The Effect of Neighborhood Characteristics on Nonresponse in the Bronx Test Site of the American Community Survey

Joseph J. Salvo and Arun Peter Lobo
NYC Department of City Planning, 22 Reade Street, Suite 4W, New York, NY 10007

Introduction

The decennial census "long form," which is sent to approximately one-in-six households, has been the primary source of small area social and economic data used by local policy makers, program planners and service providers. However, given the increasing pace of change in many communities, the provision of data once every ten years has become a serious handicap for local officials. This has led the Census Bureau to pilot test a continuous measurement program, known as the American Community Survey (ACS), that will provide socioeconomic data throughout the decade using a "census-style" long form (Alexander, 2000; Prewitt, 2000; National Research Council, 2001). The ACS is being currently tested in 31 sites across the nation and is expected to be fully operational in 2004, when it will have a monthly sample of 250,000 households and cover every county in the U.S. Data from the 12 monthly samples would be averaged to derive annual estimates, compared to the single point-in-time (April 1) snapshot provided by the decennial census. The ACS would provide more timely data, with slightly higher levels of sampling variability (Alexander, 2002). As plans currently stand, 2010 would be a "short form" only census that would obtain basic demographic information for the purposes of reapportionment and redistricting; socioeconomic data for small areas would be available exclusively from the ACS.

Given the proposed elimination of the census long form, data users have called on the Census Bureau to better demonstrate the effectiveness of ACS data collection methods at the small area level, which would attest to the overall quality of the program (Hernandez, 2001). In response, the Census Bureau has reached out to researchers who have experience with the test sites to help evaluate the ACS. This paper is one such evaluation and focuses on the Bronx, one of the five counties that comprise the City of New York. The Bronx, with 1.3 million residents, has a large number of hard-to-enumerate neighborhoods. This paper examines whether the quality of ACS data in the Bronx varies across the neighborhood spectrum, focusing specifically on how neighborhood socio-demographic factors influence nonresponse, as measured by mail return and allocation rates. It also examines whether these neighborhood factors have a differential impact on nonresponse in the ACS and decennial census, and discusses reasons why this may be so. The paper concludes by discussing whether the proposed elimination of the decennial long form and its replacement with the ACS is a good tradeoff for users of small area data.

Measures of Nonresponse in the ACS and Decennial Census

Mail Return Rates

The Bronx data used in this study include a nine percent ACS sample (three percent each year for 1999, 2000 and 2001) and the 2000 Census long form 15 percent sample. We compare the two surveys by examining nonresponse, an excellent measure of data quality. The first measure used is the mail return rate, which refers to the percentage of households that returned their questionnaires by mail. While not a measure of final response, mail return is an excellent measure of initial cooperation: the larger the mail return rate, the fewer households that need to be pursued in nonresponse follow-up. Moreover, because questionnaires returned by mail tend to be more complete than those obtained through nonresponse follow-up, a low mail return rate may affect overall data quality (Edmonston and Schultze, 1995). Earlier work in the Bronx has shown this is especially true for the census, since the quality of completed census questionnaires obtained through nonresponse follow-up is far poorer when compared to the ACS (Salvo et al., 2003).

While the focus of this paper is on how these rates vary at a small area level, the nine percent sample from the ACS was insufficient to conduct reliable analyses at the census tract level. Therefore, the 355 Bronx census tracts were grouped into 88 neighborhoods, based on key demographic and socioeconomic characteristics, along with local knowledge of community boundaries. Table 1 shows that the 88 areas

averaged about 5,200 housing units each[1]. The neighborhood mail return rates in ACS and census are shown in Figure 1; the average neighborhood mail return rate was higher in the 2000 Census than in the ACS, 51.9 percent versus 34.2 percent (Table 1). Further, mail return rates in the ACS exhibited greater variability than in the census, with the range extending from a low of 22 percent to a high of 64 percent (data not shown). The range among neighborhoods in the census, while still substantial, was more limited, from a low of 38 percent to a high of 70 percent. The higher decennial mail return rate is primarily a function of the enormous publicity received by the census – what some refer to as the "census environment factor" (Love et al., 1995). The lack of such an environment for the ACS is clearly reflected in its lower mail return rate.

Allocation

While mail return rates are a gauge of initial cooperation, the level of imputation is a good way to evaluate the final effects of nonresponse (Office of Information and Regulatory Affairs, 2001). Once questionnaires (both from mail back and nonresponse follow-up) are deemed to be minimally complete[2] in the census and in the ACS, these records form the universe on which imputation of missing information for sample items is performed. While these questionnaires met the minimal standard for inclusion in their respective samples as interviews, it is important to examine the completeness of the sample items themselves, as gauged by their level of imputation. Imputation refers to the content edit process that takes known values from completed item responses and uses them to impute values for items that are missing or inconsistent (Groves and Couper, 1998; Citro, 2000). Both the census and ACS refer to these imputations as allocations. An allocation rate is the percent of respondents eligible to answer a question who did not respond and, as a result, had their responses imputed. Allocation rates were calculated by neighborhood, indicating nonresponse for four questions:

