# Problems in Form Randomization on the General Social Surveys

by Tom W. Smith

and

Bruce L. Peterson

National Opinion Research Center

University of Chicago

GSS Methodological Report No. 36

April, 1986 [Second Draft]

This research was done for the General Social Survey project directed by James A. Davis and Tom W. Smith. The project is supported by the National Science Foundation, Grant No. SES-8118731.

## Introduction

The General Social Survey has employed a split-ballot or experimental design in each survey since 1973 except for that of 1977. Recently we discovered that for certain years the experimental assignment of form was not fully randomized. The partial failure of the assignment procedure to randomize properly created an unintended association between experimental form and the rank order of age within certain households. This report explores the causes, implications, and a potential correction factor.

Two experimental designs have been used by the GSS as part of its continuing program of methodological survey research. The first design assigns different PSU and segments to different experimental conditions. This was done in the block quota/full probability comparisons in 1975 and 1976 and in the 1970 and 1980 sample frame comparison in 1983 (Stephenson, 1979 and Peterson and Smith, 1986). The second, and more common design, assigns individual cases to two or three different experimental conditions. This has been used in 1973, 1974, 1976, 1978, 1980, and 1982-1986. These case-level randomizations have been used to:

> Carry out experiments on question wording, order, context, scale reliability, and multidimensional questioning (for reports on these see Davis and Smith, 1985, Appendix O),
>
> Calibrate measures when new items or scales replaced standard questions (e.g. changes in the images of country question in 1985 or in the child quality question in 1980 and 1986),
>
> Accommodate additional questions on half the sample (as in the confidence supplement in 1978 (Smith, 1981) and the International Social Survey Program supplement in 1985)

The form randomization problem affected only the case-level experimental design so the PSU/segment experiments will not be discussed further. A detailed listing of the variables involved in each of these form experiments appears in Davis and Smith(1986, Appendix O).

Specifically, in this report we examine:

1. the procedures that were used to randomize form assignment,
2. the reason that these procedures failed to fully randomize,
3. the nature and associates of the confounding with form,
4. a correction adjustment or weight to minimize the problem, and
5. the impact that incomplete randomization has had on the experiments and supplements.

## Form Randomization Procedures Used on the General Social Surveys

To understand the flaw that marred the methodological experiments on the GSS from 1978 to 1985, it is necessary to review how form has been assigned to individual cases. Three basic procedures have been used to assign experimental form throughout the history of the survey.

### A. Block Quota Surveys, 1973, 1974, 1976

From 1972 to 1974 and on split halves in 1975 and 1976,[1] the GSS used block quota sampling. Multi-stage full probability sampling was employed to the block level. The interviewer was then given a fixed order to approach households on the designated block and a quota of employed and unemployed females and of males 18-34 and over 35 to complete. (For details on this method see Stephenson, 1979 and Davis and Smith, 1985, Appendix A.) Randomization of form was done within these quotas. On the quota assignment sheet interviewers were told whether to administer form X or form Y to each of the quota types. If two cases for the same type were assigned (e.g. two young males), interviewers were told to administer form X to the first person interviewed filling that quota and form Y to the second person filling that

[1]The split half sampling for the block quota and full probability experiments was done by segment and not at the case-level and therefore was independent of the form randomization procedure (Stephenson, 1979).

quota. While block quota sampling naturally allowed the interviewer an element of discretion in the selection of respondents, the administration of form, once the actual respondent had been selected, was not subject to interviewer discretion. This procedure in effect stratified form by quota attributes and interviewer assignment. (For details see "Administrative Specifications . . .", 1974 and Codebook, 1973).

B. 1976 Full Probability Sample

In 1976, a form experiment was first carried out by the GSS on a full-probability sample. Form was preassigned and noted on the address label. In this and all subsequent full-probability surveys, checks were carried out to make sure that the correct form was administered to the designated respondent. The sampling procedure assigned form X to the first two cases, form Y to the next two cases and so on in that paired, alternating order until the last case ("Label Listing for 1976 GSS," 1976, and "Administrative Specifications . . .", 1976). This method of systematic assignment successfully randomized form across cases and, in effect, stratified form assignment by PSU and segment.

C.1 1978-1985 Full Probability Samples, Two Forms

In 1978, 1982, 1983, and 1985 split ballot experiments with two forms of the questionnaire were performed on full-probability samples. Form assignment was indicated on the address label of each case as in 1976. A different sampling procedure was utilized, however, which assigned form X to the first case, form Y to the second case and continued that alternating pattern until the last case, effectively stratifying the sample by PSU and segment.

C.2 1980 and 1984 Full Probability Samples, Three Forms

The assignment of form was performed in an almost identical manner to the 1978-1985 two form years with the addition of a third ballot, form Z. Again the first case was assigned form X, the second form Y, and the third form Z and thereafter the pattern repeated in the same order to the end.

Systematic Assignment: The Reason for Form Randomization Failure

The results of the random assignment of form to individual GSS cases from 1973 to 1985 met with mixed success. While the randomization of form for the block quota and 1976 full probability surveys was successful, it was only partially successful for the two- and three-form procedures employed from 1978 to 1985. The procedure used from 1978 to 1985 is a form of systematic sampling or randomization. While some authorities suggest that full randomization should always be used in preference to systematic assignment (Kempthorne, 1952 and Kirk, 1968), the technique is actually widely employed (Kish, 1965, pp. 113, 121; Sudman, 1983; and Hansen, Hurwitz and Madow, 1953). The advantage of systematic sampling is its great ease and convenience, especially when stratification is employed in the sample design. The danger is that one has less assurance that full randomization will occur. As Cox notes:

> "If a systematic arrangement of treatments is chosen, the presumption that it does not coincide with a pattern in the uncontrolled variation is a statement of the experimenter's opinion, which may be well justified, but which cannot be assessed quantitatively and which it is difficult for others to check on . . . Whatever such pattern is chosen, there is the possibility that it coincides with some pattern in the controlled variation, maybe one of obscure origin, producing a systematic error . . . (Cox, 1958, p. 58, see also Cook and Campbell, 1979, p. 344)"

The most likely "obscure origin" to thwart systematic randomization is a periodicity in the original listing that coincides with the sampling or randomization interval (Kish, 1965, p. 120 and Sudman, 1983). It is just such a periodicity that disrupted randomization of form in the GSS from 1978 to 1985.

