

CHARACTERISTICS OF SECOND WAVE NONRESPONDENTS IN A PANEL SURVEY

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1. INTRODUCTION

The American Changing Lives (ACL) study is a national panel survey conducted by the Survey Research Center at the University of Michigan. The purpose of the study is to examine issues related to productive and other activities, stress and adaptive resources, and their hypothesized determinants and consequences, including health, for the U.S. population in middle and later life. The first wave of data collection was conducted in mid-1986 by face-to-face interviewing in a stratified multi-stage sample in the continental United States. The sample was restricted to persons aged 25 and over, with persons aged 60 and over and blacks being oversampled.

The achieved sample size at Wave 1 was 3,617 respondents, with a response rate of 70% among sampled households and 67% among sampled individuals (more than one individual being sampled in some households). The little information that is known about the nature of Wave 1 nonresponse is summarized in Table 1, where it should be noted that the percentages are computed unweighted, that is no adjustment for unequal selection probabilities has

been made. This table shows the usual finding that the response rate is lowest in large cities (the self-representing PSUs) and is highest in more rural areas. The response rate increases with the age of the household informant and is higher for black informants than for others. This last finding reflects the way in which blacks were oversampled. This was done by oversampling areas with high concentrations of blacks, with the result that the unweighted black sample is skewed towards blacks living in the rural South, where a high response rate was obtained.

All the Wave 1 respondents, except those known to have died, were assigned for reinterview in the second wave of data collection which took place in early 1989, about two-and-a-half years after the first wave. Of the Wave 1 respondents, 170 have been identified as having died. Among the remainder, a reinterview rate of 84% was achieved. Checks are still underway with the National Death Index to determine whether some of those not reinterviewed had in fact died prior to the second wave. A small number may be found to have done so. If this is the case, the Wave 2 reinterview rate will be slightly higher than 84%.

Unlike the situation with the Wave 1 nonrespondents, a great deal is known about the Wave 2 nonrespondents. The Wave 1 ACL responses provide a rich source of information for comparing the characteristics of those who were successfully reinterviewed at Wave 2 and those who were not reinterviewed. This paper presents the results of a wide range of such comparisons. The comparisons include socio-demographic characteristics, geographical and housing variables, individuals' leisure activities, selected psychological variables, and interviewers' ratings of the Wave 1 interviews. The results are presented first for the individual characteristics, and they are then combined in a logistic regression equation.

Unlike the results in Table 1, all the results in the rest of the paper are weighted. The weights compensate for unequal selection probabilities and for Wave 1 nonresponse, and they incorporate a poststratification factor. Wave 1 respondents who are known to have died before the Wave 2 data collection are excluded from all the analyses.

Table 1: ACL Wave 1 Unweighted Response Rates in Various Subgroups at the Housing Unit Level

Subgroup	%	No.
Self-representing PSUs	63.1	1518
SMSAs	69.8	2139
Other	80.3	1041
Black informant*	74.9	1443
Other*	70.4	3110
Informant under 25*	68.0	362
25-59*	72.5	2236
60 and over*	74.2	1759

*Excluding some not ascertained cases.

2. RESULTS

As noted above, the overall reinterview rate at Wave 2 of the ACL was 83.9% of the Wave 1 respondents, after known deaths had been excluded. The reinterview rate has been examined for a large number of population subgroups, and a selection of the results is presented in Table 2. All the findings reported in the table refer to the respondents' characteristics at the time of the Wave 1 data collection. The χ^2 tests reported in the table are computed to take account of the complex sample design and the weighting adjustments, using sampling error estimation routines in the OSIRIS IV Statistical Software System (Computer Support Group, 1988) and weighted least squares modeling procedures following Koch *et al.* (1975).

