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Using Temporary Refusals to Estimate Nonresponse Bias

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Refusals by selected respondents to grant an interview are the most serious deviations from the textbook assumptions of sampling that confronts contemporary survey research. Even first-rate surveys typically have a non-response rate of about 25 percent and about two-thirds of the non-response consists of refusals (Smith, 1978). The problem of refusals arises not only from their appreciable magnitude, but from their unknown quality. While we know the size of the refusals, we rarely have enough information about the refusals to gauge the distortion they might introduce into survey results. They are a mare incognitus that may contain fierce biases or only gentle randomness. It is not that we know that refusals introduce major biases, but that they may do so and we are hard pressed to prove or disprove their distortion. Given that the problem can not be completely solved by eliminating refusals from surveys (and perhaps not even appreciably reduced beyond their present level), the need is to develop a mechanism for estimating or mapping the characteristics of refusals.

Many techniques have been suggested for calibrating the attributes of refusals (for a summary see Smith, 1983). In recent years the method of using temporary refusals to estimate the characteristics of final refusals has gained popularity (Benson, Booman, and Clark, 1951; Robins, 1963; Westerhoven, 1978; O'Neil, 1979; Andersen, et al., 1979; Jones, Sheatsley, and Stinchcombe, 1979; Tuchfarber, Oldendick, and Bishop, 1979; DeMaio, 1980; Stinchcombe, Jones, and Sheatsley, 1981; Brown and Bishop, 1982; and Smith, 1983). This technique divides respondents into two categories, cooperative respondents who never refused an interviewer and temporary refusals who declined to be interviewed at one or more points but later agreed to an interview. Usually these temporary refusals are used as standins or substitutes for the final refusals.

It is also possible to use them as pointers of final refusals, extrapolating from cooperative respondents to temporary refusals and onto final refusals.

One of the advantages of the temporary refusals technique is that it can be used to estimate the bias of any variable in a study rather than being constrained to assessing the representativeness of a few variables (usually demographics) for which information on nonrespondents is available. Another advantage is that this technique is specifically designed to estimate nonresponse bias from refusals rather that lumping together nonresponse from refusals, absences, and other reasons (e.g. illness, mental incapacity). On the other hand, temporary refusals are only an estimating technique, not an absolute method for measuring nonresponse bias. It does not supply us with data on the attitudes and behaviors of refusals, but merely provides an estimate of their attributes. The estimates are based on the assumption that temporary refusals resemble final refusals more closely than cooperative respondents do. Some limited checks of this assumption will be analysed later.

Research on nonresponse bias has been carried out on the 1980 and 1982 General Social Surveys (GSSs) conducted by the National Opinion Research Center, University of Chicago. The GSSs are personal, full probability surveys of the adult, English speaking population of the contiguous United States living in households (for details see Davis and Smith, 1982). Initial research employing the 1980 GSS examined various methods of estimating nonresponse bias (Smith, 1983). This research using the 1982 GSS extends earlier work on temporary refusals.

To identify a number of attributes that might be associated with refusal to participate in a survey, we examined studies of the factors contributing to refusals and of the associates of nonresponse. Information on the

causes of refusals comes from several sources: (1) interviewer recordings of the reasons for refusals (Cantril, 1947; Benson, Booman, and Clark, 1951; "Refusals," 1974; Meyers and Oliver, 1978; Tuchfarber, et al., 1979; and DeMaio, 1980); (2) asking respondents about nonparticipation in earlier surveys (Panel, 1979 and Wiseman and Schafer, 1976); (3) temporary refusals (Westerhoven, 1978; Stinchcombe, Jones, and Sheatsley, 1981; and Smith, 1983); (4) image research about surveys ("Image," 1981); (5) studies of respondent burden (Sharp and Frankel, 1981); and (6) nonrespondent interviewers (Tuchfarber, et al., 1979 and "Long Interviews," 1980). While the specific findings of these studies varied considerably given their particular focus and the items and coding schemes employed, they repeatedly turned up several reasons for refusing to participate in a survey: (1) being too busy, (2) not interested, (3) concerned about privacy, and (4) anti-survey attitudes. Mentioned less often were (5) fear of personal safety, (6) sugging (selling under the guise of an interview), (7) anti-government attitudes, and (8) illness.

