

A REVISED THEORY OF LONGITUDINAL NONRESPONSE

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1. INTRODUCTION

The special challenge of longitudinal research is tracking changes in individuals or households over time. However, it is these very changes that often make the original respondent difficult to re-interview. The loss of individuals over time is not random, but is influenced by failures in the tracking process and the refusal of some respondents to participate once found. The dynamics driving these two processes are quite different. Using the procedure developed on the National Panel Survey of Black Americans, the current paper seeks to account for longitudinal nonresponse in the National Black Election Panel Study (Jackson, 1984). The NBEPS is a research project undertaken at the Institute for Social Research at the University of Michigan to collect and analyze national survey data on African American political attitudes and behaviors. This survey focuses on party identification, political interest, and preference for presidential candidates as well as issues and attitudes likely to have an impact on the formation and expression of political behavior. These later factors include the role of religion and the church, economic matters, employment, and quality of life issues.

The NBEPS is a telephone survey of a national probability sample of African Americans. As such, it is one of just a few surveys with the ability to inform us about nonresponse rates over time for all African Americans rather than only those living in areas with high concentrations of Black Americans. For instance, while the Americans' Changing Lives (ACL) study found that Black informants had a higher second wave response rate than other respondents, they attributed this to the manner in which Blacks were over sampled, resulting in the skewing of the sample toward rural southern Blacks (Kalton, Lepkowski, Montanari and Maligalig, 1990). The relatively large number of African Americans in the NBEPS provides us with a strong base for discussing nonresponse in this population even with considerable attrition. Of the 1,150 respondents from the 1984 pre-election wave, 873 were interviewed again after the election. Four years after the initial pre-election survey, 473 of the original 1,150 respondents were interviewed just prior to the 1988 presidential election. Most of the

attrition was due to noncontacts, but 91 respondents who had been interviewed for the first wave refused to participate in the 1988 pre-election survey. The final wave of the panel, just after the 1988 election, consisted of interviews with 392 respondents with 17 refusals.

2. SOURCES OF NONRESPONSE

In order to more effectively examine the sources of nonresponse, we must characterize the underlying processes leading to nonresponse. Presented here are nine sources of longitudinal nonresponse believed to operate in some combination for both refusals and noncontacted households. These are based both on recent work by Groves, Cialdini and Couper (1992) and by the author (Wolford and Torres, 1993). They range from such global attributes as characteristics of the population and society to attitudes of the respondent.

Societal and Population Level: The norms and values of the population under study as they relate to the legitimacy of surveys in general and the surveying organization in particular impact the response rates both initially and over time (Schleifer 1986; Goyder, 1987). They influence both the nature of the approach the interviewer uses and the respondent's assessment of that approach (Groves, Cialdini and Couper; 1992). Studies which offer something to the group to be studied and appear able to fulfill that role will gain greater respondent cooperation. In a similar vein, Steeh (1981) notes that it is disillusionment with the uses of survey results that is one of the causes of higher refusal rates in American surveys.

Survey Design: The definition of an eligible respondent either enhances or constrains the interviewers options and choice of persuasion strategies. Designs that permit the use of multiple household members as possible respondents result in higher response rates (Steeh 1981; Groves, Cialdini and Couper 1992). Unlike many of the studies in which patterns of nonresponse were examined, this is a study of an individual's attitudes. Proxy interviews or interviews from any of several sources such as those used in the Survey of Income and Program Participation (SIPP) could not be used in this study. This will result in some differences in the patterns of nonresponse as well as an attenuated response rate. The length of time the interview is expected to take or is remembered as taking may also effect response rates.

Finally, the tracking information designed into both the original data collection and follow up efforts will affect actual response rates due to noncontact and inflate nonresponse rates when loss is due to the respondent leaving the sample population through death incarceration or institutionalization. While the study examined here is of non-institutionalized African American adults, tracking information did not allow for the exclusion from the sample frame of original respondents who had since entered an institution.

Study Salience: It is only reasonable to expect that the topic of the study should effect a respondent's willingness both to participate initially (Kojetin, Borgida and Snyder, 1993) and to continue to participate. Hence nonresponse rates can be extremely low among subpopulations where interest in the topic is strong (Goyder, 1987). Certainly, as a source of nonresponse, disinterest in the topic has the potential to be the most damaging to the viability of the data collected in later waves. The systematic loss of respondents with particular attitudes toward the topic under study introduces a severe bias into any longitudinal analyses.

