VITAL and HEALTH STATISTICS

DATA EVALUATION AND METHODS RESEARCH

the influence of

Interviewer and Respondent Psychological and Behavioral Variables

on the Reporting in Household Interviews

A methodological study of the relationship of the behaviors, attitudes, perceptions, and information levels of the respondent and the interviewer to the levels of reporting health information in household interviews.

Washington, D.C.   March 1968

NATIONAL CENTER FOR HEALTH STATISTICS

THEODORE D. WOOLSEY, *Director*

PHILIP S. LAWRENCE, Sc.D., *Associate Director*

OSWALD K. SAGEN, PH.D., *Assistant Director for Health Statistics Development*

WALT R. SIMMONS, M.A., *Assistant Director for Research and Scientific Development*

ALICE M. WATERHOUSE, M.D., *Medical Consultant*

JAMES E. KELLY, D.D.S., *Dental Advisor*

LOUIS R. STOLCIS, M.A., *Executive Officer*

DONALD GREEN, *Information Officer*

DIVISION OF HEALTH INTERVIEW STATISTICS

ELIJAH L. WHITE, *Director*

ROBERT R. FUCHSBERG, *Chief Survey Methods Branch*

GERALDINE A. GLEESON, *Chief, Analysis and Reports Branch*

COOPERATION OF THE BUREAU OF THE CENSUS

Under the legislation establishing the National Health Survey, the Public Health Service is authorized to use, insofar as possible, the services or facilities of other Federal, State, or private agencies.

In accordance with specifications established by the National Health Survey, the Bureau of the Census, under a contractual arrangement, participates in most aspects of survey planning, selects the sample, collects the data, and carries out certain parts of the statistical processing.

FOREWORD

In attempting to develop procedures and devices which will increase the accuracy and completeness of data collection in the Health Interview Survey, the National Center for Health Statistics has had a continuing program of methodological studies conducted by contractual arrangement with the Survey Research Center, Institute for Social Research, The University of Michigan.

The present study, carried out with the cooperation of the U.S. Bureau of the Census, was undertaken for the purpose of identifying some of the major variables that may affect the degree of success with which health information can be collected by the interview method. Research in this area in the past has focused principally on the training and supervision of interviewers and on the development of a standard interviewing instrument which can be applied in a standard manner, namely, the questionnaire. There is little doubt that these two approaches have improved the level and consistency of reporting, but no real breakthrough in methodology has been accomplished.

More recently researchers have begun to consider the respondent as a major source of reporting bias and have turned their efforts to gaining some understanding of the respondent's attitudes and perceptions in relation to his demographic characteristics.

In the present study consideration has been given to many aspects of the interview, with particular emphasis on the individual attitudes, behaviors, and backgrounds of the respondent and the interviewer and the interaction of these characteristics during the course of the interview.

This study, which introduces a new dimension in NCHS survey research programs, suggests that interview reporting accuracy can be more effectively increased by changing the behavior in the interview rather than by attempting to change basic attitudes or to increase levels of information.

The cooperative efforts of the three agencies involved in the study have resulted in a better understanding of the interview process and have made it possible to develop a series of hypotheses for further testing.

Elijah L. White
Director
Division of Health Interview Statistics

CONTENTS

CONTENTS—Con.

CONTENTS—Con.

IN THIS REPORT a methodological study is described which was designed to identify some of the major variables relating to the level of the reporting of health information in a household interview. Procedures developed to evaluate the influence of respondent and interviewer variables during an observed interview situation include (1) a description in the form of a series of "snapshots" of the ongoing behavior of the participants during the interview, (2) the rating by the interviewer of her perceptions of and attitudes toward the respondent and the interview, (3) a reinterview to obtain respondent reactions to the interview, and (4) a discussion with the interviewer concerning her attitudes toward her job, her reaction to specific aspects of her work, and her feelings about the interview situation.

The model constructed for the study assumed that demographic characteristics, experiences, feelings, and attitudes of the participants in the interview were the principal causal factors of reporting and that these factors were mediated by the behaviors exhibited. However, the findings of this study indicate that behaviors are the most important variables in determining the course of the interview, with psychological and demographic characteristics having minimal predictive value.

THE INFLUENCE OF
INTERVIEWER AND RESPONDENT
PSYCHOLOGICAL AND BEHAVIORAL VARIABLES
ON THE REPORTING IN HOUSEHOLD INTERVIEWS

Charles F. Cannell, Ph.D., Floyd J. Fowler, Jr., Ph.D., and Kent H. Marquis, Ph.D.

Survey Research Center, Institute for Social Research, University of Michigan

INTRODUCTION

Background

For years survey practitioners and users of survey data have been concerned about problems of inaccuracies in interviews. For example, Myers[1] study of age data obtained by interviewers in the 1940 Decennial Census found a marked "heaping" of ages ending in zero, such as 10, 20, and 30. Hanson[2] and his colleagues at the U.S. Bureau of the Census conducted reinterviews of families regarding their status in the labor force. Significantly different responses were obtained for about 40 percent of the items of the interview. Hyman[3] reported a study conducted during World War II which showed that nearly half the respondents known to have cashed war bonds during the week previous to the interview failed to report this to the interviewer.

In attempts to isolate and provide techniques for overcoming these problems, early attention was centered upon the interviewer. In 1929 Stuart Rice published a pioneering article entitled "Contagious Bias in the Interview."[4] Rice was working with some interviewers who were collecting information to determine reasons for destitution of men living in cheap hotels and flophouses. In reading the interviews he discovered that various responses received by one interviewer were similar to one another but different from those received by another interviewer. He also discovered that respondents of one interviewer consistently reported overindulgence in liquor as the cause of their destitution while respondents of another interviewer tended to blame social and economic conditions. An investigation showed that the former interviewer was a prohibitionist and the latter a socialist.

Katz[5] showed that interviewers from working-class backgrounds consistently obtained more radical social and political opinions from respondents than did interviewers from the middle class.

Since early studies have demonstrated significant differences between interviewers, it is not surprising that much attention has been devoted to measuring the effect of interviewers on research results and to seeking a means of overcoming potential bias. Two main lines of activity have resulted. First, greater emphasis has been placed on the adequate training and supervision of interviewers, and, second, research workers have given more attention to the wording of questions in order to provide the interviewer with a standard instrument which can be applied in a standard manner. The objective is to obtain greater control over interviewer participation. However, interview studies still report sizable interviewer variance, the antecedents of which are largely unknown.

Interview Variation

Several factors may be responsible for interview variation. The interviewer's attitudes, her expectations of the respondent, her motives, her social and occupational class, and even her physical appearance have all at times been shown to be related to the results she obtains in interviews. Such findings were considered at one time to be relevant only when the subject matter of the survey was psychological (perceptions, attitudes, and motives) as contrasted with cognitive inquiries (level of information, descriptive data, and so forth). It becomes clear as more research is done that the "attitude" versus "fact" dichotomy is not valid. The reason appears to be that even though the subject matter of the inquiry may be nonattitudinal, the interviewer and the respondent have perceptions, attitudes, and motives about the information, interview, and each other which may affect the accuracy of the responses which are obtained during the interview. A respondent's income is an objective, nonattitudinal variable, but feelings about one's income and about reporting it are very strong among some people. Almost any descriptive data may be influenced on occasion by strong emotional feelings.

There is no question but that better training of interviewers results in more accurate data, but even now not too much is actually known about factors underlying and leading to inaccurate reporting, although speculation abounds. If the problem could be solved simply, the solution probably would have been discovered long ago. Although small advances have been made toward improvement, no real breakthrough in methodology has occurred.

Respondent Variation

Recently, researchers have begun to turn their attention from the interviewer as the sole source of bias to the other participant in the interview—the respondent. Research is being focused more specifically on the respondent's information, perceptions, attitudes, and motives. Even more important, however, is the growing realization that the product of an interview is not solely the result of either person, but rather it is the outcome of the interaction between the two—each with his individual attitudes, perceptions, and motives and each with his own personal characteristics.

Studies such as those cited above provide a basis for speculating about where some of the sources of inaccurate data may be and for considering various theoretical bases for understanding the problems.

It was against this background that the Survey Research Center (SRC) and the Health Interview Survey (HIS) planned the present study. The hypotheses which were stated were at a broad, general level, and for the most part it was felt that systematic and controlled exploration of the interview would be a profitable first step. From this study it was hoped that the researchers could select, sharpen, or generate hypotheses or identify variables which showed sufficient promise to be worth further testing. This study, then, is an exploration to provide a better understanding of the Health Interview Survey interview and to develop a series of hypotheses for further testing.

Sources of Data for the Study

Five sources of data were used in the study— the reported health information and demographic characteristics obtained in the HIS interview; questionnaires measuring the personal and social characteristics of the interviewer; questionnaires tapping respondents feelings, motives, attitudes, and information about the interview; an interviewer rating form describing the respondent, the interview, and the interviewer's impressions and feelings; and a procedure which recorded the on-going behavior in the interview. Basic to the study was the intention that the results should be indicative of specific changes which would improve reporting in the HIS.

THE STUDY MODEL[a]

As a basis for considering some of the relevant variables in this exploratory research, the following model of the interview is presented:

```
    RESPONDENT                    INTERVIEWER

 ┌─────────────┐              ┌─────────────┐
 │ Demographic │              │ Demographic │
 │ Personality │              │ Personality │
 │ Information │              │ Training     │
 │             │              │ Interviewing │
 │             │              │  experience │
 └─────────────┘              └─────────────┘
        ↓                            ↓
 ┌─────────────┐              ┌─────────────┐
 │ Attitudes   │              │ Attitudes   │
 │ Expectations│              │ Expectations│
 │ Motives     │              │ Motives     │
 └─────────────┘              └─────────────┘
        ↓                            ↓
  ┌────────────┐   ←───→   ┌────────────┐
  │ Perceptions│    ✕      │ Perceptions│
  └────────────┘           └────────────┘
        ↓                         ↓
   ┌──────────┐             ┌──────────┐
   │ Behavior │             │ Behavior │
   └──────────┘             └──────────┘
           ↘   ┌───────────┐   ↙
            →  │ Reporting │ ←
               │ accuracy  │
               └───────────┘
```
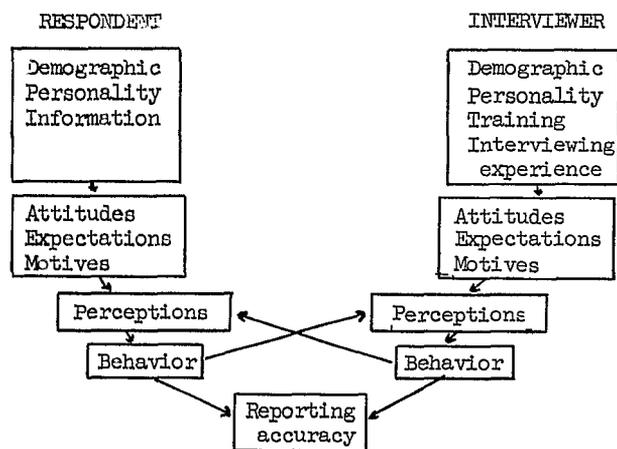
The model assumes that the outcome of the interview is a joint product of background characteristics, psychological attributes, perceptions, and behaviors of both persons taking part in the interview. The emphasis is on the psychological characteristics of persons, the effects these persons have on each other, and the resultant effects on reporting accuracy. According to this conception, knowing only about one set of variables or knowing only about one of the persons in the situation will not provide enough information to predict completely the course and outcome of the interview.

The first set of variables consists of the basic characteristics of the individuals such as their demographic characteristics, abilities, personalities, beliefs, levels of knowledge, normative standards, and effects of experience and other learning situations. It is assumed that these characteristics form the basis for the more flexible attitudes and expectations which are important in the interview.

At the next level, it is assumed that attitudes, expectations, and emotions based on these psycho-

[a]This model is taken from R. L. Kahn and C. F. Cannell, *The Dynamics of Interviewing*, New York, John Wiley and Sons, Inc., 1957.

logical characteristics play a major part in determining how the interviewer and respondent perceive the interview situation. In this study a major attempt was made to measure a wide range of attitudes, expectations, and motives which were relevant to the interview. For example, this research measures attitudes toward health, respondent attitudes toward the whole interview experience, and interviewer attitudes toward her job. Possible respondent motives for cooperating, such as a citizen orientation or hopes of deriving personal benefit from participation, are measured. Interviewers were asked questions concerning how they expect their respondents to react to different aspects of the interview.

For purposes of presenting this model in a simplified form, it is arbitrarily assumed that the behavior of each person is based on what are called here her "perceptions" (how she interprets the situation). Her interpretations are based on what she already believes and knows and on what she learns from the behavior of the respondent. The determinants of perceptions are undoubtedly much more complex than this since they are probably also arrived at on the basis of nonbehavioral cues about the respondent's social class or ability that are obtained from her physical appearance, her type of neighborhood, her manner of speech, and from other sources. In this study, attention was primarily focused on how well the respondent understood what she was supposed to do as a respondent (e.g., did she know that she was supposed to report all health ailments and the use of health facilities for all relevant members of the household). Interviewers were asked to describe, using a check list, how they perceived each of their respondents on several dimensions.

The perceptions of persons are assumed to be the final determining link with behavior, and behavior in the interview determines how accurately health information is reported. This study measured a wide range of behaviors in as great detail as possible.

Reporting accuracy is hypothesized to be dependent not on the behavior of only one of the interview participants during interview but on both. The choice of dependent variables will be discussed in detail later. They consist of reports of health from the HIS interview.

METHODS OF INVESTIGATION

Since the present study was designed primarily as a basis for identifying some of the major variables relating to the accuracy of reporting health information in the Health Interview Survey, it might be described as a search for hypotheses upon which to base further studies within the framework of the model specified above. Meeting this objective required the development of procedures which would focus attention on the behaviors, attitudes, perceptions, and information level of both the respondent and the interviewer and obtain some insights into the interaction between the two participants in the HIS interview. To do this, questionnaires were constructed for both the respondent and the interviewer, and special observational techniques were developed to permit a standardized and reliable method of measuring the behavior of both the interviewer and the respondent during the course of the HIS interview. A description of these instruments and the procedures follows. The Interview Observation Form is reproduced in Appendix IV, and other forms used are available on request from the Survey Research Center.

Observation Procedure

A special observation technique was designed to provide a permanent record, in the form of a series of "snapshots," of the behavior of the interviewer and the respondent at intervals during the interview.

Of the several techniques used previously to record ongoing behaviors, two were found to be relevant to the present study.[6,7] Although the procedures developed for this study used some of the techniques of both these systems, they are unique in most respects. Items were selected which it was felt would best describe the significant behaviors of both participants in the interview and which could be observed and recorded reliably. The procedures and forms are described in more detail in a later section of this report.

HIS Interviewer Ratings

Following the HIS interview, the interviewer made several ratings of her perceptions of and attitudes toward both the respondent and the interview. These ratings were similar to ratings made by the observers at the end of each interview.

Respondent's Reactions to the HIS Interview

To obtain respondent reactions to being interviewed, a second group of interviewers from the Survey Research Center were sent out to reinterview the respondents on the day following the HIS interview. The questionnaire used for this interview contained a large number of open questions that covered such topics as the respondent's information and perceptions of the HIS, her motives for cooperating, and her reactions to various aspects of the interview. Probing for negative feelings was emphasized, and some semiprojective techniques were used to make it easier for the respondent to make critical remarks.

Interviewer's Reactions to the HIS Interview

Each of the 35 HIS interviewers was interviewed by Survey Research Center interviewers after all of her observed interviews were completed. Questions were asked about her attitudes toward her job, about how she felt about interviewing different types of respondents, about her reactions to specific aspects of her work, and about her reactions to the questions on the HIS questionnaire.

Information from the HIS was used as a source of data for respondent demographic characteristics as well as for her reports of health information.

PRINCIPAL FINDINGS

According to the model, respondent and interviewer characteristics such as experiences, feelings, motives, and attitudes are the principal causal factors of reporting in the interview. They are mediated by behaviors and perceptions of the other person's behaviors. The results of this study cast doubt on the causal links postulated in the model and suggest a different ordering of the variables with respect to importance. Specifically, it appears that the psychological characteristics and demographic characteristics measured are of

minimal predictive importance. The behaviors and possibly the mutual perceptions of these behaviors have appeared as the variables of greatest importance in determining the course of the interview.

Summary of Principal Findings

The data from this study may be cast into four main findings which have direct relevance to understanding the dynamics of the information-gathering household interview.

1. Respondent feelings, level of information about the survey, motives, attitudes, and perceptions when measured the day after the interview are not directly related to health reporting behavior.

2. Interviewer attitudes, preferences, styles of interviewing, or expectations as measured here are not related to the reporting of conditions she obtained from her respondents.

3. Respondent demographic characteristics showed no important systematic associations with the reporting index.

4. The amount of behavior in the interview shows a strong association with reporting. Both the task and interpersonal behavior indexes of the interviewer and the respondent were positively related to the reporting index. The higher the level of behavioral activity in the interview the better the overall reporting on the part of the respondent.

Respondent Characteristics

Several things were learned from the reinterview of the respondent which took place the day after she participated in the health interview. The general level of knowledge about the purpose and sponsorship of the interview was low; and even though the respondent was sent a letter explaining the purpose of the household interview survey and telling her that an interviewer would call on her, there was almost no improvement in this knowledge. The major predictor of respondent's information level was her general level of

education—higher educated respondents had more relevant information than did those with lesser education.

Two major attempts were made to assess the respondent's overall reaction to the interview. When questioned directly, about one-third of the respondents reacted positively to the interview, more than half were neutral, and the remainder were classified as reacting negatively. Using a semiprojective technique in which the respondent was asked to "describe the feelings of the person in the picture," almost half of the respondents were classified as reacting at least somewhat negatively to the interview.

The reason given most frequently for cooperating in the survey was that it is a citizen's duty to do so. The next most frequently given reason was that the respondent merely enjoyed being interviewed or enjoyed having a chance to talk to someone.

The most frequently given reason for not cooperating was that the respondent did not know the purpose of the survey or that she felt that surveys in general were not worthwhile.

There were practically no criticisms of the interviewer. Respondents see the interviewer as highly educated, highly trained, and as a professional rather than a clerical or neighborly person. Although respondents were divided in their preferences for a businesslike or friendly interviewer, almost all of them said that their interviewer was just right.

Some criticism of the questions was given; there was slightly more among the higher income respondents. The major complaints were that the questions were too personal or too detailed.

Interviewer Characteristics

The 35 HIS interviewers employed on this study were interviewed after they had completed all of their assignments. Most of them expressed very favorable attitudes toward their jobs. The main appeal was the chance to come in contact with other people; however, they did not like the idea of going into dirty homes or bad neighborhoods.

They stated preferences for interviewing respondents who were demographically similar to themselves or who, on the basis of other attri-

butes, were easy to interview. Most interviewers felt respondents enjoyed the interview. Very few said respondents reacted negatively.