To measure whether temporary refusals were related to these factors we added items to the 1982 GSS covering the four most commonly mentioned reasons: a two-part item on subjective busyness-boredom, an item on interest in public issues and events, an item about concern over privacy, and two items on the veracity and utility of surveys (see Appendix). For the four less commonly mentioned reasons, we added to our current item of fear of walking alone at night an item about being afraid at home. Illness was already covered by items on subjective health and satisfaction with health. Anti-government attitudes were cited as a reason only in government surveys and even then not prominently, so no new items were added to existing items that tapped this dimension (e.g., confidence in government leaders and political ideology).

Finally, sugging was not approached because it was not frequently cited in the literature (Sheets, et al., 1974; Wiseman and Schafer, 1976; and Tuchfarber, et al., 1979), and NORC interviewers are specifically trained to inform and convince respondents that no selling is involved.

Other literature on the characteristics of nonrespondents in general and of refusals in particular suggested several other associates of refusals. Numerous studies show higher nonresponse in urban areas and a few studies suggest possible regional differences as well (Smith, 1983; Gorman, 1969). Demographic differences have been detected in some studies on age, race, sex, SES, immigrant status, and ethnicity. Several studies also suggest that refusals might be more politically conservative in general and less liberal on race relations in particular (Brannon, et al., 1973; Benson, Booman, and Clark, 1951; Schuman and Gruendberg, 1970; Hawkins, 1975). Finally, we looked at three possible factors that have not been examined previously. We thought that refusals might have lower psychological well-being and be more alienated. Also we used two measures of cooperativeness-interviewer's rating and willingness to provide information on family income. Finally, we included our standard sociability items. These might show two conflicting patterns. On the one hand, a person who spends a lot of time socializing might feel too busy to participate. On the other hand, an isolated individual who did not frequently interact with others might have misanthropic or anti-social inclinations that would contribute to refusing to be interviewed.

Overall, Table 1 shows few notable differences. Only half of the associations are in the hypothesized direction, only 12 of 63 associations are statistically different at the .05 level (and two are opposite the hypothesized direction), and only one difference is greater than 10 percentage points. The largest difference occurs on cooperation. People refusing to

TABLE 1

DIFFERENCES BETWEEN COOPERATIVES AND TEMPORARY REFUSALS

Variables[a]	Category[b]	Percentage Difference[c]		Probability[d]
TIME				
Busy-Bored Scale	Rushed	+6.2%	+4.3	.027
Hours worked	36 hours+	-7.1	-5.0	.191
Labor force status	Working/Student	+0.3	+0.1	1.000
Self-Employed	Yes	-1.2	-1.5	.695
INTEREST				
Civic interest	Not int. mostly	-3.5	-1.9	.489
Read paper	Less than daily	+1.9	+1.0	.439
Voted in 1980	Did not vote	+0.7	+0.5	.898
Party identification	Independent	+3.4	+1.9	.471
DK Scale[e]	More than one	+4.1	+2.2	.267
PRIVACY				
Concern about	Very concerned	+2.1	+1.1	.433
Wire taps	Disapprove	+1.4	+1.2	.688
ANTI-SURVEY				
Usefulness	No good purpose	+7.0	+4.0	.021
Truthfulness	Sometimes or less	+2.0	+1.0	.270
FEAR				
Walking alone	Afraid	+7.0	+3.7	.058
At home	Not safe	-0.6	-0.6	.900
ANTI-GOVERNMENT				
Political Ideology[f]	Not centrist	+1.7	+3.7	.058
Confidence in Federal Executive Branch	Hardly any	+2.1	+1.4	.633
Confidence in Congress	Hardly any	+2.7	+2.0	.642
Public officials don't care	Agree	+2.7	+1.5	.489
LIBERAL/CONSERVATIVE				
Abortion on demand	No	-4.5	-2.4	.245
Abortion for poor	No	+0.9	+0.5	.859
Gun control	No	-2.2	+1.4	.552
Educational spending	Not too little	-6.0	-3.1	.172
Health spending	Not too little	-4.5	-2.4	.074
Sex education	Against	-0.8	-1.3	.852
Contraceptive Information	Against	-0.8	-1.3	.809
Communism	Worst Government	-0.1	-0.1	.980

TABLE 1

(continued)