The Respondent Selection Procedures

To select the respondent in a household NORC uses a procedure developed by Kish(1965), the so-called Kish Table. First, the interviewer completes an enumeration of all household members, determining who should be counted as a member of the household, and recording their age, sex, marital status, and the relationship of each to the head of the household. The interviewer then lists all members of the household eligible to be respondents (18 years old and older) in a second "Summary Box" in descending order according to age. For each case, a selection label is generated as part of the sampling process indicating which respondent should be selected depending on the number of eligible people in the household. Thus as the example in Figure 1 shows, the number is 23256. This particular sampling label calls for the second person to be selected if there are two eligible persons, the third if there are three, the second if there are four in the household, and so forth. This procedure insures that all eligible people within the household have an equal probability of selection.

Specifically, the first (left most) column designates whether the first or second person will be the respondent when two are eligible, the second column whether the first, second, or third person will be the respondent, and so forth. Thus the possible values for the first column are 1 or 2; the second 1, 2 or 3; the third 1, 2, 3 or 4; the fourth 1, 2, 3, 4 or 5; and the fifth 1, 2, 3, 4, 5 or 6. Sixty different combinations of these numbers are used for the sampling labels (Figure 2). They are assigned to cases in blocks of sixty in the order indicated in Figure 2 and that order is repeated until all cases have been assigned. This assignment is completely systematic. For households with two eligible members, the first person listed is chosen for the first case, the second for the second case and so on in alternating

order. A similar pattern occurs for households with three to six or more eligible members.

Respondent and Form Assignment Confounding

The systematic assignment of values for the Kish Table created a periodicity in the data. For example, for households with two eligible persons, the older of the two was selected as the respondent for the first case in the sample and the younger of the two as the respondent in the second case and this selection pattern was maintained throughout the sample. As with the assignment of form there is nothing intrinsically wrong with the procedure; it is again merely a convenient form of systematic sampling or randomization. The problem is that the form and Kish Table were systematically assigned in an identical pattern, so that the assignment of experimental form and the respondent selection criteria were always in phase. Form X was always administered to the older eligible person and form Y to the younger person. Thus when two forms are used, form assignment was perfectly correlated with age rank among adults in households with two eligible members. Similarly, when three forms were used and there were three eligible people, form X was asked of the oldest, form Y of the next oldest, and form Z of the youngest. Table 1 indicates the situations in which the respondent selection procedure was confounded with the form assignment procedure. The results may be summarized as follows:

1. In all cases form was successfully randomized across households, so that no confounding with household characteristics takes place.

2. Form was always successfully randomized for single adult households.

3. When two forms were employed, form was confounded with age rank when there were two, four, or six or more eligible members of the household

4. When three forms were employed, form was confounded with age rank when there were three or six eligible household members.

Because of the distribution of adults within households, the confounding is much greater in two form years than in three form years. The proportion of cases affected is about 60 percent for two forms (1978-62.8%, 1982-60.1%, 1983-63.1%, 1985-59.3%) and 10 percent for three forms (1980-10.2%, 1984-10.7%).

To confirm that the respondent selection procedure actually resulted in the confounding of form and age order, we examined the Household Enumeration Folder (HEF) file for the 1985 GSS. This verified that in 900 of the 908 affected cases the oldest eligible person was administered form X and the next oldest eligible person was administered form Y (Table 2). (Or, in households with four eligible members, the oldest and third oldest got form X and the second and fourth oldest got form Y.) The eight discrepancies resulted from two cases in which the incorrect form was administered by the interviewer and from six cases in which the wrong listee was selected as respondent or there was uncertainty who the respondent should be.[2]

Associates of Age Order/Form

Given the confounding of form with age order, form is associated with variables tied to age order within a household (among households with a certain number of adults) and is not associated with household characteristics or with variables that are homogeneous within households.

Thus, age is naturally associated with form. Among two adult households the mean difference is 4.9-5.4 years (Table 3). While non-trivial, this

[2]The GSS accepts wrong form cases if the switch appeared to have been made accidentally. Wrong respondents cases are refielded, but in some cases the composition of the household is in doubt or the age of household members unclear so wrong or possibly wrong respondents may be included.

difference is smaller than one might suppose since the vast majority of two adult households consists of a married couple who are fairly close in age (mean difference = 3.9 years).

However, since women tend to marry older men this moderate age difference between spouses results in large sex difference (Table 3). In 1985 the oldest adults in two adult households were usually husbands (70.3%), followed by wives (12.8%), post-married (separated, divorced, widowed) females (6.5%), never married males (4.0%), post-married males (2.9%), never married females (2.1%), and others - mostly married people with absent spouses (1.3%).

The heavy concentration of husbands among the oldest member of the household is completely matched by their wives among the second oldest. As a result, husbands are heavily concentrated on form X and wives on form Y. Marital status itself is virtually unrelated to age order and form (Table 3). When we look at marital status by sex, however, we observe differences. Among the males who are the oldest household members, 90.4% are married, 3.5% post-married, 5.4% never married, and 0.8% other. Among females who are the oldest only 57.8% are married, 29.4% post-married, 9.6% never married, and 3.2% other.

In sum, because of the demographic composition of contemporary American families, age order is strongly related not so much to age, but to an individual's sex. In most cases form X is administered to a husband and form Y to a wife. As a result, we would expect to find form associated with other variables associated with sex, marital status, and age.

