

COGNITIVE MODELLING OF THE SURVEY INTERVIEW

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Introduction

The Cognitive Aspects of Survey Methodology (CASM) Movement has resulted in a closer examination of the information processing, decision-making, and behaviors of interviewers and respondents during the survey interview. The purpose of this effort is to reduce nonsampling error during survey data collection. Several models have been produced as a result of the movement, primarily focusing on the information processing of the respondent (e.g., Tourangeau, 1984). To our knowledge, there has been no attempt to model the information processing and behaviors of the interviewer. Two models representing the interviewer's generation and clarification of a survey question will be presented, as a part of larger theory called the Information Exchange Theory.

The Information Exchange Theory is a theory about what cognitive processes occur in a standardized interview from the time a question is asked to the time a response is recorded for it. It may be likened to a two-way analysis of variance: the interviewer's and respondent's cognitive processes are modelled as main effects, and the interaction between them is represented in an interviewer-respondent interaction model. The theory embraces two models for the interviewer, one of question generation and the other question clarification; one model of respondent question answering; and one model of interviewer-respondent interaction. The four models illustrate major information processes and behaviors of the interviewer and the respondent.

Background

Before describing two of the four models in detail, some background information must be provided. First, the theory is based on a standardized survey, conducted by personal visit or over the telephone. Secondly, preliminaries in the interview have taken place. Thus, the first model of question generation begins with the interviewer preparing to ask a question. Third, the models

focus on completing one question on a survey, not the entire survey. Fourth, the models are intended to illustrate the *major* cognitive processes that can occur while a typical standardized survey question is being asked and answered. Our intention was to keep the models parsimonious and useful to the survey methods field. Finally, language production and comprehension are at the heart of the models.

The Models

The four models are purposely sequenced to follow the logical presentation of a standardized survey question. *The Interviewer Model of Question Generation* begins as the interviewer mentally prepares to ask a question and concludes when s/he asks it. *The Respondent Model of Question Answering* begins as the respondent mentally processes the interviewer's question and ends with the respondent's codable response, or a question or statement. *The Interviewer Model of Question Clarification* illustrates the thinking processes of the interviewer and respondent when there is a communication breakdown during the asking of the question. Therefore, clarification statements/questions are often given by both parties to facilitate the understanding of the question and the response. The model begins as the interviewer mentally processes the respondent's response and ends with the interviewer deciding to code the response or ask another question/make a statement. *The Interviewer-Respondent Interaction Model* concerns the discourse between the participants and the effect of interpersonal impressions on communication.

Model Development

The steps for developing the models occurred over a two-month period. First, we identified cognitive processes that seemed central to the interviewer, respondent and their interaction during a standardized interview. Secondly, we specified the kinds of survey phenomena that should be accounted for by a theory of the survey process. Third, we combed the literatures in cognitive science and psychology for processing constructs, and then assembled the models from those constructs to account for the survey

phenomena. Additionally, we specified the order of their execution and their behavioral effects. Finally, we developed model conventions that are fairly typical of psychological models of this type. We used a) a rectangle to represent information processing; b) a diamond to represent decision making; and c) a circle to represent behaviors. The behaviors generally involve language production in our models.

The Interviewer Model of Question Generation

Figure 1 presents the processes of question generation and the sequences in which these processes occur. The model allows for standardized or non-standardized presentations of questions and illustrates the processes that lead to one or the other.

The left branch of the model is likely to be familiar to those who have examined interviewer training manuals for standardized surveys, or read arguments in support of interviewers "reading the standardized survey question as written" (e.g., Fowler & Mangione, 1990). When the interviewer reads the question verbatim, the meaning of a question is constructed from smaller units of information, such as phonemes and words (*Read Text - Yes*). After looking at the question and encoding the question words, the interviewer next makes a decision about whether to present the question verbatim or to phrase it in her/his own words (see Brewer, 1975) (*Commit to Verbatim Speech?*). Interviewers are taught in training to be committed to verbatim speech, regardless of whether, for example, the question is worded poorly and the respondent speaks primarily in a different language.