Variables[a]	Category[b]	Percentage Difference[c]		Probability[d]
RACE RELATIONS				
Busing	Against	-2.2	-2.2	.506
Intermarriage	For law against	-6.2	-3.8	.072
Spending on blacks	Not too little	+1.3	+0.8	.678
Dinner guest, attitude	Some objection	-4.2	-3.3	.007
Degree of School Integration	OK if 50-50	+0.1	+0.1	1.000
Black for president	Not vote for	-0.5	-0.5	.948
Blacks pushing too much	Strongly agree	-3.5	-2.2	.232
Separate schools	Yes	-5.2	-8.4	.016
Open housing opposed	Not strongly disagree	-3.2	-4.6	.228
Integrated neighborhood	Do not live in	-6.7	-3.5	.075
UNHAPPY, ALIENATED				
Happiness	Not very happy	+1.5	+0.9	.564
Anomia Scale[g]	4+	+1.6	+1.0	.955
Family Satisfaction	Not very great	+0.7	-0.4	.935
Job Satisfaction	Not very satisfied	-0.8	-0.4	.303
Financial Satisfaction	Not at all satisfied	-7.2	-4.5	.080
COOPERATION				
Interviewer's rating	Not friendly/interested	+8.9	+7.7	.001
Income	Refused to give	+8.9	+23.8	.000
HEALTH				
Subjective health	Not excellent	-3.7	-2.2	.544
Satisfaction with	Less than a great deal	-5.8	-3.3	.061
SOCIALIZING[h]				
Friends	Monthly or less	+2.3	+1.1	.609
Neighbors	Monthly or less	+3.4	+1.8	.792
Relatives	Monthly or less	-6.4	-3.3	.717
Bar	Monthly or less	+1.7	+1.5	.797
Parents	Monthly or less	-3.3	+2.9	.750
Siblings	Monthly or less	-2.7	-1.4	.960
GEOGRAPHIC				
Region	Northeast	+7.6	+5.6	.002
SRC urban/rural	Not rural county	+10.7	+9.4	.000
NORC urban/rural	Not open country	+11.6	+9.6	.001

TABLE 1

(continued)

Variables[a]	Category[b]	Percentage Difference[c]		Probability[d]
DEMOGRAPHICS				
Age	65+	+1.8	+1.5	.645
Sex	Male	-5.9	-3.1	.108
Race	White	-3.1	-3.8	.006
Occupational Prestige	less than 20	-1.8	-2.7	.312
Education	Less than High school	-3.3	-2.0	.532
Immigrant Generation[i]	1st/2nd generation	+6.6	+6.0	.021
Ethnicity	Hispanic	+2.5	+8.6	.044

[a]A complete description of all variables appears in Davis and Smith, 1982.

[b]For presentation purposes all variables were dichotomized. The listed category was expected to have a larger share of temporary refusals than cooperatives. Differences across all categories of a question were actually inspected but only collapsed categories are used in the table.

[c]A "+" indicates that difference was in the expected direction while a "-" means it was in the opposite direction. The first column treats refusing as an independent variable. This shows the refusal bias. The second column treats refusing as the dependent variable and shows difference in the percent refusing on the independent variable.

[d]The probabilities for non-interval variables are based on uncollapsed categories with don't knows excluded from analysis. For interval-level variables both uncollapsed and collapsed associations were examined. The probabilities presented here are for the collapsed versions of interval level variables. For a number of variables alternative collapsed versions and the inclusion of don't knows were also tried. No notable differences from the above figures were detected in these variations.

[e]The DK scale counted the number of don't knows given to 39 attitude items.

[f]Liberal versus Conservative differences were also examined and fewer refusals were conservatives than cooperatives (-1.5 percent).

[g]An additive scale of the three Srole anomia items.

[h]Contrary expectations existed for these socializing variables. On one hand frequent visits to friends, neighbors, etc. might indicate a busy schedule and less time to be interviewed. On the other hand a person with few social contacts might indicate an isolated, even misanthropic or antisocial individual who would reject an interview. Because of these conflicting expectations, the pluses and minuses do not really reflect any theoretical expectation.

