# LENGTH OF INTERVIEW: THE NATIONAL SURVEY OF FAMILY GROWTH

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## 1. INTRODUCTION

Gathering information takes time. Time represents both burden on the respondent and cost to the organization collecting the data. Any reduction in the amount of time for interview would be desirable, as long as it did not decrease the amount of information or its quality. This paper presents data from the first cycle of the National Survey of Family Growth (NSFG). It analyzes the time required to complete interviews as related to characteristics of the respondent, of the interviewer and of the interviewer training. Characteristics of the respondent that affect the length of interview are not subject to modification without modifying the design of the survey itself. The effect of characteristics of the interviewer on the length of interview might be modified by differential selection of interviewers, but it is interviewer training that is most subject to modification by the survey organization.

The author has found little published data relating to the length of interview. One study showed that the time spent in actual interviewing is a fraction of the total time spent by the survey organization for each case (Sudman 1965). Another study found that younger and higher educated interviewers had higher production ratios than did older or less educated interviewers. Production ratios also increased with length of experience with the Bureau and with progression through the assigned work load (U.S. Bureau of the Census 1972).

Changes in length of interview do not necessarily imply changes in interview quality. A decrease in the length of interview could be at the expense of quality if the interviewer is taking shortcuts, not probing completely, or failing to record all relevant verbatim information given by the respondent. The National Center for Health Statistics (1977) found a decrease in the amount of information obtained with increased experience of the interviewer. However, characteristics of interviews that shorten the time required for interview might also increase the quality of the interview. The quality or completeness of the information obtained in the NSFG is beyond the scope of this analysis. However, a brief investigation showed that the longer the interview, the greater the number of errors discovered in the preliminary office edit ($r=0.14$) and the greater the percentage of items that were not ascertained ($r=0.07$).

## 2. DATA AND METHODS

The NSFG is a periodic survey conducted by the National Center for Health Statistics. It was designed to provide information about fertility, family planning, and aspects of maternal and child health that are closely related to childbearing. Data on these topics were collected in the first cycle by personal interviews with 9,797 women aged 15-44 years who had ever been married or who had children of their own living in the household. Field work was conducted between July 1973 and February 1974 by the National Opinion Research Center of the University of Chicago. Background data were obtained for the 335 female interviewers working on the project.

The time at the beginning and end of interview was recorded on the questionnaire for 9,676 interviews. The length of these interviews ranged from 15 minutes to 4 hours and 40 minutes, with 60 minutes being the mode. The average length of interview was 67 minutes with a standard deviation of 22 minutes.

Multiple Classification Analysis (MCA) is used in the analysis (Andrews et al. 1973). MCA is basically a multiple regression analysis using dummy variables that shows deviations from the grand mean. The unadjusted deviation in the tables shows the actual number of minutes more or less that interviews in the category took compared with the grand mean. The adjusted deviation is interpreted as what the deviation of the category would be if the cases in the category had the same distribution as all cases with respect to all other characteristics entered into the analysis. The "eta" statistics shows the strength of the simple bivariate relationship between each of the predictor variables and the length of interview; eta squared is the proportion of the variance in length of interview explained by the predictor characteristic. The "beta" statistic is a measure of the relationship between the length of interview and the predictor characteristic holding constant the effect of the other predictor characteristics. As with a multiple regression "beta," the MCA beta can be used to show the relative importance of the different predictor characteristics. Because of the large number of interviews, almost all differences are statistically significant. Therefore, the analysis will focus on the relative importance of the characteristics and on their practical significance.

## 3. FINDINGS

### 3.1 Respondent Characteristics

The design of the NSFG meant that women with more pregnancies were asked more questions than women with fewer pregnancies. Likewise, currently married women were asked more questions than other women. These characteristics should definitely affect the length of interview, while other characteristics like race, age, work status and education might affect the length. Although neither the survey design nor respondent characteristics can be modified to reduce the length of survey without changing the nature of the survey or the surveyed population, the effect of these characteristics should be understood and should be controlled in subsequent analysis.

