

RELATIONSHIPS BETWEEN COGNITIVE PSYCHOLOGY AND SURVEY RESEARCH¹

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Introduction

Although collaboration between cognitive psychologists and survey researchers can be traced back to the late 1970's (Sudman, Bradburn, and Schwarz, 1996), the CASM movement was essentially launched in the U.S. in 1983 with the convening of the Advanced Research Seminar on Cognitive Aspects of Survey Methodology (Jabine, Straf, Tanur, and Tourangeau, 1984). The CASM movement represents a deliberately planned effort to foster interdisciplinary research on the cognitive aspects of survey methodology (Feinberg and Tanur, 1996). The movement was broadly conceived at the Advanced Seminar. It involves collaboration between survey research and the family of cognitive and related disciplines in conducting interdisciplinary research on the cognitive aspects of the survey measurement process.

In this paper, however, we focus on relationships between survey research and cognitive psychology in conducting questionnaire design research. This has been CASM's major focus during the past decade. Our objective is to better understand the nature of CASM relationships so that optimum strategies can be developed to foster future CASM relationships including those with other disciplines and those involving interdisciplinary research on other survey measurement processes.

First, we describe and illustrate CASM relationships between cognitive psychology and survey research. We do this within the framework of Sirken's (1995) model of interdisciplinary relationships between basic and applied research disciplines. Then, we apply the model in reviewing the past accomplishments of the CASM movement and in proposing research programs for fostering the CASM movement during the next decade.

CASM Interdisciplinary Relationships

Figure 1 presents our conceptualization of CASM relationships between cognitive psychology and survey research. The model proposes that mutually beneficial information transfers between basic cognitive research and applied survey research are the conduits for establishing and maintaining CASM interdisciplinary relationships.

The model postulates that direct transfers between basic cognitive research and applied survey research are unlikely because, as Tanur (1994) noted, their distinctly different cultures serve as formidable barriers to effective communication. For example, basic cognitive research essentially represents an individual enterprise. Scientists apply rigorous scientific research methods in their pursuits of fundamental knowledge. On the other hand, applied survey research represents a corporate enterprise. Cognitive testing of questionnaires, one of many parts of a complex survey operation, is constrained by survey conditions of timeliness, budget, and data quality.

The model postulates that two kinds of research activities are effective in overcoming the cultural barriers that bar transfers directly from one discipline to the other. Those activities are technology transfer research and knowledge transfer research. The former clears the culture barriers for technology transfers, and the latter performs the same function for knowledge transfers. Both types of research activities are acculturating agents and adapt transfers from one discipline to the culture of the other discipline.

Figure 2 describes the functions of the four research modes in CASM interdisciplinary relationships.

Technology Transfer Research

This section illustrates some of the ways that technology transfer research adapts transfers that originate in one discipline so that they benefit the other.

Timeliness requirements for fielding surveys make the carefully controlled experimental designs of basic cognitive research inapplicable for cognitively testing and designing survey questionnaires. In collaboration with cognitive psychologists, NCHS conducted experiments that successfully demonstrated the utility of applying cognitive interviewing methods. These methods substantially improved survey questionnaire designs and yet were feasible within the timeliness constraints of conducting surveys (Lessler, Tourangeau, and Salter, 1989). Cognitive interviewing testing involves an iterative process. Questionnaires are tested and retested repeatedly on small samples of independently recruited batches of respondents until all cognitive glitches are repaired, or testing time runs out, whichever comes first.

Sample survey methods are being devised for

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investigating the cognitive aspects of everyday behavior on representative population samples, tasks that basic cognitive research laboratory methods are poorly suited to perform. For example, Sirken et al. (1995) investigated primacy and recency memory effects in split ballot experiments that were embedded in an ongoing national population sample survey. A somewhat different problem was addressed by Tulving and Press (1984). They were interested in constructing national memory inventories and data banks to be based on information that would be compiled in a series of national population surveys on memory.

Knowledge Transfer Research

Knowledge transfer research facilitates interdisciplinary transfers by investigating the cognitive aspects of issues germane to designing survey questionnaires. Problem oriented research of this kind is often referred to in the literature as mission oriented basic research (Feathermore, 1991).

This type of research is illustrated by the experiments conducted by Schwarz and Stack (1991) and Bradburn et al. (1987). They investigated the cognitive aspects of judgmental heuristics that often lead respondents to make poor responses to survey questions. Schwarz investigated cognitive aspects of "context" effects, and Bradburn the cognitive aspects of "forward telescoping" effects.

A somewhat different approach is illustrated by the experiments conducted by Sirken, Willis, and Nathan (1991) and Sudman, Warnecke, Johnson and Davis (1994). They investigated the cognitive aspects of answering cognitively challenging survey questions dealing with important health policy related topics, such as, illegal drug use, cancer prevention testing, etc.