Behavior During the Interview

A description of the HIS interview was obtained by counting and recording the behaviors which took place. It appears that the interviewer gave a short introduction to the HIS and that respondents took most of the initiative in inviting the interviewer in and setting the stage for the interview. Respondents usually appeared polite and receptive at the door.

The question and answer process generally followed the programed procedures specified in the *Interviewer's Manual*.[8] As a rule, interviewer activity was confined to asking questions and probing for answers. Respondents usually answered the questions adequately, but they often volunteered extra information not needed by the interviewer to fill out the questionnaire. Radical departures such as the respondent asking the interviewer to clarify a question or a respondent consulting records were seldom noted.

Irrelevant conversation was more frequent than might have been expected and was initiated primarily by the respondent rather than the interviewer. Respondents usually talked about themselves or about those for whom they were reporting, or they laughed and joked. The very few instances of nonquestion-related conversation initiated by interviewers were primarily concerned with the respondent or were instances of laughter or joking. Respondents reacted more favorably to irrelevant initiations than did the interviewers.

In general, older respondents showed a higher level of behavior than did the younger ones. Interviewers did a little more initiating of irrelevant conversation for the higher educated and higher income respondents but showed more specific initiative of a directive sort for the lower educated, the lower income, and older respondents.

Originally, based on previous research and theory, it was felt that the behaviors in the interview could be classified on at least two dimensions, interpersonal and task oriented behaviors. It was possible to make this distinction in devising the recording form, but the data indicated that

behaviors classified by this system were, in fact, highly related to each other or nonorthogonal. In an attempt to understand how the interview behaviors should be classified with respect to each other, the behavior data were subjected to factor analysis (see Appendix I). In spite of the emergence of two orthogonal or independent factors, one in which task behaviors loaded highly and the other in which interpersonal behaviors showed exclusively high loadings, a plot of the actual behaviors in the factor space suggested that if the two dimensions existed psychologically, they were better described as oblique (not independent). In addition, one of the most surprising findings was that the interviewer and respondent usually behaved on the same level of task and interpersonal behavior, especially when the level of behavior in the interview was either very high or very low. Hence, according to these data, the best way to classify behavior in the HIS interview is on a single dimension of activity rather than by trying to make distinctions between the quality of the behaviors or distinctions between the behavior levels of the interviewer and respondent.

THE STUDY DESIGN AND SAMPLE

Health Interview Survey interviews are supervised by the 12 regional offices of the Bureau of the Census. Between 7 and 10 interviewers work out of each regional office, receiving assignments each week or every other week. Each assignment calls for interviews at about 18 households in the same primary sampling unit (PSU). The interviewers are expected to complete their assignments as early in the week as possible, and they usually interview 10 or 12 respondents by Tuesday of the week in which an assignment is received.

In order to save travel costs, the sample for this study was drawn from areas serviced by six of the regional offices and included all of the United States east of the Mississippi River with the exception of a small section of the Northeast. It was felt that six regions were needed to insure an adequate sample spread of both urban and rural and northern and southern areas.

Within each region, a sample of six interviewers was chosen, one for each week of the study. Observers attended all of the interviews

taken on Monday and Tuesday of each week. The reinterviewers for the followup interviews were told to reinterview only those respondents who could be contacted in the 2 days following the original interview. Even with this restriction, 90 percent of the respondents were reinterviewed. Only 13 respondents (3 percent) refused to be reinterviewed.

In all, 412 respondents were observed and reinterviewed. Table 1 shows the composition of the sample.

Eligible respondents in the health interview—that is, people who could report for themselves as well as for other members of their families—were adults 19 years of age and over or married residents of the household. However, single people 17 or 18 years of age could respond for themselves but not for other people. Adults not related to the head of the household were required to answer for themselves. As shown in table 1, a high proportion of respondents were women.

DESCRIPTION OF THE HEALTH INTERVIEW SURVEY

General Orientation to the Health Interview Survey

Before discussing the descriptions of the HIS from the point of view of respondents, interviewers, and behavioral records, a brief outline of the general characteristics of the Health Interview Survey will be given. In addition to providing a brief overview of HIS procedures, this description points out that the HIS represents one of several possible types of household interviews. Therefore the findings of this study cannot be applied to all household interviews automatically.

A complete description of the aims and methods of the HIS may be found in three earlier publications. [9-11] The information in these publications is applicable to current operation and goals.

Objective

The main objective is to provide data on illnesses, impairments, accidents, and injuries of persons; on use of medical, dental, and hospital facilities; and on allied health-related topics.

Table 1. Percent distribution of demographic characteristics of 412 respondents in the sample

Demographic characteristics	Percent distribution
Age	
Total	100
Under 35 years	27
35-54 years	39
55-74 years	28
75 years and over	6
Race	
Total	100
White	85
Nonwhite	15
Sex	
Total	100
Male	20
Female	80
Family income	
Total	100
$0-$1,999	14
$2,000-$3,999	21
$4,000-$6,999	25
$7,000-$9,999	20
$10,000 or more	14
Income unknown	6
Education	
Total	100
0-8 years of grade school	31
1-3 years of high school	22
4 years of high school	30
1 year of college or more	16
Education unknown	1

Interviewers

The interviewers are female, part-time employees of the Bureau of the Census. Most have graduated from high school and a few have had

some college education. Compared with other interviewer jobs in the United States, the HIS interviewer's job is fairly demanding. She must carry out 15 or 16 extremely complicated interviews as early in the week as possible, often calling at a household several times before information is obtained. Her workload varies, depending upon the population density of the area to which she is assigned. Her task is largely repetitive, but it changes enough from time to time that she must be adaptive. She is aware that extensive quality control records are being kept on her performance, and she is required to fill out "homework" tests throughout her term of employment.

Interviewer Training

An explicit assumption of Health Interview Survey planners was that interviewers can represent a large potential source of bias in data collection. Anyone familiar with the early research on interviewing techniques will recognize the validity of such an assumption. The Bureau of the Census has concentrated on creating a detailed job procedure description[8] and, in addition, has provided for extensive training and continuous supervision of interviewer performance.

Type of Interview

The HIS is a survey sponsored by the U.S. Government and therefore carries a high degree of legitimacy for the majority of respondents.

The questionnaire contains a large number of detailed questions about demographic and health characteristics. The questions call for the reporting of largely factual information. The health questions emphasize recall of past conditions, the impact of these conditions, the utilization of health services and facilities. The task is undoubtedly difficult and taxing for many respondents. Attempts are made to minimize the effects of the respondent's personal perception of his own state of health in collecting objective health information.

The Interview Process

A letter explaining the sponsorship, general purpose of the survey, and the confidential nature of reported information is sent to each household prior to the interviewer's arrival. When the interviewer arrives, she is instructed to introduce her-

self, mention why she is there, and then to begin the interview without volunteering further explanation. The interviewer proceeds through the questionnaire, adhering to the printed format exactly. Irrelevant conversation is expected to be minimal, and a respondent who deviates from the subject is quickly brought back to the questions. Instructions in the *Interviewer's Manual* define how the interviewer should answer certain respondent questions and how to handle other specific problems with respondents. In general, the interaction is task oriented, with only a minimum of attention paid to respondent behavior.

Respondents

The HIS is based on a national sample, but most respondents are housewives and must report information both for themselves and related members of the household if the latter are not present. Respondents are informed only generally about the purposes and content of the interview. Some respondents receive almost no information and many others do not remember anything about the information they did receive.

Summary

This brief description of HIS is intended to call attention to features in which this type of interview differs from other household interview projects. Differences occur in such areas as objectives of the planners, type of interviewer, demands made on the interviewer, type of interview content, legitimacy of sponsor, construction of the interview, and eligibility of respondents. It is necessary to take such factors into account when considering how these data might be applied to other types of interviews.

RESPONDENT'S VIEW
OF THE HEALTH INTERVIEW SURVEY

This section of the report summarizes the highlights of the reinterviews with regard to the respondents' perceptions of and feelings about the HIS interview.

Respondent's Level of Information

There is a common assumption that it is necessary for the respondent to have some information about the interview in order to report health

events accurately—the more information available, the better the reporting can be. To gather data to test this assumption, one of the objectives of the reinterview was to ascertain the amount and accuracy of information which respondents had about the HIS interview.

Respondent information about the survey comes mainly from three potential sources. The first is his general level of sophistication about the U.S. Public Health Service and about research and surveys in general. Having such information may be useful if it provides a positive reason for reporting. It may also be indicative of how readily the respondent understands and assimilates new information. The second source of information is the printed materials from HIS—a letter and brochure mailed to the respondent's home prior to the interview from the Bureau of the Census. The third source is the interviewer, in mentioning why she is there and in answering questions which arise during the interview.

Ideally one would analyze data separately for the three sources of information. In this study,

however, it is impossible to identify the sources of a respondent's information, since the reinterview was conducted after the respondent could have been exposed to all three sources.

Adequate addresses are often not available to researchers. Therefore the letter and brochure may not have reached all of the households to be interviewed. Even if the information did reach the correct address, it may not have reached the correct family in a multifamily dwelling or the person who eventually served as a respondent in a single-family dwelling. It was estimated that no more than 73 percent of the letters were delivered to the intended family. Even where the address appeared adequate, 42 percent of the respondents reported reading neither the letter nor the brochure (table 2). Not surprisingly, when the address was unclear, reported readership was very low.

A comparison of level of readership by characteristics of respondents showed surprising similarities. Respondents of all age, educational, and income groups reported similar readership. There was a slight tendency for women to have read more than men.

The main interest in this analysis is to discover the level of respondent information about the task he is being asked to perform, i.e., to be a respondent in the Health Interview Survey. Several questions were asked in the reinterview to ascertain the level of information about the Public Health Service, surveys in general, and the HIS in particular.

In general the results indicated a low level of information in all areas questioned. Those who reported reading the letter and brochure were slightly better informed than the nonreaders. More important than readership was educational level of the respondent. The high educational group was better informed than the lower educated. Even within the higher educational group, however, the information level was low. Data on the information level for different educational groups are shown in tables 3, 4, and 5.

Advance materials were not effective in communicating information even though they were especially prepared for that purpose. The main factor in the amount of information was the re-

Table 2. Number and percent distribution of persons in the sample, by readership of advance materials according to adequacy of address

Materials read	Total persons in sample	Adequate address	Inadequate address
Number of persons--	412	301	78
Percent distribution			
Total---	100	100	100
Both letter and brochure-	28	35	5
Letter only---	21	23	10
Neither letter nor brochure-	51	42	85

NOTE: 33 cases where the adequacy of the address was unclear are excluded.

Table 3. Number and percent distribution of persons in the sample, by response to the question "Who did the interviewers work for?" according to education of respondent

Response	Total persons in sample	Education of respondent	
		Not high school graduate	High school graduate and above
Number of persons--------------------------------	412	[1]222	190
	Percent distribution		
Total---	100	100	100
Interviewer works for:			
U.S. Bureau of the Census----------------------	11	5	16
A Federal health agency------------------------	20	11	29
A health agency--------------------------------	17	17	17
"The Government"--------------------------------	7	6	9
Did not know or was not ascertained------------	45	61	29

[1]Includes 4 responses for which education was not ascertained.

Table 4. Number and percent distribution of persons in the sample, by response to the question "Why is the information being collected?" according to education of respondent

Response	Total persons in sample	Education of respondent	
		Not high school graduate	High school graduate and above
Number of persons--------------------------------	412	[1]222	190
	Percent distribution		
Total---	100	100	100
Information being collected:			
For statistical purposes-----------------------	34	26	42
To help the Nation's health--------------------	5	6	3
To find answers to specific health problems----	2	1	3
For legislative purposes------------------------	2	2	2
Gave vague response or did not know------------	57	65	50

[1]Includes 4 responses for which education was not ascertained.

10

Table 5. Number and percent distribution of persons in the sample, by response to the question "What does the U.S. Public Health Service do?" according to education of respondent

Response	Total persons in sample	Education of respondent	
		Not high school graduate	High school graduate and above
Number of persons--------------------------------	412	[1]222	190
	Percent distribution		
Total---	100	100	100
Knowledge of Public Health Service:			
Specific or general, indicating some knowledge of Public Health Service----------------------	35	24	46
Vague or obviously incorrect--------------------	6	7	6
Heard of it, but did not know its function------	37	38	35
Never heard of the Public Health Service--------	20	30	11
Not ascertained--------------------------------	2	1	2

[1]Includes 4 responses for which education was not ascertained.

spondent's educational level. Respondents generally did not have much information about the survey purpose or sponsorship. Many respondents participated in the interview with little knowledge of the organization conducting the survey or of why it was being conducted. With this background, it is interesting to see how respondents react to being interviewed in the HIS.

Respondent Attitudes and Perceptions

In the reinterview, respondents were asked questions to obtain their general reactions to the HIS interview. Their reactions might have been influenced by such factors as how busy the respondent was, how she felt about her health, how she liked the interviewer, or how much health information she had to report.

Previous studies have shown that some respondents tend to respond more positively than they actually feel when asked direct questions about any interview; this is probably because they do not want to say anything which might reflect unfavorably on the interviewer. For this reason, indirect questions were also asked. Respondents

were shown three pictures, one showing the beginning of an interview with the interviewer at the door, a second showing two people sitting, the third showing the interviewer leaving the house following the interview. Respondents were asked how the person in the picture was feeling. In addition, direct questions were asked later about the respondent's general reactions to the interview. Responses to both the direct and indirect questions, categorized as positive and negative affect, are ·shown in table 6.

The proportion of respondents with positive reactions was about the same for both types of questions, but, as was expected, the indirect questions brought out a significantly higher proportion of negative reactions. It must be pointed out that "negative" was broadly interpreted and did not necessarily imply major unhappiness or criticism. For example, among the 50 percent who gave a negative reaction to the picture of the end of the interview are many who simply said that the respondent was glad the interview was over.

When asked for reasons for a positive response, respondents most often said that they were glad to be of service in a worthwhile activity. The

Table 6. Percent distribution of the 412 persons in the sample, by respondent affect from indirect and direct question about the interview according to phase of the interview

Respondent affect	Indirect questions about how the person feels--			Overall reaction to direct question about interview
	At beginning of interview	In middle of interview	After interview is over	
	Percent distribution			
Total---------------------------------	100	100	100	100
Positive------------------------------	20	11	} 30	} 25
Qualified positive--------------------	6	19		} 10
Neutral or equally positive and negative--	19	34	6	31
Qualified negative--------------------	6	11	} 50	} 7
Negative------------------------------	24	10		} 7
Depends, did not know-----------------	23	9	4	11
Not ascertained-----------------------	2	6	10	9

next most frequent response was that the respondent enjoyed the interview itself—either enjoyed responding to the questions or enjoyed talking to the interviewer.

The most common reasons given for negative reactions were that the respondent did not know enough about why she was being interviewed, i.e., she did not know the purpose of the survey, and she had a feeling that the survey was not worthwhile. Some mentioned specific problems with the questionnaire or the questions. There were virtually no negative reactions to the interviewer. Only 3 percent had any specific criticism to make of her, while 68 percent of respondents had positive statements to make about the interviewer.

Several questions were asked about the respondent's perception of the interviewer since it was felt that these perceptions might influence how conscientiously the respondent role would be performed. Of particular interest was the level of expertise and professional status attached to the interviewer. In general, respondents saw interviewers as being somewhat better educated than they actually were: 53 percent thought the interviewers had at least some college. Further, over half thought that the interviewers must have had

at least 6 months of special training for her job. When presented with a list of possible professional and nonprofessional roles—ranging from doctor, teacher, to clerk, salesman, neighbor, etc.— nearly half thought that the interviewers role most closely resembled that of a social worker, a professional role. Overall, 60 percent selected a professional role as most resembling that of the interviewer while 19 percent thought she most resembled someone in clerical or sales occupations. The remainder considered her role more personal, resembling that of a neighbor or friend.

Respondents did not agree as to whether the interview should be strictly businesslike and efficient or whether it should allow for "visiting" and friendly interaction. About 40 percent voted for a strict businesslike interview while another equal percentage wanted visiting. This question was followed by one asking whether the respondent would have preferred the interviewer to have been more businesslike or more friendly. Nearly 90 percent said that they preferred the interviewer to behave just as she did, only 8 percent wished she had been more friendly, and 2 percent wished she had been more businesslike.

Table 7. Frequency distribution of most and least preferred aspects of interviewer job

Reasons given	Number of inter-viewers
Total	35
Most preferred aspects:	
Enjoy meeting people	27
Flexible working hours	3
Other (traveling, money, etc.)	4
Not ascertained	1
Least preferred aspects:	
Dirty homes, bad neighborhoods	10
Physical hardship (bad roads, long hours, etc.)	8
Time production pressures	4
Other (imposing on respondents, too much or too little work, etc.)	12
Not ascertained	1

Attitude Differences for Subparts of the Sample

When the data were analyzed in reference to specific demographic groups, a few differences appeared. Older respondents had somewhat more favorable attitudes toward the interview than did the younger. This positive attitude was not connected with an accurate perception of the respondent role—older respondents were more likely to report that the interviewer wanted only general rather than exact answers.

Better educated respondents tended to mention more specific negative factors—reluctance to give up time, inconvenience of the time of the call—and they were more likely to prefer the interviewer to be businesslike in her approach. Although somewhat more negative generally, they had a clearer perception of their role as a respondent, and they were more likely to think that the interviewer wanted exact answers. They also more often reported the desire to be of public service as a positive reason for participation in the interview.

ATTITUDES AND FEELINGS OF THE INTERVIEWERS

On completion of her assignments for this study, the HIS interviewer was interviewed by a staff member of the Survey Research Center to measure her attitudes, feelings, and perceptions. In tables 7-9 several questions from this interview have been selected to give a picture of how the 35 HIS interviewers reacted to the job of being an interviewer, how they felt about the questionnaire with which they were currently working, and how they felt about their respondents.

