

DISCUSSION

Murray Aborn, National Science Foundation
Washington, DC 20550

KEY WORDS: Cognition, surveys

The papers you have heard presented here today may appear to be little more than a collection of discrete studies aimed at determining the best ways of eliciting responses to specific varieties of survey questionnaires. Not so. Although limited in purpose and scope in and of themselves, these papers represent attempts to improve the trustworthiness of survey data, and as such they emerge from a much broader and more ambitious agenda of research into the survey process begun circa 1983 and now commonly referred to as CASM, acronym for Cognitive Aspects of Survey Methodology. I believe it will be more fruitful to view the studies reported in this session in the context of CASM, than to review the specific approaches and findings already reported to you and discussed by the investigators themselves.

CASM began under the guidance of a cadre of survey statisticians and cognitive psychologists as a means of encouraging cross-disciplinary collaboration between cognitive scientists -- principally cognitive psychologists but including linguists, computer scientists, and neuroscientists -- and survey researchers seeking to understand the survey process from a more scientific as well as a more in-depth practical standpoint.

The agenda developed by the organizers of CASM called for the initiation of a series of university-based research projects and the establishment of an experimental cognitive laboratory at the National Center for Health Statistics, a federal agency whose participation in the origination of CASM indicated a genuine commitment to the furtherance of the enterprise.

The university-based research projects suggested by the originators of CASM are currently being carried out at sites such as the National Opinion Research Center at the University of Chicago and BBN Laboratories at Cambridge, Mass., and with results finding their way into the general scientific literature as well as the survey and statistical literatures *per se*. And as you have heard from two of the preceding papers, a cognitive research laboratory engaged in collaborative endeavors with academic scientists has been functioning under the aegis of the National Center for Health Statistics. Similar facilities have now been created at two other federal agencies, the Bureau of Labor Statistics and the Bureau of the Census, concerning whose activities you have also been given a glimpse of during this session.

It is no exaggeration to say that no methodological development since the introduction of probability sampling has been so rapidly adopted into survey-taking as CASM. The approach is being promoted by government agencies and private survey outfits well beyond those noted above, and it seems to be permeating the Canadian statistical system as well. An international newsletter

on cognition and survey research is being published and disseminated by ZUMA, a central statistical organization in West Germany, and the second to two international conferences on cognition and survey research co-sponsored by ZUMA and the University of Illinois is scheduled to be held in the United States in the fall of 1990.

There are two perspectives one might adopt in sizing up the CASM enterprise. One is to see it as a merging of methodologies -- the view most visible from the particular set of studies presented here today. The other is to see it in a more visionary light -- one in which survey-taking becomes an applied research arm of cognitive science.

METHODOLOGIES BEING MERGED

Sample Surveys	Laboratory Studies
Post hoc manipulation of data collected under uncontrolled conditions	Control over extraneous causal factors
Randomization in sample selection	Randomization of subjects among experimental treatments
Over-time continuity in measurement	Reproducibility of measurement
Real world settings	Artificial settings
Large numbers of subjects	Small numbers of subjects
Diversified populations	Homogeneous populations
Broad range of subject characteristics	Narrow range of subject characteristics

The chart above is meant to display the features of survey-taking and laboratory-based experimentation which, each in contrast with the other, are presumed, under CASM, to be capable of absorption into an integrated methodology -- one combining the advantages of, and offsetting the limitations of, each individual methodology applied singularly. But how can such an integration be accomplished?

MEANS OF MERGING

1. Utilizing the laboratory to pretest survey instruments, then referring the results of field implementation back to the laboratory for reconciliation of differences.
2. Utilizing the laboratory to explore and rectify instrument inadequacies and difficulties experienced in the course of traditional field-oriented survey-taking.

3. Embedding of laboratory-like experiments within surveys (e.g., so-called "split-ballot" experiments).

The techniques most widely employed thus far in attempts to merge the laboratory-based methodology of cognitive psychology with traditional field-based modes of survey-taking are listed above. These three techniques by no means exhaust the possibilities, but they have proved to be both feasible and cost-effective in a large number of survey applications.