[i]This variable uses three items on nativity (country of birth of respondent, parents, and grandparents) to determine immigrant generation. Each of the constituent variables also showed significant differences in the expected direction.

give their family income are much more likely to be temporary refusals (percent of income refusers who are temporary refusals - percentage of income responders who are cooperatives = 23.8 percent).[1] Similarly, respondents rated as not friendly and interested are more likely to be temporary refusals. Relatively large and consistent differences also appear on the ecological variables. People in rural areas are most cooperative while residents of large cities are most likely to refuse. Temporary refusals are also concentrated in the Northeast. Anti-survey attitudes also appear to contribute to refusals. Both measures are in the anticipated direction but only one is statistically significant.

All of the other dimensions showed more mixed patterns. On time only our subjective measure of time pressure shows a significant association with temporary refusals. None of the objective indicators even hint at an association. While more precise behavioral measures might reveal an association, it may be that only a subjective sense of being rushed and pressed for time contributes to refusing. Among the demographics three variables show significant associations. Refusals tend to concentrate among non-whites, certain ethnic groups--especially Hispanics, and recent immigrants. These findings disagree with some earlier research that either showed whites responding less often (Schuman and Gruenberg, 1970; Weaver, Holmes, and Glenn, 1975; Hawkins, 1975) or no significant differences between the races (DeMaio, 1980; Lansing, et al., 1971; Smith, 1983; Tuchfarber, et al., 1979). The significant difference here comes almost entirely from the higher refusing of other race

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[1]On one hand, the cooperation variables can be seen as dependent variables to refusing since they come after the initial refusal and can be seen as reflecting the reluctancy to be interviewed. On the other hand it is possible to see them as measures of a general willingness to cooperate and therefore as tapping a dimension that is a determinant of refusing.

respondents (mostly Asians and Amerindians). No significant difference exists between blacks and whites or non-whites (blacks and others combined) and whites. Several earlier studies showed significant differences by ethnicity (Dohrenwend and Dohrenwend, 1968; O'Neil, 1979; Robbins, 1963), but they have not consistently identified particular ethnic groups as problematic and our results added to the diversity of alleged refusal prone groups.[2] More consistency prevails on immigrant status since all studies (Dohrenwend and Dohrenwend, 1969; Robbins, 1963) agree that immigrants are more likely to be temporary refusals. Fear has a borderline association with temporary refusals. Since fear also showed a borderline association in 1980 we suspect that concerns about personal safety and distrust of strangers are probably associated with refusals. Insecurity inside of one's home does not seem related to refusals however. Anti-government attitudes do not even approach significance as a cause of temporary refusals, but the trivial associations are all in the right direction. Since the GSS does not emphasize a connection to government we did not expect any association in our case, but for government surveys this could be a significant factor. Similarly, both privacy measures are in the right direction but of trivial size.

None of the remaining factors show any clear sign of determining temporary refusals. Our measures of civic or issue interest did not show any significant associations and the differences often ran opposite the hypothesized direction (Stinchcombe, Jones, Sheatsley, 1981; Speak, 1964; Tuchfarber,

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[2] O'Neil (1979) found temporary refusals higher than average among Germans, Poles, and the Irish and lower than average among the British, Italians, and Scandanavians. Dohrenwend and Dohrenwend (1968) found temporary refusals high among Irish immigrants but not Puerto Ricans. On the 1982 GSS the groups with the highest refusals were Orientals, French, Hispanics, Poles, and Norwegians. Those with the lowest levels of refusals were American Indians, Swedes, Scotch, Germans, Irish, and Italians.

et al., 1979). The same is true for unhappiness and alientation, and socializing. Health shows some indication of going in the opposite direction with those less satisfied with their health and rating it lower being more likely to cooperate (but not significantly so). Nor does the general liberal/conservative dimension appear related and especially on race relations the associations tend to run against the anticipated concentration of temporary refusals among conservatives. On two race items there are significant associations between liberal responses and refusals. This even more strongly rejects the conservative refusal hypothesis than the 1980 GSS data which showed no association between refusing and political ideology. In sum, refusals tend to be concentrated among people with lower cooperation, outside of rural areas, who feel rushed, and who have negative attitudes about surveys. Racial and ethnic differences may exist but the results have been diverse enough (including those between the 1980 and 1982 GSS) to make any firm conclusions impossible. Immigrants, on the other hand, do appear to refuse more often. Fear, concern over privacy, and anti-government sentiments may contribute to refusals, but these leanings are far from certain. Little or no evidence supports any association with interest, liberalism/conservatism, unhappiness/alienation, health, socializing patterns, or the other demographics such as age, sex, education, or occupational prestige.

