the attachments they had to each place.

Most of the objective measures of household social attachments in the LSS³ were derived from Gerber’s 1989 small-scale cognitive study of residence concepts. She examined how respondents used basic residence concepts, such as “live,” “stay” and “visit,” and how they resolved ambiguous residence situations in vignettes. In deciding where the characters lived, respondents used criteria such as whether the person eats there, sleeps there, keeps belongings, and makes rules. Gerber concluded that these social attachment criteria were indicators of a conceptual system her respondents used to make residence decisions.

We felt that further research on the residence concepts and social attachments naturally used by respondents held promise of developing better, more respondent friendly questions that might increase census coverage. Gerber and I added these social attachments to the Living Situation Survey.

COMPARISON OF SUBJECTIVE ASSESSMENTS OF HOUSEHOLD MEMBERSHIP

We turn now to the comparison of household and individual respondent s’ subjective assessments of each rostered person’s household membership status. Of the 999 household respondents, all but 2 identified

themselves as household members. Of the 452 non-household respondents, whom I will call “other individuals,” 95.7% were designated as household members by the household respondents. In contrast, a slightly higher 96.9% of the “other individuals” classified themselves⁴ as household members.⁵

When we compared the subjective household membership assessments of household respondents and non-household respondents, we found that 385 unweighted comparisons were consistent: in 344 cases both said the person was a member, and in 44, both said he/she was not. However, in 50 cases, there were inconsistent subjective assessments by household respondents and by non-household respondent individuals. In 39 of these, the household respondents did not consider the individuals members, but the individuals or their proxies did. These persons are at risk of being omitted from the roster and the census. In examining these unweighted cases, we noticed some overrepresentation of the 18-29 age group and of minorities: minorities represented about two-thirds of the inconsistencies in household membership status but less than half of the non-household respondents interviewed. Table 1 shows the potential omission rates in the U.S. population generated by these inconsistent cases by race/ethnicity, and age. The chi-square test for equality of proportions, using the weighted data, was statistically significant at $p=.05$ for age only. These results suggest that mismatches in the subjective assessment of household membership by household respondents and other individuals may lead to omissions from rosters, particularly among those aged 18-29, and potentially among minorities, two subpopulations known to be undercounted in the census (Robinson et al 1991).

The remaining 11 inconsistent cases resulted from the household respondent considering individuals to be household members while the individuals or their proxies did not. These cases are potential overcounts. The remaining 17 cases had missing data.

Although the number of cases in this consistency analysis is small, the results suggest that inconsistencies between self- and household respondent reported residence status may be a factor in census errors.

The subjective household membership data also show that not every one of the “other individuals” claimed one and only one household membership. While 92.4% claimed one household membership, 6.8% claimed two, and 0.2% claimed three, while 0.6% claimed no household membership.⁶ Those claiming more than one membership during the reference period are at risk of overcounting. Those claiming no household membership are likely omissions, particularly because in the actual cases, the household respondents said they were not members. These may be homeless persons who,

according to the census rules, are to be listed on the household respondents’ rosters even if they aren’t considered members or usual residents.

COMPARISON OF SUBJECTIVE AND OBJECTIVE ASSESSMENTS OF HOUSEHOLD MEMBERSHIP

We now examine the assumption that the objective social attachments to the household may be indicators of the conceptual system respondents use to assess each person’s membership status. We treat these attachments as independent variables to see if they predict how household respondents answered the subjective question, “Do you consider this person to be a member of this household?” If the attachments predict household membership, they might be adaptable as future questionnaire roster questions or probes. We limit our analysis now to those rostered people who completed individual forms and who were 18 or more years old (some of the attachments were irrelevant or misleading for children). This yielded a sample size of 1129 individuals for this analysis.⁷

We conducted loglinear analysis to examine relationships of the household respondent’s subjective assessment of each person’s membership status with the 12 dichotomous objective attachments identified in Note 3. This was run on Fay’s CPLX software because the data were collected in a stratified cluster sample. Loglinear models were fit, using the stepwise selection of explanatory variables. Several models were fit with these attachments. The best model includes two attachments predicting the household respondent’s subjective assessment of household membership. These attachments are “help with chores, such as cleaning house or watching children” and “have a say in making house rules.” Table 2 presents the summary of this model. The parameter estimate for the two-way interaction term between the response and help with chores was positive, indicating that persons who answered “yes” to help with chores were more likely to be assessed as household members by the household respondents than persons who answered “no.” The parameter estimate for the two-way interaction term between the response and “have a say in making house rules” was also positive.

The standardized value was obtained by dividing a parameter estimate by its standard error. The greater the absolute value of the standardized value the more important the parameter is in predicting the response. Both two-way interaction terms had standardized values close to 3, showing their importance in predicting the response independently. The three-way interaction among household membership, chores, and rules was not statistically significant. Hence, the results of the loglinear analysis indicate that chores and rules taken

together are the best predictors of affirmative answers to the household membership question by the household respondent.