As can be seen from the first variable in the table, there is no significant variation in reinterview rate by geographical region. There is also no significant variation in reinterview rate by urbanicity, although there is a suggestion that the rates might be lower in the centers of large cities and higher in rural areas. The reinterview rate varies significantly according to the type of dwelling structure in which the individual resides, with a much lower rate for those living in apartment houses. Associated with this finding is the significant variation by home ownership, with a lower reinterview rate for renters and an especially low rate for the small number of persons who neither own nor rent.

Variables 5 to 11 relate to socio-demographic characteristics. There are no significant variations in reinterview rates by age and marital status. However, it needs to be remembered that the ACL sampled only persons aged 25 and over; it is possible that reinterview rates among young people (say 15-24 years old) would be lower (see, for instance, McArthur and Short, 1985). Reinterview rates are lower for males, blacks and Hispanics, those with fewer years of education, those not employed, and those with lower family incomes. Conversely, those with twelve or more years of education and those with incomes over \$25,000 have appreciably higher reinterview rates.

Variables 12 to 16 relate to leisure activities. Reinterview rates are markedly and significantly lower for those who reported less social contacts in the form of telephone calls with friends, neighbors or relatives (variable 12) or in attending meetings of groups, clubs or organizations that they belong to (variable 13). Reinterview rates are also appreciably and significantly lower for those who reported that

they never work in the garden or yard, that they never engage in active sports or exercise, or that they never take walks.

The next two variables, variables 17 and 18, are respondents' reports of their psychological characteristics. The results for the first of these variables show that those who reported that they have had an entire week or more in their lives when they felt sad, blue or depressed most of the time or when they lost all interest and pleasure in the things they usually care about or enjoy had significantly higher reinterview rates. The results for the second show that those who reported that they are mostly quiet with other people had a significantly lower reinterview rate.

Variables 19 and 20 are scores based on the responses to several items. The verbal intelligence score is the number of correct responses given to six multiple choice sentence completion tests (e.g., "Not every cloud gives ___" with alternatives "weather, shade, sky, climate and rain"). The results show a wide and significant variation in reinterview rate, with those performing poorly having a much lower rate and those performing well having a much higher rate than the average. The cognitive impairment score is the number of incorrect responses to seven items on the date and the day of the week of the Wave 1 interview, the names of the President of the U.S. and of the President before him, the respondent's age, and the respondent's mother's maiden name (being different from the respondent's). The reinterview rate for those with cognitive impairment scores of 2 or more is appreciably lower than the average.

The last three variables were obtained from the interviewers' rating forms that were completed at the end of the interviews to record the interviewers' impressions of how the Wave 1 interviews went. The results in the table demonstrate that the interviewers' impressions are significantly associated with the reinterview rate. Respondents whom interviewers rated as having only a fair or poor understanding of the questions, whose cooperation interviewers rated as fair or poor, and who seemed not to enjoy the interview much were markedly less likely to be reinterviewed.

Table 2 describes the relationships between the reinterview rate and each of the variables individually, and some of the results are clearly interrelated. The next step in the analysis was to develop a regression model to predict Wave 2 reinterview status using the set of variables found to be associated with reinterview status as the indepen-

Table 2: ACL Wave 2 Reinterview Rates (RR) by Selected Characteristics (Excluding Deaths)