1. Where was this person born? (*birthplace*)
2. Did this person live in this house or apartment five years ago (census) or one year ago (ACS)? (*mobility*)
3. What kind of work was this person doing? (*occupation*)
4. Income in 1999 (census) past 12 months (ACS) from wages, salary, commissions, bonuses, or tips from all jobs? (*wages*)

For all four items, the average level of allocation for the 88 neighborhoods was higher in the 2000 Census compared to the 1999-2001 ACS (Table 1). For *mobility* (11 percent), *birthplace* (15 percent), and *occupation* (26 percent), the level of allocation in the 2000 Census was about twice that of the ACS. Although the difference was narrower for *wages*, it was still substantial, with 26 percent allocated in the census compared to 17 percent in the ACS.

Earlier research on the Bronx has established that the ACS and the decennial census long form are very different from a data collection standpoint (Salvo et al.,

[1] The largest neighborhood, Co-op City, was the only neighborhood where the total number of housing units in the ACS (20,400) diverged substantially from the number in the 2000 Census (15,200). This development has been a source of difficulties for the Census Bureau in the past, because of addressing conventions that contain hyphens and a unconventional pattern of streets. It is possible that such difficulties produced MAF anomalies that were handled differently in the 2000 Census and in the sample drawn for the ACS.

[2] In the 2000 Census, "minimally complete" refers to questionnaires that were "sample data-defined," which means that at least two 100 percent questions and two sample population questions were completed by at least one respondent in the household. Households that meet this threshold are included in the base for sample estimates; those that fall short are dropped from the sample. The ACS uses the "acceptability index," which is broadly defined as the number of basic ("100 percent") questions answered divided by the number of persons in the household. An index of 2.5 or more is considered by the Census Bureau to constitute an interview; any household that fails to make this threshold is deemed a "non-interview" and is adjusted for in the weighting as if the ACS had not received a questionnaire. Earlier research using the "sample data-defined" criterion on both the census and the ACS found that the 2000 Census failed this "minimal completeness" test more than the ACS, with more than 22 percent of all long forms being discarded from the base of sample estimates in the Bronx (Salvo et al., 2003).

2003). The sole focus of the ACS is on the collection of complete long form information and it has adopted effective strategies in nonresponse follow-up to meet this goal. This includes the use of experienced interviewers, the use of telephone interviews, and a follow-up of only one-in-three nonresponding households, strategies that have enabled the ACS to collect more complete long form data in nonresponse follow-up (Salvo and Lobo, 1997).[3] In comparison, the decennial census's focus is on the constitutionally mandated population count for the purposes of reapportionment; the long form content frequently takes a back seat in nonresponse follow-up efforts. Furthermore, the census relies on a temporary workforce of interviewers, most of whom get minimal training, and it follows-up every nonresponding household. Indeed, while the mail return rate for the 2000 Census was higher than in the ACS, less efficient nonresponse follow-up resulted in higher levels of allocation for key long form items (Salvo et al., 2003).

Socio-Demographic Characteristics of Bronx Neighborhoods

In order to examine neighborhood correlates of nonresponse, variables were created to gauge the social and economic characteristics of the 88 neighborhoods being examined. In an effort to stay at least partly independent of the ACS and decennial census, data from administrative records, vital statistics, and the full count census[4] were included in this analysis. Table 2 lists the seven variables obtained from the above data sources along with the means and standard deviations for the 88 neighborhoods. These included measures of socioeconomic distress, nativity, and race, which were chosen as they relate to important dimensions of survey response (Bruce and Robinson, 2001; Word, 1997; National Research Council, 2001).

Socioeconomic distress was measured using administrative data from New York City's Human Resources Administration for the period 1999-2001. These data represent the broadest definition of persons in need, and include persons in at least one of the following categories: those receiving public assistance benefits, those receiving Supplemental Security Income, and those eligible for Medicaid benefits. The average for the three year period was expressed as a percent of the total population of a neighborhood from the 2000 Census (*public assistance*). An average of 29 percent of the population was drawing some form of *public assistance* over the 88 neighborhoods, with a substantial amount of variation, as indicated by the standard deviation (sd) of over 13 percentage points (Table 2). So that we did not rely on a single data set for this measure, another indicator of economic distress was obtained from vital statistics, in the form of births to mothers who were on Medicaid in 2000 (*medicaid births*). The 88 areas had an average of over three-fifths of births to mothers on Medicaid, with a standard deviation of 18 percentage points.

An indicator of immigrant presence was developed using births to foreign-born mothers, from vital statistics (*foreign-born*). These data are for resident births in 2000. Given the high fertility and youthful age distribution of the major immigrant populations in the borough, this measure does a good job in identifying immigrant areas. More than 42 percent of the births in Bronx neighborhoods were to foreign-born women, with substantial variation (sd=14).

