A General Model of the Survey Interaction Process

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ABSTRACT

In this paper, we propose a general model of the survey interaction process. Our framework consists of three components: the survey context, the survey participants, and a descriptive model of the interviewer-respondent interaction process. Because subjective perceptions of the survey context influence the way individuals interpret, ask, and respond to survey questions, we first present a taxonomy of contextual variables. We then briefly discuss our views on the nature of the human organism, as these views will have implications for the behavior of interviewers and respondents within the survey context. We conclude the theoretical discussion with a seven-phase model of the survey interaction process. In the final section of the paper, we offer some suggestions for systematizing the survey methodological literature.

KEYWORDS

interviewer-respondent interactions, context, taxonomy, survey framework/model

INTRODUCTION

Our understanding of how to design questionnaires and conduct interviews/surveys has improved dramatically over the past 10 years. Advances have been made both in the methodological domain (e.g., questionnaire design) and in the operational domain (e.g., computer-assisted telephone interviewing). For example, in the methodological domain, significant improvements in the design of questionnaires have taken place as a result of the recent emphasis on the cognitive aspects of survey measurement (CASM) (Jabine, Straf, Tanur, and Tourangeau, 1984; for a recent review of the CASM movement, see Jobe and Mingay, in press). In fact, in the past decade, there has been a substantial increase in the number of publications on a wide range of topics related to survey/questionnaire design and data-collection methodology (e.g., Belson, 1981; Cannell, Miller, and Oksenberg, 1981; Converse and Presser, 1986; Dijkstra and van der Zouwen, 1982; Groves et al., 1988; Groves, 1989; Hippler, Schwartz, and Sudman, 1987; Schuman and Presser, 1981; Sudman and Bradburn, 1982; Turner and Martin, 1984).[1] Missing from these works, however, is a single, comprehensive model that describes the sequence of interactions that take place between interviewers and respondents during an actual interview, and that also identifies the various contextual and person-specific factors which collectively influence what goes on in the course of such interactions.

In this paper, we propose a general model of the survey interaction process that we hope will serve as a preliminary framework not only for integrating research efforts within the survey field, but also for stimulating new interdisciplinary research. To be more specific, our purpose is to provide a theoretical framework that researchers from a variety of disciplines (e.g., anthropology, psychology, sociology, statistics) can use to structure and

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1/ Among the works cited here are some very thorough reviews of the survey methodological literature (e.g., Groves, 1989) and of basic questionnaire-design principles (e.g., Sudman and Bradburn, 1982). We could not hope to accomplish here what these authors have accomplished so well in their considerably longer works; so, generally speaking, our citations are few and clearly not representative of the body of relevant research. We recognize, also, that survey research has a history spanning many decades (Converse, 1987; Jobe and Mingay, in press; Fienberg and Tanur, 1983), and that all of us are indebted to those individuals whose enduring contributions have provided the foundations upon which we build (e.g., Bradburn and Sudman, 1979; Cannell, Marquis, and Laurent, 1977; Converse and Schuman, 1974; Kahn and Cannell, 1957; Payne, 1951; Sudman and Bradburn, 1974).

communicate their research ideas and findings. Two points of elaboration: First, we offer the framework not only as a theoretical model of the survey interaction process, but also as a practical tool for planning, analyzing, and conducting methodological research related to surveys. At the present time, many investigators appear to structure their research ideas in terms of a four-step cognitive model of the response-formulation process (i.e., comprehension, retrieval, judgment, response; see Tourangeau, 1984; Tourangeau and Rasinski, 1988). As influential as this model has become, it is not a model of the survey interaction process--we suspect it was never intended to be. It does not address the broader context in which surveys take place, the influence of other organismic processes (psychophysiological and biological) on the way questions are asked or answered, or the interactive nature of most interviews--all of the above affect the behavior of interviewers and respondents and, as a result, the quality of survey data. The general model being proposed in this paper does include these elements and, therefore, can be used as a tool for evaluating survey research. For example, whenever contextual factors (such as, interview setting, timing of contact, survey sponsorship, response security) and organismic factors (such as, the psychophysiological and biological state of interviewers and respondents) are not addressed in the course planning and conducting survey research, the findings from such research will be difficult to interpret and should be qualified in terms of generalizability. We suspect that many failures to replicate can be attributable to situations of this type (i.e., to the presence of "uncontrolled" contextual and person-specific influences on the survey interaction process). Second point: To the extent that any model is adopted by a community of researchers, it provides a common theoretical perspective that facilitates communication within and between disciplines; to the extent that the model is comprehensive, it fosters an integration of related ideas and theories. The four-step cognitive model alluded to above may stimulate research activity among psychologists, but it probably seems overly restrictive or foreign to researchers in other disciplines. By expanding the scope of the model to include contextual variables and interactive exchanges, one invites researchers from a broad range of disciplines to collaborate in the research enterprise--collaborations that potentially could lead to exciting new ways of studying and conceptualizing the survey interaction process. We could elaborate further here, but it perhaps best to move on; we hope that the utility of the model will become more apparent as each element is presented.

Our framework consists of three components: the survey context, the survey participants, and a seven-phase model of the survey interaction process--the three components together constitute a general model of the survey interaction process.[2] In the following three sections of this paper, we elaborate on each of these components in turn. We begin with a discussion of the survey context and how contextual variables can influence the way an individual interprets, asks, or responds to particular survey questions; in this section, we present a taxonomy of contextual variables. We then turn our attention to a discussion of the survey participants. In our view, the human organism can be conceptualized in terms of biological systems and associated psychophysiological processes (e.g., sensation, cognition, motivation, emotion). To fully understand human behavior in any context, one must appreciate the continuous, dynamic interaction of these systems and processes. The theoretical portion of the paper is drawn to a close with a discussion of our seven-phase model of the survey interaction process. In the final section of the paper, we offer some suggestions for systematizing the survey methodological literature.

THE SURVEY CONTEXT

All behavior occurs within context--or to be more precise, within embedded contexts (see Bronfenbrenner, 1977)--and these contexts play an important role in regulating behavior. The context within which a survey takes place is no exception. Because of their variety and complexity, natural contexts are difficult to describe adequately, though impressive attempts have been made

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2/ The model might also be considered general in the sense that it is meant to apply both to opinion/attitude surveys (e.g., Gallup Polls) and fact-gathering surveys (e.g., Current Population Survey).

(e.g., Barker, 1968). Lacking a comprehensive model of the survey context, social scientists who conduct surveys would appear to have at least two options available to them in dealing the effects of problematic contextual variables: the focused-research option and the limited-control option. The first option requires an active research program that explores potential sources of error variability in surveys produced by identifiable contextual factors, such as the effects of interviewer and respondent racial characteristics on the validity of surveys responses (e.g., Schuman and Converse, 1971). In the limited-control option, the survey organization tries to control for factors that are known to be problematic (e.g., providing assurances of confidentiality or anonymity in sensitive-topic surveys) and assume that less problematic factors (e.g., potential gender effects) balance out via the randomization process. We believe the success of both options depends on how well social scientists and survey design groups have identified potential problems, and that success at problem identification depends on how well these individuals have conceptualized the survey context--the more simplistic the approach, the more likely it is that important contextual factors will be overlooked.

We now present a taxonomy of contextual variables that identifies aspects of the survey context which we believe influence the way individuals interpret, ask, or respond to particular survey questions (see Table 1). We believe, further, that these contextual variables, acting collectively, will have a significant impact on the way interviewers and respondents interact. Though this taxonomy was developed independently, much of what follows may be viewed as an integration and extention of earlier taxonomic works that have had a substantial impact in the field of survey methodology (e.g., Kahn and Cannell, 1957; Sudman and Bradburn, 1974). The major headings of this taxonomy, and a brief description of each, follows.

(1) *Interview Setting.* This variable refers to the place where the interview is conducted, or more specifically, to the place(s) where the respondent and interviewer are situated when the interview is conducted. Generally speaking, respondents probably feel most comfortable with surveys that allow them to complete the interview in the privacy of their own homes (e.g., telephone surveys), as long as the timing is convenient. Interviewers probably differ widely in their preferences, but if for no other reason than personal safety, we suspect that most would prefer to interview respondents by phone, or conduct face-to-face interviews within the confines of a familiar office. Presumably, the more at ease one can make respondents and interviewers, the higher the quality of the data collected during the interview.

(2) *Timing of Contact.* This variable refers to the gestalt of past, current, and anticipated events (proximate and remote) that collectively define the "psychological climate" of the interview. Recency is one of many factors that influence the salience of events (Sudman and Bradburn, 1974). To the extent that the salience of recent events has the potential to unduly influence survey responses, the timing of a survey is very important. For example, automobile workers who have just been laid off because of slumping car sales would probably have some very colorful--if not radical--opinions to share with an interviewer if called to participate in a survey about the long-range economic benefits of foreign competition in the automobile industry. Those same workers might have a very different set of opinions if they were all about to be hired by one of the foreign automobile manufacturers that had cost them their jobs in the first place. It should be noted here that whereas timing of contact would appear to be more critical for opinion surveys, fact-gathering surveys are affected as well (e.g., respondents are more apt to provide accurate earnings information if they have recently completed their income tax returns or are in the process of being audited by the IRS).