Characteristic	RR %	No.	Characteristic	RR %	No.
1. <u>Region</u> ($\chi^2=1.55$; 3 d.f.; $p>0.05$)			9. <u>Education</u> ($\chi^2=30.44$; 3 d.f.; $p<0.01$)		
Northeast	84.1	705	Under 9 years	72.2	654
North Central	85.6	900	9-11 years	77.8	587
South	84.5	1429	12 years	85.5	1015
West	80.6	583	Over 12 years	87.8	1191
2. <u>Urbanicity</u> ($\chi^2=6.60$; 5 d.f.; $p>0.05$)			10. <u>Employment Status</u> ($\chi^2=4.68$; 1 d.f.; $p<0.05$)		
Central city (over 2 mn.)	77.8	426	Employed	85.2	1844
Central city (under 2 mn.)	83.4	707	Not employed	81.2	1602
Suburbs of largest SCSAs and SMSAs	81.9	592	11. <u>Family Income</u> ($\chi^2=28.96$; 3 d.f.; $p<0.01$)		
Other suburbs	83.9	700	Under \$15,000	77.7	1548
Adjacent areas	87.5	850	\$15,000-\$24,999	81.4	659
Outlying areas	88.4	172	\$25,000-\$39,999	87.4	660
3. <u>Dwelling Structure</u> ($\chi^2=14.69$; 2 d.f.; $p<0.01$)			\$40,000 and over	89.5	580
Detached single family house	85.7	2325	12. <u>Social Telephone Calls</u> ($\chi^2=15.92$; 3 d.f.; $p<0.01$)		
Apartment house	71.7	436	More than once a day	87.2	1202
Other	83.7	665	More than once a week, up to once a day	84.3	1582
4. <u>Home Ownership</u> ($\chi^2=31.33$; 2 d.f.; $p<0.01$)			Once a week or less	78.7	500
Owns or is buying	87.6	2223	Never	69.8	158
Rents	76.1	1049	13. <u>Attendance at Meetings of Groups, Clubs, etc.</u> ($\chi^2=34.77$; 2 d.f.; $p<0.01$)		
Other	71.1	173	More than once a month	88.1	1181
5. <u>Gender</u> ($\chi^2=9.80$; 1 d.f.; $p<0.01$)			Once a month or less	86.6	874
Male	81.4	1279	Never	78.4	1389
Female	86.1	2168	14. <u>Garden/Yard Work</u> ($\chi^2=12.30$; 2 d.f.; $p<0.01$)		
6. <u>Age</u> ($\chi^2=9.20$; 4 d.f.; $p>0.05$)			Often	85.3	1372
Under 35	82.7	734	Sometimes or rarely	86.2	1127
35-44	87.2	584	Never	77.0	944
45-54	81.3	384	15. <u>Active Sports/Exercise</u> ($\chi^2=16.45$; 2 d.f.; $p<0.01$)		
55-64	87.2	660	Often	85.0	1004
65 and over	81.3	1085	Sometimes or rarely	86.7	1339
7. <u>Race</u> ($\chi^2=11.17$; 3 d.f.; $p<0.05$)			Never	76.7	1100
White	85.2	2231	16. <u>Takes Walks</u> ($\chi^2=45.41$; 2 d.f.; $p<0.01$)		
Black	78.6	1104	Often	82.0	1361
Hispanic	61.6	41	Sometimes or rarely	88.2	1503
Other	82.9	71	Never	74.5	580
8. <u>Marital Status</u> ($\chi^2=1.92$; 2 d.f.; $p>0.05$)					
Married	84.5	1912			
Separated, widowed, divorced	84.0	1145			
Never married	80.0	390			

Table 2 (continued)

Characteristic	RR %	No.	Characteristic	RR %	No.
17. <u>Depressed for Week at Some Time in Life</u> ($\chi^2=10.33$; 1 d.f.; $p<0.01$)			21. <u>Understanding of Questions</u> ($\chi^2=40.56$; 2 d.f.; $p<0.01$)		
Yes	86.4	1484	Excellent	88.4	1591
No	82.0	1958	Good	80.3	1301
18. <u>Are You Mostly Quiet When You Are With Other People?</u> ($\chi^2=9.36$; 2 d.f.; $p<0.01$)			Fair or poor	70.3	453
Yes	80.6	1417	22. <u>Cooperation</u> ($\chi^2=50.39$; 2 d.f.; $p<0.01$)		
Sometimes	83.5	504	Excellent	87.1	2240
No	86.7	1516	Good	77.9	921
19. <u>Verbal Intelligence Score</u> ($\chi^2=42.52$; 2 d.f.; $p<0.01$)			Fair or poor	61.0	183
2 or less	74.9	758	23. <u>Apparent Enjoyment of Interview</u> ($\chi^2=22.45$; 3 d.f.; $p<0.01$)		
3 or 4	84.2	2183	A great deal	89.0	696
5 or 6	91.3	506	Quite a bit	86.6	1349
20. <u>Cognitive Impairment Score</u> ($\chi^2=35.24$; 2 d.f.; $p<0.01$)			Some	82.3	979
0	88.7	1328	A little or not at all	70.2	402
1	83.1	1166			
2 or more	75.5	953			