It appears that the main attraction of the job was that it offered the interviewer a chance to

Table 8. Frequency distribution of interviewer feelings about the questionnaire and interview

Question and response	Number of inter-viewers
Total	35
5. Are there any things that the respondents find too personal or embarrassing to report?	
Response:	
Yes	29
No	6
22. . . .are there some sections of the questionnaire with which respondents have particular trouble?	
Response:	
Yes	31
Depends on the respondent	2
No	1
Not ascertained	1
15. Do you feel that the interviews are too long or not?	
Response:	
Too long	16
Qualified	7
Not too long	9
Did not know	2
Not ascertained	1

13

meet different people. This reason was given first by most of the interviewers in preference to other possible responses such as getting a chance to travel, having extra money, or doing a public service. As major reasons for disliking the job, interviewers mentioned having to go into dirty homes or undesirable neighborhoods, having to endure

Table 9. Frequency distributions of interviewer orientations to respondents

Question and response	Number of interviewers
Total---------------------	35
1. In general, how do respondents feel about being interviewed? Do they like it, not like, or what?	
Response:	
Generally positive--------	12
Generally neutral---------	11
Some like it, some do not-	4
Generally negative--------	6
Not ascertained----------	2
2. What things do respondents usually enjoy most about being interviewed?	
Response:	
Chatting, visiting--------	23
Being good citizen, helping-----------------	4
Flattered at being chosen-	2
Other--------------------	3
Nothing enjoyed----------	3
9. Here is a list of kinds of respondents; which would you prefer to interview? (Interviewer was allowed to select more than one kind of respondent.)	
Most chosen type:	
Concerned about health----	26
Quiet--------------------	24
Friendly-----------------	22
Middle income ($3,500-$10,000)----------------	19
Middle aged (30-60 years)-	19
College educated---------	17
Women--------------------	16
Least chosen type:	
Low income (under $3,500)-	1
Grade school education----	1
Over 60 years of age------	1
Men----------------------	4

Table 10. Gamma coefficients[1] showing the direction and degree of association between how hard the interviewer had to work in the interview and her ratings of the respondent

Rating of respondent	Direction and degree of association with how hard the interviewer worked
Respondent tenseness-----------	+.62
Respondent ability to understand questions-------------	-.72
Respondent cooperativeness----ȧ	-.58
Respondent willingness to give time-------------------	-.48
Respondent accuracy-----------	-.57
How much interviewer liked respondent-------------------	-.48
Other comments (negative sign indicates more critical than positive comments)-----------	-.61

[1]A description of the statistic gamma, a nonparametric coefficient of association, is given in Appendix III.

conditions of physical hardship such as driving in bad weather and putting in long hours, or being away from home overnight (table 7).

Interviewers indicated a sensitivity to problems which their respondents had with the questionnaire (table 8). Most interviewers felt that the questionnaire contained items which were too personal or embarrassing for the respondent to report easily and that there were some sections of the questionnaire which were difficult for respondents to cope with for various other reasons. About half of the interviewers thought the interviews were too long.

HIS interviewers portrayed respondents in general as either enjoying or being neutral toward the interview experience, although a small minority of the interviewers felt that respondents in general tended to react negatively to being interviewed. Most interviewers felt that respondents enjoyed a chance to talk with someone new and that this was probably the most enjoyable aspect of the interview for the respondent. Interviewers

themselves tended to prefer certain types of respondents. In table 9 it can be seen that interviewers preferred to interview respondents who were interested in the topic of the interview, who behaved in such a way as to make conducting the interview easier (a preference for quiet rather than talkative respondents), and who were friendly rather than businesslike. They also preferred interviewees who were demographically similar to themselves (moderate income, middle aged, higher education, and female). They tended not to prefer respondents who had low income, low education level, who were over 60 years of age, or who were male.

From the ratings which each interviewer made of each of her respondents after the HIS interview, it would seem that the harder the interviewer had to work, the less she liked the respondent and the greater the likelihood that she would rate the respondent as tense, inaccurate, uncooperative, and unwilling to give of her time. Furthermore, the interviewer was more likely to make a negative rather than positive comment about such a respondent at the end of her rating form. Table 10 shows the degree of association between the interviewer's rating of each respondent and her rating of how hard she had to work in each interview.

From these data it appears that interviewers like the opportunity to get out and meet other people, and they feel that respondents like to meet them and are willing at least to put up with the business part of the interview. Interviewers do not like to interview respondents who are demographically different from themselves. Interviewers react negatively to difficult respondents in the ratings and yet are sensitive to respondent problems in the interview. Since these interviewer rating and preference data will not be discussed further in this report, it should be pointed out here that there is no evidence from this study to indicate any relationship between interviewer preferences or interviewer feelings and the measure of respondent reporting accuracy employed. Preferences and feelings may exist but they do not produce a discernible effect on the data.

DESCRIPTION OF THE INTERVIEW FROM OBSERVATION RECORDS

Observation Techniques

One of the principal instruments used to collect data in this study was the Behavior Observation Form, a technique for recording what went on during the interview. Since this technique was developed especially for this study, a detailed description is provided here.

For the purposes of this study, the observation procedure had to meet three general criteria:

1. It should describe as much of the significant behavior which takes place during the interview as possible
2. It should obtain reliable and valid measures of the concepts of interest
3. It should be simple enough that people not acquainted with observation techniques could be taught the procedure in a relatively short period of time and could use it in the field without difficulty

A search of the literature revealed several procedures for observing and recording interaction between two persons or more. However, it was found that none combined the criteria of comprehensiveness, reliability, validity, and economy required for this particular study; therefore it was necessary to design a new procedure specifically for this study.

Characteristics of the SRC Observation Procedure

The observation procedure was designed to obtain measures of a wide range of behaviors of both interviewer and respondent while keeping the observer's job simple so that it could be done adequately with relatively little training. The various activities of interviewer and respondent were broken down into small segments of easily identifiable behaviors. The observer's job was to make tallies or checkmarks when the specific behaviors were observed.

To record a wide variety of behaviors, the interview was divided into segments, each containing a specific set of questions from the HIS questionnaire. For each segment, several types of behaviors were observed. By sampling segments of the interview in this way, observation could be focused on different kinds of interviewer and respondent activity, with measures obtained on a variety of behaviors while keeping the task within the observer's capability.

Problems of validity were resolved partially by recording only directly observable behavior, i.e., words spoken or gestures used rather than inferred behavior. Inferences about the psychological meaning of the data were made after the objective data were recorded. These inferences were made both by the observers in the form of a set of ratings made at the end of the interview and by the experimenters in the data analysis presented in this report.

Observation Item Pretesting and Selection

A set of initial items was developed and subjected to intensive laboratory and field testing. Laboratory testing involved actual and simulated interviews observed simultaneously by three members of the research staff. Field testing consisted of observation of actual HIS interviews by members of the research staff.

If any one of the staff judged an item or procedure difficult or impossible, it was eliminated or simplified. An item was also discarded if agreement between observers was consistently low in the staged interviews.

On the basis of these pretests, many items were eliminated and others simplified. Items which were eliminated were those for which reliability was low and could not be improved easily as well as those which required too much time to record. A number of the items involving complex judgments were deleted or shifted to the last section of the observation form so that the observer could have time to think about them after the interview. For example, observers tried to rate whether the respondent "shows lack of understanding" after each respondent answer. Because this judgment took too much time and was unreliable, it was moved to the end of the observation form and the observer was asked to make a rating

on: "How well did the respondent grasp the meaning of the questions?" Most judgments which required the observer to use visual cues (e.g., posture and facial expressions) proved unreliable and were discarded.

Also eliminated were codings of long sequences of interaction, indicating what was said, who said it, what was the reaction of the other person, and so forth. Finally, most of the time recordings were eliminated—both measures of duration (e.g., amount of time spent answering a particular question or explaining the survey) and actual times (e.g., when the interviewer entered the house, when the first question was asked). Several efforts were made to get an objective indication of the pace of the interview (e.g., how fast the questions were being asked or answers being given), but all proved impossible and subjective ratings had to be used. Use of a stop watch was found to be of no great value.

Description of the Observation Form Content

The observation form is divided into four major sections. The first section includes behaviors occurring during the first minutes of contact between the interviewer and respondent, both at the door and inside the house, as the preparation for the interview takes place; the next section focuses on the interview itself, including the question and answer exchanges between interviewer and respondent; the third section concentrates on events taking place after the last interview question has been answered; and in the final section, the observer records general impressions of the interview.

Different behaviors were recorded within each of the major sections of the interview.

Observer Training

For this study the U.S. Bureau of the Census, the agency which collects the data for the Health Interview Survey, selected six HIS interviewers to be trained as observers.

During the week before the field work began, the six observers were trained at the Survey Research Center. Training sessions were primarily concerned with the goals of the study, a detailed explanation of the *Interview Observation Manual,*

Table 11. Percent of interviews in which selected explanations were used by interviewers to introduce the survey

Topic used in introduction	Percent of interviews[1] in which it was mentioned
U.S. Bureau of the Census-----	96
U.S. Public Health Service----	71
Interview process[2]------------	61
HIS (specifically)------------	9[1]
Advance letter----------------	6[1]
Other[3]------------------------	4[1]

[1]Number of interviews= 412.

[2]Anything which describes the interview, for example, "I want to ask some questions about your health," or "It should take about 20 minutes."

[3]Usually indicates interviewer showed her credentials to respondent, but neglected to mention either of the sponsoring agencies.

and practice in observing and recording staged interviews. The staged interviews followed carefully prepared scripts covering all aspects of the form and stressing difficult items. Furthermore, each simulated interview was tape recorded while it was in progress. Differences among observers concerning any verbal behavior were resolved by listening to the tape recordings.

To supplement the role-played interviews, two training films were made of staged HIS interviews. For these films, an experienced HIS interviewer questioned two respondents who had no connection with the HIS or with SRC. The movies proved valuable in conveying the subtleties of using the observation form, and they could be rerun when questions arose.

One half day of training was devoted to actual field experience, so that the trainers would have an opportunity to answer questions and to deal with problems that did not appear in the controlled setting.

Training performance records were kept for each observer on six staged interviews, including the two movies, and served as a check upon the amount of interobserver reliability to be expected.

In order to eliminate one potential source of bias, it was continually emphasized to the observers that the study was not designed to "check up" on their colleagues whom they would be observing. It was stressed that respondent performance was of primary interest.

Descriptive Data From Observation Records

This section of the report is a description of the HIS interview as it was observed using the observation procedure described above. The data are presented to provide a general description of what HIS interview looks like as observed by this technique. The data are based on the observation of 412 HIS interviews.

Table 12. Average frequency of interviewer and respondent behaviors at the beginning[1] of each interview and percentage of interviews in which the behavior occurred

Behavior	Average frequency per interview	Percent of interviews in which behavior occurred
Number of different topics mentioned by interviewer in introduction--	[2]2.45	100
Number of respondents' questions----------------------------------	[2]0.51	40
Number of polite acts initiated by respondents-----------------	1.22	73
Number of times interviewer takes initiative (getting in door, selecting a chair, and so forth)--------------------------------	0.55	41

[1]Recorded from the time interviewer knocked on door until first question from questionnaire was asked.

[2]Approximate; if respondent asked more than two questions, this was treated as if she had asked only two.

Initial Contact

Table 11 shows the distribution of explanations used by the interviewers at the beginning of the interview. From this table it can be seen that most frequently the interviewer mentioned that she was from the Bureau of the Census and that she was taking a survey for the Public Health Service. If she said anything beyond this minimum identification, it was usually something about the interview process, such as how long it would take or that the questions pertained to health issues.

On the average, the interviewer mentioned about 2½ introductory topics at the beginning of the interview (table 12).

In about 40 percent of the interviews the respondent asked some questions before he permitted the interviewer to enter the house. A count was kept of the number of behaviors indicating polite-

ness by the respondent, such as inviting the interviewer inside or offering her a chair. Another count was kept of the number of times the interviewer had to take the intiative in asking to be let into the home, finding a chair for herself, and so forth. The average respondent made 1.2 polite gestures at the beginning of the interview, and 73 percent of the respondents made at least one polite gesture. The interviewer took some initiative in 41 percent of the interviews.

Question-Answer Behavior

Table 13 contains a description of behaviors in the interview relevant either to gaining or giving information necessary to fill out the health questionnaire. These are the main behaviors relating directly to the task. The behaviors were recorded for three sections of the interview and combined into single scores. The results are presented in terms of the average frequency of each behavior in the three sampled sections of the interview and its frequency relative to the other task related behaviors. The latter is expressed as a percent of the total task related behavior recorded in the three selected sections.

Table 13 shows the kinds of behavior used by the interviewer in obtaining health information after the initial question had been asked. Probes—directive, nondirective, and repeating the question—made up 85 percent of the interviewer's task behavior. The average interview contained five probes in the three sampled sections. Nondirective probes were slightly more frequent than directive probes. While nondirective probes are generally more acceptable techniques, the reader should not conclude that the directive probes necessarily produce biased information. Frequently they merely check on what the respondent is thought to have said, for example, "You said that was within the last six months, didn't you Mrs. Smith?") It is clear from the table that the interviewer took little initiative in suggesting that medical records, hospital bills, and other sources of information be consulted.

Table 13 also shows the behavior of the respondent in answering questions for the same three sections of the interview. The major activity was the giving of acceptable answers, those for which the interviewer did not need to probe further. One surprising finding is the high frequency with which respondents elaborated or voluntarily furnished

Table 13. Average number and percent distribution of task related behavior in sampled segments of the interview

Behavior	Average number per interview	Percent of total recorded task behavior
Interviewer		
Total	6.2	100
Repeats question as worded	0.7	11
Other nondirective probes	2.4	39
Directive probes	2.2	35
Clarifies meaning of question	0.8	13
Suggests other sources of information be consulted	0.1	2
Respondent		
Total	53.4	100
Acceptable answers	39.0	73
Inadequate answers	2.0	4
Elaborated answers	11.0	21
Requests clarification	1.0	2
Consults other information sources	0.2	(¹)
Questions adequacy of answer	0.2	(¹)

[1] Less than .5 percent.

more information than required by the question. Such elaborations characterize 21 percent of the answers in the average interview.

An average of 2 answers were given by the respondent which were inadequate to meet the objective of the question. For an answer to qualify as inadequate, it had to be probed by the interviewer, and the observer had to concur that probing was required to obtain the needed information. In the table it appears that interviewers probed an average of about 5 times in the sampled parts of the interview. The discrepancy may reflect both conflicting definitions of probing and also "superfluous" probing by interviewers.

The other respondent behavior categories show a low frequency of initiative on the part of the respondent in requesting clarification of a question, consulting other sources of information, and questioning the adequacy of an answer.

The overall picture from this table is of a reasonably cooperative respondent who seldom gave inadequate information and who often volunteered additional information and of an interviewer who did not probe excessively and who incorporated a variety of techniques when she did use probes. Neither takes special initiative in searching for other sources of information beyond the question and answer process.

Unrelated Conversation

Table 13 deals with those behaviors which are an intrinsic part of the questionnaire and thus anticipated by the designers of the interview. Regardless of how well designed and well engineered an interview schedule and procedure may be, behaviors which are not relevant to the questions and answers do occur. Because these behaviors may play an important part in determining the accuracy of information gathered from an interview, they received special attention in this study. Rather than record them from particular parts of the interview, observers attempted to record every instance of behavior which was not directly related to the task outlined by the questionnaire. Each such behavior was categorized by whether it was initiated by the interviewer or by the respondent as well as by content. Finally, the observers recorded the reaction of the other person to this behavior. Table 14 shows the content and frequency of behavior initiations which are not directly related to health information. For ease

of reference this is called "unrelated conversation" or "interpersonal behavior."

Throughout the average interview, the interviewer initiated 1.7 instances of unrelated conversation (table 14). About half of these are classified as humor—the classification includes anything from a short chuckle to the telling of a funny story. Nearly all of the remaining initiations—40 percent of the total—were directly concerned with the respondent and took the form of flattery, praise, nonhealth questions, and suggestions. The respondent initiated nearly 16 instances of unrelated conversation during the average interview. These are divided about equally between "humor" and "talking about self, family, friends." Only rarely was the respondent observed to have initiated conversation directly about the interviewer or about the interview. The high frequency of "talking about self, family, or friends" was an unexpected finding. This category did not appear in other descriptions of task oriented interaction, and it proved valuable in further analysis of the data from this study.

Table 14. Average number and percent distribution of unrelated conversation initiations by interviewer and respondent during entire interview

Content of initiations	Average number of initiations	Percent of total initiations
Interviewer		
Total-----------	1.68	100
Talks about the respondent--------------	0.68	40
Talks about self, family, friends----------	0.19	11
Talks about the interview----------------	0.00	0
Laughs, jokes----------	0.81	49
Respondent		
Total-----------	15.87	100
Talks about the interviewer----------------	0.34	2
Talks about self, family, friends----------	7.58	48
Talks about the interview----------------	0.69	4
Laughs, jokes----------	7.26	46

Table 15. Number and percent distribution of unrelated conversation initiations, by interviewer and respondent reaction according to content of initiation

Content of initiation	Number	Interviewer reaction			
		Total	En-cour-ages	Neutral	Dis-cour-ages
		Percent distribution			
Total respondent initiation---------------	6,516	100	21	78	1
Talks about interviewer------------------------	146	100	62	34	4
Talks about self, family, friends--------------	3,121	100	20	79	1
Talks about the interview----------------------	284	100	75	24	1
Laughs, jokes--------------------------------------	2,965	100	15	85	0

Content of initiation	Number	Respondent reaction			
		Total	En-cour-ages	Neutral	Dis-cour-ages
		Percent distribution			
Total interviewer initiation-------------	705	100	55	44	1
Talks about respondent--------------------------	272	100	70	28	2
Talks about self, family, friends--------------	90	100	60	40	0
Talks about the interview----------------------	17	100	76	24	0
Laughs, jokes--------------------------------------	326	100	40	60	0

These findings suggest that the interviewer and respondent had different orientations to the interview situation in general.

Generalizing from the conversation data, it may be suggested that respondents were more active than interviewers in initiating unrelated comments and were more preoccupied with their own interests. The use of humor is particularly interesting since some research finds that humor is frequently a reaction to tension.[12] Thus the data presented here may indicate that the respondents, especially, were under some tension.

Interviewers appeared to be somewhat less active, more task oriented, more preoccupied with the respondent than with themselves, and under less tension. The special emphasis which interviewers placed on comments about the respondent may be interpreted as behavior designed to gain or maintain rapport with the respondent.

Reactions to Unrelated Conversation

The observers recorded the nature of the verbal response following initiations of unrelated conversation. Each response was rated as to whether it encouraged further unrelated behavior, was neutral, or whether it discouraged such behavior.

Interviewer reactions to the various kinds of unrelated conversation initiated by the respondent are shown in table 15.

In total, about 78 percent of the interviewer reactions were classified as "neutral," and nearly all of the remaining reactions were in the "encourages" category. The interviewer tended to react encouragingly when the respondent talked about the interview. She was almost as likely to be encouraging when the respondent initiated conversation about the interviewer. The neutral reactions were

most prevalent when the respondent talked about himself or his family and when he laughed or joked. These two categories, "talking about self or family" and "jokes," represented the large proportion of respondent initiation of irrelevant conversation.

Also shown in table 15 are data on how respondents reacted to interviewer initiations of unrelated conversation. The respondents divided their reactions to interviewer initiations about equally between "encourages" and "neutral" (55 and 44 percent, respectively). "Encouraging" reactions were most frequent when the interviewer talked about the respondent, or the purpose of the survey, use of results, and other topics related to the interview. "Neutral" reactions were most frequent when the interviewer laughed or joked and when she talked about herself. "Discouraging" reactions were seldom recorded, they were most frequent when the interviewer initiated conversation about the respondent.