This group of attachments makes sense. Most people staying at a household would be likely to eat and sleep there, whether they were members or just guests. Hence the basic “yes/no” eating and sleeping questions may not do well in distinguishing between members and nonmembers. But tasks such as helping with chores and making house rules are more likely to be reserved for members and less likely to be done by non-members, making these attachments useful in predicting membership. This suggests that an objective measure of household membership might be obtained in surveys by adding questions on these two attachments.

However, questions about participation in making rules and doing chores might seem odd as roster questions at the beginning of a survey. One solution is to use other roster questions, move to the demographic questions for each rostered person, and add questions on helping with chores and making rules for those 18 or older.⁸ The attachment questions might be used as backups to a direct residence or membership question when trying to resolve ambiguous cases.

The second analysis examines whether an additive scale of these attachments would produce a better fitting model. Respondents were given one point for each attachment they had to the housing unit, for a maximum score of 12. To reduce the number of cells with zero, we grouped the respondents into two categories: those with 0 to 9 attachments and those with 10 or more. We used loglinear analysis to test the relationship between the additive attachment scale and the household respondents’ subjective membership assessment. We did obtain a better fitting model, shown in Table 3, including the scale and the rules variable.

The parameter estimate for the two-way interaction term between the response and the scale variable is positive. The persons responding “yes” to 10 or more social attachment questions were more likely to be identified as household members by household respondents than persons responding “yes” to fewer than 10 questions. The parameter’s large standardized value indicates that the scale of objective social attachments variable was very important in predicting the household respondent’s subjective household membership assessment.⁹

These results suggest two things. First, there are different scale distributions for those who are and are not considered household members by a household respondent. Individuals identified as members had a mean scale score of 11.6, just under the maximum scale score of 12. This indicates that all of the objective attachments are important factors associated with

decisions about a person’s household membership status. Second, even the persons not considered household members had a mean score of 8 of a possible 12 attachments. This suggests that the attachments used in this analysis are indicators of a basic conceptual system that respondents use to assess the residence statuses of people associated with their households. These results indicate that Gerber’s delineation of indicators of the residence concept cognitive system used by low- and middle-income African-Americans applies to the wider population as well. Further research might refine and/or identify new objective attachments associated with residence determinations.

IMPLICATIONS OF THE RESULTS FOR THE CENSUS BUREAU AND OTHERS

The analysis of inconsistent subjective assessments of household membership by household respondents and individuals in the Living Situation Survey revealed a small number of individuals who might be undercounted when census forms are completed by just one household respondent. Some of these belong to populations known to be undercounted. This suggests that census errors may occur in some cases because one household respondent completes the census or survey form. That person’s assessment of membership may not match the assessments of the others in that household. Coverage might be improved if we supplemented a household census form for one household respondent with individual booklets for other persons in the household to complete. Individual booklets were used in 2 of 6 Alternative Questionnaire Experiment long forms in the 1990 census, but the slight coverage increases could not be directly attributed to this design feature (Bates 1991). We might try a small-scale pilot study of individual booklets for use with the short census form and assess whether the new format produces coverage gains.

The subjective analysis of self-reported household membership also revealed that 7% of the weighted Living Situation Survey population claimed membership in more than one household. These people could be overcounted. It also identified a small number with no household membership. These may be homeless people who are hard to locate and enumerate in the census. Further research on the effects of no membership and multiple household memberships on coverage is recommended.

The scale of household membership and/or the attachment questions shown earlier through loglinear analysis would probably not be used in a census where the number of questions is minimized to control costs and speed processing. However, the scale and attachment questions would fit in surveys such as the CPS, SIPP, and non-Census Bureau surveys asking

questions about household composition and dynamics over time. In surveys conducted by personal interview, the field representative might conduct the interview with more than one respondent present. The scale and/or specific attachment probes could be used to explore the changing dynamics of household membership in anthropological and sociological studies of relationships and functions within and between households over time.

REFERENCES CITED:

Bates, N. 1991. "The 1990 Alternative Questionnaire Experiment: Preliminary Report of the 100-Percent Items." Center for Survey Methods Research Report.

Forsyth, B. 1993. "Living Situation Analysis Memorandum" to L. Schwede, November, 29 1993.

Gerber, E. 1989. "Calculating Residence: A Cognitive Approach to Household Membership Judgements among Low Income Blacks." Center for Survey Methods Research report.

Robinson, G.B. Ahmed, P. Das Gupta, K. Woodrow.. 1991. "Estimating Coverage of the 1990 United States Census: Demographic Analysis." Paper presented at the American Statistical Association Annual Meeting.

Schwede, L. 1993. "An Empirical Exploration of Residence Rules: The Living Situation Survey." Paper presented at the American Statistical Association Annual Meetings in San Francisco, 1993. Published in the Conference Proceedings Volume of the Section on Survey Methods Research.