dent variables. At first all the independent variables were entered into a logistic regression analysis in the form of categorized variables handled as dummy variables. Nonsignificant variables were then deleted in a stepwise process until all the remaining variables were significant. The coefficients for the final model are presented in Table 3. Since a form of coding equivalent to multiple classification analysis (Andrews *et al.*, 1973) was used, coefficients are given for all categories of each predictor variable, with the weighted sum of the coefficients for each variable being zero. The χ^2 test results reported are tests of the overall significance of the variable in the logistic regression. No account has been taken of the effects of the complex design or of the weights in computing these χ^2 values; hence the significance levels are probably somewhat overstated.

A sizeable number of significant independent variables appears in the final logistic regression model. The results in Table 3 show that reinterviews are more likely to be obtained (i.e., a positive coefficient) with women, persons who have children in their households, persons with family incomes above \$25,000, persons who own or are buying their homes, and persons living outside cities. They are less likely to be obtained with persons with lower

verbal intelligence, and higher cognitive impairment scores. They are also less likely to be obtained with those whose cooperation at Wave 1 interviewers rated as less than excellent, and whose family income had to be imputed. Those who reported having felt sad, blue or depressed for a week or more at some time in their lives were more likely to be reinterviewed, as were those who reported taking walks sometimes or rarely. The results for frequency of attending meetings or programs of groups, clubs or organizations and for respondents calling themselves tense or "highly strung" are barely significant, and may fall below the 5% significance level if the χ^2 tests were corrected to allow for the complex sample design.

The preceding analyses have compared those reinterviewed at the ACL Wave 2 with those not reinterviewed for any reason. Table 4 separates those not reinterviewed into two groups - the refusals and the remainder, mainly those lost to followup and not-at-homes. The table clearly shows that the sources for failure to obtain a reinterview differ between different population subgroups. The lower reinterview rates for blacks, the never married, and those living in apartments, is caused not by refusals but by other reasons. It seems likely that this is associated

Table 3: Logistic Regression of Wave 2 Reinterview Status on the Significant Independent Variables

Variable	Coeff	Variable	Coeff
Constant	1.93	Takes Walks ($\chi^2=39.03$; 2 d.f.; $p<0.001$)	
Gender ($\chi^2=25.05$; 1 d.f.; $p<0.001$)		Often	-0.15
Male	-0.29	Sometimes or rarely	0.29
Female	0.22	Never	-0.55
Children in Household? ($\chi^2=14.21$; 1 d.f.; $p<0.001$)		Depressed for Week ($\chi^2=13.10$; 1 d.f.; $p<0.001$)	
Yes	0.20	Yes	0.21
No	-0.18	No	-0.17
Family Income ($\chi^2=12.95$; 3 d.f.; $p<0.01$)		Tense or "Highly Strung"? ($\chi^2=5.49$; 1 d.f.; $p<0.05$)	
Under \$15,000	-0.16	Yes and sometimes	-0.17
\$15,000-	-0.26	No	0.08
\$25,000-	0.18	Verbal Intelligence ($\chi^2=13.83$; 3 d.f.; $p<0.005$)	
\$40,000-	0.20	2 or less	-0.21
Home Ownership ($\chi^2=43.30$; 1 d.f.; $p<0.001$)		3	-0.06
Owens or is buying	0.22	4	-0.09
Other	-0.50	5 or 6	0.44
Urbanicity ($\chi^2=18.74$; 2 d.f.; $p<0.001$)		Cognitive Impairment ($\chi^2=15.64$; 2 d.f.; $p<0.001$)	
Large city	-0.25	0	0.22
Small city	-0.03	1	-0.11
Other	0.33	2 or more	-0.28
Frequency of Attending Meetings ($\chi^2=8.92$; 2 d.f.; $p<0.05$)		Cooperation ($\chi^2=20.38$; 1 d.f.; $p<0.001$)	
More than 1 a month	0.03	Excellent	0.13
1 a month or less	0.24	Good, fair or poor	-0.36
Never	-0.14	Family Income Imputed? ($\chi^2=37.17$; 1 d.f.; $p<0.001$)	
		Yes	0.07
		No	-0.88
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with the mobility of these subgroups and the difficulties of finding them at home. The lower reinterview rates for those with lower levels of education, lower incomes, income imputed, higher levels of cognitive impairment, and fair or poor cooperation is caused by both higher refusal and higher other rates of nonreinterview.