(3) *Respondent/Interviewer Characteristics.* These organismic (e.g., intelligence), demographic (e.g., age, race, gender), and experiential characteristics (e.g., years of experience as an interviewer) can be used to construct unique profiles for interviewers and respondents at a given point in time; and behavioral patterns associated with different profiles may affect the way individuals interact in a survey situation. For example, there are several studies in the survey methodology literature that seem to suggest that individuals with a certain combination of characteristics tend to obtain higher quality survey data, or appear to have greater success at recruiting respondents for the survey (e.g., Fowler and Mangione, 1986; Henson, Cannell, and Lawson, 1976; Singer, Frankel, and Glassman, 1983; Cf. Hagenaars and

Table 1. A Taxonomy of Contextual Variables to be Considered in the Analysis of the Survey Interaction Process*

Interview Setting:
a. location of interview
   (1) the respondent's home
   (2) the interviewer's office (e.g., a cognitive laboratory)
   (3) a neutral setting (e.g., train station)
b. characteristics of location
   (1) security (e.g., good vs. bad neighborhood)
   (2) presence of observers (e.g., family members, authorized observers)

Timing of Contact:
a. state/national/global events
b. local/community events
c. personal events

Respondent/Interviewer Characteristics:
a. demographic characteristics
   (1) gender
   (2) age
   (3) race
b. socio-economic status (SES) characteristics
   (1) education level
   (2) income level
c. organismic characteristics
   (1) biophysiological status (e.g., good/poor health; fatigue level)
   (2) psychophysiological status (i.e., system states: sensory, cognitive, motivational, emotional, etc.)
   (3) other salient characteristics [i.e., physical appearance; personality traits (e.g., introversion vs. extroversion); intelligence level; communication skills]
d. experiential characteristics [Note: This category is, in fact, a subset of the psychophysiological status subcategory.]
   (1) relevant past experience (e.g., as an interviewer/respondent; with interviewer's/respondent's ethnic or racial group; with particular sponsor)
   (2) knowledge of, and interest in, subject matter (i.e., involvement)

Survey Publicity Method:
a. advance correspondence from the sponsor of the survey (e.g., informational letter)
b. "cold contact" procedures (i.e., on-the-spot description of the survey, such as those used in random-digit-dialing surveys)
c. use of the media (e.g., television, radio, newspapers)
d. word of mouth (e.g., via social networks, such as family and friends)

Survey Sponsorship:
a. public/governmental sponsorship (e.g., surveys such as the Current Population Survey, the Decennial Census, and the National Health Interview Survey)
b. university/survey-research-center sponsorship
c. private industry sponsorship (e.g., TV network polls, automobile industry surveys of consumer satisfaction)

Survey/Interview Administration Mode:
a. face-to-face interview
   (1) paper-and-pencil format
   (2) computer-assisted format (i.e., CAPI)
b. telephone interview
   (1) paper-and-pencil format (i.e., questions read from, and answers recorded on, a paper copy of the questionnaire)
   (2) computer-assisted format (i.e., CATI)
c. self-administered questionnaire (e.g., mail-back questionnaire)

Response Security Level:
a. complete anonymity (i.e., no connection is possible between the providers of information and the data itself)
b. confidentiality (i.e., respondents are in principle identifiable, but binding legal assurances are made guaranteeing that only aggregated data will be divulged)
c. restricted availability--usually with binding confidentiality statements (i.e., information is available to legitimate research organizations only)
d. unrestricted availability (i.e., information is available to whoever might want it)

Attributes of the Survey Instrument:
a. general questionnaire characteristics
   (1) the nature and content of the questionnaire [e.g., attitude/opinion survey vs. fact-gathering survey (e.g., economic, health, sex, or drug survey; see b.)].
   (2) length of questionnaire (i.e., respondent burden)
   (3) pace of questionnaire (e.g., fast-paced survey; usually a function of questionnaire length)
   (4) homogeneity/heterogeneity of questionnaire (i.e., item mix; a gross measure of a questionnaire's susceptibility to context effects)
   (5) amenability of questions to self vs. proxy reporting
b. item characteristics
   (1) the target of the question (i.e., the person/group to, or about whom, the question is being asked)
   (2) the focus of the question (e.g., beliefs, opinions, autobiographical facts)
   (3) the content and salience of the question [i.e., subject matter of question (e.g., social, political, or moral issues) and the relevance/irrelevance of the question for the respondent or the interviewer]
   (4) the desirability and sensitivity of the question content
   (5) the response format of the question (e.g., fixed vs. open-ended, verbal vs. purely numerical scaling, number of response categories, availability of "other" response option)
   (6) the length and/or complexity of the question

Incentives:
a. monetary incentives (e.g., respondents may be paid a certain amount of money for their participation in the survey)
b. tangible, non-monetary incentives (e.g., respondents may be given some sort of certificate or gift for their participation in the survey)
c. verbal incentives (e.g., in a national health survey, respondents may be told that their participation will help improve the quality of health care in the United States)

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* **NOTE:** The contextual variables identified in this table have the potential to influence the way in which individuals interpret, ask, or respond to survey questions. Though specific features of the survey context may be perceived as more salient than others (e.g., the sensitive nature of the questions), it is the mix or configuration of variables that determines what respondents and interviewers will think, say, and do.

Heinen, 1982; see also Dijkstra and van der Zouwen, 1987). Other research has shown that when the profiles of interviewers and respondents differ, survey data on particular topics can be biased or unreliable (e.g., Ballou, 1990; Schuman and Converse, 1971).

(4) *Survey Publicity Method.* There are a variety of ways to inform potential respondents of the details of a survey (e.g., use of the media, "cold contact" procedures). In addition to potentially influencing the way respondents interpret and respond to survey questions, the use of a particular survey publicity method may have dramatic effects on nonresponse rates. Though impressionistic, our field experience with the Current Population Survey suggests that individuals are more willing to serve as participants, and seem less suspicious of the interviewer, if they receive an informational letter describing the survey prior to contact by a Census interviewer; in comparison,

the use of "cold contact" procedures seem far less desirable (e.g., in telephone surveys where households are selected via random digit dialing).

(5) *Survey Sponsorship.* Surveys are sponsored by various groups (e.g., governmental agencies, universities, market research firms) for various reasons (e.g, fact gathering, attitude or opinion assessment, commerical product viability); and one can reasonably assume that the behavior of respondents and interviewers will be influenced both by the survey sponsor and that sponsor's motives--information that is not always readily available to respondents. For example, most of us willingly participate in governmental surveys that contribute to the common good; we are less willing to participate in market research surveys that we suspect to be exploitive. With respect to the latter point, Brunner and Carroll (1969) found that response rates increased dramatically when an introductory letter describing the survey came from a university-affiliated group rather than from a market research company.

(6) *Survey/Interview Administration Mode.* Interviews can be administered in a variety of ways (e.g., face-to-face, via telephone) and these different modes/ procedures may influence the way in which survey participants interpret, ask, or respond to survey questions. The decision on mode of administration is most often an economic one (Groves, 1989), but there can also be good psychological reasons for choosing one mode over another or for mixing modes. The federal government's Current Population Survey provides a case in point. The CPS is an employment survey in which households are interviewed for four consecutive months, given the next eight months off, and then interviewed again for four consecutive months. One interesting feature of the CPS is that the first and fifth interviews are personal visits, the other six are conducted by phone. In addition to establishing the legitimacy of the survey (via the presentation of official documentation, credentials, and personal identification), we believe that personal visits are important for establishing a sense of rapport and familiarity between household respondents and the government's field representatives. And we suspect this sense of rapport carries over when interviewers call in subsequent months, enhancing the quality of data that one might have otherwise obtained had all eight interviews been conducted by phone.

(7) *Response Security Level.* This variable refers to the degree of privacy or security associated with an interviewee's responses, and can range all the way from complete anonymity to unrestricted access to a respondent's data. The federal goverment has laws that protect the confidentiality of a respondent's data for government-sponsored surveys (Nelson and Hendrick, 1983; see also, Cox et al., 1985; Plewes, 1985), but for many other types of surveys it is probably not always clear to respondents how their data are being protected. The quality of certain types of survey data (e.g., questions on sensitive topics) can be assumed to vary inversely with respondent uncertainty regarding data security (Esposito et al., 1990; Nathan et al., 1990; Willis et al., 1990).

(8) *Attributes of the Survey Instrument.* These attributes refer to characteristics of the survey instrument (e.g., content, length and pace, item characteristics) that not only influence whether individuals will agree to participate in a survey, but also how those individuals interpret and respond to particular survey questions. For example, in addition to affecting the nonresponse rate, the length of the survey will probably also affect the level of cognitive effort respondents expend on certain questions (i.e., the "satisficing" concept; see Krosnick, in press). To follow through with the example, it would seem reasonable to assume that the longer the survey, the higher the nonresponse rate and the greater the likelihood that some satisficing will occur--especially for questions appearing at the end of the questionnaire.

(9) *Incentives.* This variable refers to the strategies used by the survey sponsor (or its agent) to enhance the potential respondent's willingness to participate in the survey (e.g., money, certificates, appeals to civic responsibility). On this point, Ferber and Sudman (1974) have found that the effectiveness of a given incentive strategy depends not only on the amount of compensation respondents receive, but also on such considerations as temporal commitment (i.e., the amount/period of time respondents are required to cooperate) and survey sponsorship. Cannell and Henson (1974) believe that incentive determination should be viewed as a research project in and of itself, as overpayment may result in unanticipated (negative) effects. It is important to recognize, also, that whereas incentives may motivate the

respondent to participate in a survey, they are no guarantee that he or she will provide accurate data.

To conclude this section on the survey context, we wish to point out that the categories listed above are not to be viewed as exhaustive; nor are the contents of specific categories to be viewed as mutually exclusive of the contents of other categories. Nevertheless, we believe the taxonomy described above represents a fairly comprehensive blueprint of the survey context. Much in the way of elaboration, however, remains to be done.