Survey response has been shown to be related to race, especially in the census (Bruce and Robinson, 2001). The percent of population that was nonhispanic black (*nonhispanic black*) or Hispanic *(Hispanic)* was obtained from Summary File 1 of the 2000 Census. Bronx neighborhoods average 32 percent *nonhispanic black* (sd=19) and 48 percent *Hispanic* (sd=20). Also obtained from Summary File 1 was the percent of households that were *renter-occupied*, with over four-in-five households in this category (sd=17). Finally, in

[3] The ACS utilizes a combination of Computer Assisted Telephone Interviews (CATI) and Computer Assisted Personal Interviews (CAPI) for households that do not mail back their questionnaires. CATI is attempted for all households that fail to mail back their questionnaires, while those that do not respond via CATI are then sub-sampled at a rate of one-in-three for CAPI (the Census Bureau is currently reviewing this procedure in an effort to boost CAPI in low mailback areas). Unweighted, CAPI cases constituted approximately four-fifths of all cases in non-response follow-up.

[4] The data from the 100 percent census are largely independent from the sample census items, because these were based on 100 percent of all households and not on the approximately one-in-six sample used for the long form.

order to control for the effect of age on the propensity to respond to the census, a variable indicating the *percent age 60 and over* was used from Summary File 1 that averaged 13 percent for the 88 neighborhoods (sd=6).

The substantial level of variability in the social and economic measures developed for this analysis is indicative of the of the diversity of neighborhoods across the Bronx. We next turn to how these measures are associated with nonresponse.

Analysis of Mail Return Rates

The zero-order correlation coefficients in Table 3 provide insight into some of the differences between the ACS and census in the factors that affect mail returns. In the ACS, economically distressed neighborhoods were associated with lower mail return rates, as seen in the strong negative coefficients for *public assistance* (-.70) and *medicaid births* (-.81). A large *percent age 60 and over* led to higher levels of mail returns (.82), which is consistent with the high level of survey compliance among older adults. Lower ACS mail returns were evident in areas with larger numbers of *Hispanics* (-.55), *renter-occupied* units (-.53), *nonhispanic black* residents (-.39) and births to *foreign-born* mothers (-.30).

The census mail return picture was very different from that of the ACS. There was little or no relationship between socioeconomic distress and mail returns, as gauged by *public assistance* (.13) and *medicaid births* (-.12). Areas with higher *percent age 60 and over* did have higher mail return rates, but the coefficient (.18) was very weak compared to that for the ACS (.82). The strongest relationship was with race, in the form of lower mail returns in *nonhispanic black* neighborhoods (-.50). The next highest coefficient was between *foreign-born* and census mail returns, a modest -.38, indicating that neighborhoods with higher percentages of foreign-born births had lower mail return rates in the 2000 Census.

The relatively weak and positive coefficient (.22) for *renter-occupied* units and census mail return is likely related to the fact that the nonhispanic black neighborhoods with the lowest mail return rates also had relatively low levels of renter-occupancy. For example, the north Bronx neighborhoods of Wakefield, Williamsbridge and Eastchester, were among the lowest on census mail return. These areas had levels of renter-occupancy that were all under 50 percent, well below the borough average of 82 percent. Moreover, these areas were characterized by low levels of *public assistance,* testimony to their higher socioeconomic levels. This helps explain the low correlation of *public assistance* and *renter-occupied* with census mail return rates.

Perhaps the most striking relationship in Table 3, is between the ACS and census mail return rates themselves. In the Bronx, the two were only moderately correlated, with a coefficient of .42. Therefore, the mail return for neighborhoods in the 2000 Census were not a very good predictor of return rates in the ACS. This was primarily due to the performance of the 2000 Census in economically distressed neighborhoods that was not matched by the ACS.

Multivariate Analysis

In an effort to better sort out these effects, a multivariate analysis was conducted where the mail return rate was regressed on a set of independent variables, separately for the ACS and the census. Based on the analysis above and the correlations between variables, three variables emerged as representing factors that were at least moderately related to mail return rates on the ACS or the census – *public assistance, foreign-born* and *nonhispanic black*. Also, given the high correlation between *percent age 60 and over* and the ACS mail return rate, this variable was included as a control in the ACS equation only. Other variables had effects that were either not meaningful or were too highly correlated with other predictors to be useful in the specification presented in Table 4.[5]

The results show that mail return rates on the ACS were closely related to *public assistance* across Bronx neighborhoods, after controlling for *nonhispanic black, foreign-born* and *percent age 60 and over*. Each percentage point increase in *public assistance* resulted

[5] High correlations were apparent between *public assistance* and *medicaid births* (.87), *Hispanic* (.82), *renter-occupied* (.82), and *percent age 60 and over* (-.77). This is indicative of high levels of redundancy that effectively precluded the use of more than one or two of these variables in the multivariate analysis.

in a decline of .18 in the mail return rate on the ACS, net of other effects in the model. In comparison, *public assistance* did not have a significant effect on census mail returns, a reflection of both higher-than-average mail returns in many poor neighborhoods of the south Bronxand lower-than-average returns in some wealthier parts of the borough.