Interviewer Characteristics: Groves, Cialdini and Cooper (1992) note that the characteristics of the interviewer can impact response rates in cross-sectional surveys through the "script" evoked in the respondent's mind. Additionally, the decision to respond to later waves may be influenced by the nature of the interaction between the respondent and the interviewer during the initial interview. This interaction is most likely influenced by the interviewer's characteristics such as experience, training, gender, race, socio-economic status, and region of origin.

Demographics: Many demographic variables have been found to be associated with nonresponse. These range from the respondent's education (Kalton, Lepkowski, Montanari and Maligalig, 1990; Koval Ecclestone, Paterson, Brown, Cunningham, and Rechnitzer, 1992), age (DeMaio 1980; McArthur and Short, 1985; Herzog and Rodgers, 1988; Adams, Scherr, Branch, Hebert, Cook, Lane, Brock, Evans and Taylor, 1990) gender (McArthur and Short 1985; Kalton et al. 1990; Koval et. al. 1992), and race (Kalton, Kasprzyk, and Santos, 1980; Kalton et al. 1990) to household characteristics (McArthur and Short 1985; Adams et al. 1990; Kalton et al. 1992). For many of these studies demographic data was the only information available about the nonrespondents. Hence, it may be that some of these demographics may be substituting for more complex processes. Still, it is reasonable to assume that many of the dynamics that determine nonresponse in a cross-sectional survey would continue to influence response rates in a longitudinal context. Additionally, demographic indicators of the likelihood that a respon-

dent will change residences and their facility with survey formats and understanding of research agendas must be considered.

Employment: Another important determinant of response rates is the nature of the respondent's employment situation (Kalton et al. 1990; Kovel et al. 1992; Wolford and Torres, 1993). This goes beyond the mere presence or absence of employment, to include the nature of the job search for the unemployed and the stability of employment for those currently employed. Obviously, those respondents currently looking for work who find work in another locality are more difficult to trace. Similarly, people who lose their jobs are more likely to leave their original location. The type of employment and how the individual feels about that work may have an impact on his or her staying in that job as well as their willingness to continue to participate in the study.

Financial Resources: Financial stability and the resources to weather economic downturns should result in less movement among respondents. Several studies have linked both income and other financial resources to both reduced refusal rates and lower noncontact rates (Eckland, 1968; Smith 1983; McArthur and Short, 1985; Kalton et al. 1990; Wolford and Torres 1993).

Social Connectedness: The degree of involvement the individual has with the community through interaction with neighbors, club memberships, important relationships with others, and civic activities would seem to be related to an individual's willingness to complete a survey (O'Neil, 1979) as well as the likelihood of their being locatable at recontact.

Affective States: Finally, the individual's affective states and attitudes toward the survey should be related to their likelihood of participating in later waves. Kalton et al. (1990) report that the interviewer's rating of the cooperativeness of the respondent was positively related to further participation. Negative emotional states such as self-reports of depression, tenseness, and low morale (Goudy, 1976) have a negative effect on response rates.

3. ANALYSES

Since the dynamics leading to a refusal are considerably different than those leading to noncontact (Stinchcombe, Jones and Sheatsley, 1981; Kalton et al., 1990; Groves and Couper, 1994), the analyses presented here are divided into those attempting to account for nonresponse from refusals and those predicting noncontacts in the post-election wave of the National Black Election Study. Items in the first wave of the survey were included in the analyses based on their fit to the sources of nonresponse outlined above. Since (as O'Muircheartaigh (1989) notes) it is particular subgroups in the population that are subject to attrition, the first set

of analyses presented used the SEARCH algorithm, or Automatic Interaction Detector developed by Sonquist, Baker, and Morgan, (1973). A total of 29 variables entered the final SEARCH analyses. Both the SEARCH analyses and the logistic regressions are weighted to compensate for unequal selection probabilities in the 1984 pre-election survey.

While the SEARCH technique has some advantages, the use of logistic regression to predict nonresponse is also common. Since SEARCH is designed to identify interaction effects, and logistic regression favors main effects, both were used and are presented here.

4. RESULTS

It is clear that many subgroups do end up under-represented in later waves. In particular, for the 1984 post-election survey, the subgroup with one of the highest rates of refusal were individuals who were rated by the interviewer as neutral or uncooperative, whose main bread winner's occupation (coded using the 1980 Census 2 digit occupational codes) was sales, operative, laborer, or in a technical or professional field, or who did not have an occupation. This group had a refusal rate of 45.5%.