Table 1 shows that each pregnancy increased the interview length by an average of 3.5 minutes.

1. Percent of interviews and unadjusted and adjusted[a] deviations in minutes from the mean length of interview by characteristics of the respondent: National Survey of Family Growth, 1973.

| Characteristics of the respondent | eta | beta | Percent of Interviews | Unadjusted deviations | Adjusted deviations |
|---|---|---|---|---|---|
| All interviews | | | 100.0 | 0.0 | 0.0 |
| Number of pregnancies | 0.35 | 0.35 | | | |
| No pregnancies | | | 10.6 | -14.2 | -13.7 |
| 1 pregnancy | | | 19.5 | - 4.5 | - 4.8 |
| 2 pregnancies | | | 23.3 | - 0.7 | - 0.8 |
| 3 pregnancies | | | 18.2 | 0.7 | 0.9 |
| 4 pregnancies | | | 11.0 | 2.9 | 3.0 |
| 5 pregnancies | | | 7.1 | 6.7 | 7.0 |
| 6 pregnancies | | | 4.0 | 10.4 | 10.4 |
| 7 pregnancies | | | 2.5 | 13.9 | 13.7 |
| 8 pregnancies | | | 1.6 | 14.5 | 14.3 |
| 9 pregnancies | | | 0.9 | 25.0 | 23.9 |
| 10 pregnancies | | | 0.6 | 20.9 | 23.9 |
| 11 pregnancies | | | 0.4 | 28.9 | 27.4 |
| 12 pregnancies | | | 0.2 | 41.5 | 40.6 |
| 13 pregnancies | | | 0.1 | 31.6 | 31.7 |
| 14 pregnancies | | | 0.0 | 63.3 | 61.3 |
| 17 pregnancies | | | 0.0 | 113.3 | 111.3 |
| 19 pregnancies | | | 0.0 | 78.3 | 76.5 |
| 26 pregnancies | | | 0.0 | 33.3 | 33.4 |
| Race | 0.14 | 0.12 | | | |
| White and other | | | 61.0 | - 2.5 | - 2.1 |
| Negro | | | 39.0 | 3.9 | 3.3 |
| Marital status | 0.00 | 0.08 | | | |
| Currently married | | | 77.4 | - 0.0 | 1.0 |
| Widowed, divorced, separated, single with own children | | | 22.6 | 0.2 | - 3.3 |
| Age | 0.10 | 0.06 | | | |
| 15 to 19 years | | | 5.4 | - 4.9 | - 0.0 |
| 20 to 24 years | | | 18.9 | - 3.3 | 0.9 |
| 25 to 29 years | | | 21.6 | - 0.2 | 1.6 |
| 30 to 34 years | | | 20.1 | 1.2 | 0.7 |
| 35 to 39 years | | | 17.9 | 2.1 | - 1.1 |
| 40 to 44 years | | | 16.1 | 1.8 | - 2.1 |
| Working status | 0.10 | 0.05 | | | |
| 35 or more hours per week | | | 32.9 | - 2.8 | - 1.3 |
| 1 to 34 hours per week | | | 9.1 | - 1.4 | - 0.8 |
| Not working | | | 58.0 | 1.8 | 0.9 |
| Education | 0.14 | 0.04 | | | |
| Not a high school graduate | | | 34.3 | 4.2 | 1.2 |
| High school graduate | | | 45.2 | - 1.9 | - 0.9 |
| Some college or more | | | 20.5 | - 2.7 | 0.8 |
| Number of interviews | 9696 | | | | |
| Mean length of interview | 66.7 | | | | |
| Coefficient of determination | 0.14 | | | | |

[a]Adjusted for the other characteristics in the table by use of Multiple Classification Analysis.

The number of pregnancies by itself explains 12 percent (eta$^2$) of the variation in the length of interview.