The presence of black residents significantly affected mail returns on both the census and the ACS. For each percentage point increase in *nonhispanic black*, mail return rates declined by .13 points in the census, which was virtually identical to the effect in the ACS equation. However, the standardized coefficients show that the role of *nonhispanic black* was more important for the census (-.43) than for the ACS (-.29).

The presence of immigrants, as gauged by percent of births to foreign-born mothers, had a significant effect on census mail returns, but not on ACS returns. For each increase in the percent of births to foreign-born mothers, mail returns declined by .11 percentage points in the 2000 Census, net of the effects of other variables in the model.

Overall, the model does a much better job in predicting mail returns for the ACS than for the census. The R^2 for the model on ACS mail returns was .78 (.69 without age in the model), substantially higher than the .33 for the census mail return rate.

The lack of a significant relationship between *public assistance* and mail returns in the 2000 Census is a reflection of the successful national and local outreach campaigns that boosted initial levels of response in poorer areas over the 1990 level. Indeed, the correlation between census mail return rates in 1990 and 2000 was just .14, a result of greatly improved mail return rates in poor neighborhoods and a slight decline in wealthier areas (data not shown).

Analysis of Allocation

Table 5 shows correlation coefficients between selected neighborhood characteristics and allocation rates on *birthplace, mobility, occupation,* and *wages*. Included in Table 5 are coefficients describing the relationships among the allocation rates themselves. In general, allocation for a single variable is more closely related to the general level of allocation in the same survey than to allocation for the same variable in another survey. For example, allocation of *mobility* in the ACS is more closely correlated with the ACS allocation of *birthplace* (.47), *occupation* (.49) and *wages* (.25) than to the allocation of *mobility* on the census (.04). This indicates that the propensity for allocation relates more to an overall pattern of nonresponse in the same survey, than to a problem in responding to the content of a specific question across surveys. Further, the overall pattern of nonresponse, as judged by the correlations among allocation rates in the same survey, was stronger in the census than in the ACS. Allocation of *mobility* in the census, for example, was strongly related to the allocation rates for its census counterparts: *birthplace* (.69), *occupation* (.75) and *wages* (.73). The comparable coefficients within the ACS, shown earlier, were much lower.

Allocation on *birthplace* was not strongly correlated with any of the predictors, for either the ACS or the census. Higher levels of allocation on *mobility* for the census were strongly and positively related to *public assistance* (.66) and *medicaid births* (.72). Neighborhoods with higher *percent age 60 and over* had lower allocation rates on *mobility* in the census (-.63). Moreover, *Hispanic* and *renter-occupied* neighborhoods were moderately correlated with allocation on *mobility* (.52 and .54 respectively); this was not the case with the ACS. The weak correlations for the ACS on *mobility* indicate that allocation among the city's neighborhoods was not as closely related to socioeconomic level as in the census.

For census allocation on *occupation*, the strongest relationship was with socioeconomic status, .85 for *public assistance* and .83 for *medicaid births.* There were also strong correlations with neighborhoods that were *renter-occupied* (.71) and those that were *Hispanic* (.70). Further, there was a minimal immigrant effect, the correlation with *foreign-born* being just .04. Areas with larger percentages of *persons age 60 and over* had sharply lower rates of allocation on *occupation* in the census (-.74). The coefficients for the ACS operated in almost identical fashion to those in the census; however, the relationships were not nearly as strong. *Public assistance* was positively related to allocation on *occupation* (.55), as was *Hispanic* (.51) and *renter- occupied* (.49). Also, the coefficient for *percent age 60 and over* was negative and moderate (-.42). There was a similar pattern with allocation for *wages*, with the census coefficients indicating stronger relationships with *public assistance* (.57), *medicaid*

births (.68), *nonhispanic black* (.45) and *percent age 60 and over* (-.60) than in the ACS.

Multivariate Analysis

Separately for the ACS and census, we regress allocation rates on *public assistance, foreign-born* and *nonhispanic black;* we include the *mail return rate* as a control (Table 6). Given the absence of a strong correlation between allocation on *birthplace* and the above predictors, we focus on allocation for *mobility*, *occupation*, and *wages*. An important question concerns whether the effect of *public assistance* on allocation in the census is maintained in the presence of other variables in the model.

The top panel of Table 6 provides results on allocation for *mobility*. Each percentage point increase in *public assistance* increases *mobility* allocation levels in the census by a little more than one-tenth of one percent, net of other variables in the model. Overall, the model explains more than 54 percent of the variation in the allocation of *mobility* in the census. In the ACS, the lower socioeconomic standing of a neighborhood made little difference in how much data were allocated on *mobility;* nor were the other predictors significant. The overall variation explained by the model was under six percent.

With respect to allocation for *occupation*, the only significant variable in each equation is *public assistance*, with the increase in allocation levels associated with a unit increase in *public assistance* being more than twice as high in the census (.35), compared to the ACS (.15), net of other variables in the model. The census equation explained 74 percent of the variation in allocation for *occupation*, compared to just 31 percent for the ACS.