Table 1.

VARIANCE IN POST-ELECTION REFUSAL EXPLAINED BY PRE-ELECTION RESPONDENT CHARACTERISTICS	
Study Salience	Percent of Variance
Attitude Towards Affirmative Action	1.57%
Attitude Towards Defense Spending	1.01%
Interest in Jackson's Campaign	0.16%
Demographics	
Number of Years Living in Area	2.11%
Number of Phones in the Household	1.96%
Number of Persons in Hhld	1.39%
Education	1.25%
Number of Children	0.89%
Respondent's Gender	0.74%
Employment	
Occupation of Primary Earner	3.85%
Occupation of Respondent	2.31%
Social Connectedness	
Voted in 1980 Presidential Election	0.87%
Affective States	
Interviewer Rating of Cooperativeness	5.72%
Percent Variance Accounted for (Total)	23.82%

In contrast, one of the groups in this panel with no refusals were individuals rated as very cooperative, who had at least some high school education, whose occupation was either white collar or one of the crafts and who had five or more people living in the household. The factors associated with refusal and the percent of the variance they accounted for in the SEARCH analysis are presented in Table 1.

The logistic regression results presented in Table 2 show much the same results as the SEARCH. It may be that it is individual factors that act singly or in concert rather than subgroup attributes that determine the likelihood of a respondent refusing. However, the two techniques did not generate identical results. While the logistic regression showed a significant decrease in refusals with increasing interest in political campaigns and a willingness to endorse a democratic candidate, the SEARCH focussed on specific issues. Respondents who had not formed an opinion about defense spending or affirmative action programs or whose interest in political campaigns had increased due to Jesse Jackson's candidacy were more inclined to refuse to be interviewed again.

Table 2.

LOGISTIC REGRESSION OF REFUSALS POST-ELECTION SURVEY	
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Level of Interest in Politics	-0.198 ***
Candidate Preference	**
Republican	0.124
Democrat	-0.593 **
Refused to Give Preference	1.067 *
Years Lived in the Area	0.032 **
Education	-0.379 ***
Gender: Women	0.808 ***
Occupation of Main Earner	***
Professional/Technical	0.667 *
Managers and Administrators	0.081
Sales	1.464 ***
Clerical and Service Workers	-0.351
Craftsmen	-0.428
Operatives	1.566 ***
Transportation	-0.859
Laborers and Farmers	-0.302
Cooperativeness of Respondent	-0.446 ***
* p < .10 ** p < .05 *** p < .01	
Percent Predicted Correctly	90.6%

Many of the demographic variables associated with refusal in cross-sectional studies predict refusal to

complete a second interview as well. In this study however, age is a notable exception. DeMaio (1980) also found that age ceased to be a predictor of refusal after the initial interview.

Interestingly, the number of years the respondent had lived in the area increases the likelihood of his or her refusing to participate. Since few other studies have examined its relationship to refusal, this finding is difficult to interpret. Increased education is associated with lower refusal rates. This is consistent with the findings on the Americans Changing Lives study (Kalton et al., 1990) and Koval et al. (1992). As in the study by Koval et al. (1992), women were more likely to refuse than men.

Since the number of phones in the household is not significant in the logistic regression, it may well be that it is only its interaction with length of time in the area and occupation that influences refusals. Similarly, the number of people residing in the household is nonsignificant in the logistic regression and interacts with occupation and education in the SEARCH analysis.

The occupation of the main bread winner predicted refusals in both analyses. Respondents in households where the primary income was from the fields of sales, factory work, or professional or technical jobs were most likely to refuse.

Neither financial resources nor social connectedness appeared to play much of a role in refusals in this study. Only voting, which is related to the topic of the study, showed even a small impact on refusals. In contrast, the only affective measure included in the questionnaire, the interviewer's rating of the respondent's cooperativeness was a strong predictor of refusals for both analysis methods. This confirms the findings from the ACL (Kalton et al., 1990) and the NPSBA data (Wolford and Torres, 1993), though clearly, the interviewer rating of the respondent's cooperativeness is more central to later nonresponse than the dimensions used in the National Survey of Black Americans.