We then carried out a multivariate regression analysis to determine which of the significant bivariate determinants of refusals had independent effects. Race and ethnicity were dropped from the analysis since the groups showing the differences (others on race and Hispanics and a few other groups on ethnicity) were too small for multivariate breakdowns. We also eliminated NORC size of place since it is highly associated with the SRC size of place measure. We combined the two race relation items into one scale. The

remaining variables (region, busy-bored, income refusals, immigrant generation cooperation, and survey utility) were used as in the bivariate analysis.

Table 2

Multiple Regression Analysis of Determinants of Temporary Refusals

Variables (high category)	Standardized Coefficient	F
In Equation		
Income refusal (gave income)	-.114	19.0
SRC size of place (non-urban county)	-.087	11.3
Region (not Northeast)	-.073	7.9
Interviewer Rating (hostile)	.073	7.7
Time (Bored)	-.068	7.1
Race Relation Scale (intolerant)	-.054	4.3
Not in Equation		
Survey Usefullness (waste of time/money)	.034	1.7
Immigrant Generation (parents foreign born)	.017	0.4
$r^2 = .048$		

Table 2 shows that most variables had modest independent associations with refusing. Immigrant generation had no net association (its bivariate association having resulted largely from a covariation with region) and the association with anti-survey attitudes weakened enough to become insignificant.

Can Refusals be Explained?

The proceeding analysis suggests that determinants of temporary refusals are fairly limited in range and magnitude. In turn this means that refusal bias is restricted to a relatively small number of variables and moderate to negligible in size. On the one hand this is a pleasant finding since it suggests that refusals do not seriously distort most survey data. We have demonstrated that temporary refusals do not indicate any appreciable bias in a wide range of variables. Even if other factors are isolated that are associated with refusals and therefore biased, that will not change the

absence of bias in the variables that have been tested above. On the other hand in part because we have failed to delineate strong predictors of temporary refusals we are left wondering whether we have missed important predictors and therefore have underestimated the refusal bias that can result.

To determine the likely causes of low association we need to consider the structure and composition of refusals. Refusals may depend on two factors (1) propitiousness and (2) inclination. Propitiousness is a situational factor. It may be thought of as the proportion of time when an interview is convenient or as the likelihood of contacting a respondent at a suitable time. Propitiousness is a transitory factor since everyone has periods when other activities (going out, napping, headaches, having dinner, entertaining company) makes an interview inconvenient. It is not homogeneous however, since different people may have a higher share of time occupied by these inconvenient periods. Overcoming these refusals is simply a matter of following up until a respondent is contacted at a convenient time, similar to following up absent respondents until they are found at home. Often these refusals are resolved through the making of appointments.

The second general factor is one's inclination to be interviewed. At a given level of propitiousness respondents can be thought to vary in inclination or willingness to be interviewed. Some of the specific causes of one's inclination are transitory (and somewhat similar to propitiousness). This might include such factors a family problems, work related pressures, and other life stresses that do not make it literally inconvenient to be interviewed at a particular time, but preoccupy respondents' thoughts and dissuade them from being interviewed. Other more permanent reasons to be disinclined include people living in various types of illicit situations (e.g. illegal

aliens, deadbeats, fugitives, welfare cheats, etc.) who fear "inspection." Another enduring cause for disinclination would be attitudes and beliefs that reduce willingness to be interviewed. These may be very specific attitudes towards surveys or a sponsoring agency based on past experiences such as sugging or government red tape or somewhat more generalized concerns about such matters as confidentiality, privacy, etc. Inclination may also depend in part on basic personality traits such as suspiciousness, misanthropy, cussedness, diffidence, misogyny, reclusivess, or even paranoia. In these various situations an interview can be obtained by overcoming the specific reason for the objection (e.g., convincing the deadbeat that you are not from the loan company or persuading those wary of sales pitches that you are not selling anything); by building rapport and trust to overcome concerns about such matters as privacy, suspiciousness, or anti-social tendencies; or by persisting until the cost of refusing becomes greater than the cost of participating.