Turning to *wages*, all of the predictors are significant for the census, with *public assistance* being the most important. In comparison, *public assistance* is not significant in the ACS equation. The coefficient for *foreign-born* in the ACS was significant and negative, indicating that an increase in a neighborhood's share of immigrants yielded lower levels of allocation in the ACS. Each percentage point increase in the *foreign-born* resulted in a decline of .08 percentage points in allocation rates, net of other effects. For the census, the coefficient was significant and positive, implying an increase in allocation. Interestingly, the coefficient for *foreign-born* in the ACS was negative, though not significant, for allocation on *mobility* and *occupation* as well. For both the ACS and census, higher mail return rates were significant in explaining allocation for *wages* and is indicative of the difficulties in eliciting information on wages in nonresponse follow-up. The model explains nearly two-thirds of the variation in allocation on *wages* in the census, compared to just 28 percent for the ACS.

The ACS is much more successful than the decennial census in nonresponse follow-up, with lower levels of allocation across the neighborhood spectrum. Moreover, this analysis shows that the socioeconomic level of a neighborhood does not have a significant effect on ACS allocation, with the exception of allocation for occupation, where the effect was small. In comparison, the socioeconomic level of a neighborhood has a large and significant effect on allocation in the census. As a result, census allocation rates in poorer neighborhoods were higher than those in wealthier areas; more importantly, these differentials could potentially bias census estimates for small areas.

Discussion and Conclusion

Local and national census outreach efforts in 2000 made dramatic inroads in poor and Hispanic neighborhoods, resulting in higher mail return rates in these areas, compared to 1990. Overall, the decennial census long form mail return rate was 52 percent in 2000, significantly higher than the ACS mail return rate of 34 percent. Further, this study shows that census 2000 mail returns in poor neighborhoods often exceeded return rates in wealthier areas. This convergence was likely related to both, effective outreach that boosted 2000 Census returns in poorer areas, coupled with declines in mail return rates in middle income areas. For ACS mail returns, sharp distinctions by socioeconomic level and other variables are apparent, indicating that more effort is needed to enhance mail returns in poorer areas. Our model, which included measures of socioeconomic status, race and nativity, explained only 33 percent of the variation in census mail return rates, compared to 78 percent of the variation in ACS mail return.

The ACS lacks the national publicity campaign and special outreach efforts that boost mail return rates. The ACS mail return rates are not only lower than that of the census, but are also declining slightly, from 37.7

percent in 1999, to 36.3 percent in 2000, to 34.2 percent in 2001. Given that these rates are highly sensitive to race and socioeconomic distress, the ACS can focus its efforts at improving mail return in poor minority neighborhoods.

Higher levels of initial cooperation result in better data quality and lower costs. Questionnaires returned via mail tend to be more complete than those obtained through nonresponse follow-up (Salvo et al., 2003); moreover, the greater the number of questionnaires returned by mail, the fewer the number of households that require nonresponse follow-up. Given its higher mail return rates, the census has a clear initial advantage over the ACS. But, the level of initial cooperation is only one part of the story. The bottom line is the final level of nonresponse to specific questions on the survey, and the resultant allocation, and it is here that the ACS has the advantage.

The ACS had lower levels of allocation on key variables, relative to the 2000 Census, despite the latter's initial mail return advantage. For *birthplace, mobility, occupation* and *wages*, allocation rates were far higher in the 2000 Census than in the ACS. Moreover, this study shows that the effect of neighborhood socioeconomic distress on allocation rates in the ACS was minimal, compared to its effect on census allocation. This is testament to the greater effectiveness of nonresponse follow-up in the ACS across the neighborhood spectrum. The model that included measures of socioeconomic distress, the foreign-born population, the representation of nonhispanic black residents, and mail return rates worked far better in explaining allocation in the census than in the ACS. After controlling for differences in mail returns, the model explained 74 percent of the variation in the allocation of *occupation* on the census, compared to just 31 percent for the ACS. The results were similar for *mobility* and for *wages*. Given the significant effect of neighborhood factors on allocation rates in the census, further study needs to be done on potential bias that this may introduce on small area estimates.

The mandate of the census is to count the population, which it did well in the Bronx in 2000. The Census Bureau's 2010 plan is for a short form only census. Given its shortcoming in obtaining socioeconomic information, the Bureau has argued that such a census would be more cost-effective as nonresponse follow-up could focus on the collection of only basic short form information. Indeed, this study shows that the ACS in the Bronx, with a three percent annual sample, has been more successful in obtaining complete information on the socioeconomic characteristics of the population, thanks to its trained cadre of interviewers and relatively predictable caseload of nonresponding households to be followed-up. Subject to continuing funding, the ACS would become *the* source for small area socioeconomic data throughout the decade. This strategy is intended to provide data users with more timely data, while permitting the Census Bureau to focus on its constitutional mandate to count the population for reapportionment. This analysis of nonresponse in the ACS and census in one of the hardest-to-count counties in the nation suggests that this course of action is reasonable. We await the results of other test site evaluations to see if similar conclusions can be reached in those areas.