Under-represented subgroups also appear in later waves due to patterns of noncontactable respondents. Examining the results of the SEARCH done to identify groups most likely to be lost in later follow up efforts yields the following. One of the groups most likely to be noncontactable are those respondents who have never married or are divorced or separated and whose household income is either low or was not ascertained (42.4%). Among those single respondents with moderate to high incomes, those whose occupation is not managerial or craft work and whose household's primary income comes from clerical, factory, professional or technical work, or from farm labor, who have only a high school education, and two or fewer phones are even more likely to be noncontactable (60.3%). All of the

respondents who were married or widowed, preferred a democratic candidate, whose occupation was sales, farming, transportation or in professional or technical fields and who were middle-aged or older were contacted.

In the case of noncontactable respondents, the SEARCH program appears to be identifying subpopulations rather than factors which act in the same manner for all respondents. It is no surprise then that the logistic regression generates only four factors that account for nonresponse due to noncontactable respondents. Having a stable marital status, the number of phones in the household, age, and preference for a democratic candidate each significantly decrease the likelihood a respondent being lost in tracking.

The results of the SEARCH program for factors identifying noncontactable respondents are presented in Table 3. The effects of the saliency of the survey's topic to the respondent are even stronger for noncontact than for refusal. Specific issues, candidate preferences and interest in campaigns all show an influence on who will be successfully recontacted. In addition to the considerable quantity of the variance they account for, their relation to the topic of the study makes them particularly important to account for.

Table 3.

VARIANCE IN POST-ELECTION NONCONTACT RATES BY PRE-ELECTION RESPONDENT CHARACTERISTICS	
Study Saliency	Percent of Variance
Attitude Towards Affirmative Action	1.93%
Attitude Towards Defense Spending	1.72%
Candidate Preference	1.64%
Interest in Jackson's Campaign	1.20%
Interest in Political Campaigns	0.46%
Demographics	
Number of Phones in the Household	1.98%
Marital Status	1.71%
Number of Persons in Hhld	1.54%
Respondent's Age	0.99%
Education	0.97%
Number of Children	0.44%
Employment	
Occupation of Respondent	2.64%
Occupation of Primary Earner	0.70%
Financial Resources	
Household Income	1.60%
Percent Variance Accounted for (Total)	19.52%

The demographics of the noncontactable cases show few surprises. Respondents with a greater number of phones are more likely to be reached. Married respondents are more readily recontacted. However, the effect of household size is contradictory; its impact appears to depend on the age of the respondent. Education again shows a positive influence on response rates.

The respondent's occupation interacts with income and education in accounting for cases who were noncontactable. Unlike refusals it is the occupation of the respondent which accounts for the greater variance while the occupation of the primary earner accounts for only a small portion.

Financial resources also play a greater role in accounting for noncontact, than for refusal. Single person headed households with low to moderate incomes or for whom no income information was ascertained were less likely to be reinterviewed. However, for married or widowed respondents who believed minority groups should help themselves, those with lower incomes were more likely to be recontacted.

None of the variables used to approximate social connectedness accounted for any of the variance in our ability to contact the respondents. The interviewer ratings of the respondent's mood also failed to account for any variance.

5. CONCLUDING REMARKS

While this paper presents only a framework for a theory of longitudinal nonresponse, what we have discovered so far is useful for enhancing efforts to account for nonresponse. Generally, these findings are consistent with the current literature on nonresponse. Some of the discrepancies are due to the differences in the data collected as well as the nature of the African American sample. Not all of the possible causes of nonresponse outlined at the beginning of this paper were adequately represented in the questionnaire. Indicators of social connectedness or community involvement and measures of affective states were not included in the original instrument. Key demographics such as the nature and condition of the dwelling and home ownership were also omitted.

One of the contexts in which this framework is useful is identifying the range of important issues for nonresponse during the process of developing a questionnaire. Whenever feasible, items should be included to cover this range or modified to tap it more centrally.

In addition, this work can act as a guide for preparing for future waves in a panel study. It provides a framework for highlighting respondents who are most

likely to be lost in tracking. This allows us to target tracking efforts more economically. Efforts may then be made to maintain contact between waves with respondents who are likely to move. Efforts may also be targeted at likely refusals. By identifying these individuals in advance, more experienced interviewers can be assigned to these cases.

Finally, the adoption of this framework allows the analyst creating nonresponse weights to restrict the focus of his or her search to those variables already identified as associated with longitudinal nonresponse.

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