THE SURVEY PARTICIPANTS

Arguably the two most important features of the survey context are the interviewer and the respondent--the survey participants. And it would seem reasonable to conclude that if the goal was to understand how the survey interaction process works, one would start by learning as much as one could about the nature of the human organism. Needless to say, volumes have been written on this topic; the very best we can hope to accomplish here would be to provide the reader with a grossly simplified description of this highly complex organismic system. Before we begin, however, we want to be explicit about the assumptions that guide our theorizing.[3]

The assumptions that follow have been derived from a larger set of assumptions shared by two very similar philosophical/scientific world views: the organismic world view (Overton, 1984) and systems theory (von Bertalanffy, 1967, 1968; Miller, 1978; Laszlo, 1972; Capra, 1982, especially Chapter 9). The first assumption is that the human organism is inherently active. Individuals constantly select aspects of their environments to attend to and act upon, they do not simply react to salient environmental stimuli. Of course, there are occasions when individuals behave in a very passive fashion (e.g., watching TV for hours on end); but this behavior pattern is not innate, it has to be learned. Second, we believe that organismic change is fundamental--and relative. The hallmark of the human organism is process/change. Some organismic processes (e.g., aging) require more time than others (e.g., sleep cycles) and, as a result, produce very slow change; this apparent stability should not be taken as evidence against the premise of fundamental, ongoing organismic change. The illusion of stability can be very powerful indeed. For example, none of us will ever live long enough to perceive continental drift, but scientists inform us that tectonic plates move several inches every year. If the very ground on which we stand is not stable, what is? And third, we prefer to view the human organism (body and mind) as a holistic system, not as a structured collection of independently operating parts. Survey participants, therefore, are not to be viewed as passive, unchanging, multi-component machines; they are to be viewed as active, dynamic, organismic systems with the freedom to do what they want to do, when they want to do it--and that would include the freedom not to expend the effort necessary to generate accurate answers to survey questions.

One final premise: The psychophysiological processes (e.g., cognition, motivation, emotion) to be described below are theoretical constructs. With few exceptions, reciprocal interrelationships among these processes and biological systems are accepted as givens (e.g., the influence of mood on memory, or motivation on perception, or psychological stress on physical well-being). It is the lack of connection or relationship among these organismic processes that needs to be supported with empirical evidence, and not the converse. Having stated these assumptions, we now present a very simplified model of the human organism.

3/ The human organism is a system comprising many subsystems (organs, cells) and is itself a subsystem relative to the larger systems (groups, organizations, societies/cultures, supranational systems) of which it is an integral part (Miller, 1978). The assumptions (i.e., inherent activity, continuous change, holism, reciprocal interrelationships) that appear in this section, therefore, apply not only to the human organism, but also to all of the systems/contexts in which that organism finds itself. To the extent that the survey interaction process takes place within a given societal/cultural context and involves individuals speaking a common language, these assumptions are relevant to the discussion in every section of this paper.

The human organism can be thought to consist of biological systems and associated/correlated psychophysiological processes (Miller, 1978); it is the integrity of the former that makes the latter possible (e.g., an intact brain is essential for normal cognitive functioning, whereas serious brain trauma may result in short-term or long-term memory loss; see Poon, 1980).[4] Each of us comprise many disparate but nevertheless interrelated biological systems: organ systems (e.g., lungs, heart, kidneys), vascular systems (e.g., blood and lymph circulation), musculo-skeletal systems (e.g., muscles, bones), and the nervous system (e.g., the brain). One's genetic endowment provides a blueprint for the growth, development, and differentiation of these systems, whereas the environment provides sustenance and determines to what extent genetic potential will be realized.

Depending on one's training and theoretical orientation, psychophysiological processes can be described and organized in a variety of ways. The framework provided below is but one of many possible, non-comprehensive arrangements (for others, see Dippo and Herrmann, 1990; Poon, 1980; Royce, 1973). For the purposes of this paper, the following processes are considered to be most important: (1) sensation, (2) cognition, (3) motivation, and (4) emotion. Other important psychological characteristics (e.g., attitudes, personality) may be viewed as synthetic or emergent properties of the organism (i.e., manifestations of relationships between biological systems and psycho-physiological processes). We now briefly describe these processes and illustrate the relevance of each to the survey interaction process.

Sensation (e.g., vision; hearing) refers to those processes that convert physical stimulus energy into neural impulses; these impulses are later interpreted by the brain in sense-specific ways (e.g., images; sounds). Most of us take the functioning of our sensory systems for granted. With the aging of the American population, however, we suspect greater attention will be paid to the social and pragmatic consequences of sensory deficits. The communication problems associated with hearing deficits provide a case in point. In the survey context, if a respondent has not heard all of a particular question, the interviewer will reread it for him; but a respondent with a serious hearing problem may have difficulty with most or all of the survey questions--even though the interviewer is speaking louder than normal. The quality of the interaction and the data obtained in this type of situation can deteriorate very rapidly, especially if the survey is being conducted over the telephone. Oftentimes, the respondent becomes annoyed or self-conscious about constantly asking to have questions repeated, and the interviewer begins to paraphrase questions instead of reading them exactly in an effort to expedite the survey. For some questions, the respondent may simply provide an answer to the question he thought he heard, and the interviewer will record that answer as long as it matches one of the acceptable response precodes. Whenever it is apparent that a respondent has a serious sensory deficit, the use of a proxy or special collection procedures should be considered (e.g., scheduling a face-to-face interview, use of a dual-view CAPI instrument for interviews conducted in the home).

Cognition refers to those "processes by which information is acquired, analyzed, and synthesized, including perception, memory, thought, and the processes producing speech and behavior" (Stang and Wrightsman, 1981, p. 14). Within the confines of this all-encompassing definition, we would include such processes as encoding, comprehension, rehearsal, and retrieval; included also would be the processes that make learning (e.g., conditioning, inhibition, discrimination, generalization) and communication possible (e.g., the acquisition of language, the development of concepts and other schemata).

It would be difficult to overstate the central role of cognitive processes in directing and regulating human behavior, yet for much of this century mainstream psychology ignored these processes. The cognitive revolution of the late 1960s provided psychology with a new perspective (e.g., Gardner, 1985). Within federal statistical agencies, the cognitive revolution inspired the

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4/ The senior author (JLE) wishes to thank Douglas Herrmann for sharing his views on the issue of relationships between biological/psychophysiological processes and memory, and for bringing to our attention the thought-provoking article by Leonard Poon (1980).

Cognitive Aspects of Survey Methodology (CASM) movement (e.g., see Jabine, Straf, Tanur, and Tourangeau, 1984). The history and achievements of this movement have been well documented by Jobe and Mingay (in press). We would like to mention, however, that although the majority of CASM-inspired research has been conducted on comprehension processes (e.g., Campanelli, Rothgeb, and Martin, 1989; Lessler, Tourangeau, and Salter, 1989; Jobe and Mingay, 1989; Palmisano, 1988) and retrieval strategies (e.g., Bradburn, Rips, and Shevell, 1987; Jobe et al., 1990; Means and Loftus, in press; Smith, Jobe, and Mingay, in press), more survey-relevant research needs to be done on cognitive concepts and processes that are "content based". For example, more attention needs to be paid to "knowledge structures" such as schemata and scripts that make everything from communication to image management possible (Bartlett, 1932; Fiske and Linville, 1980; Graesser and Nakamura, 1982; Hastie, 1981; Rumelhart and Norman, 1978; Schank and Abelson, 1977; Taylor and Crocker, 1981; cf. Alba and Hasher, 1983; Thorndyke and Yekovich, 1980; for discussions specifically relevant to surveys, see Dippo, 1989; Mathiowetz, Eisenhower and Morganstein, 1990). Other cognitive processes (e.g., logical operations) are important to be sure, but clearly it would be impossible to interpret and respond to real-world events in a meaningful way were it not for knowledge structures. These organized memories serve also as the bases for interrelationships between and among other psychophysiological processes.

Consider an example of how schemata affect the data collection process and interact with other psychophysiological processes. Suppose a census representative calls you at home regarding the Current Population Survey. She mentions that the CPS is the survey the government conducts every month to generate employment and unemployment statistics, so you agree to participate. Three minutes later, after all the relevant labor force questions have been answered, she begins to ask a series of questions on earnings or on family planning (e.g., "How much does Mr. Smith usually earn per week at this job before deductions?"; "How large a family do you want?"). These questions surprise you at first, because your schema (i.e., script) for this particular type of survey does not include questions on income or ideal family size; soon after, you become angry. Emotionally upset, you expend little cognitive effort in answering further questions--that is, you satisfice (Krosnick, in press)--and you may even decide to terminate the interview. These things actually happen, but the point of the example is not to provoke a debate on the merits of asking earnings questions or attaching supplements to the CPS; it is to underscore the key role that knowledge structures play in regulating human behavior. These organized memories not only help us to make sense of the world, they also provide observers with a basis for understanding interrelationships between and among other psychophysiological processes. Similarly, self-schemata may affect how respondents answer survey questions. For example, if a respondent perceives herself to be health conscious, her answers to a series of survey questions on disease-preventive behaviors (e.g, exercise, red meat or alcohol consumption) may be distorted in subtle ways.