Bibliography

Alexander, C. H. (2002). A Discussion of the Quality of Estimates from the American Community Survey for Small Population Groups. Paper Presented at the Fall 2002 Census Advisory Committee Meeting.

Alexander, C. H. (2000). American Community Survey. In Encyclopedia of the U.S. Census, ed. M. J. Anderson, Washington D.C.: Congressional Quarterly Press, 26-28.

Bruce, A. and Robinson, J.G. (2001) Hard-to-Count (HTC) Scores and Broad Demographic Groups Associated with Patters of Response Rates in Census 2000. Paper Presented at the Joint Statistical Meetings of the American Statistical Association, Atlanta.

Citro, C.F. (2000). Editing and Imputation. In Encyclopedia of the U.S. Census, ed. M. J. Anderson, Washington D.C.: Congressional Quarterly Press, 195-197.

Edmonston, B. and Schultze, C. (1995). Modernizing the U.S. Census. Washington, D.C.: National Academy Press.

Groves, R. and Couper, M. (1998). Nonresponse in Household Interview Surveys. New York: John Wiley & Sons.

Hernandez, D. (2001). Testimony of the Population Association of America and the Association of Population Centers on the American Community Survey. Hearings before the U.S. House of Representatives Subcommittee on the Census. 107th Congress (July 13).

Lobo, A.P., Salvo, Salvo, J.J., and Virgin V. (1997). The Newest New Yorkers: 1995-1996 Update. New York: Department of City Planning.

Love, S., & Diffendal, G. (1998). The 1996 American Community Survey Monthly Response Rates, by Mode. Paper presented to the American Community Survey Symposium, March.

Love, S., Dalzell, D., and Alexander C. Constructing a Major Survey: Operational Plans and Issues for Continuous Measurement. Paper presented at the Annual Meeting of the American Statistical Association, Orlando 1995.

McLaughlin, D. K., Melz, H. M., Lichter, D. T., Gardner, E. (2000). The Quality of Rural Population Estimates from the American Community Survey. Journal of Economic and Social Measurement, 26, 193-230.

National Research Council (2001). The 2000 Census: Interim Assessment. Panel to Review the 2000 Census. Washington, DC: National Academy Press.

Office of Information and Regulatory Affairs (OIRA), Statistical Policy Office. (2001) Measuring and Reporting Sources of Error in Surveys. (Statistical Policy Working Paper 31). Office of Management and Budget.

Prewitt, Kenneth. (2000). Testimony Before the House Committee on Government Reform Subcommittee on the Census. July 20.

Salvo, J.J., Lobo, A. P. and Love, S. P. (2003). Evaluating Continuous Measurement: Data Quality in the Bronx Test Site of the American Community Survey. Journal of Social and Economic Measurement (forthcoming).

Salvo, J. J. and Lobo, A. P. (1997). The American Community Survey: Nonresponse Follow-up in the Rockland County Test Site. Paper presented at the Joint Statistical Meetings of the American Statistical Association, Anaheim, CA.

U.S. Census Bureau (2003). American Community Survey: Operations Plan: Release 1. U.S. Department of Commerce, Economics and Statistics Administration.

U.S. Census Bureau. (2002). Meeting 21st Century Demographic Data Needs - Implementing the American Community Survey (Report 2: Demonstrating Survey Quality). U.S. Department of Commerce, Economics and Statistics Administration.

Word, D.L. (1997). Who Responds/Who Doesn't? Analyzing Variation in Mail Response Rates During the 1990 Census. Population Division Working Paper No. 19, U.S. Census Bureau.