If the interviewer is committed to the communication rules of the interview (*Commit to Verbatim Speech - Yes*), s/he may read the question in two ways. First, the interviewer may limit comprehension to recognizing the question in a rote fashion, and then transfer the question into working memory where it is formulated before speaking. Thus, the meaning of the question is not used by the interviewer to generate the question, and the surface structure of the question is mentally formulated and transferred to the speech mechanisms (*Formulate Question Phrasing*). Secondly, the interviewer may follow the communication rules of the interview, read the question and formulate the question for verbatim presentation using at least a partial meaning of the question (*also Formulate Question Phrasing*). Then the interviewer is ready to ask the question as

written in one or more of the following ways: a) formulate the utterance word by word or phrase by phrase from short term memory; and b) place the entire question in short term memory after reading it silently, in order to speak it shortly thereafter (*Ask Question*).

The reader may be wondering what the rest of this model illustrates if this one pathway represents what the interviewer has been trained to think and do during the asking of a standardized survey question. During the period we were examining the survey methods literature, we found several major studies that indicated interviewers often do not read questions the way they are written on standardized surveys. Interviewers presented standardized questions in a nonverbatim manner as much as 33% of the time (e.g., Rustemeyer, 1977). Undoubtedly some of the 33% can be accounted for by interviewers' reading and speech errors or even by interviewers' attitudes about the question topics. However, we were interested in modelling a particular phenomenon that we believe accounts for a large part of the 33%, and that is the interviewer's tendency to paraphrase the original survey question.

One major reason that interviewers offer for paraphrasing questions for the Consumer Expenditure Survey (a standardized survey sponsored by the Bureau of Labor Statistics), was the undue length and awkward structure of the written questions; the interviewers found the questions difficult to read (Miller, Herrmann & Puskar, 1991). Other research has shown that interviewers will paraphrase any survey question (even if it is well written) if they believe that the paraphrase will be better understood by respondents (Bradburn, 1983). Interviewers' repetitions of the same question can convey that the respondent's answers to it are not heard or not correct. Interviewers feel compelled to negotiate the meaning of the question with the respondent if the standardized question is failing to communicate meaning (Mishler, 1986). In addition, interviewers have reported common sense reasons for this phenomenon: a) the interviewer wishes to establish rapport with the respondent; b) the interviewer suspects that the respondent will be offended by the original wording of the question; and c) the interviewer is bored with asking the identical question over and over again.

Therefore, according to Figure 1, interviewers utter paraphrased questions even after they have read the actual text as a cue (*Read Text - Yes - Look at Question - Encode Question Words*). If