Motivation refers to those processes that invite or induce goal-directed behavior. Psychologists (Murray, 1938; Maslow, 1970) often differentiate between two types of motives, primary and secondary motives. Primary motives (e.g., hunger, thirst) are geared to the satisfaction of basic biological needs (e.g., the need for food and water to nourish the body). Secondary motives are directed to the satisfaction of basic social-psychological needs (e.g., the need to interact with others). Maslow (1970) has proposed a hierarchy of human needs which has implications for human behavior. The most powerful or influential needs lie at the bottom of the hierarchy, the least powerful or influential, at the top; the ordering from bottom to top is as follows: physiological needs (e.g., food, water), safety needs (e.g., security, stability, freedom from fear and anxiety), love/belongingness needs (e.g., affection, solidarity with others), esteem needs (e.g., desire for achievement, mastery; desire for status, reputation), and self-actualization (i.e., the desire to be all that one can be). According to Maslow, it is the satisfaction of lower order needs that dominates our lives and our behavior; very few of us achieve self-actualization.[5]

5/ It is worth noting that there is no level of needs in Maslow's hierarchy speaking to the issue of survey participation; in other words, most people probably do not sit by their telephones at night waiting to be called by a

Sometimes questionnaire designers are so concerned with the cognitive demands being placed on respondents (e.g., recall over extended reference periods), they fail to recognize the potentially overriding significance of motivational variables. For example, when respondents are asked sensitive questions in a survey situation (e.g., questions on drug use or sexual behavior), motivational considerations become very important and may affect responding in unexpected ways. In an exploratory study of response tendencies to sensitive questions, Esposito et al. (1990) asked volunteers recruited from a drug treatment clinic how they thought survey participants might respond to a subset of questions appearing on a draft version of the National Household Seroprevalence Survey (NHSS); this survey requests information on behaviors that place individuals at a high risk for transmitting or contracting the human immunodeficiency virus. The responses that male volunteers provided to a question pertaining to the frequency of heterosexual contacts in the previous 12 months are instructive. Most believed that participants would overreport sexual activity; a few thought participants would underreport. The explanations provided for both overreporting and underreporting had to do with image management, a motivational concern. The former group thought that participants would want to maintain a macho image of themselves, whereas the few individuals in the latter group thought that participants might prefer not to be viewed as persons who engaged in such high-risk behavior. These responses suggest that, for some groups, the misreporting of sexual behavior is attributable not so much to faulty cognitive processing (e.g., retrieval failure), but rather to motivational considerations (i.e., image management).

Emotion refers to those psychophysiological processes that are experienced as either distinctly pleasant (e.g., happiness, joy) or distinctly unpleasant (e.g., anger, disgust). Mood, a closely associated concept, refers to "a passing emotional state ... that tends to pervade and influence an individual's thoughts, behaviors, and experiences during its occurrence (Stang and Wrightsman, 1981, p. 60). Research by Bower and his associates (see Bower, 1981) has demonstrated that emotional states can affect such cognitive processes as free associations and social perceptions. The Stanford-based research program has also provided evidence for mood-state dependent memory (i.e., events encoded in a particular mood state are more easily retrieved if the individual is in the same emotional state during the recall attempt; for reviews of this literature, see Johnson and Magaro, 1987; Singer and Salovey, 1988). Bower's research carries some interesting implications for conducting surveys. For example, experienced interviewers can usually avoid angry individuals when selecting a respondent from the household roster (e.g., they can ask to speak to someone who is not so "busy" or they can offer to call back at a "better time"); and doing so would appear to be an especially prudent strategy in the case of sensitive-topic surveys like the NHSS. Besides the obvious reasons for not wanting to interview such a person, Bower's findings suggest that an angry respondent would be much more likely to perceive the interviewer as a potential law-enforcement collaborator than as a neutral data collector. Another implication of Bower's research is to expect more retrieval failures for certain types of questions than for others. For example, a cancer patient in a positive state of mind (perhaps because his/her cancer is in a state of remission) presumably would have less success recalling each in a series of painful chemotherapy treatments than a similar number of pleasant physical treatments, because it is more likely that the former were encoded when the respondent/patient was in a negative state of mind (e.g., depression) (for related research, see Eich et al., 1985; Salovey, Jobe, and Willis, in

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[Continuation of footnote 5] market research firm or the Census Bureau. In fact, to the extent that people have other things they want to do, surveys are essentially intrusive. The argument that surveys benefit society in the long run (i.e., by determining what consumers/citizens do, think, or want) may prove persuasive to the model citizen or to the individual who feels strongly about a particular issue (e.g., gun control), but it simply will not do for those of us who have come to expect immediate payoffs for our time and effort. Problematic as this and the following may seem, the sooner we recognize that most surveys are imbalanced social exchanges (i.e., the respondent gives and the sponsor/interviewer takes), the sooner we will take steps to rectify the imbalance (see Table 1, "Incentives" category). For a more generous evaluation of the nature of this social exchange, the interested reader is directed to Converse and Schuman (1974, pages 55-59).

press). It is important not to get carried away here: affective state is but one of many features of an event encoded in memory (for others, see Underwood, 1969). Inducing mood states as a means of improving recall may not be as practical or efficient a strategy as using less problematic retrieval cues (e.g., reading a script of the chemotherapy treatment process and including photographs of the treatment room) (see Means and Loftus, in press).

Except when these psychophysiological processes are being actively inhibited (e.g., during sleep), they are presumed to be ongoing. As for organizational preeminence, there are good reasons for viewing cognition as the dominant set of processes (e.g., the central role these processes play in the construction of meaning and in the regulation of adaptive behavior), but motivation and emotion also exert powerful influences on behavior in certain situations. Perhaps the only tenable position, then, is to recognize that all of these processes play important roles in directing and regulating human behavior--including the behavior that ensues when individuals agree to serve as survey respondents.

A MODEL OF THE SURVEY INTERACTION PROCESS

To this point, we have presented a taxonomy of the survey context and have described in very general terms the biological and psychophysiological characteristics of survey participants. The third component in our framework is a descriptive model of the survey interaction process (SIP); the seven phases that comprise the model are identified below and described on the following pages:

1. Interviewer and Respondent Orient Themselves Within the Survey Context
2. Interviewer Asks Question
3. Respondent Processes Question and Provides Answer
4. Interviewer Processes and Records Respondent's Answer
5. Interviewer and Respondent Reorient Themselves and Proceed to Next Question [Recycle to Phase 2, or proceed to Phase 6]
6. Interview Is Concluded
7. Interviewer Reviews/Adjusts Protocol [optional phase]

In the case of face-to-face interviews, the interaction process (see Figure 1)[6] is best represented as an ongoing verbal and nonverbal exchange between the interviewer and the respondent (Kahn and Cannell, 1957; Suchman and Jordan, 1990; Sudman and Bradburn, 1974); hence the behavioral time lines are drawn parallel to one another with bidirectional arrows in between. In the case of telephone interviews, the exchange is primarily verbal. Several phases (2, 3, and 4) overlap with one another, while others are best viewed as temporally distinct.[7] Also, the question asking/responding/reorientation segment of the

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6/ Of course, reality is never quite as neat and simple as the schematic diagrams we generate in our feeble attempts to model it, and that is certainly true of Figure 1. The reader unfamiliar with the actual conduct of surveys might look at this figure and conclude that the question-asking-and-answering sequence (phases 2-5) proceeds smoothly and effortlessly; nothing could be further from the truth. Respondents oftentimes have difficulty either understanding what information the interviewer is requesting or retrieving that information from memory. They request clarification or provide qualified answers. Interviewers occasionally have difficulty categorizing a respondent's answer. They are required to probe when respondents give inadequate answers and to provide feedback when respondents request clarification. It is anything but smooth and effortless, interpersonal communication rarely is, and it is no big deal--language is far from a perfect invention. To summarize, the above are examples of the types of exchanges that often take place in person-to-person interviews; unfortunately, because their representation would complicate our presentation of the model, these exchanges have not been made as explicit as we might have liked (see bidirectional arrows).

7/ To be completely consistent with the organismic assumption of ongoing change, the reorientiion box in Figure 1 should really be represented as overlapping with phases 2, 3, and 4. We thought that might make the model overly complex. Again, it is very difficult to represent complex human interactions with boxes and arrows--and only two dimensions.

Figure 1. A Model of the Survey Interaction Process

Phase Sequence:

1. Interviewer and Respondent Orient Themselves Within Survey Context
2. Interviewer Asks Question
3. Respondent Processes Question and Provides Answer
4. Interviewer Processes and Records Respondent's Answer
5. Interviewer and Respondent Reorient Themselves and Proceed to Next Question [Recycle to Phase 2, or proceed to Phase 6]
6. Interview Is Concluded
7. Interviewer Reviews and Adjusts Questionnaire Protocol

Schematic Diagram:

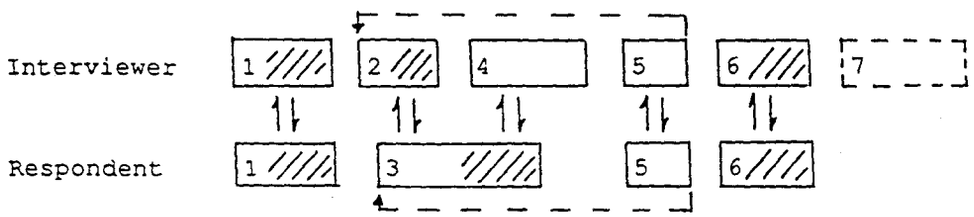

Diagram Key:

Phase with Directed Verbal Communication

Information-Processing Phase

Optional Phase

Bidirectional Verbal and/or Nonverbal Communication

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model (phases 2 through 5) recycles until the interview is either completed or abruptly terminated. Let us now look at each of these phases in greater detail.