This overview of refusal suggests two possible reasons for finding only limited associates of refusing. If refusing was mainly a function of propitiousness depending on transitory situations, then we would expect few associates. While some authors stress the transitory and situational nature of refusals and argue that there are not "perpetually non-compliant" respondents (Westerhoven, 1978; see also Holt, 1981), the bulk of evidence suggests that a substantial portion of refusals is persistent and repetitive. Dohrenwend and Dohrenwend (1968) found that on wave two of a panel 19 percent of those who had been cooperative on wave one refused to participate while 38 percent of temporary refusals on wave one refused a second interview. Similarly, Stinchcombe, Jones, and Sheatsley (1981) found that 50 percent of cooperative respondents reported they had agreed to an earlier farm survey while only

20 percent of temporary refusals reported earlier participation. (See also Stephen and McCarthy, 1958 and "Long Interviews," 1980.) The stability of refusals is also evident in conversion rates of initial refusals. Typically about 35-50 percent of initial refusals can be converted into respondents. This is much lower than the number of absent respondents who came eventually be interviewed (over 90 percent) and indicates that a substantial portion of refusals are not situational.[3] On the other hand, many refusals are related

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[3]Conversion rates vary widely depending on the populations sampled, the level of conversion effort, and the effectiveness of the initial interviewer (the more effective they are the harder conversions are). Conversion rates range as follows:

6.5% -	letter follow up to national sample	Panel, 1979
10.1% -	personal follow up to CPS	DeMaio, 1980
27.0% -	personal follow up to adults with childhood problems	Robbins, 1963
29.1% -	telephone follow up to Cincinnati survey	Brown and Bishop, 1982
35.0% -	personal follow up to 1980 GSS	Smith, 1983
35.2% -	telephone follow ups to Cincinnati area telephone surveys	Brown and Bishop, 1982
40.0% -	various SCPR surveys	Holt, 1981
41.0% -	personal follow up to 1982 GSS	
48.3% -	telephone follow up to Chicago area telephone survey	O'Neil, 1979
80+% -	various Dutch surveys	Westerhoven, 1978
82.6% -	personal followup in Elmira study	Stephan and McCarthy, 1958
97.0% -	personal followup to study in Minneapolis	Benson, et al., 1951

to transitory, situational characteristics and these types of refusals would attenuate associations between more permanent types of refusals and their causes.

In addition, we may have failed to adequately cover some of the major reasons for refusals. This might be particularly true if refusals are not primarily a function of the kind of proximate causes that we have focused on (fear, time pressure, anti-survey attitudes, privacy, civic interest, etc.). If personality traits of various types are the real cause of refusals, then we have failed to detect the true magnitude and locus of refusing bias because we have not looked in the right places. People may name the various surface reasons we have examined just like a patient describes the symptoms of a disease (e.g., cold hands, chest pains) rather than the cause (arteriosclerosis). In fact, refusers may not be able to articulate the underlying causes of their refusals since cognitive and psychological introspection is a very difficult task. To check this possibility an attempt should be made to identify personality traits that are associated with cooperation/refusing and create short scales to measure them.

Finally, the confounding of respondents and other household members among temporary refusals also contributed to weaker observed relationships between refusing and our predictor variables. Often when a temporary refusal occurs we have not yet been able to determine who the respondent should be and therefore do not know whether the refusal is coming from the respondent or from some other family member.[4] For several of the variables it does not matter who gives the refusal since we are using aggregate level variables that

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[4]We know that the respondent was the temporary refuser in 43 percent of the cases and that either the respondent or another adult in the household refused in the remaining 57 percent of cases.

apply to all household members (e.g., geographics codes, family income, number of earners, etc.) or characteristics that tend to the same for all family members (e.g., race). Refusals by third parties do however distort the association between individual-level characteristics and predictor variables since the personal attributes of the respondent have no direct connection to refusals by other family members. We were partly able to get around this problem by examining separately refusals that occurred on the questionnaire (and therefore by the respondent) and refusals to the household enumeration (by either the respondent on another adult family member) and by looking at households with 1, 2, or 3+ adult members (i.e., households in which there was only a respondent to refuse versus households in which the refusals could have come from either the respondent or other household members). We found that differences between cooperatives and the unconfounded temporary refusals was usually slightly greater than reported in Table 1. For example, among questionnaire refusals interviewer ratings of cooperation was 13.4 percentage points lower than cooperatives. Among the mixed group of respondents and other household members who refused, cooperation was only 7.7 percentage points lower than cooperatives. In most cases however the increase difference was only 1-2 percent points indicating that while relationships were attenuated, the loss in predictive strength was typically minor.