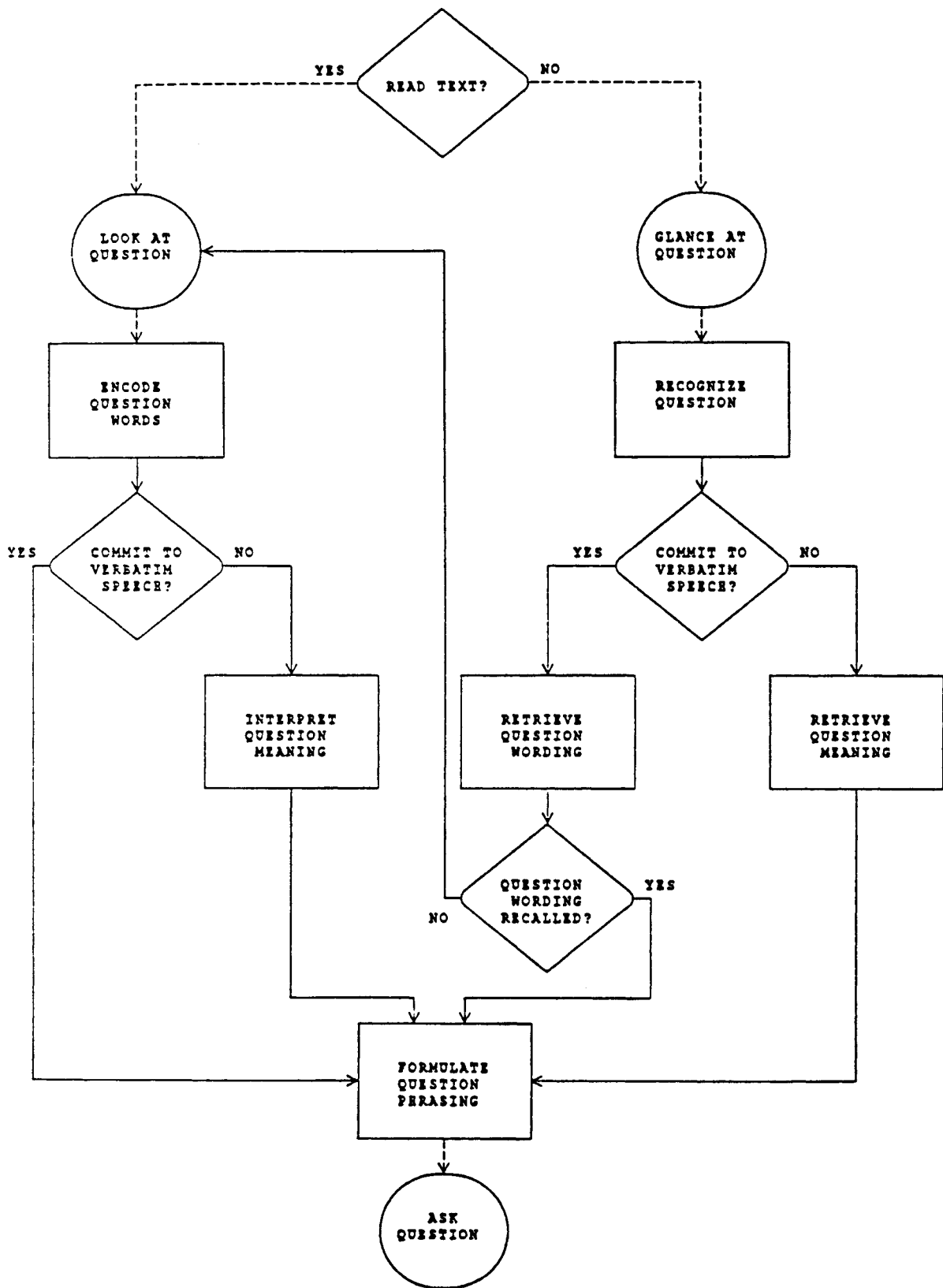


Figure 1

The Interviewer Model of Question Generation

they find compelling reasons such as those mentioned above to abandon their commitment to verbatim speech (*Commit to Verbatim Speech - No*), they can quickly formulate a deep structure of the question (*Interpret Question Meaning*) from the surface structure (the text). Once they have interpreted the meaning of the question, interviewers may formulate their own surface structure by processing and uttering synonyms for words in the original question (*Formulate Question Phrasing - Ask Question*) (Gleitman & Gleitman, 1970).

As the top component of the interviewer model in Figure 1 indicates, some interviewers start the standardized interview without reading the question word by word, contrary to what is taught in the majority of standardized interview training programs (*Read Text - No*). After reading a question many times, experienced interviewers can remember it by glancing at a word or even by noting on what part of the survey page it is printed (*Glance at Question - Recognize Question*).

At this point, the interviewer's mental processing takes one of two paths, involving the use of memory. First, there is another way, in addition to verbatim reading, that interviewers produce a paraphrase of a survey question. If the interviewer is not committed to verbatim speech (*Commit to Verbatim Speech - No*), the question information is likely to be stored in long term memory according to the general gist or theme of the question (Bransford & Johnson, 1972). This is called a reconstructive memory process, because the question is reconstructed mentally from the deep structure and then asked (*Retrieve Question Meaning - Formulate Question Phrasing - Ask Question*). Secondly, if the interviewer is committed to verbatim speech (*Commit to Verbatim Speech - Yes*), s/he may attempt to recall the question word for word, much like an actor recalls a line from a play exactly as it is written. This process is called reproductive memory. If the interviewer is able to recall the question words (*Question Wording Recalled? - Yes*), then s/he formulates the question phrasing and asks it. However, if the interviewer is unable to recall the question wording (*Question Wording Recalled - No*), then the interviewer returns to the survey text to read the question, because of the commitment to verbatim speech.