Interviews with black women took 6.4 minutes longer, on the average, than did interviews with white and other race women. Adjusting for the other characteristics of the respondent shown in the table reduced the differential to 5.4 minutes. However, there was an attempt to match interviewers and respondents by race, and so this characteristic of the respondent may be picking up effects

2. Percent of interviews and unadjusted and adjusted[a] deviations in minutes from the mean length of interview by characteristics of the interviewer: National Survey of Family Growth, 1973.

| Characteristics of the interviewer | eta | beta | Percent of interviews | Unadjusted deviations | Adjusted deviations |
|---|---|---|---|---|---|
| All interviews | | | 100.0 | 0.0 | 0.0 |
| Age | 0.18 | 0.16 | | | |
| Under 30 years | | | 14.0 | - 3.9 | - 3.2 |
| 30 to 39 years | | | 27.5 | 2.7 | 1.6 |
| 40 to 49 years | | | 31.0 | - 3.8 | - 3.4 |
| 50 to 59 years | | | 22.4 | 2.7 | 3.4 |
| 60 to 69 years | | | 2.7 | - 1.0 | - 0.7 |
| Not ascertained | | | 2.4 | 16.3 | 13.3 |
| Race | 0.20 | 0.15 | | | |
| White and other | | | 62.2 | - 2.4 | 0.0 |
| Black | | | 37.5 | 3.5 | - 0.5 |
| Not ascertained | | | 0.3 | 60.1 | 58.4 |
| Religion | 0.06 | 0.09 | | | |
| Protestant | | | 68.2 | 0.0 | - 0.8 |
| Catholic | | | 11.2 | 0.2 | - 0.2 |
| Jewish | | | 10.3 | 0.5 | 4.1 |
| None | | | 5.5 | 0.3 | 3.8 |
| Other | | | 4.3 | - 4.0 | - 1.9 |
| Not ascertained | | | 0.4 | 16.4 | 15.2 |
| Education | 0.05 | 0.07 | | | |
| Not a high school graduate | | | 3.1 | - 1.8 | - 2.5 |
| High school graduate | | | 21.0 | - 0.2 | 2.2 |
| Some college | | | 40.1 | - 0.7 | - 1.3 |
| College graduate or more | | | 35.7 | 1.1 | 0.5 |
| Not ascertained | | | 0.1 | -19.0 | -19.9 |
| Marital status | 0.09 | 0.06 | | | |
| Currently married | | | 77.5 | - 0.7 | - 0.2 |
| Widowed, divorced, separated | | | 18.2 | 2.9 | 0.8 |
| Never married | | | 2.9 | 4.7 | 5.0 |
| Not ascertained | | | 1.4 | - 9.2 | - 7.3 |
| Children ever born | 0.07 | 0.06 | | | |
| No children | | | 14.2 | 1.6 | 0.2 |
| 1 or 2 children | | | 37.0 | - 1.0 | - 1.1 |
| 3 or 4 children | | | 34.7 | - 1.0 | - 0.2 |
| 5 or more children | | | 13.2 | 3.3 | 3.2 |
| Not ascertained | | | 0.2 | 5.7 | 2.6 |
| Number of iterviews | 9696 | | | | |
| Mean length of interview | 66.7 | | | | |
| Coefficient of determination (adjusted): | | | | | |
| interviewer characteristcs | | | 0.08 | | |
| Interviewer and respondent characteristics | | | 0.20 | | |

[a]Adjusted for other characteristics of the interviewer in the table as well as characteristics of the respondent in Table 1.

of race of the interviewer (to be discussed below).

The NSFG questionnaire consisted of separate forms for currently married and currently unmarried women. Table 1 shows no differences in the unadjusted length of interview by marital status. However, once the number of pregnancies and other characteristics of the respondent are controlled, currently married women, as expected, took an average of 4.3 minutes longer per interview than did previously married or single women.

The unadjusted deviations in Table 1 show an increasing length of interview with increasing age of the respondent. However, the adjusted deviations suggest that the relationship is curvilinear. Women 25-29 years old took longer to interview than did women who were either older or younger.