On years with three forms for households with three persons eligible to be respondents, form X and Y differ as on two form years, that is, older persons within the household received form X, while younger persons, usually wives, got form Y. Form Z, containing the third oldest adult, consists

largely of grown children. They do not differ in their sex distribution from either the total nor from the combined sex distributions of forms X and Y, but are much less likely to be married and more likely to be younger than the general population.

Table 4 shows the probability of association between form and 20 major demographics. Looking down the right-hand column we see that the variables most frequently associated with form are age and sex -- as previously mentioned, plus labor force status, respondent's income, and respondent's occupation, variables all strongly linked to the age and sex of household members. Showing little or no association with form are:

1. Variables that are fixed for all household members, such as region, community type, family income, number of earners, and number of people in the household

2. Variables that tend to be homogeneous within households, such as race, religion, church attendance, and to a lesser degree, political preference and education.

If we group the years into unconfounded years (1973, 1974, and 1976), minimally confounded, three form years (1980 and 1984), and maximally confounded, two form years (1978, 1982, 1983, 1985), we find the proportion of significant associations increases from .057 to .125 to .313. When we adjust for design effects (Stephenson, 1978 and Peterson and Smith, 1986), the proportion of significant relationships are respectively .026, .100, and .213. Thus, for the unconfounded years there are no more significant relationships than could be expected by chance, while for the confounded years more associations occur than could be expected by chance.[3]

---

[3]For a sense of the magnitude of the associations reported in Table 4 consider the following percentage differences in 1985: Percent male (% male on X - % male on Y) = 24.6, percent full-time employed = 12.9, percent professional or manager = 5.4, percent over 54 years old = 3.7.

To assess how widespread the contamination might be among variables, we first selected 12 variables that were known to be strongly associated with age or sex. These variables should show the maximum associations with form beyond those attributes that were directly confounded. The age associated variables (legalization of marijuana, health status, satisfaction with health, support for health spending, health problems, and visiting bars) showed no association with form. Sex associated variables (veteran status, union membership, fear to walk at night, gun regulation and capital punishment) showed significant associations with two forms in 10 of 14 comparisons, but the three form comparisons showed little association with form (one of nine significant). Union membership illustrates the general situation. When this variable is collapsed into degree of union membership (both spouses members, one spouse member, neither member) there is no association with form, but when the variable distinguishes between whether the spouse or the respondent is a union member, form X shows significantly more respondents as members while form Y has more spouses as members (% respondents who are union members in 1983, X=13.6, Y=9.6, prob= .002). In sum, the association between form and sex and between sex and certain other variables is strong enough to create significant associations between form and these sex-linked variables.

To determine how common these "pass-through" associations to form were, we randomly selected 20 attitude items from the GSS. These 20 variables appeared in 53 crosstabulations with form. Unadjusted significance tests showed three significant associations (5.6%) with none of the significant associations showing up in more than one year for the same variable. When clustering is adjusted for, only one of the 53 associations was significant (1.8%). In general, form does not appear to be associated with attitudes. In other words, the proportion of variables confounded with form appears to be fairly small and concentrated among strong sex-linked variables.

Form Adjustment Weight

To adjust for the biased assignment of experimental form, we constructed a weight to reduce the observed association with form. Statistically, we wanted the weight to effectively minimize the bias (the association with form), while being as parsimonious as possible with minimum variance. To do so we looked for variables that were:

1. highly associated with form,
2. highly associated with other variables,
3. but not so highly associated with other variables to be used as part of the weight as to be redundant.[4]

Drawing on the analysis of variables confounded with form in the previous section, we selected sex, age, and marital status as the components of the weight. We explored adding other additional variables, notably working status, race, and education, but found little gain in effectiveness along with some loss in efficiency.

The general procedure was to develop weighting classes that were combinations of sex, age, and marital status that maximized the explained variability in form. To reduce the number of possible combinations of sex, age, and marital status and hence increase the number of cases within each combination, the latter two variables were recoded. Age was collapsed into quartiles while marital status was recoded into a married/single/post-married trichotomy. However even with these recodes, there were 24 combinations of 2 sex, 3 marital, and 4 age categories (actually 48 and 72 when one considers the two and three categories of form). For certain cells, there were too few cases, such as single males in the oldest quartile or young post-married males

[4]For discussions of similar procedures used for post-stratification and nonresponse weights see Andersen, Kasper, and Frankel, 1979, p. 109; Moser and Kalton, 1972, p. 92; Chapman, 1976, p. 248; and Hanson, 1978, p. 58.

and females. We collapsed these twenty-four categories so that the expected cell size would be 10 or greater (Kish, 1965, p. 90) in order to increase both the reliability and efficiency of the weight.

To collapse the variables and maximize their variability with form, we utilized the program AID (Automatic Interaction Detection, see Chapman, 1976 and Sonquist, Baker, and Morgan, 1973). For the two-form years, we were able to reduce the number of classes to eleven, while for the three-form years, because of the low number of affected cases, the reduction was to three classes (Tables 5 and 6).

With the classes combining sex, age, and marital status selected, we calculated the extent to which each class was over or underrepresented on each form compared to the total sample. More technically,

$$w_{i,j} = \frac{P_{i,.}}{P_{i,j}}$$

where $P_{i,.}$ is the marginal proportion of the $i^{th}$ weighting class across all forms; and
$P_{i,j}$ is the marginal proportion of the $i^{th}$ weighting class conditional on form j.

These comparisons were carried out only on the household compositions confounded with form (for two-form households with 2, 4, or 6 eligible adults and for three-form households with 3 or 6+ eligible adults).[5] No adjustments are made to unconfounded household compositions.[6] The weights were then

---

[5]Since the number of eligible adults in the household, i.e., the number of names listed in the sampling table, was not coded on the cumulative file, we used the closely related ADULTS variable, i.e., the number of people 18 years of age and older living in the household. A comparison of the two in 1985 showed them to correlate at 0.973, (35 cases out of a total of 1534 off the diagonal).