The major difference between interviewer reactions and respondent reactions to unrelated conversation was that interviewer reactions were likely to be neutral while respondent reactions were about evenly divided between neutral and encouraging, with the latter slightly more frequent. Respondent and interviewer responded in about the same ways to the different content areas. Both were more likely to respond encouragingly to initiations about the other person or to "humor." Neither interviewer nor respondent gave many reactions classified as "discouraging."

It appears therefore that the atmosphere of the interview was neither overly friendly nor overly businesslike.

Interview Behaviors and Respondent Demographic Characteristics

The several hundred variables arising from the observation form have been related to respondent demographic characteristics (age, education, family income, race, and sex) and have been inspected for patterns of relations. In general, the magnitude of the relations between objectively counted behaviors and demographic characteristics was very small, while the magnitude of the relations to subjectively rated items was a little larger. Both types of measures suggest that three demographic characteristics (age, income, and education) showed some association with counts or ratings of respondent behavior. Furthermore, a consistent pattern of relations was found.

Generally, of the three demographic variables age, income, and education, the one most closely associated with respondent behavior was age. Older persons tended to engage in many different types of behaviors and in large quantities; younger respondents exhibited less variability in behavior. Like younger respondents, persons with high income or high education exhibited less behavior. Further qualitative distinctions can be made. Older respondents showed much less discrimination in the types of behavior—they elaborated more and engaged in more irrelevant conversation; they were rated as wanting to talk a lot, trying hard to communicate, and as being not fully accurate. Because of these types of behaviors, the interviewer had to use more probes for them, read the specialist card more often, and frequently help them ascertain family income. The pace of the interaction was rated as slow and not smooth.

Respondents with high education or high income elaborated less, and they initiated an average amount of unrelated conversation; they were rated as understanding the questions well and reporting relatively accurately. They gave fewer answers that required probing, they considered the questions more carefully, and they needed less help in figuring family income. Although their behaviors occurred less often, they appeared to be consistent with the giving of accurate information.

One hypothesis about the relation between respondent demographic characteristics and behavior is that a different pattern of interaction takes place when interviewer and respondent are of the same social class than when they are from different social classes. Specifically, when a higher status person communicates with a lower status person, he tends to take more initiative, to be more active in directing the interaction, and to stick to the job, while the lower status person exhibits a deference pattern of compliance and often initiates conversation of an irrelevant nature.

In the interview situation, this dominance-deference pattern may also hold. If it can be assumed that the less educated, lower income, and

older respondents represent persons who are of a relatively lower social class than the average interviewer, then it can be assumed that for these respondents, interviewer behavior will show more initiative, directiveness, and task orientation while respondent behavior will show deference and nontask orientation.

To test this hypothesis, the observed interviewer behaviors were divided into three groups: programed-task behavior (probes on the routine health questions), initiation of unrelated conversation, and opportunities for specific task initiative (reading the specialist card, giving help on the income question, and adjusting the pace of reading the chronic and acute conditions lists).

The data indicate that interviewers did not engage in more of the programed-task activity (probes to health questions) for any group of respondents. This finding suggests that little variance in the main interviewer-task activity is determined by status differences between interviewer and respondent, and it probably reflects a successful training procedure.

On the other hand, interviewer initiations of irrelevant conversation support the dominance-deference hypothesis to some degree. Interviewer initiation of almost all types of irrelevant conversation (praise, suggestions, talking about herself, and jokes) shows a low but positive relationship to both respondent education and income.

Finally, interviewers showed much more initiative in guiding the response for older, less educated, and lower income persons. The interviewer was more likely to read the specialist card to these respondents rather than letting them fill it out themselves; she was more likely to read the chronic and acute conditions list slowly enough to make sure the respondent understood and considered each of the items; and she was more likely to help the respondent arrive at the correct family income figure. These findings are supplemented by the two observer ratings of interviewer initiative. According to these initiative ratings, the interviewer clarified more and tried harder to communicate for older, less educated, and lower income respondents.

In summary, interviewers initiated somewhat more unrelated conversation to the higher educated and higher income respondents, thereby indicating an interviewer-deference pattern. Second,

there were no differences in frequency of initiating the main task activity of probing answers to the principal, repetitive health questions for respondents of different demographic characteristics. Interviewer-probing behavior on these questions was given careful and extensive attention during interviewer training, and it is possible that this training reflected itself in the lack of variation of effort for the respondent groups of concern here. The third pattern shows the expected differences to a slight degree in interviewer initiative with respect to respondent demographic groups. These items consisted of observer ratings of the amount of interviewer initiative and some nonroutine behavior items where interviewer initiative can make a dramatic difference in reporting quality.

HYPOTHESIS TESTING

This section examines the relationship between the main variables of the study. A detailed discussion of how the variables were constructed is given in Appendix II.

The Dependent Variable, Reporting Accuracy

Because of the lack of good, independent validation criteria, the most difficult variable to construct in this study was an index representing the accuracy of reported health information. For reasons discussed in Appendix II, the main dependent variable used is an index based on the number of chronic and acute conditions which the respondent reported for himself, corrected for the age of the respondent and hereafter referred to as the "reporting index." It is assumed on the basis of the evidence presented in this appendix that within a certain range the number of chronic and acute conditions reported for oneself reflects the general degree to which all information in the interview is reported accurately.

Demographic Characteristics and Reporting

It may be hypothesized that certain demographically defined groups of respondents will report more accurately than others. Specifically, on the basis of previous SRC research, the follow-

ing demographic groups were thought to represent the highest potential for good reporting: the highly educated, high income, female, and white groups. Conversely, groups thought to have the lowest potential for good reporting were the less educated, low income. male, and nonwhite groups.

Table 16 shows the amount and direction of the association between these demographic variables and the reporting index. There are no significant relations between the demographic characteristics and the measure of reporting accuracy.

Behavior During the Interview

It was hypothesized that behavior in the interview could be classified on three independent dimensions: (1) behavior directly related to the task, (2) behavior related to the maintenance of the relationship between the interviewer and respondent, and (3) behavior oriented essentially toward the rapid completion of or escape from the interview. These are referred to as "task," "interpersonal," and "completion" behaviors, respectively. Indexes of these behaviors were constructed for both the interviewer and respondent for every interview, according to the procedures described in Appendix II, and were related to the reporting accuracy index. As it turned out, completion behavior could be identified only as the absence of task and interpersonal behavior. Because of this, no further consideration is given to a completion-behavior index.

To test the validity of the classification of interview behaviors, a factor analysis was performed using the items from the interview observation records which discriminated well between respondents. The appearance of one factor made up largely of task related behaviors and another made up of interpersonal behaviors tends to provide some confidence in the validity of the a priori classification. A further examination of the behavioral dimensions of interview behavior is made in the sections to follow.

Demographic Characteristics and Behaviors'

Initially it was felt that certain behaviors would be more frequent among respondents with certain demographic characteristics. It was hypothesized that more highly educated respondents would show more task oriented behavior than lower educated respondents and that older respondents would show more interpersonal behavior than younger respondents.

The data indicate that older respondents are more likely to score higher both on the task and interpersonal indexes (table 17).

Task behavior was not found to be more frequent for higher educated or higher income respondents; there is a nonsignificant trend for interviewer task behavior to be comparatively lower for respondents with these characteristics.

Table 16. Gamma coefficients showing the direction and degree of association between respondent demographic characteristics and the reporting index

Respondent demographic characteristic	Reporting. index
Education	-.12
Family income	-.03
Race	.11
Sex	-.03

Table 17. Gamma coefficients showing the direction and degree of association between respondent demographic characteristics and observation indexes of respondent and interviewer behavior

Observation indexes	Respondent demographic characteristics		
	Age	Education	Income
Respondent interpersonal behavior	[1].22	-.03	-.02
Respondent task behavior	[1].21	-.06	.04
Interviewer interpersonal behavior	.07	.09	.15
Interviewer task behavior	.09	-.18	-.09

[1]Significant, p = .05 or less.

Table 18. Gamma coefficients showing the direction and degree of association between interview behavior indexes and four measures of health reporting

Interview behavior indexes	Measures of health reporting			
	Respondent conditions index	Total RU conditions[1]	Total RU doctor visits[1]	Total RU hospitalizations[1]
Respondent task behavior----------------	[2].56	[2].76	[2].28	[2].23
Interviewer task behavior---------------	[2].46	[2].61	[2].28	[2].40
Respondent interpersonal behavior--------	[2].22	[2].30	.08	.04
Interviewer interpersonal behavior-------	.18	[2].20	.19	.02

[1]RU is an abbreviation for the total household reporting unit (all persons in the household for whom the principal respondent reported fully or in part),

[2]Significant, p = .05 or less.

Interview Behavior and Reporting

One of the major hypotheses of this study was that interviewers and respondents who engage in a high level of task behavior during the interview would produce interviews having a high degree of accuracy and completeness. It was also thought that even though interpersonal behavior was essentially independent of reporting accuracy, it would correlate with length of the interview. These hypotheses and relevant data are discussed below.

Table 18 shows the gamma coefficients between the interview behaviors and reporting. In addition to the reporting index, several other measures of reporting frequency have been included to demonstrate the generality of the findings.

The table indicates a positive relationship between each behavior index and the various measures of reporting frequency—the more task behavior engaged in by the interviewer or respondent, the better the reporting; the more interpersonal behavior engaged in by the interviewer or respondent, the better the quality of reporting. The task behavior indexes appear to be more strongly related to reporting than the indexes of interpersonal behavior.

Interpersonal behavior is not independent of reporting accuracy as originally hypothesized. With respect to the hypothesis concerning inter-

personal behavior and length of the interview, table 19 shows that both interpersonal and task behavior are positively related to the length of time the interview lasted. Again, the relation holds for both interviewer and respondent behavior,

Relationship Among Behaviors

Initially, it was hypothesized that interview behaviors would form two clusters (task behaviors and interpersonal behaviors) and that these clusters would be statistically independent of each other. Essentially, behaviors in the inter-

Table 19. Gamma coefficients showing the direction and degree of association between behavior indexes and length of the interview

Behavior index	Length of interview
Respondent interpersonal behavior----------------------------	[1].26
Interviewer interpersonal behavior-------------------------	[1].20
Respondent task behavior--------	[1].51
Interviewer task behavior-------	[1].51

[1]Significant, p = .05 or less.

24

Table 20. Number and percent distribution of the interviews, by respondent task behavior according to respondent interpersonal behavior

Respondent interpersonal behavior	Number	Respondent task behavior				
		Total	Low	Some-what low	Some-what high	High
		Percent distribution				
Low-----------------------------------	102	100	40	39	19	2
Somewhat low--------------------------	129	100	33	18	30	19
Somewhat high-------------------------	95	100	14	39	19	28
High----------------------------------	86	100	6	17	28	49

NOTE: Gamma = .46 (significant, p = .05 or less).

view do form two clusters, but there is some evidence that these clusters are not independent. Tables 20 and 21 show in detail the relations between the task behavior indexes and the interpersonal behavior indexes separately for the respondent and for the interviewer. A fairly strong positive relationship occurs between the respondent behaviors, indicating that a respondent who is performing at a high level of task behavior is also likely to be engaging in a good deal of interpersonal behavior. The relation between interviewer task behavior and interviewer inter-

personal behavior is somewhat weaker but in the same direction of positive association.

The interdependence of interview behaviors is further demonstrated by comparing the two qualities of behavior across interviewer and respondent. Tables 22 and 23 show that there is a very close correspondence within each interview between the level of respondent behavior and interviewer behavior both with respect to task behavior and interpersonal behavior. Thus within the same interview the interviewer is also likely

Table 21. Number and percent distribution of the interviews, by interviewer task behavior according to interviewer interpersonal behavior

Interviewer interpersonal behavior	Number	Interviewer task behavior				
		Total	Low	Some-what low	Some-what high	High
		Percent distribution				
Low-----------------------------------	71	100	34	32	25	9
Somewhat low--------------------------	125	100	24	29	27	20
Somewhat high-------------------------	99	100	15	18	44	23
High----------------------------------	117	100	17	20	31	32

NOTE: Gamma = .26 (significant, p = .05 or less).

Table 22. Number and percent distribution of the interviews, by interviewer task behavior according to respondent task behavior

Respondent task behavior	Number	Interviewer task behavior					
		Total	Low	Somewhat low	Somewhat high	High	
		Percent distribution					
Low--------------------------------------	102	100	46	28	25	1	
Somewhat low-------------------------	115	100	29	36	24	11	
Somewhat high---------------------	100	100	7	22	44	27	
High-------------------------------	95	100	2	8	37	53	

NOTE: Gamma = .64 (significant, p = .05 or less).

to be high in task behavior if the respondent is high in task behavior. The same is true for interpersonal behavior.

Taking into account the above empirical relations between the behaviors which occur in the interview, a high degree of interdependence is observed both between qualities of behavior and between the persons doing the behavior. It appears, then, that using these a priori indexes of behavior each interview can be ranked on a single behavioral dimension and on a general behavioral activity level and that this behavior level is positively related to reporting accuracy.

Behavior Similarity at Extremes

The data do not permit discovery of who is primarily responsible for setting this common general activity level—the interviewer, the respondent, or some interaction of the two. Such an analysis must await further experimentation in which variables are experimentally manipulated rather than merely observed. (Such a study is being carried out by SRC in conjunction with HIS.) However, one interesting dynamic of behavioral balance may be studied with existing data.

Table 23. Number and percent distribution of the interviews, by interviewer interpersonal behavior according to respondent interpersonal behavior

Respondent interpersonal behavior	Number	Interviewer interpersonal behavior					
		Total	Low	Somewhat low	Somewhat high	High	
		Percent distribution					
Low--------------------------------------	102	100	46	39	10	5	
Somewhat low-------------------------	129	100	14	44	22	20	
Somewhat high-----------------------	95	100	4	20	40	36	
High-------------------------------	86	100	2	10	27	61	

NOTE: Gamma = .65 (significant, p = .05 or less).

Table 24. Relationship of interviewer interpersonal behavior to respondent interpersonal behavior

Respondent interpersonal behavior	Interviewer interpersonal behavior			
	Low	Some-what low	Some-what high	High
	Ratio of obtained to expected cell frequencies[1]			
Low-----------	2.6	1.3	0.4	0.2
Somewhat low--	0.8	1.5	0.9	0.7
Somewhat high-	0.2	0.7	1.7	1.3
High----------	0.1	0.3	1.1	2.2

[1]Based on data shown in table 23.

$$\text{Ratio} = \frac{O_{ij}}{E_{ij}},$$

where $E_{ij} = \dfrac{n_i \cdot x\, n_{\cdot j}}{N}$

$n_i.$ = row frequency

$n_{\cdot j}$ = column frequency

E_{ij} = expected frequency in cell ij

O_{ij} = obtained frequency in cell ij

N = total number of cases

The number of persons who score low, or high, or at any other point on an index is of no intrinsic interest since the distributions were arbitrarily constructed. (See Appendix II.) It is possible, however, to compute the number of interviews in which behavioral balance is expected "on the basis of chance" by the chi-square procedure of multiplying marginal totals and dividing by total N. Expected cell frequencies can then be compared with obtained cell frequencies, independent of spurious effects in the arbitrarily constructed distributions on single indexes. This procedure was used to construct tables 24 and 25, which show the ratio of observed to expected cell frequencies for task behavior and interpersonal behavior. Both of these tables indicate that behavioral balance is most likely at the behavioral extremes. In other words, the interviewer and respondent are most likely to behave similarly high or similarly low, and the probability of balance at some intermediate level of effort is not as great. These tables as well as some others indicate that behavioral balance at any level is more likely than behavioral imbalance.

The reasons for this phenomenon are not clear. It may be that behavioral balance is achieved only when one or both of the interacting persons furnish obvious cues about their "preferred" levels of behavior. The most obvious cues are probably those associated with the extreme rather than intermediate levels of behavior.

Factor Analysis of Interview Observation Variables

In an attempt to test the validity of the a priori index construction procedure, a factor analysis was performed using most of the variables from the interview observation recording form.

Table 25. Relationship of interviewer task behavior to respondent task behavior

Respondent task behavior	Interviewer task behavior			
	Low	Some-what low	Some-what high	High
	Ratio of obtained to expected cell frequencies[1]			
Low----------	2.1	1.2	0.8	0.0
Somewhat low--	1.3	1.5	0.8	0.5
Somewhat high-	0.3	0.9	1.4	1.2
High----------	0.1	0.3	1.2	2.4

[1]Based on data shown in table 22.

$$\text{Ratio} = \frac{O_{ij}}{E_{ij}},$$

where $E_{ij} = \dfrac{n_i \cdot x\, n_{\cdot j}}{N}$

$n_i.$ = row frequency

$n_{\cdot j}$ = column frequency

E_{ij} = expected frequency in cell ij

O_{ij} = obtained frequency in cell ij

N = total number of cases

27

Items which represented actual counts or ratings of behavior, which provided a reasonable discrimination between respondents (fewer than 90 percent of the individuals were coded in the most frequent category), were intercorrelated and factor analyzed and the factors subjected to orthogonal rotation. (Principal Axis Factor Analysis and Hotelling Varimax Rotation with normalized solution. Missing data, which existed for a small number of the ratings only, were treated by assigning the individual a rating score at the mode of the overall distribution on the rating.)

Five significant factors were found, four of which could be interpreted meaningfully. The four factors were labeled interpersonal behavior, task behavior, task ratings, and respondent receptiveness. A more detailed presentation of the content of each factor is in Appendix I.

The factor analysis confirmed the initial distinction made between interpersonal and task oriented behaviors, indicating that these factors can be made orthogonal in mathematical space. However, data from the a priori indexes and further work with the factor data indicated that these two behaviors were best described by two oblique dimensions rather than by orthogonal dimensions for this study and that one dimension accounts for most of the variance in the reporting index.

The factor analysis also confirmed the above finding concerning the high degree of dependence between the behaviors of the respondent and interviewer. The two factors heavily loaded with behavioral variables, the task and interpersonal behavior factors, contained both interviewer and respondent items. Interviewer and respondent task behaviors were not separated, nor were interviewer and respondent interpersonal behaviors.

A third factor contained most of the observers' ratings of both interviewer and respondent task oriented behavior, which suggests that these ratings are made largely with respect to a single dimension and are not highly correlated with the objectively measured task behaviors even though they were designed to be.

In the initial analysis of the observation data, an attempt was made to construct an index of respondent receptivity to the interview based largely upon objective behavior recorded at the beginning of the interview. This index did not meet the criteria necessary for its inclusion in further analysis. The fourth factor from the factor analysis contained a number of subjective ratings which appeared to represent the degree to which the respondent was willing to admit the interviewer and to provide time for the interview. However, there were no items indicative of the quality or degree of effort put into the performance. Although an index of receptivity could not be constructed by using objective behaviors, it seems that it is possible to capture essentially the same idea by using the subjective ratings which the observers made at the beginning and end of the interview.