Interviews with women working full time were shorter on the average than were interviews with women working part time; interviews with women working part time were shorter than were interviews

with women not working at all. The amount of the differences is over twice as great in the unadjusted figures than it is when other characteristics of the respondent are controlled.

Education considered separately has a strong relationship with the length of interview. Women with at least some college education took almost 7 minutes less to interview than women who had not graduated from high school. Once other characteristics are controlled, however, the effect of education is reduced.

In summary, the NSFG was designed to ask currently married women and women with greater numbers of pregnancies more questions than previously married or single women and women with fewer numbers of pregnancies, respectively. These aspects of the survey design are reflected in the length of interview. In addition, interviews were slightly longer for black women, women in their twenties, women who were not working, and women who were not high school graduates. Altogether, characteristics of the respondent explain 14 percent of the variance in the length of interview.

### 3.2 Characteristics of the Interviewer

The length of the interview may be affected by the interviewer as well as the respondent. Table 2 shows the deviations from the overall average length of interview for selected characteristics of the interviewers. The adjusted deviations control for all respondent characteristics of Table 1 as well as all of the other interviewer characteristics in Table 2.

Although the beta coefficient indicates a fairly important relationship between age of interviewer and length of the interview, the lack of pattern may indicate that only random variations are occurring.

Interviews conducted by black women took about 6 minutes longer than interviews conducted by white women. The differential is reduced to 0.5 minutes once other characteristics of the interviewer and characteristics of the respondents are controlled.

The NSFG matched interviewers and respondents on race to the extent possible. In only 3.3 percent of the interviews were the respondent and the interviewer not of the same race, making it difficult to differentiate how much of the effect on length is due to race of the respondent and how much is due to the race of the interviewer. Table 3 shows the adjusted deviations from the mean length of interview by the cross classification of race of respondent and race of interviewer. Interviews with white or other race respondents conducted by white or other race interviewers were 4.3 minutes shorter (net of other factors) than interviews with black respondents conducted by black interviewers. Controlling for the race of respondent, race of interviewer affects the length of interview by 2.7-3.2 minutes. Controlling for the race of interviewer, race of respondent affects interview length by 1.3-1.6 minutes. Therefore, it appears that race of interviewer has a slightly greater effect than the race of the respondent.

3. Adjusted[a] deviations in minutes from the mean length of interview by race of respondent and race of interviewer: National Survey of Family Growth, 1973 (numbers of interviews in parantheses)

| Race of Interviewer | Race of Respondent | |
|---|---|---|
| | White/Other | Black |
| White or other | -1.8 (N=5801) | -0.2 (N= 217) |
| Black | 1.4 (N= 104) | 2.5 (N=3524) |
| Not ascertained | -2.8 (N= 28) | 65.5 (N= 2) |

[a]Adjusted for other characteristics of the respondent in Table 1 and other characteristics of the interviewer in Table 2 (excluding the race variables).

The religion, education, marital status and children ever born by the interviewer were collected to determine if they had an effect on the interview. They do have some effect on the variation in interview length, but less so than the interviewer's race and age.

The six interviewers' characteristics in Table 2 explain 8 percent of the variation in length of interview by themselves. The combination of the respondents' and the interviewers' characteristics explains 20 percent of the variation in the length of interview.

### 3.3 Interviewer Training and Experience

Interviewer training and experience, whether on this particular survey or surveys in general, is related to the length of interview. Length decreases rapidly with the first few interviews, as the interviewer gains experience with the NSFG questionnaire. It then decreases more slowly with additional experience. A log model (Length = 78.6-9.9164 Log Order) fits better than a quadratic or a cubic model, but it does not fit the unadjusted group means very well between the 50th and the 150th interview. The fit of the log model to the adjusted group means is better for the first 100 interviews than for more than 100 interviews. Adjusted for other characteristics and training, interviews which were among the first 10 conducted by an interviewer took an average of 25 minutes longer than did those which had been preceeded by at least 149 other NSFG interviews. It could be that interviewers, who take a long time completing their first few interviews, drop out earlier than interviewers who take less time. Investigation did not show this to be the case.