[6]The weight was initially developed for the pooled two-form years (1978, 1982, 1983, 1985). The classes developed for the pooled two-form years were then utilized for the construction of weights for the individual years. A similar procedure was used to develop a weight for the black oversamples in 1982.

normalized by dividing by their mean and truncated to three decimal places. We considered further reducing the weight's variability by either collapsing the components further or truncating the range of the weight (Chapman, 1976, p. 248; Hanson 1978, P. 58, 141; Bailey, 1983, p. 289; and Andersen, Kasper, and Frankel, 1979, pp. 91, 109, 254), but found that the gains in efficiency were trivial. A similar procedure was used to develop a weight for the three-form years (1980 and 1984). The weights for the cumulative two- and three-form cross-sections (i.e., not including the 1982 black oversamples) are shown in Table 7. Both weights are standardized to reproduce the raw number of cases and thus have a mean of unity.

Since a much higher proportion of cases were affected in two-form years than in three-form years, the two-form weight is more complex, has a higher variance (.306) than the three-form weight (variance=.149), and therefore is much less efficient.[7]

Table 8 shows the association between form and selected variables after the form adjustment weight has been applied. While the unweighted figures

---

[7] weighted sample is less efficient than an unweighted sample where the tradeoff is usually between the loss of cases and the extra precision gained by weighting. Though we do not do so here, the sample size is reduced by a factor of 1/(1+relative variance) where the relative variance is the variance of the weight divided by the square of the mean.

| Year | Variance | N | Adjusted Sample Size |
|---|---|---|---|
| 1978 | .374 | 1532 | 1115 |
| 1980 | .119 | 1468 | 1312 |
| 1982 | .215 | 1506 | 1240 |
| 1983 | .345 | 1599 | 1189 |
| 1984 | .179 | 1473 | 1249 |
| 1985 | .286 | 1534 | 1193 |

Note: Figures for the 1982 GSS omits the black oversample.

showed 27 significant associations (SRS) for the two-form years, only six remain after weighting and only one of these is significant when clustering is adjusted for. Comparing weighted and unweighted etas we find that the average etas are reduced by 48-57 percent each year. Similar, although smaller, reductions are achieved for the three-form years. The number of significant relationships (assuming no cluster effect) falls from six to two and the average etas are reduced 13-20 percent. Overall these weights seem to reduce the associations with form to a modest level.[8]

Impact of Weighting on Form Related Variables

The incomplete randomization of form affected any experimental comparisons between forms and estimates based on variables that appear on one form. The subsamples administered particular form specific questions are not random subsets and therefore are not representative cross-sections. In addition, differences between the forms may not result solely from the planned experimental variations (e.g., in wording DK filters, number of response categories), but may arise from the imbalance in form assignment discussed above. To assess the distortion caused by the incomplete form randomization, we compared raw and weighted distributions and also examined three experiments that were originally done in years that successfully randomized and were later repeated in years with incomplete randomization.

---

[8]There is a slight anomaly in the three-form years, particularly in 1984. The weight which ostensively corrects for the association between form and sex apparently fails to correct that relationship in 1984. The reason is the small number of affected cases. While the weight indeed did correct for the imbalance among affected cases, there is a significant association of sex and form among the unaffected cases in 1984 that occurred by chance. It is the contribution of these cases to the chi-square that makes the association significant.

To assess the unrepresentativeness across forms, raw and weighted marginals were compared for variables that appeared on only one form and were not part of the experimental comparisons discussed below. On three form years this involved 58 variables, and on two form years this involved 144 variables (105 ISSP variables in 1985 and 39 other variables). The average absolute change in dichotomized distributions was 0.8% points for three forms, 0.7% points for non-ISSP two forms, and 1.1% points for ISSP two form. Of these 202 comparisons only 21 involved marginal shifts of greater than 2.0% points.

Similar comparisons were carried between the raw and weighted experimental comparisons. There were 87 such experiments involving two forms and 44 with three forms. Across both two and three forms 63 percent of the experimental comparisons were not statistically significant either weighted or unweighted, 28 percent were significant in both instances, and 9 percent were significant in one condition but not the other (these balanced out with 5 percent significant on the unweighted but not the weighted form and 4 percent significant when weighted, but not when unweighted). There were no significant interactions between the experimental treatments and weighting. Across the experiments that showed changes in significance, the average absolute change in differences between forms was 1.0% points. Among the experiments that showed significant differences under both conditions average absolute change in differences across forms was 1.4% points.

Other analyses of inter-item correlations across forms and higher order interactions were also recomputed using the form adjustment weight and few changes were detected. (These reanalyzed research reported in Smith, 1981 and Smith, 1983.)

We also examined three experiments that were originally done in years that successfully randomized and were later repeated in years with incomplete

randomization (Table 9). Differences in the experimental effect could result from either change over time or from randomization problems. The expectation-of-war and women-in-politics items showed no notable variation in the experimental effect, suggesting that neither time, nor incomplete randomization appreciably affected the results. The courts item does show a smaller effect in 1982 than earlier. While the drop in percentage differences is large, the decline in the DK ratio across form is more modest (from 4.3:1 to 3.8:1). We suspect that the difference results from an increased saliency of the crime issue and a growing consensus on a punitive response which reduced selection of an explicitly offered nonattitude option (Smith, 1985 and Smith, 1982). It is possible, however, that the incomplete randomization of form is attenuating the effect.

Summary

An unintended overlap between the respondent selection and form assignment procedures in the surveys from 1978 to 1985 created an association between form and age order within certain households. This led to an association between form and various variables linked to age order such as age, sex, labor force status, and respondent's income. A weight was developed to compensate for the assignment bias and achieve the random distribution of affected variables across forms. An analysis of form-related questions by comparing weighted and unweighted distributions and response effects and by comparing affected and unaffected surveys suggests that the distortions were generally minor and that methodological conclusions drawn are unaffected by the incomplete randomization.