Phase 1: Interviewer and Respondent Orient Themselves Within the Survey Context. During this first phase of the interaction process, the interviewer and the respondent orient themselves to one another, to the setting, and to the task at hand (i.e., completing the interview as accurately and expeditiously as possible). It is here that information is usually exchanged between participants regarding such things as the survey's purpose and the characteristics of household members (i.e., household roster data). As Sudman and Bradburn point out, the survey participants assume complementary roles: It is the interviewer's role "to obtain [accurate] information" and the respondent's role "to provide [accurate] information" (1974, p.17). The behavior of each participant is circumscribed by these roles and by other social norms regarding such interactions [however, see Suchman and Jordan (1990) for a provocative discussion of how interviews differ from typical verbal interactions]. To the extent that participants deviate substantially from their prescribed roles, one can expect to find that the data collected later in the interview will be subject to response errors (Sudman and Bradburn, 1974). All subjectively salient aspects of the interview context--for example, administration mode, interviewer and respondent characteristics, response security level, item characteristics, survey sponsorship, et cetera--have the potential to affect the outcome of the orientation phase (i.e., enlisting the support and cooperation of a conscientious respondent in the information-gathering process) and the quality/validity of data collected subsequently (Sudman and Bradburn, 1974; Cannell, Marquis, and Laurent, 1977; Kahn and Cannell, 1957; Groves, 1989). In very general terms, the decision to

participate will depend in part on what interviewers and respondents think and feel about one another, and in part on what they think and feel about the survey.

Phase 2: Interviewer Asks Question. After the initial orientation phase is over, the interviewer reads the first item on the questionnaire. In considering the possibilities for miscommunication of question meaning, we must consider not only question wording (e.g., clear vs. ambiguous terminology) and item characteristics (e.g., focus, content, sensitivity), but also the position of the item within the questionnaire itself (e.g., context effects) and the interviewer's reading style (e.g., enunciation, speed). As Suchman and Jordan (1990) point out, the issue of question meaning is much more complex that the sequence of words that comprise a particular survey question; it involves the entire context, everything that the participants say and do and bring with them into the interaction (e.g., attitudes, emotions, beliefs, expectations). To the extent that severe contraints are imposed on the interviewer (e.g., strict rules against rephrasing any question the respondent finds confusing or ambiguous), the data collector runs the risk of obtaining something less than valid information.

Phase 3: Respondent Processes Question and Provides Answer. Even as it is being read by the interviewer, the respondent is processing the content of the question and considering his/her response--or the request for clarification he/she intends to make if the question is not clear. There are several good models of the question answering process (Cannell, Miller, and Oksenberg, 1981; Strack and Martin, 1987; Strube, 1987; Tourangeau, 1984, 1989; Willis, Royston, and Bercini, in press). The model we feel most comfortable with was first developed by Marquis (Cannell, Marquis, and Laurent, 1977) and later refined by Cannell and his colleagues (Cannell, Miller, and Oksenberg, 1981). It can be summarized as follows. Depending on the degree to which the survey participant is willing to be a conscientious respondent, the number of steps in the question answering process will vary (Cannell, Miller, and Oksenberg, 1981, p. 393, Figure 1). The ideal respondent will proceed through the following sequence: (1) comprehension of the question, (2) further cognitive processing (i.e., assessment of informational requirements, retrieval of appropriate cognitions, organization and response formulation), (3) evaluation of response accuracy, (4) evaluation of response in terms of personal goals, and (5) communication of response. For the less-than-ideal respondent (i.e., one who is unmotivated to cooperate or who does not fully understand a particular question), the response generation/selection process can become sidetracked by situational cues (steps 6 and 7). In step 6, which can follow any of the first four steps described above, the respondent internally modifies his/her answer to a question on the basis of situational cues that emanate from the interviewer (e.g., status, appearance), the questionnaire (e.g., context effects), or the respondent himself. In step 7, the cues alluded to in the previous step result in specific response biases (e.g., desirability bias, acquiescence bias) and the outcome is a response that is either incomplete or inaccurate (Cannell, Miller, and Oksenberg, 1981, pp. 393-396). Again, we believe this to be a very useful model; but in view of the theoretical material presented earlier in the paper, we want to be explicit in pointing out that the entire process is also subject to influences originating from biological systems (e.g., poor health, fatigue) and from other psychophysiological processes (e.g., extreme emotional states, sensory deficits).

Phase 4: Interviewer Processes and Records Respondent's Answer. A very important aspect of the interaction process is the way in which the interviewer interprets and records the answers provided by the respondent. There would appear to be parallels between the question-answering process (Phase 3) and the response-categorization process; in the former, the respondent must interpret the question appropriately in order to provide a valid answer, and in the latter the interviewer must interpret the respondent's answer appropriately in order to properly categorize it. Many of the same cognitive processes are involved (e.g., comprehension of the response, further cognitive processing, evaluation of response appropriateness, response categorization), so similar types of errors can be anticipated (e.g., faulty inferences about what the respondent said or meant to say; Kahn and Cannell, 1957, p. 19). Even more basic than the interpretation of a respondent's answers is the interviewer's understanding of the survey question. If interviewers have only a fuzzy understanding of the intent of a particular question--for whatever reason (e.g., awkwardly worded question, inadequate training)--they are apt to provide

inaccurate feedback when respondents request clarification or they may fail to probe when respondents provide an inadequate response. Both scenarios contribute to response errors.

Now that phases 3 and 4 have been described, we wish to digress for a moment to make our position on "response error" explicit. Response error, in the sense intended here, has been defined by one source (Sudman and Bradburn, 1974, p. 2) as the difference between the true answer to a question and the respondent's answer to that question. Although we recognize that, in some cases, response error can be attributed with justification (a) to interviewers (e.g., for not following standard interviewing procedures, or for following them too closely; see Suchman and Jordan, 1990; see also Means, Swan, Jobe, and Esposito, in press), (b) to respondents (e.g., for not making the effort to retrieve requested information; see Krosnick, in press), or (c) to specific questions or, more appropriately, to question designers (e.g., for wording or phrasing questions ambiguously; see Belson, 1981), we are more inclined to view response error as a collaborative effort. That is, we view response error as the outcome of an interactive process that involves the interviewer, the respondent, and, in many cases, the survey/question designer as well--a process that takes place within a particular temporal and situational context, and one that is greatly affected by that context. The three participants will not always play equally significant roles, but usually they all contribute something.[8] And if we are to characterize response error as a collaborative effort, to be consistent, we would have to characterize "response accuracy" in the same manner.[9]

Phase 5: Interviewer and Respondent Reorient Themselves. Every question asked on a survey changes the respondent and the interviewer to some degree and adds something to the survey context. And to the extent that questions differ in content, they require some form of reorientation on the part of the respondent especially. The extent or degree of reorientation experienced is intimately connected with the nature of the question and its placement within the questionnaire itself. For example, sensitive questions (e.g., "How much money

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8/ Let us clarify this point with an example that draws on our experience with the industry and occupation (I/O) series of the Current Population Survey. The I/O series asks respondents to provide information on the jobs at which they and other household members are employed (e.g., "For whom does Mr. Smith work?", "What kind of work was Mr. Smith doing?"). As straightforward as these questions appear, they can produce some very unrealiable data (Collins, 1975). Who is responsible for this state of affairs? Is it the respondent? Is it the interviewer? Perhaps, the questionnaire designer is responsible? The answer to the first question, we will argue, is that all the participants are probably responsible to some extent. Consider this sequence of events. Mrs. Smith is asked to provide industry and occupation data about her husband, who, like some husbands, does not like to talk a great deal about his job; but over the years, she has picked up some odds and ends about what he does. In response to the "What kind of work was Mr. Smith doing?" question, she tells the interviewer what she knows, but because the question is very general, she goes on for several minutes. The interviewer is hard pressed to keep up; he jots down those things that seem relevant and lets the rest go. The information on occupation is later coded by an individual in Jeffersonville, Indiana, who only has the information that the interviewer could jot down from the discussion with Mrs. Smith. Let us assume that the information provided is somewhat ambiguous and, as a result, Mr. Smith's occupation is coded improperly. To whom do you assign responsibility for the response error? Mrs. Smith? The interviewer? The coder? The person who designed the occupation questions? We think it should be viewed as a collaborative effort, and we believe that response errors associated with other types of questions may follow a similar pattern.

9/ To accentuate the collaborative nature of this concept, let us operationally define response accuracy as the appropriate, truthful answer to an unambiguous question that has been read by the interviewer in the manner intended by the question designer. What should make us somewhat optimistic about the survey interaction process is that we oftentimes obtain accurate answers to the questions we ask even when those questions are worded ambiguously (Belson, 1981) and/or when they have not been read as intended.

did you earn last year?") can be very "expensive" in terms of psycho-physiological processing. In addition to cognitive processing (e.g., retrieval of dollar amounts for salary, interest, dividends, etc.), there will be a certain amount of motivational processing having to do with the likely consequences of answering the question truthfully (e.g., suspicion as to the sponsor's intent, self-presentation strategies). Such questions can have dramatic effects on the respondent's orientation (e.g., movement from a neutral to a defensive posture) and, for just this reason, sensitive items generally appear near or at the end of a questionnaire. Attitudinal questions provide another case in point. Due in part to the cognitive reorientation that occurs after such questions are asked and answered (e.g., priming effects of a context question on the respondent's interpretation of what information is being requested in a subsequent target question; see Strack and Martin, 1987), the relative positioning of attitudinal questions within a survey has been shown to influence how they will be answered (Schuman and Presser, 1981; Tourangeau and Rasinski, 1988).

Having completed the discussion of the first five phases, let us now address briefly the issue of questionnaire length. As we mentioned above, every question asked and answered on a survey changes the respondent and the interviewer to some degree. And because questions take both time and effort to answer accurately (i.e., the continuous recycling of phases 2 through 5), questionnaires containing a relatively large number of items tend to drain the conscientious respondent both psychologically and physically; the effects on the interviewer would appear to be similar. Depending on the nature of the survey/questionnaire, there are presumably limits to how many questions respondents will answer before losing enthusiasm. Generally speaking, respondents do not appear willing to devote excessive amounts of time or energy to a survey; as a result, one can reasonably expect to find that the quality of response data will decline for the latter items on excessively long questionnaires. This is something that survey sponsors must not lose sight of, because as Groves (1987, 1989) has persuasively argued, there are clearly tradeoffs between survey costs and survey errors.