Our limited ability to explain temporary refusals probably results partly from (1) the appreciable share of refusals that are due to purely transitory situations and (2) including temporary refusals by family members other than the selected respondent. We may also have missed some determinants such as the various personality traits mentioned above. But even if we succeed in more fully modeling the determinants of temporary refusals we have not demonstrated that these produce accurate estimates of final refusals.

Are temporary refusals tracers of final refusals?

There is reason to believe that temporary refusals may not be a random subsample of initial refusers and that therefore final refusals may differ appreciably from temporary refusals. While we know that these two groups share one characteristic (both initially refused), they differ on another characteristic (response to conversion efforts). This difference may only suggest that final refusals are more extreme versions of temporary refusals and that temporary refusals should be used to extrapolate to final refusals. Temporary refusals may however be substantially different from final refusals. It is possible that temporary refusals are made up principally of those reached at impropitious times while final refusals may consist largely of people with enduring attitudes or personality traits that make them disinclined to grant an interview. Thus temporary refusals may not indicate a substantial difference between cooperatives and refusals when such pronounced differences do exist.

To try and determine whether temporary refusals can substitute for final refusals or are different from them, we divided temporary refusals into easier versus harder to convert groups based on how many times they refused to give an interview. Unfortunately, the initial small number of converted refusals (230) and the large number with only one temporary refusal (160) left few cases with multiple temporary refusals (49 with two refusals, 21 with three or more). Examination of all the variables in Table 1 by the number of temporary refusals revealed no notable differences.

Focusing on the ten variables that showed significant differences in the hypothesized direction, we used one way analysis of variance to test for differences by degree of conversion difficulty. A linear association between the predictors and conversion difficulty would indicate that the nonresponse

bias increased as noncooperation rose and would suggest that extrapolation should be used to estimate the characteristics of final refusals. No association would suggest that initial refusals were a fairly homogeneous group and that there may not be notable differences between temporary and final refusals. (This is not proven since the data can only demonstrate that there is no difference between easy and hard to convert temporary refusals. The assumption is that difficult to convert cases would more closely resemble the unconverted cases.) A non-linear association would suggest that final refusals were distinct from temporary refusals. Examining only the temporary refusals we found that no significant differences existed except for region where proportion in the northeast increased linearly with conversion difficulty. This lack of significant variation is not especially surprising given the small number of cases and the probable crudeness of our measure of difficulty, but it does suggest that final refusals may not substantially differ from temporary refusals.

A direct test of the reliability of using temporary refusals to estimate the charactertistics of final refusals is to compare these estimates with the known attributes of final refusals. The problem is that there are very few variables for which information about the final refusals is available. Only for the three geographic variables was definitive and complete information available for the final refusals. In each case cooperatives are significantly different from both temporary refusals and final refusals while temporary and final refusals did not significantly vary from each other (Table 3).

Using temporary refusals to estimate the characteristics of final refusals improves the accuracy of our results. For example, on SRC size of place 17.7 percent of the completed cases are in non-urban counties while for

Table 3

Comparison of Nonrefusals, Temporary Refusals, and Final Refusals

	Proportions			Probabilities		
Variables	Coop.	Temp. Ref	Final Ref	Coop v. Temp. Ref.	Coop v. Final Ref.	Temp. Ref. v. Final Ref.
SRC size of place (non-urban county)	.194	.087	.108	.0001	.0001	.916
NORC size of place (central city 250K+)	.181	.239	.247	.0261	.0020	.903
Region (Northeast)	.215	.291	.313	.0001	.0009	.965
Race (other)[a]	.013	.043	.027	.0060	.0280	.067
Dwelling type (apartment)	.118	.173	.146	.0118	.0000	.285
(Detached, single family home)	.644	.628	.677			
Sex (male)[b]	.453	.411	.524	.257	.124	.041

[a]Race was known for 75.3 percent of the final refusals. For the remaining final refusals race was estimated according to the racial distribution of the other cases in the same neighborhood.

[b]These figures show a smaller difference than in Table 1 (5.9 percent) because they are weighted by household size.

completed cases and refusals the known distribution is 16.5 percent. When the distribution of temporary refusals is used to estimate the distribution of all cases, we come up with 16.2 percent. While slightly underestimating the true distribution (-0.3 percent), it is closer than the unadjusted completed cases (+1.2 percent).