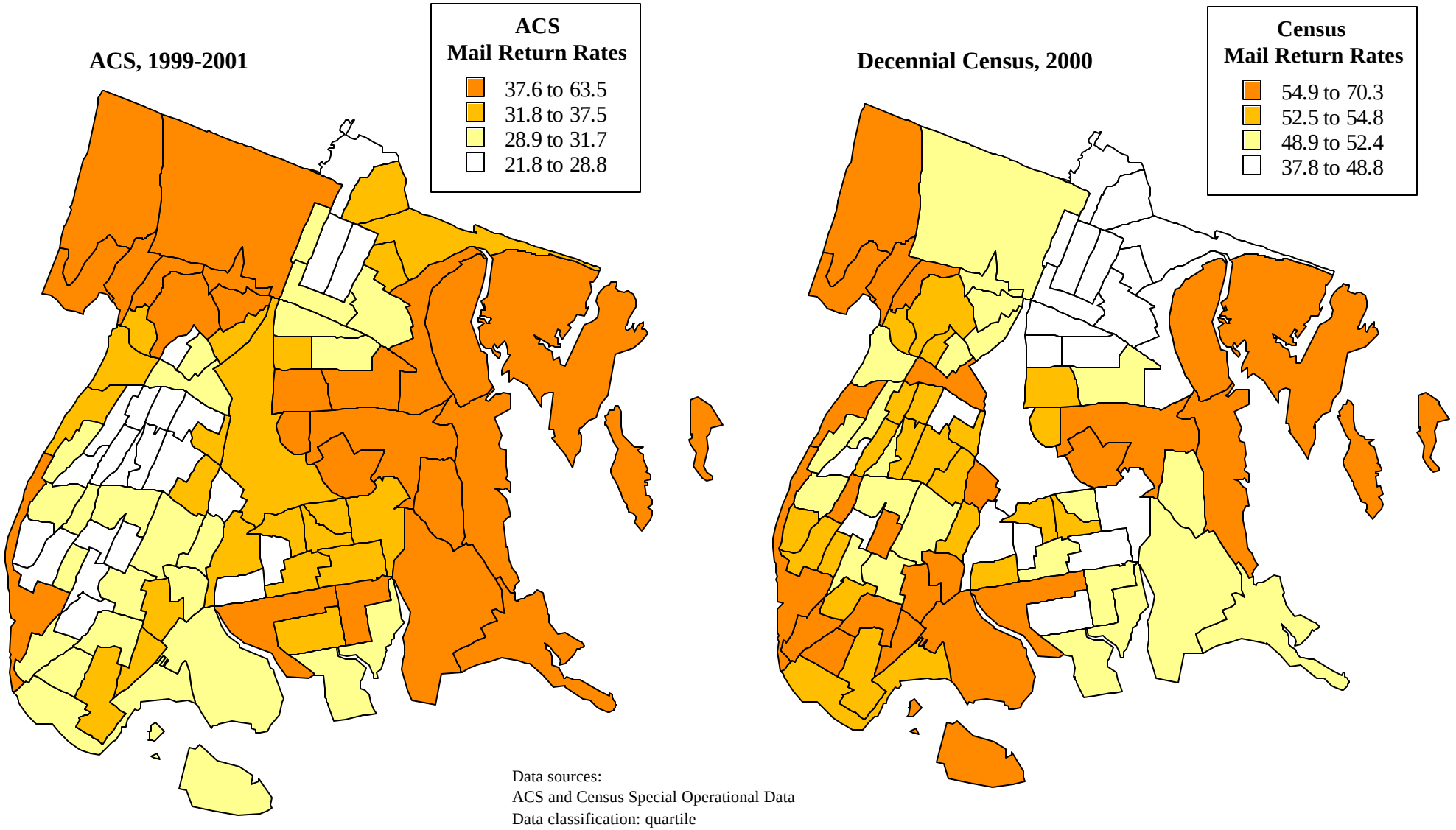

Figure 1. Neighborhood Mail Return Rates for the ACS and Census in Bronx, New York

Table 1. Average Mail Return Rates and Allocation Rates on Selected Variables for Bronx Neighborhoods in the American Community Survey (1999-2001) and the 2000 Census

	ACS: 1999-2001		2000 Census	
	Mean	Standard Deviation	Mean	Standard Deviation
Occupied Housing Units	5,225	2,094	5,149	1,697
Mail Return Rate	34.2	8.3	51.9	5.8
Percent Allocated:				
Birthplace	6.9	2.8	14.5	2.1
Mobility	4.6	1.4	10.8	2.3
Occupation	13.1	3.7	25.6	5.4
Wages	17.2	3.4	25.9	3.7

Data Sources: 1999-2001 ACS and 2000 Census Operational Data Files
U.S. Census Bureau

Table 2. Means and Standard Deviations for Sociodemographic Variables Used to Characterize Bronx Neighborhoods

Variable	Neighborhhod Average	Standard Deviation	Definition
Public Assistance	29.0	13.3	PA, MA, SSI Persons as Percent of 2000 census population
Medicaid Births	62.9	17.6	Births to mothers on medicaid as percent of all births
Foreign-Born	42.6	13.6	Births to foreign-born mothers as percent of all births
Nonhispanic Black	32.0	19.3	Percent of 2000 population nonhispanic black
Hispanic	48.4	19.7	Percent of 2000 population Hispanic
Renter-Occupied	81.5	17.0	Percent of 2000 occupied units renter-occupied
Percent Age 60 and over	13.4	5.6	Percent of 2000 population 60 years and over

Data Sources:
Public Assistance – NYC Human Resources Administration
Medicaid Births – NYC Department of Health
Foreign-Born – NYC Department of Health
Nonhispanic Black, Hispanic, Renter-Occupied and Percent Age 60 and Over – 2000 Census Summary File 1

Table 3. Zero-Order Correlation Coefficients for Selected Bronx Neighborhood Characteristics and Mail Return Rates in the American Community Survey (1999-2001) and the 2000 Census