Users should however be cautious about using the form related variables in 1978 to 1985 and should use the form adjustment weight to help compensate for the biased assignment of form.

BEGIN DECK 04

12. Now I'm going to scientifically select the one person in this household chosen for this study. By interviewing only the person picked in this way, we can be sure the views we find do accurately represent the views of the country as a whole.

STEP 1: ELIGIBLE PEOPLE: 18 OR OVER
MARK NOT CROSSED OUT ON HOUSEHOLD ENUMERATION (P. 2)

IF ONLY ONE ELIGIBLE PERSON, GO TO Q.13 AND MAKE APPOINTMENT TO INTERVIEW THAT PERSON.

IF MORE THAN ONE, CONTINUE WITH STEPS 2 - 6 BELOW.

STEP 2: LIST NAMES OF ELIGIBLE PEOPLE IN SUMMARY BOX, IN ORDER OF AGE

OLDEST (Not necessarily the head)

↓

YOUNGEST

SUMMARY BOX

| LINE # | AGE | NAMES OF ELIGIBLE PERSONS |
|---|---|---|
| 1 | 62 | [redacted] |
| (2) | 61 | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

STEP 3: USE SAMPLING TABLE TO THE RIGHT TO SELECT WHICH ELIGIBLE PERSON TO INTERVIEW.

STEP 4: CIRCLE SELECTED R'S LINE # IN SUMMARY BOX ABOVE.

STEP 5: PRINT SELECTED R'S NAME HERE: [redacted] 07/

STEP 6: ARRANGE TO INTERVIEW THIS PERSON. REQUEST PHONE AND MAILING INFORMATION (Qs.13 AND 14) TO HELP IN FOLLOW-UP.

SAMPLING TABLE

| NUMBER OF ELIGIBLE PERSONS LISTED ABOVE | INTERVIEW PERSON ON LINE NUMBER |
|---|---|
| ONE 1 | 1 |
| TWO 2 | 2 |
| THREE 3 | 3 |
| FOUR 4 | 2 |
| FIVE 5 | 5 |
| SIX OR MORE 6 | 6 |

13. If I have to talk with (SELECTED RESPONDENT), what phone number should I use?

Telephone number given: ( [redacted] )
AREA CODE NUMBER

A. Code location of phone:

In household . . . . . 1
In home of neighbor. . . . . 2
Other (SPECIFY)_____ . . . 3

B. If no number given, code

No phone . . . . . 4
Refused. . . . . 5

14. If I have to mail a note to (SELECTED RESPONDENT), what would be the best mailing address to use?

[redacted]
# AND STREET/BOX #/RFD #
POST OFFICE, TOWN
STATE ZIP CODE

THANK RESPONDENT FOR THEIR TIME AND HELP.

TIME HEF ENDED: 9:50 AM (PM)

LENGTH OF TIME FOR HEF: 10 MIN

IMMEDIATELY AFTER LEAVING THE HOUSEHOLD, FILL OUT A-D BELOW AND COMPLETE THE SAMPLING REPORT ON PAGE 5.

A. Date HEF administered: 03 21
MONTH DAY

B. Name of HEF informant: [redacted]

C. List line number of HEF informant from Household Enumeration P.3, Q. 4. . . . . 02

D. Race of household (by observation)

White . . . . . 1
Black/Negro . . . . . 2
American Indian . . . . . 3
Asiatic, Oriental . . . . . 4
Other, mixed, not able to observe 5

E. List line number of selected respondent from Household Enumeration P.3, Q. 4. . . . . 01

GO TO PAGE 5 AND COMPLETE SAMPLING REPORT

Figure 1
NORC's Kish Table

Figure 2

KISH TABLE VALUES

| Index | Kish Table Entries | Index | Kish Table Entries |
|---|---|---|---|
| 1 | 11111 | 31 | 11311 |
| 2 | 22222 | 32 | 22422 |
| 3 | 13333 | 33 | 13133 |
| 4 | 21444 | 34 | 21244 |
| 5 | 12155 | 35 | 12355 |
| 6 | 23216 | 36 | 23416 |
| 7 | 11321 | 37 | 11121 |
| 8 | 22432 | 38 | 22232 |
| 9 | 13143 | 39 | 13343 |
| 10 | 21254 | 40 | 21454 |
| 11 | 12315 | 41 | 12115 |
| 12 | 23426 | 42 | 23226 |
| 13 | 11131 | 43 | 11331 |
| 14 | 22242 | 44 | 22442 |
| 15 | 13353 | 45 | 13153 |
| 16 | 21414 | 46 | 21214 |
| 17 | 12125 | 47 | 12325 |
| 18 | 23236 | 48 | 23436 |
| 19 | 11341 | 49 | 11141 |
| 20 | 22452 | 50 | 22252 |
| 21 | 13113 | 51 | 13313 |
| 22 | 21224 | 52 | 21424 |
| 23 | 12335 | 53 | 12135 |
| 24 | 23446 | 54 | 23246 |
| 25 | 11151 | 55 | 11351 |
| 26 | 22212 | 56 | 22412 |
| 27 | 13323 | 57 | 13123 |
| 28 | 21434 | 58 | 21234 |
| 29 | 12145 | 59 | 12345 |
| 30 | 23256 | 60 | 23456 |

Source: Documentation for ANSPAK, NORC's Automatic National Sampling Package 9/23/76.

Table 1

A Summary of Problems in Case - Level (Form) Randomization

| | | Number of Forms | | | |
|---|---|---|---|---|---|
| | | Two | | Three | |
| | | Biased | Unbiased | Biased | Unbiased |
| Number of Adults | 1 | None | All | None | All |
| | 2 | 78,82,83,85 | 73,74,76 | None | All |
| | 3 | None | All | 80,84 | None |
| | 4 | 78,82,83,85 | 73,74,76 | None | All |
| | 5 | None | All | None | All |
| | 6+ | 78,82,83,85 | 73,74,76 | 80,84 | None |

Note: Entries are survey years.