There is an established debate in the survey methods field about whether interviewers should be allowed to paraphrase standardized survey questions under any circumstances. This model may, in our view, be of some value to both sides of

the debate. By identifying where and under what circumstances paraphrasing may occur in a standardized interview, those who feel paraphrasing is unacceptable will know where to focus their training to reduce its frequency. On the other hand, this model will inform those who wish to explore the potential of paraphrase in data collection. For example, can an interviewer's paraphrase of a survey question significantly improve the validity of the response to it?

The Interviewer Model of Question Clarification

Figure 2 presents the interviewer encoding and decision and behavior processes that lead to the clarification of standardized and non-standardized presentations of questions and answers. As mentioned earlier, this model begins as the *Respondent Model of Question Answering* concludes.

The interviewer actively listens to the respondent's answers from the words, intonation and volume of the response, as well as the respondent's gestures, eye movements and other body language (*Orient to Respondent - Interpret Response Meaning in Figure 2*). If the interviewer cannot initially understand the respondent's meaning (*Respondent's Meaning Understood? - No*), the interviewer must ask a question about the word or phrase that was misunderstood (*Formulate Clarification Question - Ask Question*). Once the interviewer comprehends the respondent's utterance, and the interviewer experiences a feeling of understanding, (*Respondent's Meaning Understood? - Yes*), the interviewer decides whether the respondent has asked for clarification of the question or has answered the question (*Respondent Asked for Clarification?*). If the respondent has asked for clarification, (*Yes*), the interviewer must formulate a statement to clarify the question, and utter it (*Formulate Clarification Statement - Make Statement*). If the respondent has not asked for clarification (*No*), the interviewer must make a judgement about the meaning of the respondent's answer. The interviewer must decide whether it fits within the constraints for appropriate responses to the question (*Compare Response Meaning with the Intent of the Question*). Next, the interviewer must decide if the respondent understood the question by determining if the answer is an appropriate or inappropriate response for this survey question (*Respondent Understood Question?*). If the respondent's answer is totally inappropriate (*No*), the interviewer has no choice but to ask the