You have heard several attempts to apply the first two techniques in some of the papers presented at this session. Examples of applications of the third can be found in the survey literature, particularly in the work of Howard Schuman at the University of Michigan's Survey Research Center, whose pioneering research into the effects of question order, sequence, and context has relied primarily upon the conduct of split-ballot experiments.

There seems little doubt that, as an enterprise, CASM was initiated at the instigation of the survey research community more so than at the behest of cognitive scientists. CASM became viable owing to the active interest of a handful of the latter, but, as the pattern of adoption and the papers presented here today attest, the survey community was the one most active at the outset, and remains the one providing the driving force at the present time. What might account for the lopsidedness of the collaboration?

There are, to my mind, three possible explanations:

First, at about the time that CASM was gestating, the survey community had been experiencing some major failures attributable to methodological shortcomings, as, for example, in the attempts to gauge the extent of criminal victimization via sample surveys of the general population. A follow-up assessment found the surveys severely deficient owing to a lack of methods for evaluating the accuracy of information obtained on the basis of retrospective recall.

Second, increasing nonresponse due to respondent noncooperation posed the most serious threat to voluntary surveys in the entire history of survey research. For example, records compiled at the University of Michigan's Survey Research Center --one of the largest and most highly regarded of its kind-- showed an increase in respondent refusal rates for the center's ongoing Survey of Consumer Attitudes series from about four (4) percent in large cities in 1955, to about twenty-four (24) percent in cities of this size in 1975. Refusal rates for the National Election Studies, another ongoing series, rose from about nine (9) percent in 1953, when the series began, to about thirty (30) percent in 1977.

Third, the survey literature was yielding increasingly persuasive evidence of the susceptibility of survey results to the effects of question wording, order, and context as these little understood and difficult to control

aspects of questionnaire construction impinged upon respondent comprehension and response.

As these explanations suggest, the attention of the survey community was being called to what goes on in the respondent's head in place of a passive acceptance of what comes out of his mouth, and this coincided with the realization that the predominant paradigm in psychology had shifted from behaviorism to cognition, awakening an interest in examining the possibility that the new concepts and techniques being developed by cognitive psychologists and other cognitive scientists might be employed in constructing vastly more insightful survey instruments and data-gathering procedures.

What had to be imported, and worked with, then, was an entirely revised research paradigm from a discipline whose theories and knowledge base had served to guide survey-taking since its modern inception -- at least to the extent that psychological science had, in fact, provided such guidance in the past.

Though not highly visible from the set of studies presented here today, the underlying paradigm might be depicted as follows:

Information processing provides the basic model for all conscious mental functioning.

Memory is conceived of as a system of systems rather than as a single entity.

Concepts such "representation," "encoding" and "imaging" are used to explain how the contents of memory are stored,

and operating principles such as "search" and "retrieval" can be observed and manipulated in studying all mental phenomena associated with memory and knowledge.

All systems and operating principles are ultimately referable to neurological structures and computational processes.

Much more visible from the particular set of studies presented at this session are the investigative techniques which you have heard and seen employed and which are techniques borrowed from cognitive psychology. You might recall from the various papers the use of such techniques as:

"Think-aloud protocols" (e.g., eliciting from the experimental respondent the steps and strategies he/she went through in formulating a response)

"Focus groups" (e.g., conducting small-group sessions to uncover variations in respondent interpretations of specific questions)

"Immediate retrospective" (e.g., controlling for memory decay and proactive interference by obtaining cognitive information

from respondents at the time of survey administration)

"Part-set cueing" (e.g., use of some members of a class of objects or events as prompts for the retrieval of others)

"Random probing" (e.g., obtaining ancillary information about the respondent's understanding of a question at the time the question is asked)