Table 2

Impact of Incomplete Randomization of Form Assignment

| | Unaffected Cases[a] | | Affected Cases[b] | |
|---|---|---|---|---|
| Age Rank in Household | Form X | Form Y | Form X | Form Y |
| 1 | 252 | 252 | 437 | 0 |
| 2 | 23 | 35 | 0 | 440 |
| 3 | 20 | 37 | 9 | 0 |
| 4 | 1 | 0 | 0 | 13 |
| 5 | 0 | 1 | 0 | 0 |
| 6 | 0 | 0 | 0 | 1 |
| | $eta^2$=.013 | | $eta^2$=1.000 | |

[a]The number of eligible household members equals 1, 3 or 5.

[b]The number of eligible household members equals 2, 4 or 6+.

Source: 1985 GSS with eight wrong respondent and switched form cases omitted.

Table 3

Associates of Age Rank/Form

2 Adult Households

| | 1985[a] | | 1978, 82, 83, 85[b] | |
|---|---|---|---|---|
| AGE (Mean Years) | | | | |
| OLDEST | 45.4 | (845) | 45.4 | (1772) |
| SECOND | 40.0 | (853) | 40.5 | (1756) |
| SEX (% male) | | | | |
| OLDEST | 76.9 | (857) | 71.2 | (1777) |
| SECOND | 21.1 | (857) | 21.6 | (1764) |
| MARITAL STATUS | | | | |
| OLDEST | | | | |
| Never married | 6.3 | | 5.5 | |
| Married | 84.4% | | 84.7% | |
| Post-married | 9.3 | | 9.8 | |
| | (845) | | (1777) | |
| SECOND | | | | |
| Never married | 11.6 | | 9.5 | |
| Married | 83.7% | | 85.8% | |
| Post-married | 4.7 | | 4.7 | |
| | (851) | | (1764) | |

[a]1985 HEF used to compare attributes of all household members.
[b]1972-1985 GSS cumulative file compares attributes of respondents only.

Table 4

Variables Associated with Form, 1973-1985

(Probability Level)

| Variables | Years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1973 | 1974 | 1976 | 1978 | 1980 | 1982 | 1983 | 1984 | 1985 |
| Sex | .880 | .850 | .550 | .0000 | .607 | .0000 | .0000 | .0001 | .000 |
| Working Status | .084 | .393 | .878 | .0000 | .129 | .0000 | .0000 | .272 | .000 |
| Education | .959 | .992 | .605 | .018 | .490 | .296 | .095 | .046 | .445 |
| Region | 1.000 | .999 | .999 | .909 | .998 | .958 | .986 | 1.000 | .995 |
| SRCBELT | .923 | .857 | .941 | .976 | .673 | .883 | .845 | .781 | .703 |
| Religion | .293 | .893 | .401 | .172 | .059 | .528 | .555 | .224 | .663 |
| Attend | .707 | .623 | .603 | .529 | .513 | .629 | .384 | .305 | .593 |
| Marital | .496 | .318 | .072 | .010 | .090 | .561 | .517 | .155 | .004 |
| Family Income | .664 | .758 | .082 | .585 | .996 | .615 | .836 | .985 | .719 |
| R's Income | - | .254 | .969 | .0001 | .089 | .0000 | .0000 | .007 | .000 |
| Age | .667 | .353 | .475 | .0000 | .012 | .035 | .049 | .007 | .001 |
| Race | .890 | .781 | .651 | .130 | .525 | .882 | 1.000 | .969 | 1.000 |
| Occupation | .339 | .911 | .918 | .0000 | .974 | .0000 | .0000 | .783 | .000 |
| Industry | .817 | .259 | .317 | .245 | .871 | .512 | .005 | .541 | .078 |
| # Children | .612 | .170 | .505 | .700 | .227 | .311 | .100 | .777 | .299 |
| # Family | .620 | .471 | .087 | .471 | .305 | .613 | .478 | .536 | .494 |
| # Earners | .613 | .872 | .057 | .145 | .348 | .440 | .513 | .882 | .102 |
| Who Voted, 72-80 | .323 | .012 | .347 | .172 | .247 | .303 | .948 | .343 | .119 |
| Party ID | .926 | .028 | .710 | .948 | .057 | .820 | .220 | .717 | .061 |
| Ethnic ID | .040 | .793 | .568 | .046 | .434 | .071 | .820 | .445 | .387 |
| S/NS | 1/18 | 2/18 | 0/20 | 8/12 | 1/19 | 5/15 | 6/14 | 4/16 | 6/14 |

Note: Entries are probabilities of chi-squares.

Table 5
Collapsed Weighting Classes -- Two Form Years

| Class | Proportion |
|---|---|
| Single Males | 8.5 % |
| Single Females | 8.3 |
| Married Males, 18-29 | 5.1 |
| Married Females, 18-38 | 14.6 |
| Married Males, 30-56 | 15.1 |
| Married Females, 39-56 | 9.3 |
| Married Males, 57+ | 8.3 |
| Married Females, 57+ | 7.0 |
| Post-Married Males | 6.2 |
| Post-Married Females, 18-56 | 8.2 |
| Post-Married Females, 57+ | 9.5 |
| | (6157) |

Note: Pooled 1978, 1982, 1983, and 1985 GSS, black oversample omitted.

Table 6

Collapsed Weighting Classes -- Three Form Years

| Class | Proportion |
|---|---|
| Single Males and Females | 31.8 % |
| Married and Post-Married Males | 28.5 |
| Married and Post-Married Females | 39.7 |
| | (305) |

Note: 1980 and 1984 GSS.