Sweet, E. and N. Alberti. 1994. "Coverage Implications of Using the Term 'Usual Residence.'" Paper presented at the 1994 American Statistical Association Meetings in Toronto.

NOTES:

¹ Elizabeth Sweet contributed to this paper by running the first loglinear analyses on CPLX software.

² A full description of the purposes, goals, and design features of the Living Situation Survey is found in Schwede (1993).

³ The 12 measures of attachment to households were obtained by asking, "When you stayed at (PLACE NAME), did you: 1) Eat (t)here most of the time? 2) Sleep (t)here most of the time? 3) Have your own room/space? 4) Feel free to invite visitors at any time? 5) Help with chores, such as cleaning house or watching children? 6) Have your name on the lease or mortgage? 7) Have a say in making house rules? 8) Use the address to receive mail, phone calls, or messages? 9) Have a key and the right to come and go at any time? 10) Contribute money for rent, food, or bills? 11) Keep furniture, T.V., or other large belongings (t)here? 12)

Keep personal belongings such as clothing or jewelry (t)here? Three additional attachments on the questionnaire were not used in this analysis.

⁴ The LSS design specified situations in which proxy interviews were required or allowed for non-household respondent individuals. All children under 13 were to be proxied by the adult most knowledgeable about their living situation. This produced 151 proxied interviews. Residents 13 or above could be proxied if they had been away from the sample housing unit less than eight nights and were not present at the household interview time. Special efforts were made to interview mobile residents, but if reasonable efforts to interview them failed, proxies were allowed in order to avoid missing the person entirely. Of the 300 respondents 13 or older, 45% were proxied by an adult knowledgeable about their living situation. The overall proxy rate for the individual interviews was 63%.

⁵ For other consistency analyses on the LSS, see the Forsyth Memorandum (1993) for household membership and the Sweet and Alberti paper on usual residence in this volume.

⁶ These results are based on the 452 non-household respondent individuals. We do not have comparable data for household respondents.

⁷ We excluded the following groups of persons 18 and over: 4 respondents who had missing data on household membership, 39 who had more than 6 missing answers on an attachment question, and 72 who were missing on all attachment questions.

⁸ We have not yet determined which attachments are predictors of membership for those under 18.

⁹ Household respondents reporting on their own membership statuses and attachments comprised a large majority of the 1129 persons on which these loglinear results are based. Thinking that some household respondents might assess their own attachments differently than those of other rostered persons, we decided to run the same loglinear analyses but include just those cases where the household respondent was assessing attachments for other individuals. Analyses summarized in Tables 2 and 3 were repeated for the 229 rostered persons 18 or older with sufficient data on the critical variables. The loglinear results showed few differences from those analyses that included both the household respondents and the "other individuals" shown in these tables.

TABLE 1
POTENTIAL OMISSION RATES IN THE U.S. POPULATION:
PROPORTIONS OF INDIVIDUALS IDENTIFIED AS HOUSEHOLD MEMBERS BY
INDIVIDUALS OR PROXIES BUT NOT BY HOUSEHOLD RESPONDENTS

Standard errors are presented in parentheses

RACE/HISPANIC ORIGIN:	White and Other		Black		Hispanic
Potential omission rates	0.83% (0.47%)		0.96% (0.59%)		1.34% (0.62%)
AGE GROUPS:	<13	14-17	18-29	30-49	50+
Potential omission rates ¹	0.37% (0.34%)	0.26% (0.30%)	5.32% (3.22%)	0.19% (0.11%)	0.20% (0.13%)

TABLE 2
BEST LOGLINEAR MODEL AMONG THREE DEMOGRAPHIC VARIABLES
AND TWELVE SOCIAL ATTACHMENT QUESTIONS

Margins fitted under the model:
 Membership by Chores
 Membership by Rules
 Chores by Rules

Jackknifed Pearson Chi-Square Value for overall fit = 0.05 with 1 d.f. (P=0.30)

Estimated Parameter Estimates, Estimated Standard Errors and Standardized Values:

	Beta Parameter	Standard Error	Standardized Value
Membership	1.807	0.521	3.469
Membership*Chores	1.295	0.445	2.914
Membership*Rules	1.741	0.584	2.984

TABLE 3
BEST LOGLINEAR MODEL AMONG THREE DEMOGRAPHIC VARIABLES,
TWELVE SOCIAL ATTACHMENT QUESTIONS AND A SCALE VARIABLE

Margins fitted under the model:
 Membership by Scale
 Membership by Rules
 Scale by Rules

Jackknifed Pearson Chi-Square Value for overall fit = - 0.96 with 1 d.f. (P>0.50)

Estimated Parameter Estimates, Estimated Standard Errors and Standardized Values:

	Beta Parameter	Standard Error	Standardized Value
Membership	2.322	0.517	4.492
Membership*Scale	1.721	0.427	4.028
Membership*Rules	0.834	0.389	2.145