A further analysis of the characteristics of this receptivity factor was obtained, but it was not possible to demonstrate any relationship between it and either respondent demographic characteristics, respondent task and interpersonal behaviors, respondent attitudes, or quality of reporting. If the factor correctly identifies respondent receptivity, the data suggest that respondent reporting performance cannot be predicted by superficial indications of cooperativeness and friendliness.

PSYCHOLOGICAL ORIENTATION OF THE RESPONDENT

Background

Earlier in this report two general hypotheses were implied concerning the effects of psychological orientations of the respondents. The first was that the quality of these orientations (her attitudes, expectations, motives, and perception) would be, at least partially, related to the respondent's characteristics and that favorable dispositions would be related to good reporting.

In this study a high degree of correlation was expected between respondent demographic characteristics and respondent psychological orientations. On the other hand, it was assumed that interviewers would be reasonably homogeneous with respect to background characteristics and also with respect to training and further experience with respondents. It was felt that this homogeneity precluded finding any relationships at this level of analysis for interviewers.

The second general hypothesis was that psychological orientations are the main causal variables in determining behavior in the interview and reporting accuracy. Specifically, it was assumed that positive attitudes or feelings toward the interview would be related to good reporting. It was further assumed that attitudes, motives, expectations, and perceptions relevant to specific aspects of the interview would determine specific behaviors during the interview.

In the following sections specific interviewer and respondent psychological orientations are examined for their relations to demographic characteristics, behavior in the interview, and the reporting index. The general results indicate a lack of any of the expected relationships, a finding which implies that the model hypothesized above is not especially useful for understanding this particular type of interview.

Respondent Orientations

Two scales of respondent attitude or feeling toward the interview experience were constructed—one based on questions of an indirect nature and the other based on questions which asked the respondent how she felt about the interview. The details of the construction of these scales is given in Appendix II.

Contrary to the initial hypotheses, there is no significant association between the feeling of the respondent about the interview and her demo-

Table 26. Gamma coefficients showing the direction and degree of association between respondent attitude and respondent demographic characteristics

Respondent attitude	Respondent demographic characteristics		
	Age	Education	Income
Feeling about interview (indirect questions)---------	-.03	-.11	-.09
Feeling about interview (direct questions)-	.08	-.13	-.15

Table 27. Gamma coefficients showing the direction and degree of association between respondent attitude and the reporting index, respondent interpersonal behavior, and respondent task behavior indexes

Respondent attitude	Reporting index	Respondent behavior indexes	
		Interpersonal	Task
Feeling about interview (indirect questions)-------	.03	.00	.07
Feeling about interview (direct questions)-------	.01	.01	.06

graphic characteristics, either for the direct or indirect measure of overall feeling (table 26).

These data indicate that respondents of high education and income status do not have as positive a feeling toward the interview as would be hypothesized on the basis of previous data. In fact, the data indicate a trend for these respondents to be more critical of the interview, although this trend is not statistically significant. Indirectly these data also indicate that having information about the HIS or about surveys in general does not, in itself, result in a positive evaluation of the interview experience.

To test the hypothesis that positive attitudes or feelings are necessary conditions for behavior which will lead to an accurate interview, the two respondent attitude scales are related to the indexes of respondent interpersonal and task behavior and to the index of reporting accuracy. The data in table 27 indicate that no systematic relations exist.

In this particular study, having a positive (or negative) feeling about the interview experience is not related to background characteristics nor does it have any direct effect on behavior or reporting during the interview. It appears that respondents, like good interviewers, do not let their feelings about the situation bias the interview. Data presented in Appendix II indicate, however, that these feelings are not always hidden from the observer.

Table 28. Gamma coefficients showing the direction and degree of association between respondent motive for cooperating and respondent demographic characteristics

Respondent motive for cooperating	Respondent demographic characteristics		
	Age	Education	Income
Good citizen motivation--------	.04	.14	.03
Chance to talk motivation------	.06	.02	-.03
Personal benefit motivation------	.03	-.35	-.16
Chance to rest motivation------	[1].27	.00	[1]-.26
Like talking about health motivation------	-.18	-.18	.00

[1]Significant, p = .05 or less.

Motives for Cooperating

Respondents say they cooperate for one or more of many possible reasons. The data from this study identify five such reasons: the willingness to perform the duties of a citizen, the feeling that cooperation will result in personal benefit, a desire to talk to someone, a desire to take a break from usual activities, and satisfaction in discussing health.

Initially it was felt that the distribution of these motives in the sample would be random with respect to demographic characteristics with the possible exception of age. It was felt that older respondents, because of social isolation and general lack of activity, would show more indications that they enjoyed the interview because it gave them a chance to talk to someone. In table 28, the five motives for cooperating are related to respondent demographic characteristics. The coefficients of association are all small, and the only statistically significant associations are between age and chance to rest and between income and chance to rest. Therefore the older respondents and those in low income groups are more likely to mention that the interview affords a chance to take a break from usual activities than are other groups.

It was further hypothesized (1) that the existence of these motives for cooperation would correlate positively with reporting; (2) that the qualities of a good citizen, personal benefit, and desire to talk about health would correlate with respondent task behavior; and (3) that the willingness to talk to anyone and the chance to rest from usual activities would show a positive association to interpersonal behavior of the respondent. The data indicate that none of these motives correlates significantly with the reporting index (table 29). None of the expected correlations with behavior is found, although some trends may exist.

It was felt that certain negative feelings may be generated in the interview situation. Two such forces were identified in this study: respondent concern about the time the interview took and respondent concern about the nature of the questions. Only a very few respondents voiced any concern about the interviewer and the way she conducted herself. Therefore this concern is excluded from further analysis.

The mention of time pressure and question concern in the followup interview is correlated with respondent demographic characteristics. Four of the six possible relations are statistically significant although still rather weak (table 30).

Table 29. Gamma coefficients showing the direction and degree of association between respondent motives for cooperating and reporting index, respondent interpersonal behavior, and respondent task behavior indexes

Respondent motive for cooperating	Reporting index	Respondent behavior indexes	
		Interpersonal	Task
Good citizen motivation---------	.08	.00	.03
Like talking motivation-------	-.05	.12	.02
Personal benefit motivation-------	-.13	.14	.21
Chance to rest motivation-------	.08	.20	-.06
Like talking about health motivation-------	-.07	-.20	-.14

The younger, higher educated, and higher income respondents are more likely to mention time pressure. The higher income groups are slightly more likely to mention a concern about the nature of the questions.

Contrary to expectations, the existence of negative forces or feelings does not act to suppress reporting accuracy. Although the coefficients of association reported in table 31 are not significantly different from zero, there is a tendency for question concern to be positively related to task behavior and the reporting index.

Perceptions of the Task

It can be hypothesized that accurate perception or understanding of the task is a necessary condition for accurate and complete reporting and that a misunderstanding of what is wanted can lead to poor performance. Respondents were asked two specific questions about the conduct of the interview: Did the interviewer want exact or general answers? Did the interviewer want everything or only the important things? In addition, an understanding of why information about health was being collected (respondent information level) also serves as an indirect indication of how accurately the respondent understood the task. There is some indication from the data presented in table 32 that respondents in the higher educational groups have a more accurate understanding of what the interviewer wanted than do other demographic groups. They are also more likely to say that the inter-

Table 31. Gamma coefficients showing the direction and degree of association between respondent concern and reporting index, respondent interpersonal behavior, and respondent task behavior indexes

Respondent concern	Reporting index	Respondent behavior indexes	
		Interpersonal	Task
Concern about time------------	-.01	.00	.00
Concern about questions--------	.15	.08	.12

viewer wanted exact rather than general answers and more likely to give at least one accurate reason why the health information was being collected (for compilation of statistics). While the other coefficients of association are not significant, there is a trend for the older respondents more often to say that the interviewer wanted general answers and to have a less clear idea of the

Table 32. Gamma coefficients showing the direction and degree of association between respondent understanding and respondent demographic characteristics

Respondent understanding	Respondent demographic characteristics		
	Age	Education	Income
Interviewer wanted exact answers--------	-.21	[1].43	.17
Interviewer wanted everything to be reported---------	.06	-.10	-.09
Respondent knew why information being collected---------	-.25	.13	.11

Table 30. Gamma coefficients showing the direction and degree of association between respondent concern and respondent demographic characteristics

Respondent concern	Respondent demographic characteristics		
	Age	Education	Income
Concern about time-----------	[1]-.21	[1].23	[1].20
Concern about questions------	.11	.10	[1].18

[1]Significant, p = .05 or less.

[1]Significant, p = .05 or less.

Table 33. Gamma coefficients showing the direction and degree of association between respondent understanding and reporting index, respondent interpersonal behavior, and respondent task behavior indexes

Respondent understanding	Reporting index	Respondent behavior indexes	
		Inter-per-sonal	Task
Interviewer wanted exact answers------------	.18	.06	.07
Interviewer wanted everything to be reported----------	.10	-.02	-.13
Respondent knew why the information was being collected-------	.22	.02	.13

purpose for which the information was being collected.

The data in table 33 show the direct effects of having knowledge about the requirements and goals of the survey on reporting accuracy and on the major respondent behavior indexes. Although none of the gamma coefficients is significantly greater than zero, there is a trend in the direction indicating that increased under standing does have a positive effect on reporting.

One other finding which, in retrospect, seems to be relevant to the respondents' understanding of the requirements of the survey is the unexpected (and not quite significant) positive relationship between the respondent conditions index and the respondents' saying that the interviewer did not get all the information about the family's health during the interview. Of the 27 respondents who said the interviewer missed something, about half scored high on the conditions index. The remaining 385 respondents either avoided answering the question ("I gave her what she asked for") or said the interviewer did not miss anything. Only about a quarter of this group scored high on the reporting index. The gamma coefficient is -.21.

It would seem that in order for a respondent to say that the interviewer did not get all the information about the family's health during the interview, she must have understood what the interviewer wanted to know. Granting this assumption, it may be a little less surprising to find that those who have reported well are a little more likely to understand what was required and a little more likely to say that the interviewer did not get all the required information.

The data presented essentially point to a lack of relationship between respondent psychological orientation and the behavior or accuracy-completeness outcome of the interview. While a few of the measured orientations show a slight correlation with respondent demographic characteristics, the orientations themselves are of little value in predicting directly the level or quality of respondent behavior during the interview or in predicting reporting accuracy. Of the various categories of respondent orientations mentioned, the most promising to be followed up are the respondent "perceptions," or her understanding of the task requirements. Fowler[13] discusses and analyzes these data further in his doctoral thesis.

PSYCHOLOGICAL ORIENTATION OF THE INTERVIEWER

Interviewer data collected in a separate interview after the Census interviewer had completed her work for this study are grouped into three major categories—the interviewer's style of interviewing, her feelings about her job, and her general expectations about respondents. Data are presented, again, in terms of gamma coefficients. This was accomplished by treating the 35 interviewers as 412 independent interviewers, one for each interview taken. Because of this artificial procedure, no significant tests have been applied to the data. The conclusions reached from these data are based on what appear to be consistent patterns of data rather than statistically significant coefficients of association.

Style of Interviewing

The interviewers were asked to state their preferences for types of respondents from a list of respondents grouped according to demographic

Table 34. Gamma coefficients showing the direction and degree of association between interviewer style and reporting index, interviewer interpersonal, and interviewer task behavior indexes

Interviewer style	Reporting index	Interviewer behavior indexes	
		Interpersonal	Task
Concern with accuracy----------	.09	-.16	-.08
Concern with speed and efficiency--------	.01	.06	.01
Concern with affiliation-------	.00	.00	-.07

and personality characteristics. After each choice was made interviewers were asked to state the reasons for the choice (or in many cases for refusing to make a choice). These reasons were content analyzed (see Appendix II) for three dimensions of interviewing style: the interviewer's concern with accuracy, her concern with speed and efficiency, and her concern with affiliation. It was initially hypothesized that interviewers with a concern for accuracy would get more accurate data and show more task behavior. It was also felt that interviewers concerned with the pleasantness of the relationship would show more interpersonal behavior, but that the data obtained would not differ significantly in accuracy. Finally, it was hypothesized that interviewers who were oriented to speed and efficiency would obtain poor reporting and would show low levels of both task and interpersonal behavior. The data in table 34 indicate not only that the hypotheses were wrong but also that there seems to be a clear lack of relationship between these indexes of interviewer style and actual behavior and production in the interview.

Interviewer Feeling About Job and Questionnaire

Interviewers were asked a series of direct questions on their feelings about their jobs, about the importance they attached to the HIS survey effort, and about the efficiency of the questionnaire

and other data-collection instruments. Initially it was hypothesized that interviewers with favorable attitudes toward their job and with a realization of the importance of the data-gathering function of the interview would be better interviewers—they would obtain better reporting and show more task behavior. Recognition that there are problems associated with using the rather complicated HIS questionnaire and other materials was thought to be an indication of interviewer sensitivity to the possible difficulties inherent in getting accurate data with the given instruments. Hence, the mentioning of problems with the questionnaire and procedures was hypothesized to be associated with the obtaining of accurate information. The data again show a lack of any relationship between the interviewer orientations and either reporting accuracy or interviewer behavior (table 35).

Interviewer Expectations

Each of the 35 Census interviewers responded to a series of direct questions about the reaction of respondents to the interview situation. The answers to these questions were made into seven indexes representing different types of expectations. Inspection of the data in table 36 leads to the conclusion that expectations as they are measured here are not related to the performance variables, although it is interesting that the great

Table 35. Gamma coefficients showing the direction and degree of association between job-related attitude and reporting index, interviewer interpersonal behavior, and interviewer task behavior indexes

Job-related attitude	Reporting index	Interviewer behavior indexes	
		Interpersonal	Task
Attitude toward job--------------	.05	-.17	-.09
Importance of survey-----------	.07	-.10	-.15
Problems with instruments------	.09	.16	-.03

Table 36. Gamma coefficients showing the direction and degree of association between interviewer expectation and reporting index, interviewer interpersonal behaviors, and interviewer task behavior indexes

Interviewer expectation	Re- porting index	Interviewer behavior indexes	
		Inter- per- sonal	Task
Expect positive attitude---------	.01	-.18	.05
Expect citizen motivation-------	-.04	-.20	-.02
Expect affiliation motivation-------	.02	-.01	-.05
Expect personal benefit moti- vation-----------	-.32	-.04	.01
Expect respondents to be busy-------	-.08	.08	-.06
Expect respondent to think survey is worthwhile----	-.13	-.16	-.05
Expect respondent to have problems with questions---	-.08	.04	.03

majority of the gamma coefficient signs are negative. Further analysis of these data (not presented here) suggested that this "negative effect" may be "real" and has led to the hypothesis that interviewers who do not expect problems or who predict that their respondents will have some positive orientation to the interview are not as effective as the interviewers who anticipate some trouble.

Interviewer Orientations on the Interview

As with the data on the effects of respondent orientations, the interviewer orientations did not show any associations with interviewer behavior or productivity. Her interviewing style orientations, her evaluation of her job, and her general expectations about respondents did not give any direct insight into how she behaves in the interview or how accurate and complete her interview data tend to be. Further analysis of these data has not revealed any definite areas where associations

occur, but these ex post facto analyses have led to the hypothesis that interviewers who expect respondent cooperation and a general lack of problems may not obtain as much data as interviewers who do expect problems and lack of cooperation. In addition, data analysis (not presented here) suggests that if there is any variation in interviewer behavior which is related to interviewer orientations, it seems to be in the interpersonal behavior of the interviewer. Unfortunately adequate exploration of this area is precluded in this study because there is really little general variation between interviewers or within interviewers in their interpersonal behavior. In approximately 90 percent of the interviews, the only interviewer initiations of irrelevant "conversation" were initiations of laughter. On the other hand, this aspect of the interview receives relatively little emphasis in training, in the instruction manual, in supervision, or in the feedback evaluations which interviewers get. In the absence of such training and control, it is reasonable to expect variation attributable to individual differences in psychological orientation in the interpersonal behavior area.

INTERPRETATION OF THE FINDINGS

Conclusions and Possible Implications

As stated at the beginning of the report, this investigation was planned as a broad exploration of the HIS interview to provide insights and to develop hypotheses about techniques of improving reporting in the household interview which could be investigated in future research. In the section below a further discussion of the most important findings of this study and some tentative interpretations are presented.

A model of the antecedents of good reporting was offered at the beginning of this report. It was this model which dictated the overall design of the study.

Two general interpretations of the pattern of results may be made: one is that the hypothesized model of the dynamics of the interview needs to be revised; the other is that the initial model is essentially correct but that it did not receive an adequate test in this study.

The question may be raised as to whether the lack of expected relationships between the demo-

graphic or attitude-type variables and reporting was not due to the inadequacy and omission of measurement of the important variables. Because the question is a crucial one, this report contains a detailed description of the operational definition of each of the main variables used in the analysis (see Appendix II). The following two points can be made:

1. This study was especially comprehensive in including measures of demographic and attitude-type variables.
2. The operational definitions of these variables have at least face validity, and, in addition, the variables do show patterns of acceptable reliability and internal consistency in places where this type of analysis could be performed.

It appears reasonable to conclude, therefore, that the variables were comprehensive enough to test the hypothesized model and that, while the variables may contain some "error" variance, they should be considered moderately acceptable operations for the concepts they were designed to represent.

If the measures of the variables of interest are valid, some explanation is needed of why the expected relationships of the social and psychological variables to reporting were not found. Two complementary explanations for the findings are offered here and developed further in the next section. First, it seems highly likely that, even though respondents do possess attitudes, feelings, and motives which are potentially relevant to the household interview situation, the strength of these characteristics is such as to make them relatively unimportant in determining the outcome of the interview once the respondent has made the commitment to be interviewed. Apparently other variables become paramount in guiding behavior once the interview has started.

Second, with respect to the interviewer, the lack of relationship between preferences for type of respondents, preferred styles of interviewing, demographic characteristics, expectations about respondents, or rated feelings toward individual respondents is a little less surprising. The most cogent explanation of these data is that the interviewers are well trained and are successful in keeping their personal feelings from biasing the data.

One hypothesis which may have merit for future research is that a household interview may be a unique experience for respondents. It may be so out of the ordinary stream of daily events that respondents really have no cognitive "set" which they bring to the situation. The situation is so new that it is difficult to generalize their associated feelings, attitudes, and expectations. Therefore existing attitudes, expectations, and feelings do not provide a basis for behavior, and the respondent must look to the interviewer or some other source for cues as to her expected behavior.

On the other hand, the interviewer may be in somewhat the same situation. She has been trained in how to ask questions and fill in the spaces on the questionnaire, but she has learned from experience that respondents are different: some will enjoy the interview, others will be annoyed with it; some will have trouble with certain sections, others will not; some will be rushed or pressed for time, others will want to talk about many irrelevancies. Therefore the interviewer too will be attentive to subtle cues from the respondent to supplement her training and to arrive at a strategy for dealing with this particular respondent.