On race also temporary and final refusals are not significantly different while both differing from cooperatives. Using temporary refusals as substitutes for final refusals exactly replicates the distribution of other races arrived at from interviewer observation. On dwelling type and sex however temporary refusals fail to improve our estimates. In fact, for detached single, family dwellings temporary refusals point in the wrong

direction. This may not represent a failure of the temporary refusal technique, however, since dwelling type was unknown for 28.5 percent of final refusals. If this unknown group differed from the known final refusals, then our criterion could be in error rather than our temporary refusal estimate. Similarly sex is off the mark. While no significant difference appears between cooperatives and temporary refusals, final refusals are significantly more male than temporary refusals. This relationship is only barely statistically significant and is hampered by not knowing the sex of 61.5 percent of the final of the final refusals. Estimates of the sex distribution of the final refusals of unknown sex based on the sex distribution of the known cases and the sex distribution of the total population (from the Census) suggest however that probably 50-57 percent of final refusals of unknown sex were male.[5]

These six checks on the adequacy of temporary refusal estimates show a mixed pattern. Four of the items, including the geographic items with the strongest theoritical linkage to refusing, find that temporary refusals are useful predictors of the characteristics of final refusals. Dwelling type show a doubtful result but reliance on the criterion is uncertain. The analysis of sex distributions indicates however that temporary refusals mispredict the sex distribution of final refusals. We suspect that this misprediction results because more males have low inclination than females do. Obviously using temporary refusals to estimate the attributes of final

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[5]If we assume that 47.2 percent of all potential respondents (respondents plus nonrespondents) should have been male and given the 45.7 percent of potential respondents for whom sex is known, then 56.6 percent of potential nonrespondents of unknown sex would have to be males. Various assumptions about the sex distribution of final refusals vs. final not-at-homes and final others (ill, died, senile, etc.) suggests that at least 50 percent of final refusals were male. For a fuller treatment of sex difference on nonresponse see Smith, 1979.

refusals is not an inerrant procedure. Results seem positive enough to merit further use of the technique, but due caution must be applied, and further efforts to validate the estimates are needed.

Conclusion

Overall, temporary refusals seem an appropriate procedure for estimating nonresponse bias. Used in conjunction with other techniques such as interviewer estimates and aggregate level comparisons, it can help to provide estimates of nonresponse bias. More work is needed on the associates of refusing, however. Probably the most promising candidates for predictors are various personality traits related to cooperation such as misanthropy, diffidence, or reclusiveness. Special scales should be developed to measure these attributes and test for their association with refusing. Another possibility would be to develope measures that would inquire directly about willingness to be interviewed. This might allow us to determine the maximum possible association. Other differences would presumably be smaller in magnitude so an indication of the maximum response bias might be obtained (Stinchcombe, Jones, and Sheatsley, 1981). This might include items about cooperation with surveys in the past, personal cost of participating in a survey, or personal value or enjoyment of participation. The modest results with our measures of survey utility and veracity, however, do not indicate that this is an extremely promising line of pursuit. Another possibility would be a detailed accounting of the factors contributing to temporary and final refusals. This would serve several purposes. First, we would be able to compare the observed reasons for refusals to see if differences exist between final and temporary refusals. Substantial differences in reasons for refusals would suggest that these two groups were not homogeneous and that temporary refusals could not be used to

estimate final refusals. Also, the temporary and final refusals could be classified into groups for separate analysis. In particular it may be possible to distinguish situational refusals from people with low inclinations to participate. With the situational refusals separated it should be possible to predict a much higher proportion of the variance on refusing since the situational refusals would tend to attentuate the association between low inclination and other variables. Such classification would not be easy. Review of detailed interviewer comments on final refusals indicates that reasons for refusing are not always clear and that some people seem to offer a string of reasons hoping that the interviewer will accept one and leave them alone. Finally, more validation of temporary refusal estimates against known attributes of final refusals would be desirable. Special list samples where important data were already known about potential respondents might be useful for this purpose. Through these and other techniques we should be able to better understand the reasons for refusing, improve our estimates of refusing bias, and gain insights that would lead to a reduction in the refusal rate and of refusal bias.

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