Concluding Remarks

Figure 3 profiles our subjective judgements of CASM's relative impact in fostering the four research modes involved in interdisciplinary relationships as postulated by our model. The research modes are arrayed along the histogram's abscissa from the most cognitively oriented on the extreme left to the most survey design oriented on the extreme right.

We think that the CASM movement has had a spectacular impact in fostering applied survey research, relatively less impact in fostering either technology transfer research or knowledge transfer research, and scant impact in fostering basic cognitive research. Overall, we feel these achievements are remarkable considering the recency of the CASM movement (Jobe and Mingay, 1991).

However, we would be concerned about the CASM movement losing its interdisciplinary focus and gradually disappearing as a distinct research activity, albeit a hybrid

one, should fostering not continue. We feel that more fostering of survey methods research and survey oriented cognitive research would forestall that possibility.

Technology Transfer Research Proposals

These proposals deal with the day-to-day survey problems of quality control and measurement of survey response errors.

Our first technology transfer research proposal involves developing cognitive interviewing methods to improve quality control over survey measurement errors. Cognitive interviewing methods have demonstrated effectiveness in screening questions for cognitive glitches that field testing methods often miss. Although advances in developing these methods have been remarkable, the methods are still in an early stage of evolutionary development, and further improvements are likely.

Our second proposal involves developing statistical models of the cognitive aspects of survey measurement errors. This virtually neglected field of survey research has few examples. Press (1996) proposes a statistical error model in which survey estimates of data and their confidence intervals are based on respondents' self assessments of the accuracy of their recollections in responding to autobiographical questions. Nathan and Sirken (1986), on the other hand, assume that survey questions are selected from universes of interchangeable questions, and they propose estimating questionnaire design effects from split ballot experiments embedded in surveys. These models are only suggestive of possible ways to estimate survey measurement errors relatively expeditiously and inexpensively.

Information Transfer Research

These proposals deal with fundamental issues involving the role of cognition in survey response and in "causing" survey response errors.

Our first information transfer research proposal involves expanding the scope of the experiments of Bradburn and Schwarz to other well known types of response errors. They investigated the cognitive aspects of "forward telescoping" and of "context effects". We propose investigations of the cognitive aspects of other kinds of survey response errors, such as "anchoring" and "seam effects".

We also propose expanding the scope of the CASM research program that was jointly sponsored by NCHS and NSF (Sirken, Mingay, Royston, Bercini, and Jobe, 1988). That program sponsored projects that investigated the cognitive aspects of response errors in surveys on important policy related topics in the health field. We propose expanding the scope of this program to policy related topics that would be germane to other government

sectors such as agriculture, energy, and criminal justice.

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Figure 1: A CASM model of interdisciplinary relationships based on knowledge and technology transfers

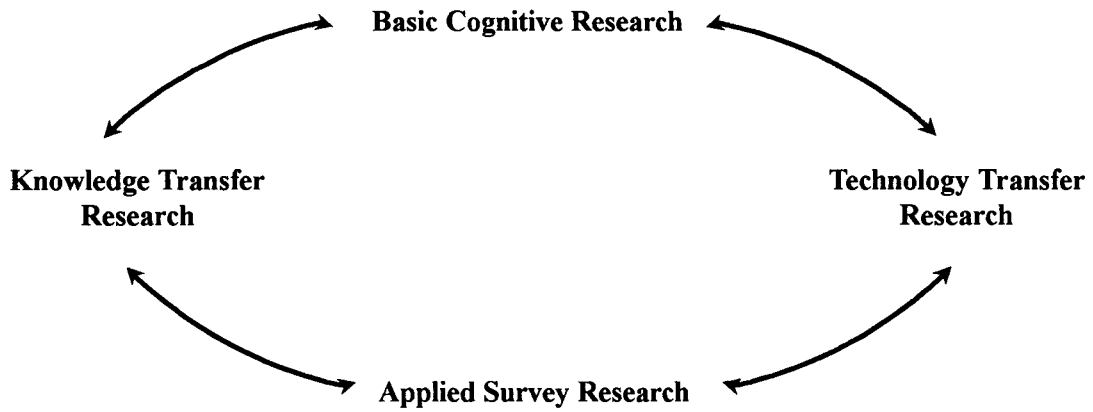


Figure 2: Research components of CASM interdisciplinary relationships

Research Component	Function
Cognitive knowledge oriented	
Basic cognitive research	creates fundamental knowledge and understanding about cognition
Knowledge transfer research	adapts knowledge transfers between applied survey research and basic cognition research
Survey methods research	
Applied survey research	applies cognitive methods in designing survey questions
Technology transfer research	adapts technology transfers between applied survey research and basic cognitive research

Figure 3: CASM's relative impact on four modes of interdisciplinary research