This hypothesis implies that both interviewer and respondent search for cues from each other on appropriate behavior. It may be this cue-searching process which accounts for the very strong tendency of interviewer and respondent to behave at the same level of activity in the interview. This heavy reliance on cues from the other person to set the behavior pattern may also account for the fact that orientations measured in this study were not predictive of behavior. In addition the reciprocal cue-searching process may explain why it is not possible to determine that one person sets the behavior activity level and the other follows. An experiment which purposefully manipulates the cues given by either the interviewer or the respondent or both should yield predictable behavior changes, provided relevant cues are discovered and then experimentally varied.

Further Interpretations of the Findings

Initially, it was felt that good reporting would come from respondents who were positively inclined in their attitudes, expectations, and motives. The empirical data have suggested these factors are not relevant to reporting. The data do demon-

strate, however, that there is a strong association between behavior levels in the interview and in the quality of information reported. Although the cue-searching process may be responsible for behavior levels, it is unclear why behavior levels are so strongly related to reporting. Before any extensive speculation is attempted on the basis for this relationship, it is necessary to list the various causal possibilities which may exist between behavior level and reporting level and to discover through research which is correct. Since relationship is correlational, the following four causal possibilities exist:

1. Behavior level causes reporting level.
2. Reporting level causes behavior level.
3. There is reciprocal causality—e.g., having more to report causes higher behavior levels which in turn cause even further reporting.
4. Both reporting level and behavior level are caused by some third variable and have no direct effect on each other. An example of this last possibility would be the case where the respondent reports well because he likes the interviewer and also does a lot of behaving for the same reason. If, somehow, this respondent could be made to behave at a high level without liking the interviewer, he would not show any accompanying increase in the accuracy-frequency of his reporting.

As was shown earlier, activity level of an individual consists of two conceptually distinct types of behavior: task and interpersonal irrelevant behaviors. The data from this study suggest some difficulty in making a psychologically meaningful yet statistically acceptable differentiation between these behavior qualities. One can hypothesize that there is no meaningful distinction between these behaviors or that there is a qualitative distinction to be made between them but that they both "naturally" occur at the same levels in this type of interview. For example, the rapport hypothesis might suggest that a high degree of personal affiliative attention (encouraging respondent to engage in irrelevant behavior) causes the respondent to engage in a great deal of task oriented behavior. The reverse ordering hypothesis may also hold. It may be that tension increases in a respondent who is engaging in much task oriented behavior;

and in order to maintain this level of output, he must engage in a higher quantity of irrelevant behavior as a means of relieving the built-up tension. If tension release is not obtained, both behavior types will fall to a low level.

Implications for Future Research

The data from this study have led away from the traditional social psychological interpretation that actions are based on enduring psychological characteristics measured by the attitude-type variables and have suggested that research be directed more in the area of social behaviorism for a better understanding of certain interview situations. The interpretations offered above have suggested that research proceed at several levels.

First, since the major findings were unexpected, a thorough replication of these findings is needed. A replication of this type of study need not involve the wide diversity of measurements used. Fewer and more refined measures of attitudes, motives, and behaviors should suffice. Although the attitude to behavior and behavior to behavior findings are interesting in themselves, the interview practitioner should be especially interested in employing a dependent variable of higher validity in a replication than the one used in this study. The feasibility of obtaining and using health record data in such studies has already been demonstrated. (A review of some of these studies appears at the beginning of this report.)

Next, the above discussion has pointed to the need for future research on the direction of causality between several of the important variables in this study. The nature of the relationship between the various qualities of behavior as well as between behavior level and reporting should be discovered before meaningful theoretical interpretations or practical suggestions can be made.

Finally, it appears that future research work could proceed to test certain aspects of the cue-search model mentioned above as well as some of the underlying assumptions which led to its formulation. Such research could focus not only on identifying what are the behavioral cues present in the interview but also the subsequent effect of these cues on different types of behavior, on general behavioral level, and on reporting accuracy.

Implications for Interviewing Practice

It was the implicit assumption of the writers prior to this study that the way to turn respondents into good reporters was to induce positive attitudes toward the various aspects of the interview (the interviewer, the questions, and the purpose). It now appears that the most promising point of leverage for change is in the behavioral interaction processes of the interview itself. If this conclusion is correct, two courses of action appear open to the applied researcher; he may take advantage of the present experimental work and theory dealing with behavior change in the social setting or he may wish to perform his own studies to identify the crucial variables affecting interview behavior.

Research in experimental, clinical, and social psychology can be translated directly into attempts to change behavior in the interview. For example, relevant work would include that in the areas of verbal conditioning, nondirective therapeutic techniques, speech and silence durations in the interview, social influence, social facilitation, suggestion, and conformity.

In summary, the data from this study suggest that one potentially effective way to influence interview reporting accuracy is by changing the behavior in the interview. Effective ways of bringing about behavior change involve manipulating cues in the immediate situation rather than trying to change basic attitudes or increase level of information. Research is possible along two lines. One possibility is basic research into the important dimensions of interview behavior, their causal relation to one another, and their immediate antecedents. The other possibility appears to be applied research which attempts to adapt already existing behavior-change techiques to the household interview setting.

REFERENCES

[1] Myers, R. J.: Error and bias in the reporting of age in census data. *Transactions of the Actuarial Society of America, 41,* 1940. pp. 395-415.

[2] Hanson, R. H., and Marks, E. S.: Influence of the interviewer on the accuracy of survey results. *J.Am.Statist.A. 53:635-655,* 1958.

[3] Hyman, H. H., Cobb, W. J., Feldman, J. J., Hart, C. W., and Stember, C. H. *Interviewing in Social Research.* Chicago. University of Chicago Press, 1954.

[4] Rice, S. A.: Contagious bias in the interview. *Am.J. Sociol.* XXXV:420-423, 1929.

[5] Katz, D.: The functional approach to the study of attitudes. *Pub.Op.Quart.* XXIV(2):163-204, 1960.

[6] Bales, R. F.: *Interaction Process Analysis.* Cambridge, Mass. Wesley Press, Inc., 1950.

[7] Heyns, R. W., and Lippitt, R.: Systematic observational techniques, in G. Lindzey, ed., *Handbook of Social Psychology.* Reading, Mass. Addison-Wesley, Inc., 1954. pp. 370-404.

[8] U.S. Bureau of the Census: *NHS Interviewer's Manual,* Form NHS-HIS-100. (revised periodically)

[9] National Center for Health Statistics: Health survey procedure, concepts, questionnaire development, and definitions in the Health Interview Survey. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 1-No. 2. Public Health Service. Washington. Government Printing Office, May 1964.

[10] National Center for Health Statistics: Origin, program, and operation of the U.S. National Health Survey. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 1-No. 1. Public Health Service. Washington. Government Printing Office, Aug. 1963.

[11] U.S. National Health Survey: The statistical design of the health household-interview survey. *Health Statistics.* PHS Pub. No. 584-A2. Public Health Service. Washington, D.C., July 1958.

[12] Flugel, J. C.: Humor and laughter, ch. 20, Vol. II in G. Lindzey, ed., *Handbook of Social Psychology.* Reading, Mass. Addison-Wesley, Inc., 1954. pp. 709-734.

[13] Fowler, F. J.: *Education, Interaction, and Interview Performance.* Ann Arbor, Mich. University of Michigan, 1965. (unpublished doctoral thesis)

[14] National Center for Health Statistics: Interview data on chronic conditions compared with information derived from medical records. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 2-No. 23. Public Health Service. Washington. Government Printing Office, May 1967.

[15] National Center for Health Statistics: Comparison of hospitalization reporting in three survey procedures. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 2-No. 8. Public Health Service. Washington. Government Printing Office, July 1965.

[16] National Center for Health Statistics: Health interview responses compared with medical records. *Vital and Health*

Statistics. PHS Pub. No. 1000-Series 2-No. 7. Public Health Service. Washington. Government Printing Office, July 1965.

[17]National Center for Health Statistics: Reporting of hospitalization in the Health Interview Survey. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 2-No. 6. Public Health Service. Washington. Government Printing Office, July 1965.

[18]Survey Research Center: *A Study of the Reporting of Visits to Doctors in the National Health Survey*. Ann Arbor. The University of Michigan, Oct. 1963. (mimeo.)

[19]National Center for Health Statistics: Cycle I of the Health Examination Survey: sample and response, United States, 1960-1962. *Vital and Health Statistics*. PHS Pub. No. 1000-Series 11-No. 1. Public Health Service. Washington. U.S. Government Printing Office, Apr. 1964.

[20]Wilcox, K. R., Jr.: *Comparison of Three Methods for the Collection of Morbidity Data by Household Survey*. Ann Arbor. University of Michigan, School of Public Health, Department of Epidemiology and the Tecumseh Community Health Study, 1963.

[21]Mooney, H. W.: *Methodology in Two California Health Surveys*. Public Health Monograph No. 70, PHS Pub. No. 942. Public Health Service. Washington. U.S. Government Printing Office, 1962.

[22]Goodman, L. H. and Kruskal, W. H.: Measures of association for cross classifications. *J.Am.Statist.A.* 49:732-764.

[23]McCarthy, P. J.: *Analysis of Data From Complex Sample Surveys*. (unpublished paper)

[24]Goodman, L. H. and Kruskal, W. H.: Measures of association, III. Approximate sampling theory. *J.Am.Statist.A.* 58: 310-364, 1963.

BIBLIOGRAPHY

Lamale, H. H.: *Study of Consumer Expenditures, Incomes, and Savings*. Philadelphia. University of Pennsylvania, 1959.

Lansing, J. B., and Blood, D. M.: *The Changing Travel Market*. Survey Research Center Monograph No. 38, pt. 3, 2179 ISR. Ann Arbor. The University of Michigan, 1964.

Neter, J., and Waksberg, J.: *Response Errors in Collection of Expenditures Done by Household Interviews: An Experimental Study*. Washington. U.S. Department of Commerce, 1965.

Parry, H., and Crossley, H.: Validation of responses to survey questions. *Pub.Op.Quart.* XIV(1):61-80, 1950.

Survey Research Center: *Observation of NHS-HIS Interviews*. Ann Arbor. The University of Michigan, May 1965.

U.S. National Health Survey: A study of special purpose medical-history techniques. *Health Statistics*. PHS Pub. No. 584-D1. Public Health Service. Washington, D.C., Jan. 1960.

———o o o———

APPENDIX I

FACTOR LOADINGS

A list of items and their loadings on the factors discussed in the body of this report (items with loadings less than .50 are not listed)

I. Interpersonal Behavior

Respondent Characteristics

Talks about himself	.73
Laughs, jokes	.63
"Encourages reactions to interviewer unrelated conversation	.74
"Neutral" reactions to interviewer unrelated conversation	.51
Rating of the amount of respondent talking	.57
Rating of how much the respondent wanted to chat about unrelated matters	.61

Interviewer Characteristics

Talks about respondent	.65
Laughs, jokes	.60
"Encourages" reactions to respondent, unrelated conversation	.79
"Neutral" reactions to respondent unrelated conversation	.70

II. Task Behavior

Respondent Characteristics

Acceptable answers	.58
Elaborated answers	.53
Asks for clarification	.71
Length of interview	.61

Interviewer Characteristics

Directive probes	.55
Question clarifications	.71

III. Task Orientation Ratings

Respondent Characteristics

Degree of effort put into communicating	.59
Ability of respondent to understand the questions	-.67
Furnishing additional information on List A items	.54
Smoothness of the interview	-.68
Pace of the interview	-.50

Interviewer Characteristics

Amount of clarification of questions given	.72
Degree of effort put into communicating	.72

IV. Respondent Receptiveness

Respondent Characteristics

Rating of initial politeness	.70
Rating of initial friendliness	.69
Rating of cooperativeness	.61
Rating of willingness to give time for interview	.54

V. Miscellaneous Factor

(no loadings greater than .50)

———o o o———

APPENDIX II

INDEX CONSTRUCTION

The Dependent Variable

The basic aim of this study was to make statements about the correlates of accurate and complete reporting of health information. The purpose of this section is to describe the rationale for choosing, as the major operation for accurate and complete reporting, an index based on the number of chronic and acute conditions the respondent reported for himself.

Several ways of assessing the accuracy of a reported health condition or event are available. The feasibility of using medical records as a check on accuracy of respondent reporting has been demonstrated in several studies.[14-18] NCHS has instituted an extensive survey using actual health examinations to assess the accuracy of health conditions reported in the household interview.[19]

Since it was decided that neither of these methods was feasible for validation of data in this study, it was decided to use a less precise but standardized and readily available indicator of health reporting accuracy—the index based on the number of conditions the respondent reported for himself.

This index has three important characteristics. It has been found to correlate with accuracy of reporting health information in record check studies, it has sta-

tistical characteristics permitting good discrimination between respondents on the basis of accuracy of reporting, and the reporting of chronic and acute conditions itself is subject to a large underreporting bias. These three properties are discussed below.

Relation to Accuracy

Previous studies demonstrate that the number of chronic and acute conditions reported in the health interview is a rough indicator of the validity of other information reported and probably an indication of the extent to which the respondent is being cooperative. In two studies of the accuracy of reporting hospitalization episodes, underreporting of hospital episodes was found to be inversely related to the number of chronic and acute conditions reported (tables I[17] and II[15]).

In these studies a sample of hospital discharges was drawn. Tables I and II show the proportion of known hospitalizations which were underreported and indicate the tendency for underreporting of hospitalizations to be associated with reporting a smaller number of chronic and acute conditions. Further analyses reported in these studies show that the number of conditions which the respondent reports for himself is correlated with how well he reports hospitalizations either for other members of the family or for himself. Thus the effect is not entirely due to the respondent's lack of knowledge of

Table I. Proportion of underreporting of known hospital episodes for the sample person, by the number of chronic or acute conditions reported for sample person, excluding hospitalizations for deliveries

Number of chronic or acute conditions reported for the sample person	Percent of under-reported episodes	Number of episodes excluding deliveries in hospital records
0 conditions-----------	20	370
1 or 2 conditions------	10	782
3 conditions or more---	6	322

¹The "sample person" is the person for whom the hospital record was selected. Since the interview report could be given by another family member, the respondent may or may not be the sample person.

Table II. Proportion of underreporting of known hospital episodes for sample person, by the number of chronic or acute conditions reported for the sample person, excluding overreported hospitalizations

Number of chronic or acute conditions reported for the sample person	Percent of under-reported episodes	Number of episodes in hospital records
0 conditions-----------	21	403
1 or 2 conditions------	12	782
3 conditions or more---	10	440

NOTE: Table combines data from three data collection procedures.

the health characteristics of the sample person but probably reflects an overall willingness to cooperate with the interviewer to furnish the required information.

A study of the accuracy of the reporting of visits to physicians reveals the same relation between the reporting of chronic and acute conditions and accuracy of reporting other health information (table III[18]).

Table III. Proportion of underreporting of physician visits by number of chronic or acute conditions reported

Number of chronic or acute conditions reported for the sample person	Percent of under-reported visits	Number of visits in records
0 conditions--------------	50	54
1 condition--------------	24	136
2 conditions--------------	10	106
3 conditions or more-----	20	108

The same association is found with respect to the number of conditions reported by the respondent for himself and his accuracy in reporting physician visits either for other household members or for himself.

In summary, the number of conditions reported by the respondent either for himself or for another person is related to how accurately the respondent reports hospitalization or doctor visits data both for himself and for other family members. The relation to doctor visit and hospitalization reporting is not due entirely to the effects of a lack of knowledge about the sample person on the part of the respondent. Rather the number of chronic and acute conditions reported seems to reflect a general willingness to cooperate in the interview.

Discriminability

Reporting of chronic and acute conditions is especially useful as a dependent variable because of the large between-respondent variation in the number reported. Conditions are more frequent in the population than are other health events asked about in the HIS, such as visits to doctors or hospitalizations. If it can be assumed that amount reported reflects accuracy, then the probability of statistical discrimination of reporting accuracy among persons on the basis of reported conditions is greater than for other health events.

Underreporting

Because evidence from several studies indicates that conditions are probably underreported at a higher rate than either visits to doctors or hospitalizations, there is a greater chance that the number of conditions

reported reflects a general level of reporting accuracy as well as an indication of the respondents' real health status. In addition studies by Wilcox[20] and Mooney[21] both show that keeping day-by-day diaries of illnesses results in substantially more conditions being reported than were obtained by personal interviews. In comparing interview reports with medical records, Madow[14] demonstrates a substantial underreporting of chronic conditions in interviews.

Initial Attempts to Construct a Dependent Variable

On the basis of the above data, it appeared that the number of chronic and acute conditions reported could be used as a basis of constructing a variable which would reflect, albeit imprecisely, the *accuracy* with which health information was reported. To construct such a variable, variations in actual morbidity must be minimized.

Since consistent data on morbidity rates which were independent of underreporting effects could not be obtained from previous studies, an alternative method of minimizing the effects of real health was used. This method involved dividing the interviews from this study into six categories based on age and sex of each person for whom health information was obtained. It was assumed that the average number of conditions reported within each age-sex category represented a rough estimate of the actual morbidity rates for that group and that aggregate deviations below this mean were more likely to contain underreports.

An accuracy of reporting index was constructed for each family by computing a reporting accuracy score based on data for each family member. An expected number of conditions was computed for each family by multiplying the number of persons in each age-sex category by the expected number of conditions for that category, summing overall categories, and subtracting this sum from the number of reported conditions. Since the variance in morbidity rates varies from category to category, the resulting difference score was divided by a correction term that was based on the number of persons in each category and the reporting variance for that category. Thus each family received a score representing how far its reporting deviated in standardized units from that which would have been expected. Even with the age-sex correction, it is assumed that some of the deviation variance is still a result of real health.

It was expected that this procedure would minimize the contribution which real health would make to the dependent variable. Preliminary analysis revealed that respondent age and family size were significantly correlated with this index: older respondents and those respondents with small families appeared as the most

accurate reporters. Recent data from Madow[14] lend support to the findings that older respondents do tend to report their chronic conditions more accurately than middle-aged or younger respondents. The negative association of family size and reporting accuracy is not surprising since numerous reports indicate that reporting for others is less accurate than reporting for self. The larger the family size, in general, the larger the number of proxy reports.

Because of these findings, it seems likely that the index based on total family members minimized the systematic variations in real health, but it also placed too much emphasis on age and family size as determinants of the reporting index score.

Final Index of Reporting Accuracy

To focus more precisely on the forces other than those due to age or family size that affect only the respondents, a new index of reporting accuracy was constructed using as its base the total number of chronic and acute conditions reported by the respondent only for himself. To minimize the effects of real health, an age correction was made and is described below. Family size corrections were unnecessary because only respondent conditions were used in the index. Since most respondents were female, adjustments based on respondent sex were not used.