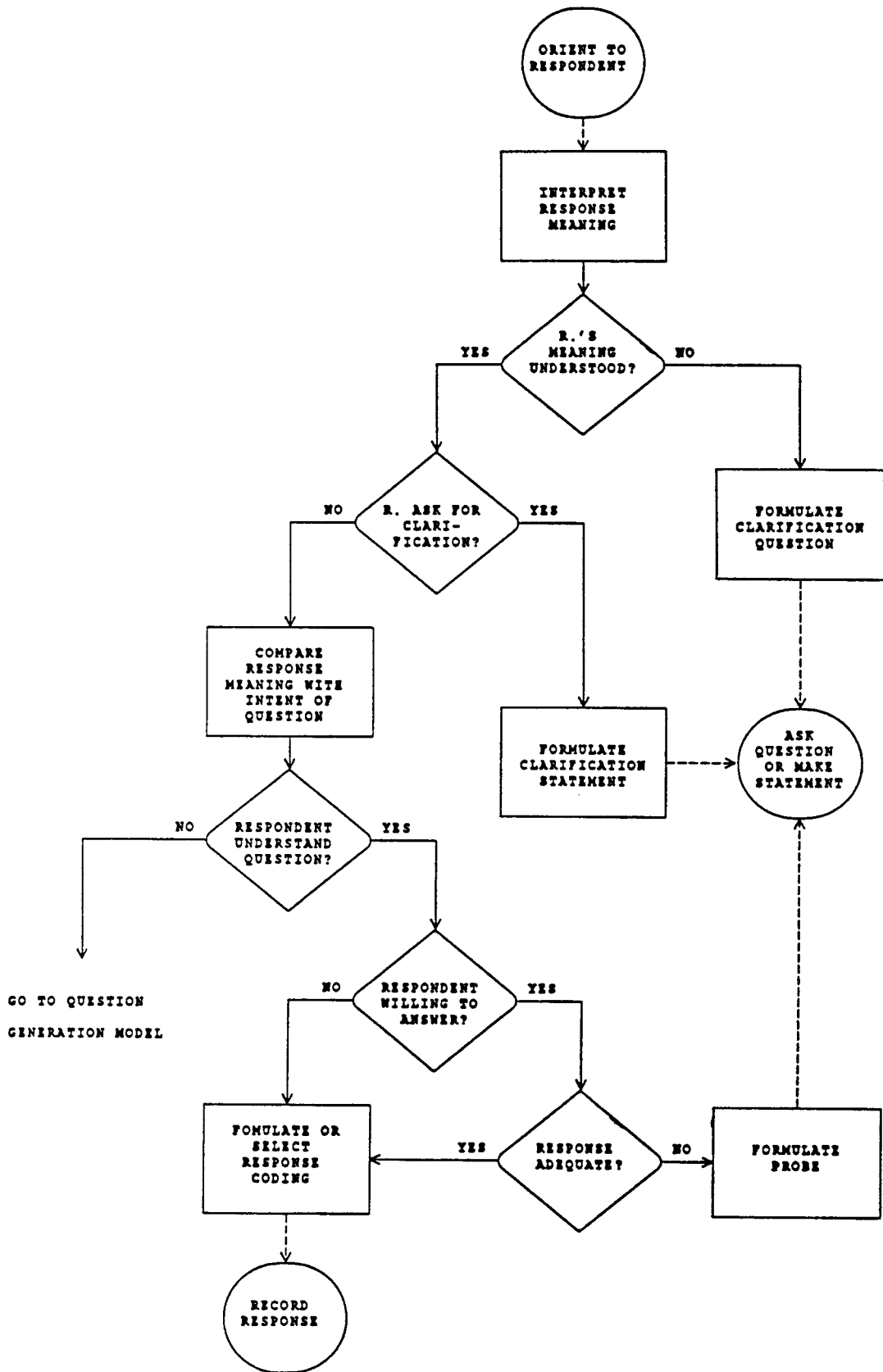


Figure 2

The Interviewer Model of Question Clarification

question or some form of it over again (*Return to Question Generation Model*).

If the respondent's answer is still totally inappropriate after the question is asked again, the "refused" or "I don't know" category is often chosen as the answer by the interviewer, not because it was the respondent's actual answer, but because the interviewer feels there are no other response alternatives (Schaeffer, 1990). If the interviewer concludes that the respondent understood the question (*Yes*), the interviewer must also discern if the respondent has indicated a willingness to answer (*Respondent Willing to Answer?*). The interviewer interprets both verbal and nonverbal communication of the respondent to determine if s/he is willing to answer, and, if s/he is willing, (*Yes*), the interviewer must finally decide if the response was adequate (*Response Adequate?*). The interviewer evaluates the adequacy of responses in terms of two general categories: a) completeness; and b) "don't know" responses (Fowler & Mangione, 1990). If the response is inadequate (*No*), the interviewer formulates a probe and asks it before recording a final response (*Formulate Question Phrasing - Ask Question*). If the response is adequate (*Yes*), the interviewer formulates or selects a response coding, depending on whether the question is open-ended or close-ended, respectively, and then rewords the response accordingly (*Formulate or Select Response Coding - Record Response*). Similarly, if the respondent is not willing to answer the question, and the interviewer is convinced that the refusal is final (*Respondent Willing to Answer? - No*), the interviewer must select the "refusal" response code on the survey form and record the response (*Formulate or Select Response Coding - Record Response*).

Weaknesses and Values of the Theory

There are two primary weaknesses of our approach. First, many experiments are needed to verify the models, and some of those experiments would be difficult to complete. Secondly, we don't really know if these models can predict phenomena not yet examined in the literature.

However, inherent values of the theory are also apparent that, in our view, outweigh the weaknesses. First, the interviewer models have implications for interviewer practices that are useful to both sides of the standardized survey debate. Secondly, the theory provides a summary of the current state of knowledge in cognitive aspects of surveys. Third, the theory provides many hypotheses to be tested. Finally, our

approach provides some guidelines about how cognitive processes may be modelled by survey methods researchers.

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