Phase 6: Interview is Concluded. The way in which an interview is completed can have carryover effects for subsequent contacts. Interviewers who are cordial and carefully explain when and why subsequent contacts are necessary are more apt to enlist the continued cooperation of respondents than interviewers who are abrupt or taciturn. And even if subsequent contacts are not necessary, an appreciative interviewer will improve the quality of the respondent pool for other surveys.

Phase 7: Interviewer Reviews/Adjusts Protocol. Given the time constraints that most surveys must adhere to, it may not always be possible for interviewers to record the entire answer to open-ended questions. In such cases, the interviewer may jot down a few key words and wait until after the interview is concluded to review and adjust those items for which he/she has recorded only a partial answer. The obvious problem with this practice is that the reconstruction process can be biased by the answers the respondent gave to other questions, or by the interviewer's own inferences about what the respondent intended to report. According to Kahn and Cannell, recording errors occur "...because of interviewers' tendencies to round out, amplify, or otherwise modify responses. The interviewer may attempt, for instance, to make logical or articulate in his recording an illogical or incomplete response, or even a response which he is convinced the person was 'about to give'" (1957, p. 19).

Now that the seven phases of the survey interaction process have been described, we would like to mention briefly some of the model's more interesting features: (1) it recognizes and highlights the interactive nature of most survey interviews (Kahn and Cannell, 1957; Suchman and Jordan, 1990; Sudman and Bradburn, 1974); (2) it takes a holistic view of the interaction process and, as a consequence, views response accuracy and response error as a collaborative effort involving the interviewer, the respondent, and the survey/question designer; (3) it takes account of behaviors (e.g., interpersonal and survey-relevant orientations) that models of the question-answering process tend to ignore (e.g., Tourangeau, 1984; Strack and Martin, 1987); (4) it incorporates psychophysiological processes (e.g., sensation, motivation, emotion) that are sometimes overlooked or understated in these models, and

(5) it draws attention to the temporal dimension of the survey interaction process (i.e., the question recycling loop) which, as Groves (1987, 1989) points out, can have serious cost and quality implications.

A PLAN FOR SYSTEMATIZING SURVEY METHODOLOGICAL RESEARCH

The survey methodological literature, already quite substantial, is growing larger every year; and our familiarity with that literature is far too modest to delineate a research agenda for the 1990s. In this section of the paper, we are more interested in suggesting ways of systematizing that body of research than we are in presuming to tell social scientists what specific research efforts should be undertaken in the coming decade. Before presenting some ideas on systematization however, we want to be explicit about two of our research biases. First, because of the inherent complexity of survey contexts and the collaborative nature of the survey interaction process, we are methodological pluralists who lean more to descriptive and relational research (e.g., small-scale lab/field simulations, ethnographic studies) than to narrowly focused experimental research (Rosenthal and Rosnow, 1984). Second, because standard experimental and quasi-experimental designs manipulate a limited set of "independent" variables (and tend not to be replicated), we favor programmatic survey research that involves sets of investigations which deal systematically with specific research issues (e.g., the quality of proxy responding). These research preferences are simply extensions of the theoretical material presented in previous sections.

Having made our biases explicit, we now present some ideas on systematization. Before a community of researchers can move forward, they must have a clear understanding of where they have been. The traditional way of documenting a large body of research is to write comprehensive books on the general topic of interest;[10] and there have been some impressive efforts made in the area of surveys (e.g., Groves, 1989). And while we recognize that there will always be a need for comprehensive reviews of specialized knowledge domains, this method of documenting and communicating technical knowledge is becoming increasingly problematic. One reason for this is the proliferation and complexity of scientific research. There are simply too many studies to be reviewed and too little page space available for describing research designs and results adequately. This would appear to be especially true in the social sciences, where there is a growing realization that interdisciplinary research is the most efficient way of tackling complex problems. A second reason is that once a book is written, one cannot reorganize its contents to address specific research questions. A third reason is the emergence of the computer as an information-management tool. We think centralized computer databases are a much more efficient method of storing and communicating technical information, and we advocate their use for systematizing and utilizing the vast literature on survey research. This is certainly not a novel idea. In 1974, Sudman and Bradburn developed an information-management plan in their study of response effects that we find both attractive and practical. The specifics of such a plan are discussed below.

To make access to the literature database efficient, survey research must be coded so that users can select studies that are of interest to them. To guide the selection process, we recommend the use of a maximally flexible coding scheme that identifies the key features of a research report without being overly complicated or burdensome. As a preliminary proposal, we would like to suggest a coding scheme (see Table 2) that is based on our taxonomy of contextual variables (for a more detailed coding scheme, see Bradburn and Sudman, 1974, Appendix A). Studies could be selected for review on the basis of key words, methods, or any of a variety of other research characteristics. This would be very similar to computerized search systems (e.g., ERIC; the Survey Methodology Information System maintained by the Inter-University

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10/ A more focused approach is the specialized monograph or series report (e.g., Cannell, Marquis, and Laurent, 1977). The federal government, for example, sponsors the publication of several statistical series reports that address survey research issues (e.g., Statistical Policy Working Paper Series, sponsored by the Federal Committee of Statistical Methodology); these reports also generally include reviews of the relevant literature.

Table 2. Coding Categories for Systematizing Survey Research

A. Key Words (list up to five):
A1: _____.
A2: _____.
A3: _____.
A4: _____.
A5: _____.

B. Research Methodology
B1: descriptive research (e.g., enthnographic method)
B2: relational research (e.g., correlational designs)
B3: experimental research (e.g., 2x3 factorial design)

C. Contextual Variables (code all that apply)
C1: Interview Setting
- C1a: location of interview
  - C1a(1): respondent's home
  - C1a(2): interviewer's office
  - C1a(3): neutral setting
- C1b: characteristics of location
  - C1b(1): security
  - C1b(2): presence of observers
- C1c: other salient characteristics (please specify)

C2: Respondent Characteristics
- C2a: demographic characteristics
  - C2a(1): gender
  - C2a(2): age
  - C2a(3): race
- C2b: socioeconomic status (SES) characteristics
  - C2b(1): education level
  - C2b(2): income level
- C2c: organismic characteristics
  - C2c(1): biophysiological status
  - C2c(2): psychophysiological status
  - C2c(3): other salient characteristics
- C2d: experiential characteristics
  - C2d(1): relevant past experience
  - C2d(2): knowledge of, and interest in, subject matter of survey

C3: Interviewer Characteristics
- C3a: demographic characteristics
  - C3a(1): gender
  - C3a(2): age
  - C3a(3): race
- C3b: socioeconomic status (SES) characteristics
  - C3b(1): education level
  - C3b(2): income level
- C3c: organismic characteristics
  - C3c(1): biophysiological status
  - C3c(2): psychophysiological status
  - C3c(3): other salient characteristics
- C3d: experiential characteristics
  - C3d(1): relevant past experience
  - C3d(2): knowledge of, and interest in, subject matter of survey

C4: Survey Publicity Method
- C4a: advance correspondence from the sponsor of the survey
- C4b: "cold contact" procedures
- C4c: use of the media
- C4d: word of mouth
- C4e: other (please specify)

C5: Survey Sponsorship
- C5a: public/governmental sponsorship
- C5b: university/survey-research-center sponsorship
- C5c: private industry sponsorship
- C5d: other (please specify)

C6: Survey/Interview Administration Mode
- C6a: face-to-face interview
  - C6a(1): paper-and-pencil format
  - C6a(2): computer-assisted format

C6b: telephone interview
C6b(1): paper-and-pencil format
C6b(2): computer-assisted format
C6c: self-administered questionnaire
C6d: other (please specify)

C7: Response Security Level
C7a: complete anonymity
C7b: confidentiality
C7c: restricted availability
C7d: unrestricted availability
C7e: other (please specify)

C8: Attributes of the Survey Instrument
C8a: questionnaire characteristics
C8a(1): nature of questionnaire
C8a(2): length of the questionnaire
C8a(3): pace of questionnaire
C8a(4): homogeneity/heterogeneity of items on the questionnaire
C8a(5): information source
C8b: item characteristics
C8b(1): the target of the question
C8b(2): the focus of the question
C8b(3): the content of the question
C8b(4): the desirability or sensitivity of the question content
C8b(5): the response format of the question
C8b(6): the length and complexity of the question
C8b(7): other (please specify)

C9: Incentives
C9a: monetary incentives
C9b: tangible, non-monetary incentives
C9c: verbal incentives
C9d: other (please specify)

D. Brief Summary of Findings: _____

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_____

_____

ID. Reference Identifiers:
ID1: Author Name(s)
ID2: Title of Work
ID3: Type of Reference
ID3(a): book
ID3(b): published article
ID3(c): series report (e.g., government, survey research center)
ID3(d): conference paper
ID3(e): other (please specify)

Consortium of Political and Social Research, at the University of Michigan); the difference, of course, is the nature of the information encoded in the system. Once the database is in place--and we realize getting it in place will be a monumental task--it can be used for a variety of purposes. For example, a "research locator matrix" can be developed that enables users to select studies on the basis of key features (see Table 3); the pool of studies retrieved could then serve as the basis for a literature review, as a tool for identifying gaps in the literature, or as a foundation for planning programmatic research.

To conclude, the proposed systematization of the survey methodological literature would make it possible for social scientists to review an ever expanding body of research in a very efficient manner; and to the extent that researchers would also be exposed to a large body of interdisciplinary work, this system could facilitate the discovery of patterns/interrelationships among contextual variables. It is our hope that a system of this type will serve to stimulate ambitious programmatic research efforts, which, in our view, hold the greatest promise for advancing our understanding of the survey interaction process.