The sample of respondents was divided into four age groups: under 35 years, 35-54, 55-74, and 75 and over. Each group was then divided into thirds on the basis of the number of conditions reported (table IV).

Table IV. Assigned classification on reporting index based upon age of respondent and number of conditions reported for respondent

Number of conditions reported for self	Age of respondent			
	Under 35 years	35-54 years	55-74 years	75+ years
0 conditions---	Low	Low	Low	Low
1 condition----	Medium	Medium	Low	Low
2 conditions---	High	Medium	Medium	Medium
3 conditions---	High	High	Medium	Medium
4 conditions---	High	High	High	Medium
5 conditions or more-------	High	High	High	High

Characteristics of the Final Index of Accuracy

The revised accuracy of reporting index, referred to either as the respondent conditions index or simply as the "reporting index," is related to the probability that other health events will be reported even though the systematic contribution of real health has been mini-

mized somewhat. The data in table V show how the respondent conditions index score relates to the reporting of hospitalizations, doctor visits, visits to specialists, visits to dentists, and total family conditions for the whole family. The tables indicate small to moderate degrees of positive association.

There are no strong relations between the reporting index and respondent demographic characteristics. These data are discussed more fully in the section "Demographic Characteristics and Reporting" on page 22.

Table V. Number and percent distribution of reporting index, by number of doctor visits, hospitalizations, visits to specialists, dentist visits, and total conditions reported for reporting unit according to reporting indexes

Characteristic	Reporting index		
	Low	Medium	High
Total number-------	138	162	112
Number of hospitalizations for reporting unit	Percent distribution		
Total-------------	100	100	100
0 hospitalizations-------	77	72	59
1 hospitalization--------	17	20	22
2 hospitalizations or more-------------------	6	8	19
Number of doctor visits for reporting unit			
Total-------------	100	100	100
0 visits-----------------	75	65	53
1 visit------------------	15	22	29
2 visits or more---------	10	13	18
Number of specialist visits for reporting unit			
Total-------------	100	100	100
0 visits-----------------	59	49	43
1-2 visits---------------	18	23	23
3 visits or more---------	23	28	44
Number of dentist visits for reporting unit			
Total-------------	100	100	100
0 visits-----------------	96	85	85
1 visit or more----------	4	15	15
Total conditions reported for reporting unit			
Total-------------	100	100	100
0 conditions-------------	36	0	0
1-2 conditions-----------	43	50	5
3-5 conditions-----------	17	39	47
6 conditions or more-----	4	11	48

Behavior Indexes

Construction of Initial Indexes

When the observation procedure was developed, items were included which could be expected to be at least partial measures of one of six major behavioral concepts. Although items explicitly designed to reflect the completion orientations of the interviewer and respondent were included in the data observed, they could not, for various reasons, be used to form indexes of completion orientation. Therefore attempts to form an index of this orientation were abandoned.

Construction of Major Behavioral Orientations Indexes

The remaining items were classified as measuring one of the four remaining concepts: interviewer task behavior, respondent task behavior, interviewer interpersonal behavior, and respondent interpersonal behavior. Items hypothesized as measuring each single concept were then intercorrelated. Any item which did not exhibit the expected pattern of correlation with other items hypothesized as measuring the same concept was discarded from further consideration. Because all behaviors tend to reflect a general activity level (a finding which became obvious only later in the analysis) it should be noted that few items were discarded because they did not meet the intercorrelation requirements.

Each item was then examined for its power to differentiate among interviewers or respondents and recoded onto collapsed scales. Those items which provided good discrimination (i.e., large variance) were made into four-point scales, those with relatively poor discrimination power were put onto two-point scales and those which provided an intermediate amount of discrimination were assigned to three-point scales.

The recoded item scales for each concept were then added together to form a total index. In order to present results in tabular form, each of the total indexes was again recoded into four almost equal categories. These collapsed indexes are used throughout this report, even where coefficients of association rather than tables are presented.

Item composition and item weight are shown below for each of the four behavior indexes. The number following each item, labeled as scale length, refers to the number of categories for that item used in the total index construction. These numbers give a rough idea of the potential relative weight of each item in each index.

Scale length

I. Respondent interpersonal behavior

Asks questions about the interviewer-------	2
Talks about self, family, friends-----------	4
Laughs, jokes-------------------------	3
Rating: how much did respondent want to chat-------------------------------	3
Number of "encourages" reactions ÷ total reactions-------------------------	2

II. Interviewer interpersonal behavior

Flatters or praises respondent-----------	2
Asks nonhealth questions of respondent---------------------------	2
Talks about self, family, friends---------	2
Laughs, jokes-------------------------	2
Rated as wanting to continue post-interview conversation------------------	2
Number of "encourages" reactions ÷ total reactions-------------------------	3

III. Respondent task behavior

Elaborations --------------------------	3
Asks clarification----------------------	2
Consults other sources of information-----	2
Questions the adequacy of an answer------	2
Pauses to consider items on chronic and acute conditions list--------------------	2
Considers the specialists card carefully---	2

IV. Interviewer task behavior

Number of inadequate answers (those interviewer probed)----------------------	3
Repeats question exactly as worded-------	3
Other nondirective probes---------------	3
Directive probes-----------------------	3
Clarifies meaning of a question-----------	3
Suggests respondent consult other sources of information------------------	2
Probes, chronic and acute conditions list---	3

Indexes of Respondent Orientation

The followup interview with the respondent contained a large number of questions, usually of the open-ended nature, designed to elicit information in three general areas.

1. The basic psychological characteristics of respondents that apply to the interview (e.g., the

amount of information he has about surveys, his general feelings about government surveys, and his motives, such as willingness to perform citizen duties, applicable to the interview situation).

2. The presence and effects of specific situational factors such as strong reactions to the type of questions asked or effects of competing demands for time and attention.

3. The degrees to which respondents understood what they were expected to do in their role as respondents.

An initial list of specific variables of hypothesized importance was formulated at the beginning of the study. Once the data were collected, a sample of interviews was selected and content analyzed to ascertain whether or not the answers to the questions contained relevant information for each variable. On the basis of the initial content analysis, certain variables were excluded from further consideration and a standard content analysis procedure was constructed and used to code all the re-interview data.

The analysis was further divided into two parts on the basis of the type of question from which the information came. Two types of questions were asked: a set of indirect questions asking the respondent to describe the feelings of two persons portrayed in pictures representing the interview setting and a set of open-ended questions (with subsequent probes) asking the respondent how he felt about the health interview he had had the previous day.

Indexes of Respondent Feeling About Interview

For each question in which the respondent had the opportunity to express a feeling about the interview, a positive point was assigned:

Each time he stated a positive feeling or reaction or
Each time he avoided stating a negative feeling;

a negative point was assigned:

Each time the respondent stated a negative feeling or reaction or
Each time he avoided stating a positive feeling.

This coding procedure was applied to two sets of questions, yielding an index based on indirect questions and an index based on direct questions. The question sets are listed below with the question number and an abbreviated version of the exact wording.

Projective Index

(to picture of interviewer at door)

Question 2a.	"How does the person in the picture feel now?"
Question 2b.	"Why does she feel that way?"

(to picture of interview taking place)

Question 3.	"How does the person in the picture feel now?"
Question 3a.	"Why is that?"
Question 4.	"What does the respondent enjoy about the interview?" (scored only for stating and avoiding positive comments)
Question 5.	"What does the respondent not enjoy about the interview?" (scored only for stating and avoiding negative comments)

(to picture of interviewer leaving)

Question 6.	"How does the respondent feel now that the interview is over?"

Direct Index

Question 9.	"In general, how do you feel about the interview you had yesterday?"
Question 11b.	(if respondent talked to anyone about the interview) "What did you talk about?"
Question 14.	"What did you like about the interview?" (scored only for stating positive and avoiding negative)
Question 16.	"How did you feel about her coming just then?"
Question 17.	"How did you feel about giving up your time for the interview?"

Respondent Motivation and Concern

Scales reflecting respondent motives and negative concerns were constructed from answers to both direct and projective questions. Each scale, with the exceptions listed below, has a range of 0-7 with three possible points coming from the projective questions and four points based on answers to the direct question as noted below.

Time Concern (range 0-7)

Up to three points for mentioning time concern in answer to the projective questions and one point for each mention of it in the direct ones.

Projective Questions—

Question 2.	(Showing Picture 1, an interviewer at the door) "What does the woman (man) of the house think when the

person says that she is an interviewer?"

Question 3. (Showing Picture 2, interviewer and respondent in the house) "How is the woman (man) of the house feeling now?"

Question 5. (Picture 2) "Is there anything about being interviewed which she (he) doesn't like?"

Direct Questions—

Question 15-16. "How did you feel about the interviewer coming just then?"

Question 17. "How did you feel about giving up your time to answer questions?"

Question 17a. "Do you usually have some free time during the day?"

Question 23. "During the interview did you feel rushed or hurried?"

Question Concern (range 0-6)

Up to three points for the projective questions and one point for mentioning question concern in each of the direct questions.

Questions 2,3,5 (see above)

Direct Questions—

Question 9. "How do you feel about the health interview you had yesterday?"

Question 13. "Were there any things the interviewer asked about that you thought were too personal or embarrassing?"

Question 27a,b. "Is everything too much to expect a person to be able to answer?"

Good Citizen Motivation (range 0-7)

Up to four points for the projective items and one point for mentioning motivation to be a good citizen in each of the direct questions.

Projective questions—

Question 2, 3. (see above)

Question 4. (Picture 2) "Is there anything about being interviewed that he (she) enjoys?"

Question 6. (Showing Picture 3, the interviewer leaving the house) "How does the woman (man) of the house feel now?"

Direct Questions—

Question 9. "How do you feel about the health interview you had yesterday?"

Question 14. "Were there any things about the interview you especially liked?"

Question 22. "Why do you think people cooperate on these health surveys?"

Chance to Talk Motivation (range 0-8)

Up to four points for the projective questions and one point for mentioning chance to talk motivation in each of the direct questions.

Projective Questions—

Question 2. (Picture 1) "What does the woman (man) of the house think when the person says that she is an interviewer?"

Question 3. (Picture 2) "How is the woman (man) of the house feeling now?"

Question 4. (Picture 2) "Is there anything about being interviewed that she (he) enjoys?"

Direct Questions—

Question 9. "How do you feel about the health interview you had yesterday?"

Question 14. "Were there any things about the interview you especially liked?"

Question 34. "What kind of person do you think the interviewer was?" (Interviewer seen as a friend or neighbor rather than professional)

Personal Benefit Motivation (range 0-4)

Up to three points for the projective and one point for mentioning personal benefit as motivation in the direct question.

Projective Questions—

Questions 2,3,4 (see above)

Direct Question—

Question 9. "How do you feel about the health interview you had yesterday?"

Chance to Rest Motivation (range 0-6)

Up to three points for the projective items and one each for mentioning chance to rest as motivation in each of the direct questions.

Projective Questions—

Questions 2,3,4 (see above)

Direct Questions—

Questions 15-16. "How did you feel about the interviewer coming just then?"

Question 17. "How did you feel about giving up time to answer questions?"

Question 17a. "Do you usually have some free time during the day?"

Talking About Health Motivation (range 0-3)

One point possible for the projective question and one each for the direct questions for mentioning that motivation was a chance to talk about the health.

Projective Question—

Question 4. (Picture 2) "How is the woman (man) of the house feeling now?"

Direct Questions—

Question 9. "How do you feel about the health interview you had yesterday?"

Question 14. "Were there any things about the interview you especially liked?"

Indexes of Interviewer Orientation

A number of answers to questions in the interview with the interviewer were coded into indexes of interviewer attitudes. The first three indexes are based primarily on a content analysis of the interviewer's reasons for preferring particular kinds of respondents. The ranges vary widely according to the number of possible index items in which the interviewer could express the particular orientation.

Accuracy Imagery (range 0-8)

One point for every indication of preferring accurate, complete performance or more accurate answers from respondents to the following questions:

Question 8. "Can you describe picture of the 'ideal' respondent— what would she (he) be like?"

Question 9. "Here is a list of kinds of respondents, which would you rather interview?" (Interviewer indicates that preference is *because* this kind of respondent is more ac-

curate, gives more complete responses.)

Question 12,12a. "Why do you think most respondents would prefer that you stick right to your job, or that you visit a little?"

Interpersonal Imagery (range 0-4)

One point for each time the interviewer prefers a respondent because she (he) is more pleasant, less hostile, or more relaxed, plus one point for every time the interviewer advocates a given approach to respondents because it produces these results. Same questions as above.

Efficiency—Speed Imagery (range 0-4)

One point for each time the interviewer prefers a given type of respondent because he (she) is more efficient or doesn't take as much time. Also one point for every time the interviewer prefers a given procedure for the same reasons. Same questions as above.

Worthwhile Work (range 0-3)

One point for saying that HIS is important to the Nation, or for saying that one of the things she liked about her job was that it was important, worthwhile, or constructive.

Question 18. "Why do you or don't you feel that it is important for respondents to know that the survey is being done for the Public Health Service?"

Question 26. "All jobs have some things that are enjoyable and some things that we don't like, what things do you like best about interviewing?"

Question 27b. "How important do you think the information from the survey is to the nation's health?"

Like To Interact (range 0-2)

One point for saying that one of the things she likes about her job is talking to people, plus one point for saying that she preferred to visit (rather than be businesslike) *because* she likes to talk to people.

Question 13. "Do you prefer to stick right to your job or visit a little?"

Question 26. "All jobs have some things that are enjoyable and other things we don't like, what things do you like best about interviewing work?"

One point for saying that one of the things she does not like about her job is imposing, plus one point for saying that she liked to be businesslike *because* it doesn't take up too much of the respondent's time, plus one point for thinking that interviews are too long *because* of imposing.

Question 12a.   "Why do you think that most respondents would prefer that you be businesslike?"

Question 13.   "Which do you prefer—businesslike or visiting?"

Question 26a.   "What things do you like least about interviewing work?"

Question 26b.   "If you were to make changes to make your job better, what would you change?"

Question 15.   "Do you feel that interviews are usually too long or not ?"

Perceived Respondent's Attitude

Taken directly from Question 1

Question 1.   "How do respondents feel about being interviewed—like it, not like it, or what?"

Problems with Questions (range 0-5)

One point for saying that people do not like something in the questionnaire, plus one for mentioning something which is hard for respondents in the questionnaire; a 'yes' answer to question 5 gained the interviewer another point, and one point for each change suggested in the questionnaire.

Question 3.   "What things do respondents not like about being interviewed?"

Question 4.   "What are the hardest things in the questionnaire for people to answer?"

Question 5.   "Are there things the respondent finds too personal or embarrassing to report?"

Question 22a,b. "How about the questionnaire, are there some sections with which respondents have particular troubles?"
                a. "What parts?" b. "Why do they have trouble?"

Validity of Indexes

This study was designed to test the validity of an overall model rather than that of specific components. However, some comments may be made about the validity of the indexes used, based on available data.

There is some doubt about what the task and interpersonal indexes are measuring, that is, whether task and interpersonal behavior are empirically different phenomena in the HIS. The task behavior index shows a low level of correlation with an index of observer ratings of task orientation as follows:

Task behavior indexes	Observer task ratings of:	
	Respondent	Interviewer
	Gamma coefficient	
Respondent task behavior————————	.30	.22
Interviewer task behavior—————————	.25	.34

The low degree of intercorrelation is also present in the factor analysis where the task orientation rating items appeared on a dimension orthogonal to one made up of task behavior items.

A suggestion has been made that the task and interpersonal scales are actually reflections of a more general activity level in the interview. The characteristics of general activity level are discussed above.

The interpersonal behavior indexes seem somewhat valid since they relate to the length of conversation between interviewer and respondent after the inter-

Interpersonal behavior indexes	Post interview conversation length
	Gamma coefficient
Respondent interpersonal behavior—————————————	.34
Interviewer interpersonal behavior—————————————	.44

view is over. They are not related very strongly to any of the interpersonal attitudes or orientations measured by other instruments.

The projective and direct indexes of respondent feeling are assumed to be somewhat valid since they correlate with an observer rating of respondent affect during the interview as follows:

Respondent affect	Observer rating of respondent affect during the interview
	Gamma coefficient
Indirect question index---	.18
Direct question index-----	.33

The gamma coefficient between the direct and indirect indexes is .37.

Each indirect and direct index of respondent feeling discussed in this report is actually made up of four subscales—number of positive comments, number of negative comments, number of times the respondent avoided saying something positive (includes neutral and negative comments), and number of times the respondent avoided saying something negative (includes neutral and positive comments). The expected intercorrelations were obtained among the subscales within each index, partly due to the definition of each subscale with respect to others. The intercorrelations of each projective subscales with its paired direct index subscales ranged from .31 to .46, yielding additional evidence of validity.

Unfortunately, few independent validating criteria are available for either the indexes of specific respondent concerns and motives or for the interviewer orientations.

—————O O O—————

APPENDIX III

DESCRIPTION OF THE COEFFICIENT GAMMA

Introduction

Throughout this report gamma, a measure of the degree of association between two variables, has been used in place of the presentation of detailed tables of marginal interest.

Gamma is an index of association for two-way classifications which was proposed by Goodman and Kruskal in 1954.[22] The measure is appropriate to data where both classifications have inherent and meaningful order. (Both variables are in categorial form, and the categories are ordered in some way of interest.)

The coefficient gamma is the difference in conditional probabilities of like and unlike order, given no ties; it indicates how much more likely two individuals are to agree than to disagree with respect to their order in two classifications.

When estimated from a sample, the index is defined as

$$G = \frac{P_s - P_d}{1 - P_t}$$

where P_s is the probability that two randomly chosen individuals will have the same ordering in the two classifications;

- P_d is the probability that they will have a different ordering; and
- P_t is the probability that one or both classifications will be identical (a tie) so that a definite order cannot be stated.

$$P_s + P_d + P_s = 1$$

Significance Test of Gamma

Several problems arise in testing the significance of gamma. First, the data in this study are based on a sample of six census regions located east of the Mis-

sissippi. A sample of the entire U.S. population would include data for all census regions. Therefore any significant tests on data from this study are not intended to be exact population estimates.

Second, the available methods of estimating the standard error of gamma are based on the assumption that the data come from a simple random sample rather than from clustered samples. Empirical methods have been developed to estimate standard errors of clustered samples,[23] but these methods were judged too expensive to use on these data because of the other limitations on interpretation which are discussed above.

On the other hand, in spite of the inability to make true population estimates or to estimate variance on the basis of clustered samples, some indication of the probability that obtained findings where not due to "chance" was desired. Therefore a conservative estimate of the standard error of gamma, proposed by Goodman and Kruskal,[24] based on the asymptotic upper bound of the variance has been used as a means of getting a "ball park" estimate:

$$SE_G = \sqrt{\frac{2n\left(1 - G^2\right)}{n^2 - P_t}}$$

where N = total number of cases;

P_t = probability of ties $(1 - P_s - P_d)$; and

G = obtained gamma coefficient

The .95 confidence interval is then given by $G \pm 2 \times SE_G$ when the statement is made that the relation between two variables is significant, the confidence interval defined above did not include zero.