3. CONCLUDING REMARKS

The results presented here show appreciable differences in reinterview rates across a number of different subclasses of the sample. Some of the findings are in line with those reported by McArthur and Short (1985) for the sample losses over the first

three waves of the 1984 panel of the Survey of Income and Program Participation. They report that persons who were lost to the panel tended: to be residents of large metropolitan areas; to rent rather than own their homes; to be interviewed by proxy rather than in person in the first interview; to be classified as an "other relative" or a "nonrelative" in the household; to be never married or separated; to be male; to be of Spanish origin; to be black; and to be between 15 and 24 years old (a subgroup not represented in the ACL study). Additional characteristics identified in this analysis for the ACL study include: lower education; lower family income; fewer social contacts (telephone calls and attendance at meetings); lower verbal intelligence; higher cognitive

Table 4: Refusals and Other Non-Reinterviews at ACL Wave 2 in Various Subgroups

Subgroup	Refusals %	Other %	No.
White	9.4	5.4	2231
Black	7.4	14.0	1104
Married	10.1	5.5	1912
Separated, widowed, divorced	6.5	9.5	1145
Never married	8.7	11.3	390
8 years or less education	16.5	11.3	654
9-11 years education	12.7	9.5	587
12 years education	8.4	6.1	1015
13-16 years education	7.7	4.7	950
17+ years education	3.2	8.2	241
Under \$10,000	13.0	11.1	1078
\$10,000-	10.4	8.4	1129
\$25,000 and over	7.2	4.4	1240
Detached single family house	9.3	5.0	2325
Apartment	7.5	18.0	542
Cognitive impairment:			
0	7.2	4.1	1328
1	9.8	7.1	1166
2+	12.4	12.1	953
Income imputed	18.1	14.0	296
Income not imputed	8.5	6.3	3151
Excellent cooperation	6.9	6.0	2240
Good cooperation	14.3	7.8	921
Fair and poor cooperation	22.8	16.1	183
ALL	9.2	6.9	3447

impairment; and less understanding of questions, less cooperative, and less apparent enjoyment of the first interview according to the interviewers' ratings. In addition to varying overall levels of reinterview rates among subgroups, Table 4 has shown that the

importance of the sources of the failure to secure a reinterview varies between subgroups.

The findings reported here have two potential applications. One is in the adjustments made for the Wave 2 nonresponse. This was in fact the initial motivation for these analyses, and they have been employed in the development of the Wave 2 nonresponse weighting adjustments. The second is to try to gain an understanding of the causes of panel attrition, and of those most liable to be lost, in order that survey fieldwork procedures may be introduced to counteract the tendency to drop out. Where refusals are a serious threat, as with those whose cooperation is not good at the first interview, procedures need to be developed to encourage continued participation in the panel. Where non-contacts are a major cause of concern, as with apartment dwellers and blacks, procedures are needed to improve the contact rates at later waves.

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