Table 3. Simplified Research Locator Matrix

Example of Use: An individual interested in the effects of survey sponsorship (C5) on nonresponse in drug-use surveys would access the relevant literature in cells "a" (nonresponse, drug use), "c9" (drug use surveys/questions), "d" (findings), and "id" (authors, reference type, title of work).

Category Codes:
A. Key Words
B. Research Methodology
C1. Interview Setting
C2. Respondent Characteristics
C3. Interviewer Characteristics
C4. Survey Publicity Method
C5. Survey Sponsorship
C6. Survey/Interviewer Administration Mode
C7. Response Security Level
C9. Attributes of the Survey Instrument
D. Brief Summary of Findings (Not a search variable.)
ID. Reference Identifiers

Category Codes

	A	B	C1	C2	C3	C4	C5	C6	C7	C8	C9	D	ID
A													
B													
C1													
C2													
C3													
C4													
C5	**a**	-	-	-	-	-	-	-	-	-	**c9**	**d**	**id**
C6													
C7													
C8													
C9													
D													
ID													

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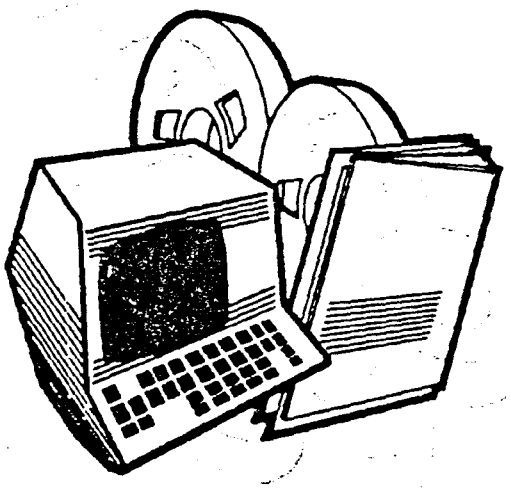

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Discussion

Eleanor Singer
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It may be useful to locate the two papers we heard today within a broader framework. One such framework is what survey methodologists refer to as "nonsampling errors in surveys" (e.g. Groves 1987, 1989) and cognitive psychologists refer to as cognition and survey research (e.g. Jabine, Straf, Tanur, and Tourangeau 1984; Hippler, Schwartz, and Sudman 1987). The paper by Shepherd and Vincent is closer to the "nonsampling error" pole of the typology, whereas the approach of Esposito and his colleagues is perhaps closer to that of the cognitive psychologists. That is, Shepherd and Vincent conceptualize a variety of interviewer behaviors as being either correct or not, with incorrect behaviors hypothesized as leading to "error" in the survey responses obtained. Esposito and Jobe, on the other hand, take a more neutral stance, conceptualizing a large range of variables as potentially influencing survey responses by changing the respondent's definition of the situation. They view responses as shaped by the context of the interview, by the characteristics of survey participants, and by the interactions between interviewers and respondents, but they do not necessarily think of responses as being objectively "true."

An alternative framework in which the two papers can be located is that of Groves' "measurers" and "reducers" (Groves 1987), with Shepherd and Vincent seeking primarily to learn about interviewer behavior in order to reduce response errors associated with that behavior, whereas Esposito and Jobe try to model and measure the behavior of both interviewers and respondents in order to understand more about the processes involved. In a sense, the Shepherd and Vincent paper can be located within section 3 of the Esposito and Jobe paper. Both papers promise significant advances for research. I'd like to begin by discussing the Shepherd and Vincent paper and then move on to that by Esposito and Jobe.

Interviewer Behavior

The research by Shepherd derives from, and extends, a long tradition of research specifically on interviewer behavior and interviewer effects (e.g. Cannell, Oksenberg, and Converse 1979; Cannell, Miller, and Oksenberg 1981; Groves and Mathiowetz 1984; Groves and Magilavy 1986; Hyman et al. 1954; Singer and Kohnke-Aguirre 1979; Singer, Frankel, and Glassman 1983; Sudman 1979; Tucker 1983). Within that tradition, we can distinguish at least two approaches. One aims to measure the fraction of total response variance associated with interviewers (e.g. Groves and Magilavy 1986; Tucker 1983). The second is interested primarily in identifying and controlling specific behaviors or qualities of interviewers that are associated with better or worse responses (e.g. Cannell, Oksenberg, and Converse 1979; Hyman et al. 1954; Singer, Frankel, and Glassman 1983; Sudman 1979). The study by Shepherd and Vincent clearly falls in the latter category.

Past studies on interviewer effects present us with something of a paradox. Those studies that have concentrated on measuring the contribution of interviewers to total response variability have generally concluded that this contribution is modest, especially in telephone interviews. Groves and Magilavy (1986), in a thorough investigation of this topic, conclude that the intraclass correlation coefficient for interviewers clusters below .01 on SRC telephone surveys, whereas those from personal interviews average closer to .02. (Of course, the total effect of interviewers will increase dramatically when a small number of interviewers take a large number of interviews, as is generally the case in telephone surveys.)

Furthermore, even though past studies of interviewer behavior, such as those by Blair (1979), have found that nonprogrammed interviewer speech behaviors occur on over half the questions in face-to-face interviews, neither Blair nor Groves and Magilavy (1986) have found any evidence that these deviations affected responses.[1] As Blair puts it, "The behaviors occur, but they do not affect the data." (1979, p. 50) He goes on to

1. Another interesting, and somewhat disconcerting, finding by Blair was that nonprogrammed speech behaviors increased (though not significantly) with interviewer experience. More experienced interviewers "made more reading errors, engaged in more variations, probed more often, and gave more feedback." (1979, p. 49) Presser and Zhao (1990), however, found no relationship between accuracy in asking questions and interviewer experience.

say that perhaps different methods are needed to capture the effects of these behaviors on responses.

So, total variance attributable to interviewers is small, and nonprogrammed interviewer speech behavior, though quite frequent, apparently has no discernible impact on responses. At the same time, studies that have hypothesized specific interviewer effects -- e.g., the effect of interviewer expectations on response (Hyman et al. 1954; Sudman 1979; Singer and Kohnke-Aguirre 1979; Singer, Frankel, and Glassman 1983) or race-of-interviewer effects (Schuman and Converse 1971; Schuman and Hatchett 1974) -- have tended to find support for such effects, though generally they have been unable to specify the means by which they come about.[2] Thus, under certain conditions, interviewers can have substantively important effects on responses. The task for research is to specify the conditions under which, and the processes by which, this occurs.

The study of interviewer behavior by Shepherd and Vincent really consists of at least two studies and two separate coding systems. One coding system is designed to measure what they, following Cannell, call "interviewer compliance" -- in the first place, compliance in asking questions, which means both asking those questions that should have been asked, and asking them as written; and second, compliance in probing -- which again refers both to probing when it is appropriate and also to probing in an appropriate fashion.

Applying this coding system to 6,810 questions on 48 interviews, Shepherd and Vincent find that interviewers follow correct skip patterns 96% of the time, with only 4% of the questions skipped when they should have been asked. But what is amazing is not the small percentage of incorrect omissions, but rather how, given the constraints of a CATI system, such omissions could have occurred at all! Groves and Mathiowetz (1984), for example, estimate that such errors occurred 1.8% of the time with a CATI system and 8.8% of the time in telephone interviews using paper and pencil questionnaires. Using a CATI system, it ought to be possible virtually to eliminate this type of error, and such an outcome is precisely the kind of benefit envisaged by Shepherd and Vincent's research.

Shepherd and Vincent also report that 94% of the questions were asked as written, and another 4% with minor variations. (No figures are presented, in this preliminary report, on interviewer compliance with probing instructions.) Presser and Zhao (1990) report that 92% of questions in their study were asked as written, and note that these levels are similar to rates reported in other centralized telephone studies but much higher than those in face-to-face studies. If we compare the Shepherd and Vincent figure with Blair's (in his study, only two thirds of the questions were asked as written), then it is clear that the combination of computer-assisted and telephone interviewing brings about a tremendous increase in the accuracy of reading the question. It would be useful to know just how much the computer contributes to the compliance observed with telephone interviewing alone, and whether the use of CAPI will bring about the same error reduction.

The second coding system, designed by Shepherd and Vincent to capture the interaction of interviewers and respondents much as Bales' system of categories (1976) was designed to capture the interaction among members of task-oriented groups, is much more elaborate, and the authors have barely begun to exploit its possibilities. Once satisfactory levels of intercoder reliability have been achieved with this system, many kinds of analyses will become possible. For example, characteristics of the interviewers, as well as characteristics of the questions, can be linked to interviewer behavior. Number and type of interactions can be related to question type, on the one hand, and to data quality, on the other. And other classificatory schemes -- for example, sensitive and nonsensitive questions -- can be introduced into the analysis, as well.

Use of this analytic tool should make it possible to achieve the goals of survey methodologists as well as cognitive psychologists. On the one hand, it should make possible improvement of interviewer compliance with the intent of the questionnaire

2. In his work on response quality, Cannell has demonstrated that certain programmed behaviors on the part of the interviewer lead to more detailed reporting, or to the reporting of more episodes, by the respondent. But this is different from being able to account for hypothesized connections between, say, interviewer expectations or interviewer race and a particular pattern of responses by specifying the interviewer behaviors involved.

developer, and investigation of whether or not compliance, in turn, is associated with reduced response error and/or reduced survey cost, which are after all the two payoff variables in research on interviewing. On the other hand, and equally important, it should also make it possible to study the processes -- the behaviors -- by which interviewers influence survey responses.