"Judgmental heuristics" (there are many varieties of this tool; but one, e.g., involves obtaining confidence ratings from the respondent)

"Landmarks" (e.g., where the recall of dates is required, tying the question to some salient event)

"Scripts and Schemas" (e.g., framing questions in a way that relates the substance to the respondent's higher-level knowledge structures)

The methodological devices listed above represent a very small subset of the family of techniques which have been adopted for cross-disciplinary methodological and/or substantive research by fields of investigation drawing upon recent developments in cognitive science. Educational research in reading, for example, has made more extensive and varied cognitive applications than has CASM -- at least up to the present time. Moreover, the list above was deliberately restricted to the types of devices utilized in the particular studies reported upon here today.

Though restricted in scope, however, the list is sufficient to illustrate the first of the two ways of sizing up CASM that I mentioned earlier; i.e., CASM viewed as a merging of methodologies. We have heard and seen some excellent examples of how CASM is becoming of strong influence in directing the survey-taker's attention to new ways of investigating and ultimately measuring nonsampling error. In this regard I hope that today's presentation do not leave this audience with the impression that CASM's main contribution to survey research has been to furnish a new bag of tricks to trigger respondent memories. I regret that the session did not leave time for the different authors to explain the cognitive science roots of the adaptations employed in their studies, or to talk more about how their studies represent the utilization of surveys as experiments in cognition.

On the basis of what it has been possible to say and show at this session, then, we have been given some good examples of the view of CASM as a means of improving survey methods -- which in and of itself is no insignificant framework.

However, the essence of CASM is collaboration between cognitive scientists and survey researchers, and this cannot be accomplished unless the bridge spanning the gap separating survey research from cognitive research is open to two-way traffic. In other words, surveys must become vehicles for the advancement of cognitive science, and it this objective can be carried

forth simultaneously with the objective of improving survey methodology per se, then the groundwork will have been laid for the creation of a wholly new interdisciplinary.

As I mentioned earlier, the perspective on CASM in which survey research becomes an applied arm of cognitive science is visionary. For one thing, it requires a growing participation by cognitive scientists in survey-taking, and this promises to be no simple task.

What might be the motivation for the movement of, say, cognitive psychologists into practicing their discipline in the survey setting as well as in the traditional laboratory mode? Well, the originators of CASM thought this through, and in a report published by the National Academy of Sciences (1) outlined a sizeable number of potential benefits that could accrue as a result of such a development. Among them are:

The opportunity to perform memorial studies over long time periods

The opportunity to study working memory, which is to say, memory from naturally-occurring events

The opportunity to study memory for every-day events

A means of constructing the curves of cognitive abilities of many kinds over the life span

The possibility of investigating human judgmental strategies in a wide variety of demographic subgroups and under diverse situational circumstances

One might summarize these benefits in terms of breaking out of the restricted and artificial environment of the laboratory to test the theories which cognitive psychologists have constructed on the basis of highly restricted and artificial experimental conditions. But the benefits of collaboration could go even beyond that by bringing into the laboratory behavioral phenomena of which the cognician has been thus far unaware.

There is reason to be encouraged about the future CASM as a cross-disciplinary enterprise and perhaps ultimately as a true interdisciplinary. At least a glimmer of promise can be seen from the increase in CASM-related articles appearing in the psychological literature, and not just in journals likely to be read more exclusively by survey researchers. Two recent examples are given below (2, 3), to which I would add that a special issue of the journal Applied Cognitive Psychology devoted to CASM is currently in press.

(1) Jabine, T., Straf, M., Tanur, J., and Tourangeau; R. Cognitive Aspects of Survey Methodology. Washington, DC: National Academy Press, 1984.

(2) Loftus, E. F., Fienberg, S., & Tanur, J. American Psychologist, 40, 2, pp. 175-180, 1985.

(3) Tourangeau & Rasinski. Psychological Bulletin, 103, 3, pp. 299-314, 1988.