Table 7

Distributions of Form Adjustment Weights

A. Two Forms (1978, 1982, 1983, 1985)

| VALUE | FREQ. | PCT. | VALUE | FREQ. | PCT. | VALUE | FREQ. | PCT. |
|---|---|---|---|---|---|---|---|---|
| .578 | 78 | 1 | .756 | 65 | 1 | 1.577 | 7 | 0 |
| .589 | 86 | 1 | .758 | 23 | 0 | 1.633 | 7 | 0 |
| .593 | 101 | 2 | .763 | 28 | 0 | 1.662 | 16 | 0 |
| .595 | 20 | 0 | .778 | 29 | 0 | 1.667 | 23 | 0 |
| .596 | 195 | 3 | .779 | 39 | 1 | 1.799 | 27 | 0 |
| .602 | 84 | 1 | .784 | 32 | 1 | 1.996 | 20 | 0 |
| .604 | 162 | 3 | .789 | 31 | 1 | 2.103 | 45 | 1 |
| .605 | 14 | 0 | .852 | 29 | 0 | 2.140 | 22 | 0 |
| .606 | 158 | 3 | .867 | 28 | 0 | 2.182 | 40 | 1 |
| .613 | 197 | 3 | .910 | 17 | 0 | 2.286 | 5 | 0 |
| .621 | 90 | 1 | .939 | 8 | 0 | 2.301 | 47 | 1 |
| .624 | 170 | 3 | .972 | 15 | 0 | 2.317 | 20 | 0 |
| .631 | 152 | 2 | 1.000 | 2404 | 39 | 2.362 | 23 | 0 |
| .632 | 86 | 1 | 1.030 | 14 | 0 | 2.377 | 23 | 0 |
| .636 | 168 | 3 | 1.069 | 7 | 0 | 2.456 | 17 | 0 |
| .639 | 73 | 1 | 1.109 | 14 | 0 | 2.551 | 22 | 0 |
| .643 | 18 | 0 | 1.177 | 21 | 0 | 2.558 | 41 | 1 |
| .645 | 133 | 2 | 1.214 | 20 | 0 | 2.695 | 45 | 1 |
| .656 | 73 | 1 | 1.364 | 18 | 0 | 2.833 | 34 | 1 |
| .660 | 146 | 2 | 1.384 | 18 | 0 | 2.843 | 3 | 0 |
| .668 | 60 | 1 | 1.391 | 17 | 0 | 2.859 | 18 | 0 |
| .696 | 71 | 1 | 1.397 | 5 | 0 | 2.945 | 33 | 1 |
| .711 | 53 | 1 | 1.402 | 16 | 0 | 3.027 | 4 | 0 |
| .714 | 37 | 1 | 1.442 | 15 | 0 | 3.118 | 4 | 0 |
| .723 | 16 | 0 | 1.463 | 12 | 0 | 3.130 | 33 | 1 |
| .731 | 15 | 0 | 1.480 | 33 | 1 | 3.207 | 16 | 0 |
| .740 | 60 | 1 | 1.522 | 14 | 0 | 3.286 | 18 | 0 |
| .748 | 29 | 0 | 1.538 | 29 | 0 | 3.742 | 12 | 0 |

(Continued)

Table 7 (Continued)

Distributions of Form Adjustment Weights

B. Three Forms (1980, 1984)

| VALUE | FREQUENCY | PERCENT |
|---|---|---|
| .402 | 34 | 1.2 |
| .404 | 46 | 1.6 |
| .416 | 32 | 1.1 |
| .495 | 32 | 1.1 |
| .512 | 40 | 1.4 |
| .555 | 36 | 1.2 |
| 1.000 | 2636 | 89.6 |
| 1.279 | 16 | .5 |
| 1.321 | 12 | .4 |
| 1.666 | 12 | .4 |
| 1.803 | 10 | .3 |
| 1.903 | 7 | .2 |
| 2.166 | 7 | .2 |
| 3.153 | 7 | .2 |
| 4.304 | 4 | .1 |
| 5.054 | 3 | .1 |
| 5.739 | 3 | .1 |
| 7.149 | 2 | .1 |
| 7.182 | 2 | .1 |
| TOTAL | 2941 | 100.0 |

Note: Figures for the 1982 GSS omits the black oversample.

Table 8
Variable Associated with Form After Weighting
(Probability Level)

| Variables | Years | | | |
|---|---|---|---|---|
| A. Two Forms | | | | |
| | 1978 | 1982 | 1983 | 1985 |
| Sex | .608 | .903 | .157 | .471 |
| Age | .062 | .863 | .139 | .801 |
| Marital | .031 | .365 | .832 | .368 |
| Working Status | .194 | .072 | .273 | .476 |
| R's Income | .158 | .030 | .008 | .125 |
| Occupation | .144 | .070 | .448 | .013 |
| # Children | .437 | .756 | .160 | .654 |
| # Earners | .024 | .515 | .440 | .034 |
| Education | .981 | .734 | .133 | .325 |
| Union Membership | .484 | -- | .457 | -- |
| Fear | -- | .726 | -- | .666 |
| B. Three Forms | | | | |
| | | 1980 | 1984 | |
| Sex | | .902 | .006 | |
| Age | | .623 | .772 | |
| Marital | | .700 | .671 | |
| Working Status | | .191 | .926 | |
| R's Income | | .083 | .022 | |
| Occupation | | .970 | .908 | |
| # Children | | .927 | .725 | |
| # Earners | | .363 | .588 | |
| Education | | .840 | .396 | |
| Union Membership | | .582 | .959 | |
| Fear | | .628 | .151 | |

Note: Entries are probability levels of chi-square.