There are two preconditions for these outcomes. One -- the relatively simpler -- is coding reliability, which the authors are working on. The second, more complex, is development of a scheme for categorizing interactions which is capable of explaining the dependent variables of interest. The authors are well on the way to developing such a scheme, but perhaps that scheme is worth a little more thought. Perhaps the reason we have failed to find effects of interviewer behaviors in the past is because we have not adequately conceptualized what this behavior means for the respondent's motivation or understanding. For example, how should an "Un-hun" by the interviewer be coded? Is it a reinforcement of the previous response? Is it an expression of solidarity with the respondent? Is it a random noise the interviewer makes to fill the pause while she enters a response? Is it an irritant to the respondent? Does "Un-hun" function in all of these ways, or sometimes in one and sometimes in another (or does it, perhaps, have a different meaning still)?

I have no better categorization scheme in mind than the one being developed by Shepherd and Vincent. I would just like to caution that there are many potential schemes, that they do not inevitably emerge from the data, and that the choice among them should probably be theory-driven. This promises to be an enormous task, but potentially a very rewarding one.

A General Model of the Survey Interaction Process

Let me turn, now, to the second paper, whose purpose is to provide a theoretical framework that researchers from a variety of disciplines can use to structure and communicate their research ideas and findings. It represents an ambitious effort to construct a comprehensive accounting scheme for all the variables in the interviewing situation that may affect survey response.

Like the paper by Shepherd and Vincent, it may be useful to locate the present one in a broader context. And to my way of thinking, the context for this paper is the area of meta-analysis. Within sociology and survey research, the impetus for meta-analysis probably came from Bradburn and Sudman's book on Response Effects in Surveys (1974), as well as a series of papers by Heberlein and Baumgartner (1978), Eichner and Habermehl (1978), and Goyder (1982). These papers tried, quite successfully, to identify the factors affecting response rates to mail surveys by drawing on a data base of published studies that provided information about the dependent variable, namely response rate, as well as about a large number of independent variables. Since then, the techniques and requirements for meta-analysis have been codified, and meta-analysis has become an accepted method for synthesizing a large amount of information about a given area (Hunter, Schmidt, and Jackson 1982; Glass, McGraw, and Smith 1981; Wolf 1986).

Coding a large number of studies (it doesn't really matter whether they are published studies, as in the case of Bradburn and Sudman or Heberlein and Baumgartner, or prospective ones) with respect to the independent variables listed by Esposito and Jobe might make it possible to identify the major variables having an impact on survey response rates and response quality. And such an undertaking may well represent a useful corrective for the tendency of survey analysts (and, for that matter, cognitive psychologists as well) to focus on one or at most a very few such variables, and thus potentially to misspecify their equations.

But the difficulty with the "model" proposed by Esposito and Jobe is that it is a taxonomy rather than a theoretical framework. And therein, unfortunately, lie its drawbacks as well as its virtues.

The virtue of the taxonomy is its attempt at exhaustiveness -- at specifying all the variables that potentially affect response rates and, more especially, response quality. But the very attempt to be exhaustive makes the model extremely difficult to work with. The list of what is there to be considered is already very long; and in fact the authors intend it to be longer still. For example, under "organismic characteristics" in Table 1, the authors list "other salient characteristics (i.e. physical appearance; personality traits; intelligence level; communication skills)." What aspects of physical appearance we are to take into account, which personality traits, and so on, all remain to be specified.

Aside from sheer length, there is another problem with the taxonomy which is reminiscent of the problem I raised in connection with the paper by Shepherd and Vincent. Absent a theoretical framework, how are we to know what dimensions of each of the variables should be attended to? Esposito and Jobe raise the same issue when they say, on page 14, "Depending on one's training and theoretical orientation, psychophysiological processes can be described and organized in a variety of ways." That statement is true not only of psychophysiological processes, but of all the factors considered in this paper. For example, does it matter whether the interview is done in the respondent's home or in the interviewer's office, or is it the privacy of the research interview, or some other aspect of the setting, which matters? Granted that we may want to describe an interview on all of the dimensions listed, which of them are we going to select for analysis, and on what grounds?

It is when we come to the analytic phase of research that the need for a theoretical framework becomes compelling. Esposito and Jobe state, on page 33, that they are "methodological pluralists who lean more to descriptive and relational research....than to narrowly focused experimental research." But although one may want to use the taxonomy for descriptive purposes, ultimately, it seems to me, one wants to see which of the variables make a difference; and in order to do that, one must decide which variables, and what dimensions, make theoretical sense. For example, even if one were to decide to focus on a subset of the variables -- say, on motivational variables only -- one needs a theory to say which of the contextual variables might be expected to interact with the motivational variables, and which could safely be ignored.

Nor is it clear to me why standard experimental and quasi-experimental designs could not fruitfully be used to investigate specific research issues related to the interview. There are at least two ways to achieve what Egon Brunswik has referred to as a "representative research design." One is to code a large number of existing (or prospective) studies along a set of theoretically relevant dimensions, and then use these studies to test hypotheses about the interrelationship of variables under varying conditions. For example, suppose we have a large number of studies in which confidentiality assurances have been used. Some have been done by government agencies, some by universities; some have asked sensitive questions, others have not; some have given absolute assurances of confidentiality, some have not mentioned confidentiality, and some have given a qualified assurance. If we are lucky -- and we rarely are, except over a long period of time and with a deliberate attempt to fill in empty cells -- we will be able to look at the effect of confidentiality assurances under all possible conditions described by these factors. But even if we are, note that we have no surveys done by commercial firms, and our ability to generalize will therefore be limited by that omission.

The other way of attaining representative research designs is to conceptualize the relevant variables and test their effects piece by piece, experiment by experiment. It seems to me tnat one could make a good case for preferring the second approach to the first, at least at a certain stage of the research. And in fact, the two papers presented today provide a good example of an area where such an approach would be useful.

The underlying assumption made by Shepherd and Vincent is that the greater the constraints on the interviewer (in terms of skip patterns, the wording of explanations to respondents, when and how to probe, and probably other variables as well), the better the quality of responses is likely to be. Esposito and Jobe articulate what appears to be the contrary hypothesis: "To the extent that severe constraints are imposed on the interviewer (e.g. strict rules against rephrasing any question the respondent finds confusing or ambiguous), the data collector runs the risk of obtaining less than valid information."

It seems to me that this juxtaposition of hypotheses cries out for experimental testing, and that in order to be most useful, such a test should systematically vary other factors as well -- for example, the topic of the survey, the educational level of the respondents, and any others that we believe, on theoretical grounds, might affect the relationship of central concern.

There is, as I have said, enormous promise for survey research in both of these papers. I think that promise is more likely to be fulfilled if we go beyond description, however elaborate the descriptive framework may be, to articulating a theory, however primitive, about the processes involved.

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Floor Discussion

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Two papers were presented during this session which addressed interviewer-respondent (I-R) interaction. The first paper analyzed interaction in a computer-assisted telephone interviewing (CATI) environment. The second paper proposed a model for evaluating factors that affect the interviewer-respondent interaction that would be applicable to all interviewing situations.

Jane Shepherd and Carmen Vincent both of Westat, Inc. taped interviews of college students responding to a 360 item CATI questionnaire. From the replay of these tapes they developed a series of codes to match to various respondent and interviewer interactions. They then paired these interviewer-respondent interactions using these coding systems. Although not complete, they are working toward developing a I-R model that could be applied when developing computer assisted interviewing systems, designing CATI questionnaires and used when developing interviewer training.

James Esposito (BLS) and Jared Jobe (NCHS) then presented a theoretical framework for evaluating the I-R interaction. This framework takes into account features of the survey process, the survey context and the survey participants. For each of these areas the researchers developed a series of contextual variables that may interact with one another in the interviewing environment. Special emphasis was given to the features of survey participants and the factors that are assumed to affect their behavior, including psychophysiological functions. From these data the researchers hope to present a framework that is more comprehensive than other I-R models currently in use.

The discussant, Dr. Eleanor Singer (Columbia University) spoke of the goal of research in this area as being to define conditions under which interviewers can affect respondent responses. She was very interested in the final results of the Shepherd and Vincent paper and its application to other CAI situations. She felt that the Esposito and Jobe I-R framework was really more of a taxonomy and that the actual framework for evaluating I-R interaction still needed to be defined. She also asserted that the framework presented, because of its size, makes it difficult to implement.

Gemma Furno of the Census Bureau asked Shepherd and Vincent whether the quality of the data entry by interviewers on the CATI survey was analyzed. They have not looked at this yet, however they did build in audit trails on the items and do plan to assess quality.

Dr. Milton Goldsamt from the National Agricultural Statistics Service, in response to the Esposito and Jobe paper, mentioned that adding the "meaningfulness of the question" as a measure in their framework may benefit cost analysis. He also mentioned that he would like to see more salience theory included in the framework.

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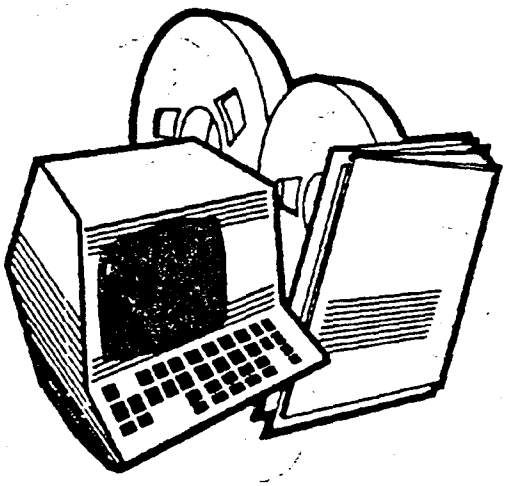

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