———o o o———

APPENDIX IV

THE INTERVIEW OBSERVATION FORM

The interview observation booklet used in this study consisted of nine sections designed to obtain information on the actual processes of the interview. The first two sections were filled out before the interview actually began (see pp. 52 and 53). Most of the remaining sections were related to specific questions on the basic questionnaire. Forms in these sections had the specific question(s) printed in a box at the top of the page and were completed only when the particular questions were being asked or answered.

One form, "Conversation not related directly to the interview questions" (see page 55), was used repeatedly as the right-hand page throughout the observation booklet. These pages were filled out when conversation unrelated to the content of the questionnaire caused major changes in the interview format. This page, which is shown only once in this appendix, actually appeared eight times in the observation booklet.

The final two pages of the booklet, devoted to the overall rating of the respondent and the observer's impressions of the interview, were filled out after the interview had been completed and the interviewer and the observer had left the dwelling unit.

The observation form was designed to apply to only one respondent. The observer chose as the principal respondent the person who answered for herself and for other family members. If two persons or more were responding equally often, the observer selected the female respondent; if two females were reporting equally, she chose the younger person (18 years of age or over).

―――――O O O―――――

SURVEY RESEARCH CENTER
THE UNIVERSITY OF MICHIGAN

IN COOPERATION WITH THE
UNITED STATES PUBLIC HEALTH SERVICE
AND THE
UNITED STATES BUREAU OF THE CENSUS

Name of Principal respondent: Miss
Mrs._____Age:_____
Mr.

Address:_____
        Street   City   State

Identification Code: PSU No. _____

Segment No. _____

Serial No. _____

Interviewer's Name _____

Instructions for reaching DU, if rural:

Time of Calls:	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.	A.M. P.M.
Date of Interview:					

Name of observer:_____

PHS-T274-1
4-64

BEFORE THE INTERVIEW - AT THE DOOR

1. The time the interviewer knocks on the door is _____ o'clock
   [A.M.]
   [P.M.]

2. Check number of seconds waiting for door to open.

   ☐ 0 - 9 seconds

   ☐ 10 - 29 seconds

   ☐ 30 - 60 seconds

   ☐ Over 60 seconds

3. How far was door opened at first? [0] [1/4] [1/2] [fully] [NA]

4. How many questions did the RESPONDENT ask?

   ☐ None

   ☐ One

   ☐ 2 or more

5. Check those things INTERVIEWER mentions at the door.

Public Health Service	
Census Bureau	
The "Dear Friend" letter to respondents or the brochure	
The interview	
Other (specify)	

BEFORE THE INTERVIEW - INSIDE THE HOUSE

6. What occurs? Who takes the initiative?

	Respondent	Interviewer
Getting in the door		
Suggests chair		
Suggests table		
Other (specify)		

Specifications: (Describe anything else which occurs to affect the setting or physical atmosphere of the interview.)

7. Who sits first? | Respondent | | Interviewer |

8. Are the respondent and interviewer sitting close to each other?

| Yes | | No |

GENERAL RATINGS

9. How polite has the respondent been to the interviewer?

☐ Particularly polite
☐ Slightly polite
☐ Average
☐ Slightly impolite
☐ Particularly impolite

10. How warm and friendly has the respondent been to the interviewer?

☐ Very warm and friendly
☐ Somewhat warm and friendly
☐ Average - Impersonal
☐ Somewhat unfriendly
☐ Very unfriendly

Q. 3. How old were you on your last birthday?
Q. 4. Race
Q. 5. Sex
Q. 6. Are you now married, widowed, divorced, separated, or
      never married?
Q. 7. (a) What were you doing most of the past 12 months...?
      (b) Are you retired?

GENERAL RATINGS

11. Which of the following describes the respondent now? (Check one or more)

☐ Enthusiastic   ☐ Bored

☐ Attentive   ☐ Irritated

☐ Neutral   ☐ Can't rate

12. How loud is each speaking?

Interviewer | Can't hear | | Soft | | Average | | Loud | | Shout |

Respondent | Can't hear | | Soft | | Average | | Loud | | Shout |

CONVERSATION NOT RELATED DIRECTLY TO THE INTERVIEW QUESTIONS
(Use this form only for MAJOR changes)

Talks about:		Who brings the topic up? (tally) Respondent	Who brings the topic up? (tally) Interviewer	Code Reaction of other person
Other person	Flatters or praises			
Other person	Questions about the other person			
Other person	Gives suggestions to other			
Self	Talks about self, family, friends, etc.			
Self	Talks about things she would rather be doing now			
Self	Talks about things she is avoiding now (like ironing)			
Interview	Asks purpose of study or of question			
Interview	Asks about Health Service, Census			
Interview	Other			
Humor	Laughs, jokes, tries to relieve tension			
Other	Specify			

REACTION
CODE

A = Encourages or answers adequately

B = Allows, evades

C = Discourages, no answer

Interviewer calls respondent   First name   Last name   Other

Respondent calls Interviewer   First name   Last name   Other

DISTRACTION CODE

A. Inhibits, causes to withhold information
B. Distracts but does not cause an interruption
C. Causes an interruption
D. Helps respondent give answers
E. No effect

DISTRACTIONS & INTERRUPTIONS (check)

Children present   A B C D E

Adults present   A B C D E

TV, radio   A B C D E

Other   A B C D E

```
Q. 8.   Were you sick at any time LAST WEEK OR THE WEEK BEFORE?
Q. 9.   Last week or the week before did you take any medicine or treatment for
        any condition?
Q.10.   Last week or the week before did you have any accidents or injuries?
Q.11.   Did you ever have an accident or injury that still bothers you or affects
        you in any way?
                    (Including (a) and (b) for each question)
```

13. How does RESPONDENT respond to
    questions? (tally)

```
_____ ANSWERS IMMEDIATELY _____
_____ Gives adequate
                 answer
_____ Elaborate response
_____ Answers inadequately
```

```
_____ DELAYS ANSWER _____
_____ Asks for clarifica-
                 tion or repetition
_____ Consults another
                 person or records
_____ Consults calendar
```

```
_____ WANTS FEEDBACK _____
_____ Questions the
                 adequacy of answer
```

```
_____ OTHER _____
_____ Other (specify)
```

14. What does INTERVIEWER do in -
    attempt to get adequate answers?
    (tally)

```
_____ Repeats question from schedule

_____ Asks question not from
         schedule which DOESN'T SUGGEST
         an answer (e.g., could you
         explain that, please?)

_____ Asks question not from
         schedule which MAY SUGGEST a
         specific answer, or asks
         respondent if she agrees to
         a specific answer

_____ Clarifies the meaning of the
         question from the schedule

_____ Suggests records, calendar, or
         other people be consulted

_____ Other (specify)
```

```
12. Has anyone in the family--you, your--,
    etc., had any of these conditions
    DURING THE PAST 12 MONTHS?

    Asthma, tuberculosis, chronic
    bronchitis, repeated attacks of
    sinus trouble... epilepsy, chronic
    nervous trouble, cancer, chronic
    skin trouble, hernia or rupture,
    prostate trouble.
```

(Tally)

15. _____ How many conditions does respondent pause
                                to consider?

16. _____ Number of conditions respondent asks for
                                clarification; definition?

17. _____ How many conditions does respondent
                                elaborate on?

18. _____ How many conditions did the INTERVIEWER
                                have to ask additional questions, probe,
                                or suggest an answer for?

```
13. Does anyone in the family have any
    of these conditions?

    (Deafness through any condition
     present since birth.)
```

19. Does the interviewer look up at the respondent after reading each
    condition?

    ☐ Almost   ☐ Often   ☐ Sometimes   ☐ Seldom   ☐ Almost
      always   never

20. Does the respondent have enough time to think about each condition
    before the interviewer asks the next?

    ☐ All items   ☐ Most items   ☐ Some   ☐ A few   ☐ None of
                                    items   items   the items

```
┌─────────────────────────────────────────────────────────────┐
│                         TABLE ONE                           │
│                                                             │
│  Did you ever at any time talk to a doctor about... (condition)? │
│  What did the doctor say it was?  Did he give it a medical name, │
│  etc.?                                                      │
└─────────────────────────────────────────────────────────────┘
```

(Tally entire table, for conditions 1, 3, 5, 7, etc.)

21. How does RESPONDENT respond to
    questions? (tally)

```
┌─────────── ANSWERS IMMEDIATELY ───────────┐
│                                           │
│ _____  Gives adequate       │
│                      answer               │
│ _____                       │
│                                           │
│                                           │
│ _____  Elaborates response  │
│                                           │
│ _____                       │
│                                           │
│                                           │
│ _____  Answers inadequately │
│                                           │
│ _____                       │
│                                           │
└───────────────────────────────────────────┘
```

```
┌─────────── DELAYS ANSWER ───────────┐
│                                     │
│ _____  Asks for clarifica-│
│                  tion, repetition   │
│                                     │
│ _____  Consults records,  │
│                  calendar           │
└─────────────────────────────────────┘
```

```
┌─────────── WANTS FEEDBACK ───────────┐
│                                      │
│ _____  Questions the       │
│                  adequacy of answer  │
└──────────────────────────────────────┘
```

```
┌─────────── OTHER ───────────┐
│                             │
│ _____  Other (specify) │
│                             │
│                             │
└─────────────────────────────┘
```

```
┌─────────────────────────────────────────────┐
│                                             │
│ _____  Repeats question from schedule      │
│                                             │
│ _____  Asks question not from              │
│          schedule which DOESN'T SUGGEST      │
│          an answer (e.g., could you          │
│          explain that, please?)              │
│                                             │
│ _____  Asks question not from              │
│          schedule which MAY SUGGEST a        │
│          specific answer or asks             │
│          respondent if she agrees to         │
│          a specific answer                   │
│                                             │
│ _____  Clarifies the meaning of the        │
│          question from the schedule          │
│                                             │
│ _____  Suggests records, calendar, or      │
│          other people be consulted           │
│                                             │
│ _____  Other (specify)                     │
│                                             │
└─────────────────────────────────────────────┘
```

Q. 18. LAST WEEK OR THE WEEK BEFORE did anyone in the family go to a dentist?

Q. 19. If "no," ask: About how long has it been since you went to a dentist?

GENERAL RATINGS
(While interviewer is asking questions 18 and 19 rate the respondent on his general behavior up to now.)

23. How well does this respondent grasp the meaning of the questions?

☐ Perfectly
☐ Very well
☐ Fairly well
☐ Not too well
☐ Not well at all

24. How much talking is this respondent doing?

☐ A great deal--lots of elaboration; unusually talkative
☐ Quite a bit
☐ A moderate amount
☐ Not too much
☐ Very little--gives minimum answers; unusually reticent

25. How smoothly are interviewer and respondent working together?

☐ Extremely smoothly--no strain
☐ Very smoothly
☐ Fairly smoothly
☐ Not too smoothly
☐ Not smoothly at all--working at cross-purposes

59

Q. 20. LAST WEEK OR THE WEEK BEFORE did anyone in the family go to a doctor or to a doctor's office or clinic? (Include (a) - (f))

Q. 21. About how long has it been since you have seen or talked to a doctor?

26. How does RESPONDENT respond to questions? (tally)

_____ ANSWERS IMMEDIATELY _____

_____ Gives adequate answer

_____ Elaborates response

_____ Answers inadequately

_____ DELAYS ANSWER _____

_____ Asks for clarification, repetition

_____ Consults another person

_____ Consults records, calendar

_____ WANTS FEEDBACK _____

_____ Questions the adequacy of answer

_____ OTHER _____

_____ Other (specify)

27. What does INTERVIEWER do in attempt to get adequate answers. (tally)

_____ Repeats question from schedule

_____ Asks question not from schedule which DOESN'T SUGGEST an answer (e.g., could you explain that, please?)

_____ Asks question not from schedule which MAY SUGGEST a specific answer or asks respondent if she agrees to a specific answer

_____ Clarifies the meaning of the question from the schedule

_____ Suggests records, calendar, or other people be consulted

_____ Other (specify)

```
                        SPECIALISTS CARD
Q. 23.  DURING THE PAST 12 MONTHS has ANYONE in the family--that is, you,
        your_____, etc.--received any services from any of the persons
        listed on this card?  Please check "Yes" or "No" for each one listed.
```

28. Did respondent ask for definitions, clarification, or meaning of any of the items on the card?

    ☐ Yes   ☐ No

    1a. (If yes) What did the interviewer do?

        ☐ Gave thorough information (according to instruction manual)
        ☐ Gave partial information
        ☐ Other (specify)

29. Did respondent ask any other question?

    ☐ Yes   ☐ No

30. How did respondent respond to the card?

        ☐ Considered the items carefully
        ☐ Rushed through it
        ☐ Other (specify)

31. Did the interviewer have to read any of the list to respondent?

    ☐ All of it   ☐ Some of it   ☐ None of it

```
Check nothing for the probes which may follow
```

Q. 25. (a) What is the highest grade you attended in school?

Q. 26. Did you work at any time last week or the week before?
If "no", ask: Even though you did not work last week or the week
before, do you have a job or business? Were you looking for work
or on layoff?

GENERAL RATINGS

32. Which of the following describes the respondent now? (Check one or more)

☐ Enthusiastic   ☐ Bored

☐ Attentive   ☐ Irritated

☐ Neutral   ☐ Can't rate

33. How loud is each speaking?

Interviewer | Can't hear | Soft | Average | Loud | Shout

Respondent | Can't hear | Soft | Average | Loud | Shout

Q. 27. Which of these income groups represents your total combined family
income...?

34. Did respondent ask the reason for the question?

Yes   No

35. Did the interviewer help the respondent arrive at an answer?

Yes   No

62

36. Time last question ("What is the telephone number here?") answered:

_____ o'clock.

37. Was there some conversation after the last question was answered?
    (Excluding standard thank you letter statement)

    Yes   No

    If yes:

38. Who wanted to continue the conversation?

    R   I   Both   D.K.

    Time leave house:_____ o'clock

63

YOUR OVERALL RATINGS OF THE RESPONDENT

1. How cooperative was this respondent?

☐ Much less than average ☐ Somewhat less than average ☐ About average ☐ Somewhat more than average ☐ Much more than average

2. How well did this respondent grasp the meaning of the questions?

☐ Perfectly ☐ Very well ☐ Fairly well ☐ Not too well ☐ Not well. at all

3. How much talking did this respondent do during the interview?

☐ A great deal--lots of elaboration; unusually talkative

☐ Quite a bit

☐ A moderate amount

☐ Not too much

☐ Very little--gives minimum answers; unusually reticent

4. How willing was the respondent to give all the time necessary for this interview?

☐ Very willing ☐ Somewhat willing ☐ Not too willing ☐ Very unwilling

5. How much did the respondent want to chat with the interviewer about matters unrelated to the schedule?

☐ Very much ☐ Somewhat ☐ Almost not at all

6. How much did the interviewer have to clarify and interpret for this respondent?

☐ Much more than average

☐ Somewhat more than average

☐ Average

☐ Somewhat less than average

☐ Much less than average

64

YOUR OVERALL IMPRESSIONS OF THE INTERVIEW

1. How smoothly did interviewer and respondent work together?

☐ Extremely smoothly--no strain
☐ Very smoothly
☐ Fairly smoothly
☐ Not too smoothly
☐ Not smoothly at all--working at cross-purposes

2. How hard did each try to communicate? (Check one box for each)

Interviewer ☐ Very much effort ☐ Much effort ☐ Some effort ☐ Slight effort ☐ Almost none at all

Respondent ☐ Very much effort ☐ Much effort ☐ Some effort ☐ Slight effort ☐ Almost none at all

3. In general, what was the pace of this interview?

☐ Much faster than average
☐ Somewhat faster than average
☐ About average
☐ Somewhat slower than average
☐ Much slower than average

4. How much did the distractions and interruptions affect the interview?

☐ Very much   ☐ Much   ☐ Somewhat   ☐ Little   ☐ Very little

5. To what extent do you feel that the information obtained was accurate and complete?

☐ Completely ☐ Mostly ☐ Some ☐ Very little ☐ Almost none

OUTLINE OF REPORT SERIES FOR VITAL AND HEALTH STATISTICS
Public Health Service Publication No. 1000

Series 1. Programs and collection procedures.—Reports which describe the general programs of the National Center for Health Statistics and its offices and divisions, data collection methods used, definitions, and other material necessary for understanding the data.

Series 2. Data evaluation and methods research.—Studies of new statistical methodology including: experimental tests of new survey methods, studies of vital statistics collection methods, new analytical techniques, objective evaluations of reliability of collected data, contributions to statistical theory.

Series 3. Analytical studies.—Reports presenting analytical or interpretive studies based on vital and health statistics, carrying the analysis further than the expository types of reports in the other series.

Series 4. Documents and committee reports.—Final reports of major committees concerned with vital and health statistics, and documents such as recommended model vital registration laws and revised birth and death certificates.

Series 10. Data from the Health Interview Survey.—Statistics on illness, accidental injuries, disability, use of hospital, medical, dental, and other services, and other health-related topics, based on data collected in a continuing national household interview survey.

Series 11. Data from the Health Examination Survey.—Data from direct examination, testing, and measurement of national samples of the population provide the basis for two types of reports: (1) estimates of the medically defined prevalence of specific diseases in the United States and the distributions of the population with respect to physical, physiological, and psychological characteristics; and (2) analysis of relationships among the various measurements without reference to an explicit finite universe of persons.

Series 12. Data from the Institutional Population Surveys.—Statistics relating to the health characteristics of persons in institutions, and on medical, nursing, and personal care received, based on national samples of establishments providing these services and samples of the residents or patients.

Series 13. Data from the Hospital Discharge Survey.—Statistics relating to discharged patients in short-stay hospitals, based on a sample of patient records in a national sample of hospitals.

Series 20. Data on mortality.—Various statistics on mortality other than as included in annual or monthly reports—special analyses by cause of death, age, and other demographic variables, also geographic and time series analyses.

Series 21. Data on natality, marriage, and divorce.—Various statistics on natality, marriage, and divorce other than as included in annual or monthly reports—special analyses by demographic variables, also geographic and time series analyses, studies of fertility.

Series 22. Data from the National Natality and Mortality Surveys.—Statistics on characteristics of births and deaths not available from the vital records, based on sample surveys stemming from these records, including such topics as mortality by socioeconomic class, medical experience in the last year of life, characteristics of pregnancy, etc.

For a list of titles of reports published in these series, write to: Office of Information
National Center for Health Statistics
U.S. Public Health Service
Washington, D.C. 20201