	Public Assistance	Medicaid Births	Foreign-Born	Nonhispanic Black	Hispanic	Renter-Occupied	Percent Age 60 and over	ACS Mail Return	Census Mail Return
Public Assistance	1.00	0.87	-0.04	0.02	0.82	0.82	-0.77	-0.70	0.13
Medicaid Births		1.00	0.29	0.15	0.78	0.80	-0.86	-0.81	-0.12
Foreign-Born			1.00	0.26	-0.04	0.13	-0.25	-0.30	-0.38
Nonhispanic Black				1.00	-0.33	-0.13	-0.12	-0.39	-0.50
Hispanic					1.00	0.77	-0.75	-0.55	0.24
Renter-Occupied						1.00	-0.74	-0.53	0.22
Percent Age 60 and over							1.00	0.82	0.18
ACS Mail Return								1.00	0.42
Census Mail Return									1.00

Sources: 1999-2001 ACS and 2000 Census Operational Data Files
U.S. Census Bureau

Table 4. Regression Coefficents for Predictors of ACS and Census Mail Return Rates for Bronx Neighborhoods in the American Community Survey (1999-2001) and the 2000 Census

	ACS Mail Returns		Census Mail Returns	
Variables	Unstandardized Coefficients	Standardized Coefficients	Unstandardized Coefficients	Standardized Coefficients
Public Assistance	-0.178*	-0.286	0.055	0.126
Foreign-Born	-0.061	-0.100	-0.113*	-0.268
Nonhispanic Black	-0.126*	-0.293	-0.129*	-0.432
Percent Age 60 and over	0.792*	0.537	-	-
Constant	0.354*		0.593*	
R^2	0.78		0.33	
N	88		88	

* Coefficient is significant at the .05 level.
Data Sources: 1999-2001 ACS and 2000 Census Operational Data Files
U.S. Census Bureau

Table 5. Zero-Order Correlation Coefficients for Selected Bronx Neighborhood Characteristics and Allocation Rates in the American Community Survey (1999-2001) and the 2000 Census

	Allocations for:							
	Birthplace		Mobility		Occupation		Wages	
	ACS	Census	ACS	Census	ACS	Census	ACS	Censu
Public Assistance	0.19	0.26	0.22	0.66	0.55	0.85	0.19	0.57
Medicaid Births	0.06	0.30	0.21	0.72	0.43	0.83	0.21	0.68
Foreign-Born	-0.17	0.02	-0.08	0.21	-0.11	0.04	-0.08	0.35
Nonhispanic Black	0.09	0.28	-0.02	0.21	0.00	0.15	0.30	0.45
Hispanic	0.02	0.06	0.27	0.52	0.51	0.70	0.16	0.32
Renter Occupied	0.11	0.10	0.22	0.54	0.49	0.71	0.13	0.39
Percent Age 60 and over	-0.06	-0.20	-0.19	-0.63	-0.42	-0.74	-0.29	-0.60
ACS Allocated Birthplace	1.00	0.01	0.47	0.05	0.43	0.14	0.23	0.04
Census Allocated Birthplace	0.01	1.00	-0.11	0.69	0.04	0.45	0.11	0.59
ACS Allocated Mobility	0.47	-0.11	1.00	0.04	0.49	0.19	0.25	0.01
Census Allocated Mobility	0.05	0.69	0.04	1.00	0.25	0.75	0.15	0.73
ACS Allocated Occupation	0.43	0.04	0.49	0.25	1.00	0.50	0.48	0.26
Census Allocated Occupation	0.14	0.45	0.19	0.75	0.50	1.00	0.21	0.73
ACS Allocated Wages	0.23	0.11	0.25	0.15	0.48	0.21	1.00	0.24
Census Allocated Wages	0.04	0.59	0.01	0.73	0.26	0.73	0.24	1.00

Table 6. Regression Coefficents for Predictors of ACS and Census Allocation Rates on Selected Variables for Bronx Neighborhoods in the American Community Survey (1999-2001) and the 2000 Census

	Mobility			
	ACS		Census	
Variables	Unstandardized Coefficients	Standardized Coefficients	Unstandardized Coefficients	Standardized Coefficients
Public Assistance	0.022	0.206	0.122*	0.694
Foreign-Born	-0.008	-0.076	0.024	0.142
Nonhispanic Black	-0.001	-0.016	0.006	0.046
Mail Return Rate	-0.004	-0.023	-0.089*	-0.218
Constant	.045*		.106*	
R^2	0.056		0.544	
N	88		88	
	Occupation			
Public Assistance	0.153*	0.544	0.348*	0.853
Foreign-Born	-0.025	-0.091	0.012	0.030
Nonhispanic Black	0.003	0.017	0.027	0.097
Mail Return Rate	0.001	0.001	-0.050	-0.053
Constant	0.096*		0.167*	
R^2	0.307		0.739	
N	88		88	
	Wages			
Public Assistance	-0.071	-0.281	0.172*	0.612
Foreign-Born	-0.079*	-0.321	0.050*	0.181
Nonhispanic Black	0.023	0.133	0.042*	0.219
Mail Return Rate	-0.262*	-0.646	-0.233*	-0.342
Constant	.308*		0.290*	
R^2	0.275		0.658	
N	88		88	

* Coefficient is significant at the .05 level.