The number of years the woman has been interviewing is related to the average length of interview (Table 4). However, this relationship

4. Percent of interviews and unadjusted and adjusted[a] deviations in minutes from the mean length of interview by experience and training of the interviewer: National Survey of Family Growth, 1973.

| Experience and training of the interviewer | eta | beta | Percent of interviews | Unadjusted deviations | Adjusted deviations |
|---|---|---|---|---|---|
| All interviews | | | 100.0 | 0.0 | 0.0 |
| Order number of interview | 0.20 | 0.23 | | | |
| 1st to 9th interview | | | 28.0 | 6.8 | 7.0 |
| 10th to 19th interview | | | 25.0 | - 0.5 | 0.3 |
| 20th to 29th interview | | | 18.2 | - 3.5 | - 2.4 |
| 30th to 39th interview | | | 11.0 | - 3.9 | - 3.3 |
| 40th to 49th interview | | | 5.8 | - 4.4 | - 4.8 |
| 50th to 59th interview | | | 3.3 | - 3.3 | - 4.0 |
| 60th to 69th interview | | | 2.2 | - 4.2 | - 7.0 |
| 70th to 79th interview | | | 1.7 | - 3.0 | - 7.0 |
| 80th to 89th interview | | | 1.2 | - 2.7 | - 5.9 |
| 90th to 99th interview | | | 0.8 | 0.5 | - 6.0 |
| 100th to 119th interview | | | 1.3 | - 2.3 | -10.2 |
| 120th to 149th interview | | | 1.0 | - 6.2 | -16.3 |
| 150th or higher interview | | | 0.7 | - 9.6 | -17.7 |
| Years with organization | 0.16 | 0.10 | | | |
| Less than 1 year | | | 56.9 | 0.9 | - 0.3 |
| 1 or 2 years | | | 8.0 | 5.6 | 3.0 |
| 3 or 4 years | | | 14.9 | - 6.1 | - 3.9 |
| 5 to 9 years | | | 13.4 | - 2.1 | 2.3 |
| 10 or more years | | | 4.3 | 7.6 | 5.4 |
| Not ascertained | | | 2.4 | - 4.2 | - 2.0 |
| Years interviewing | 0.12 | 0.10 | | | |
| Less than 1 year | | | 37.8 | 1.3 | 1.7 |
| 1 or 2 years | | | 12.5 | 3.8 | 3.0 |
| 3 or 4 years | | | 18.6 | - 3.2 | - 2.1 |
| 5 to 9 years | | | 18.4 | - 2.9 | - 2.8 |
| 10 or more years | | | 11.4 | 2.5 | 0.3 |
| Not ascertained | | | 1.3 | - 8.8 | - 6.4 |
| Training team | 0.10 | 0.10 | | | |
| Team A | | | 30.1 | - 1.2 | - 1.4 |
| Team B | | | 32.5 | 0.7 | 1.3 |
| Team C | | | 35.7 | - 0.4 | - 0.7 |
| Locally trained | | | 1.6 | 16.9 | 15.6 |
| Training session | 0.14 | 0.07 | | | |
| June 24-30, 1973 | | | 37.6 | - 3.9 | - 1.9 |
| July 8-14, 1973 | | | 32.1 | 2.8 | 1.8 |
| July 22-28 or later | | | 30.2 | 1.9 | 0.5 |
| Supervisory position | 0.08 | 0.02 | | | |
| Supervisor or coordinator | | | 18.9 | - 3.4 | - 0.3 |
| Not supervisor or coordinator | | | 79.9 | 0.8 | 0.1 |
| Not ascertained | | | 1.2 | 0.8 | - 4.1 |
| Number of interviews | 9696 | | | | |
| Mean length of interview | 66.7 | | | | |
| Coefficient of determination (adjusted): | | | | | |
| interviewer experience and training | | | 0.08 | | |
| interviewer experience and training and respondent characteristics | | | 0.23 | | |
| interviewer experience, training and characteristics | | | | | |
| interviewer experience and training and interviewer and respondent characteristics | | | 0.29 | | |

[a]Adjusted for the other interviewer experience and training factors in the table as well as characteristics of the respondent in Table 1 and characteristics of the interviewer in Table 2.

is curvilinear with interviewers of 3-9 years experience conducting shorter interviews than interviewers with fewer or more years experience.