Table 9
Experiments Replicated in Surveys With Successful and Incomplete Form Randomization

A. Expectation of War

| | 1976 | | 1985 | |
|---|---|---|---|---|
| | Form X | Form Y | Form X | Form Y |
| | "War" | "World War" | "War" | "World War" |
| Expects | 61.8%(717) | 46.5%(673) | 57.9%(731) | 45.7%(731) |
| Difference (X - Y) | 15.3% | | 12.2% | |

B. Sentencing by Courts

| | 1974 | | 1982 | |
|---|---|---|---|---|
| | Form X | Form Y | Form X | Form Y |
| | No filter | Filter | No filter | Filter |
| Too harshly | 5.6% | 4.6% | 2.6% | 4.4% |
| About right | 9.7 | 6.1 | 7.5 | 4.9 |
| Not too harshly | 77.9 | 60.3 | 86.2 | 76.3 |
| DK/Not enough | 6.8 | 29.0 | 3.8 | 14.4 |
| Information filter | (745) | (723) | (744) | (752) |
| Difference in DK/Filter (X - Y) | -22.2% | | -10.6% | |

(Continued)

Table 9 (Continued)

Experiments Replicated in Surveys With Successful and Incomplete Form Randomization

C. Men Better Suited for Politics

| | 1974 | | 1982 | |
|---|---|---|---|---|
| | Form X | Form Y | Form X | Form Y |
| | Agree/ Disagree | Men/Equal/ Women | Agree/ Disagree | Men/Equal/ Women |
| Men Better | 47.0%(698) | 33.1%(719) | 37.7%(698) | 24.4%(738) |
| Difference (X - Y) | -13.9% | | -13.3% | |

WORDINGS:

A. FORM X Do you expect the United States to fight another war within the next ten years?

FORM Y Adds "world" before "war".

B. FORM X In general, do you think the courts in this area deal too harshly or not harshly enough with criminals.

FORM Y Adds to end "or don't you have enough information about the courts to say."

C. FORM X Tell me if you agree or disagree with this statement. Most men are better suited emotionally for politics than are most women.

FORM Y Would you say that most men are better suited emotionally for politics than are most women, that men and women are equally suited, or that women are better suited than men in this area?

## References


"Administrative Specifications for the General Social Survey - Survey 4187 February, 1974," Chicago: NORC, 1974.

"Administrative Specifications, General Social Survey," Chicago: NORC, 1976.

Andersen, Ronald; Kasper, Judith; and Frankel, Martin R., Total Survey Error: Applications to Improve Health Surveys. New York: Jossey-Bass, 1979.

Bailey, Leroy, "Compensation for Unit Nonresponse in Recurring Surveys," Proceedings of the American Statistical Association, Section on Survey Research Methods, (1983), 289-294.

Chapman, David W., "A Survey of Nonresponse Imputation Procedures," Proceedings of the American Statistical Association, Social Statistics Section, (1976), 245-251.

Codebook for the Spring 1973 General Social Survey, Chicago: NORC, 1973.

Cook, Thomas D. and Campbell, Donald T., Quasi-Experimentation: Design and Analysis Issues for Field Settings. Chicago: Rand McNally, 1979.

Cox, D. R., @un(Planning of Experiments.) New York: John Wiley & Sons, 1958.

Davis, James A. and Smith, Tom W., General Social Surveys, 1972-1985: Cumulative Codebook. Chicago: NORC, 1985.

Davis, James A. and Smith, Tom W., General Social Surveys, 1972-1986: Cumulative Codebook. Chicago: NORC, 1986.

Hansen, Morris H.; Hurwitz, William N.; and Madow, William G., Sample Survey Method and Theory. New York: John Wiley & Sons, 1953.

Hanson, Robert H., "The Current Population Survey: Design and Methodology," Technical Paper No. 40 - U.S. Bureau of the Census. Washington, D.C.: GPO, 1978.

Kempthorne, Oscar, The Design and Analysis of Experiments. New York: John Wiley & Sons, 1952.

Kirk, Roger E., Experimental Design: Procedures for the Behavioral Sciences. Belmont, Cal.: Brooks/Cole, 1968.

Kish, Leslie, Survey Sampling. New York: John Wiley & Sons, 1965.

"Label Listing for 1976 GSS," NORC archives, 1976.

Moser, C. A. and Kalton, G., Survey Methods in Social Investigation. 2nd Edition. New York: Basic Books, 1972.

Peterson, Bruce L. and Smith, Tom W., "An Analysis of the 1970 and 1980 NORC Sample Frames," GSS Technical Report No. 46. Chicago: NORC, 1986.

Sudman, Seymour, "Applied Sampling," in Handbook of Survey Research, edited by Peter H. Rossi, James D. Wright, and Andy B. Anderson. New York: Academic Press, 1983.

Smith, Tom W., "An Analysis of the Accuracy of Spousal Reports," GSS Technical Report No. 57. Chicago: NORC, 1985.

Smith, Tom W., "An Experimental Comparison of Clustered and Scattered Scale Items," Social Psychology Quarterly, 46 (June, 1983), 163-168.

Smith, Tom W., "Can We Have Confidence in Confidence? Revisited," in Measurement of Subjective Phenomena, edited by Denis F. Johnston. Washington, D.C.: Government Printing Office, 1981.

Smith, Tom W., "Educated Don't Knows: An Analysis of the Relationship between Education and Item Nonresponse," Political Methodology, 8 (1982), 47-58.

Smith, Tom W., "Nonattitudes: A Review and Evaluation," in Surveying Subjective Phenomena, edited by Charles F. Turner and Elizabeth Martin. New York: Russell Sage, 1985.

Sonquist, John A.; Baker, Elizabeth L.; and Morgan, James N. Searching for Structure, Ann Arbor: ISR, 1973.

Stephenson, C. Bruce, "A Comparison of Full-Probability and Probability-with-Quotas Sampling Techniques in the General Social Survey," GSS Technical Report No. 5. Chicago: NORC, 1978.

Stephenson, C. Bruce, "Probability Sampling with Quotas," Public Opinion Quarterly, 43 (Winter, 1979), 477-496.