Most of the interviewers in the NSFG had not worked with the contracting organization prior to the NSFG, or had worked for it less than one year. However, this lack of experience with the contracting organization did not increase their average length of interview. There is also no indication that increased length of service with the contracting organization reduced the length of interviews.

The majority of interviewers for the NSFG were trained during one of three week-long training sessions. During each training session, interviewers were trained by one of three teams (denoted A, B, and C), each team comprised of 2-4 trainers. Due to interviewer loss, a fourth training session of 3½ days was held part way through the field work conducted by a single trainer. In addition a few interviewers were trained by local supervisors. The training team of the regular sessions had some effect on the length of interviews. However, interviewers trained in the mid-fieldwork session or by local supervisors took substantially longer to complete interviews than those trained by the regular trainers prior to field work, independent of the fewer number of interviews they were able to complete.

Analysis of the adjusted deviations from the overall mean length of interview shows a curvilinear relationship between length and the time of the three regular training sessions (mid-fieldwork training is included with the last session). The first session produced the shortest interviews and the second session the longest. It does not appear, therefore, that the experience of the trainers in training on the NSFG had any substantial effect on reducing the length of interviews.

Interviewers who were also supervisors or coordinators took less time interviewing respondents than interviewers with no administrative responsibilities, at least in respect to the unadjusted deviations. When other factors are controlled, this difference is reduced. Those selected for supervisory positions were probably those interviewers who had proved themselves most efficient in the past and had those characteristics or training background that enabled them to conduct interviews in shorter periods of time.

The six interviewer training factors by themselves explain 8 percent of the variation in the length of interview, and add more independent explanation to the respondent characteristics than do the characteristics of the interviewer. When combined with both respondent and interviewer characteristics, interviewer training increases the amount of the explained variance to 29 percent. The most important part of interviewer training is experience with the NSFG interview.

## 4. CONCLUSION

The first cycle of the NSFG took over an hour, on the average, per interview. There was considerable variation in the length of interview, however, and 29 percent of the variance in the length of interview can be explained by characteristics of the person interviewed, characteristics of the interviewer and the training of the interviewer. The two single most important variables were the number of pregnancies the respondent had had and the order number of the interview (the experience the interviewer had on the NSFG questionnaire).

Would reducing the variation in the length of interview actually save much time in terms of overall respondent burden or time costs? Most of the length of interview is determined by the content and design of the survey. Some of the variation in length is due to characteristics of the respondent and of the interviewers which might be difficult, or impossible, to modify without changing the nature of the survey. However, there are interviewer experience and training items that could be modified and reduce the length of interview.

Suppose that 100 interviewers, each with 5-9 years of previous interviewing experience, had been selected for the NSFG. If they had all been trained during the first training session and each had completed 97-98 interviews, the average savings per interview would have been: (taken from adjusted deviations of Table 4):

| | |
|---|---|
| Interviewers with 5-9 years experience | - save 2.8 minutes |
| Training during first training session | - save 1.9 minutes |
| Conducting 97-98 interviews each | - save 3.4 minutes |
| Total | save 8.1 minutes |

The mean interview length would have been reduced from 66.7 minutes to 58.6 minutes. This savings would have resulted in 1,323 fewer hours spent in interviewing. At $3-$4 dollars per hour for interviewers, $4,000-$5,000 would have been saved. This is a small amount in relationship to the overall cost of the survey, but is nevertheless a savings. However, the savings would have resulted in a 12 percent reduction in respondent burden.

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