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Introduction to the Special Issue on Web Surveys

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In 1997 as an untenured assistant professor of sociology at Northwestern University, I was contacted by an editor at the National Geographic Society's Web site. The editor heard I had training in demography and experience working with survey data. As part of the Society's coverage of the upcoming millennium, they were exploring the idea of using the Web to collect survey data, in particular survey data on the impact of migration on cultural identity.

With considerable programming support from Northwestern, editorial assistance from the *National Geographic*, and a measure of naiveté but no real budget, I agreed to take on the challenge. Survey2000 was created with content advice and encouragement from a diverse group of senior colleagues, including William Sims Bainbridge (the National Science Foundation), Wendy Griswold (Northwestern University), Richard Peterson (Vanderbilt University), and Barry Wellman (University of Toronto). Built on a mixture of static HTML pages and Pearl programming, Survey2000 went live in 1998 and was scheduled to collect data in time for coverage in the December 1999 edition of the *National Geographic* magazine.

From my perspective, at that time the key research question regarding Survey2000 was to see if complex survey data could be collected using the Web in a wide-open environment. Quite simply, could the contraption fly? And, in fact, it did fly. Over a 10-week period, more than 87,000 individuals in 178 countries took part in the survey. The average respondent spent nearly 45 minutes on the survey (Witte et al. 2000). In *Contemporary Sociology* Bainbridge (1999:664) described the project as an example of "innovating in the use of the new computerized media for research" rather than "retreating into a narrow niche in the university curriculum while other disciplines become the social science of the future." Data collected

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as part of the project led to a number of peer-reviewed publications including articles in the *American Behavioral Scientist* (Wellman et al. 2001) and the *American Journal of Sociology* (Griswold and Wright 2004).

Yes, the contraption flew, but not without some turbulence. For example, the initial response nearly brought down the Society's production server, and the average respondent took 45 minutes to complete the instrument. Moreover, the public opinion research community was not pleased with the public relations campaign by the Society, which glossed over methodological issues associated with the project, particularly the question of generalizing from a convenience sample, no matter how large, to the general population (Dillman 2000).

In an effort to consider the potential and limits of Web survey technology in a systematic fashion, I sought and was awarded National Science Foundation funding to field Survey2001. Also in collaboration with the National Geographic Society, Survey2001 was intended to pursue more efficient technology, integrate systematic studies of measurement effects, and include funding for a parallel random-digit-dialing phone survey. In fact, by the time the Survey2001 data were collected, the Web survey field was becoming increasingly crowded. For example, a 1999 study counted more than 1,000 online surveys of varied content, quality, and purposes (Dillman 2007). Today, a week does not pass when most Internet users are not afforded "the opportunity" to participate in at least one online survey.

This rapid and widespread deployment of online survey techniques prompted this special issue of *Sociological Methods & Research*. There is a growing literature on Web survey methods, but to date this has primarily consisted of how-to texts and monographs or isolated individual articles. The aim of this volume is to bring together a series of articles that, although they treat a variety of topics and use different analytical and statistical methods, all focus on defining best practices and key questions related to Web-based survey research. Assembled in this fashion, the reader is encouraged to note how the themes of coverage, nonresponse, and measurement error cut across the articles. In addition, the reader should also think about the implications these articles hold for other modes of survey research. The relative novelty of Web-based survey research, and how this technique is related to coverage, nonresponse, and measurement errors, sets the stage for the reader to reassess the taken-for-granted manner with which these sources of survey error are often treated when survey data are collected over the phone, by mail, or through face-to-face interviews.

Contents of This Special Issue of *Sociological Methods & Research*

The Schonlau, van Soest, Kapteyn, and Couper article concentrates on coverage issues related to Web surveys, yet they also are clear that all interview modes affect the probability of respondents being included in a sample. Moreover, these probabilities are not uniform across the population, but shift over time, and vary with the possibility and quality of the sampling frame. Using data from the Health and Retirement Study, an existing probability sample representative of the U.S. population age 50 and older, their article looks at Internet access among this group and the use of matching and propensity weighting procedures to correct for differences in access. The procedures they use reduce the problem, but they note that a large number of adjusted estimates remain problematic. Their findings caution those who would use a few basic demographic attributes to correct for Internet-based convenience samples. The authors suggest providing non-Internet users with Internet access or using a mixed-mode approach to address the selectivity bias tied to coverage issues.

The Lee and Valiant article also concentrates on issues of selectivity associated with nonrandom samples such as volunteer Web survey panels. The authors are interested in an approach that combines propensity scores with calibration adjustments, in light of control totals for the target population. This approach begins with study design weights, which are then adjusted using propensity scores to correct for selection bias due to nonrandomized sampling. These adjusted weights are then calibrated to control totals for the target population as a means to correct for coverage bias. The resulting weights are made up of multiple components, and the total estimator is nonlinear. The article reports on a simulation study that compares three approximate methods to derive variance estimates.

An interesting aspect of both of these articles is the extent to which both seek to develop procedures to use survey data to obtain representativeness without randomness. Given the general level of “survey fatigue” found today regardless of survey mode, their work should be of interest to survey researchers using any data collection mode, not just researchers interested in Web-based surveys.

The Shropshire, Hawdon, and Witte article brackets the issue of coverage and instead emphasizes design features intended to optimize data quality once a survey is initiated. In this context, the goal is to optimize response by (a) reducing nonresponse restricted to the specific case that a respondent

prematurely terminates from the survey instrument and (b) preserving measurement validity. The analyses in the article use data from the Survey2001 project described above to determine the impact on these two optimality components of visual images embedded in a Web-based survey. Page-by-page progression through the survey is modeled as a survival process with early termination seen as failure. There was no conclusive evidence that use of pictures engaged respondents and thereby reduced missing data resulting from early survey termination; however, the images did affect the responses provided and thereby raised issues of measurement error. Although images had no apparent effect on the termination process, it does appear that respondent interest is linked to early termination. The authors note that similar processes occur with other survey modes. For example, a respondent may begin to complete a mail survey and then lose interest and toss the questionnaire into a wastebasket, throwing away data that the researcher never sees. With appropriate technology, Web survey researchers can reach into “electronic wastebaskets” and make use of partial surveys. They conclude that these results highlight the importance of monitoring respondent progress and placing interest-related questions early in the survey to better control for the effects of interest-driven attrition. Moreover, these findings suggest that an interactional information system approach, one that not only collects data but also pushes relevant information to respondents, may serve to generate or maintain interest and in the process reduce survey attrition.

The article by Toepoel, Vis, Das, and van Soest uses an information-processing perspective to assess the impact of response categories on the answers respondents provide in Web surveys. Their analyses are based on Web surveys conducted with approximately 2,400 members of an online household panel representative of the Dutch population. Their findings include the fact that response categories have a significant effect on response formulation in questions that are difficult to process, while response scales have a smaller effect on easier questions. In general, people with less cognitive sophistication are more affected by contextual cues. The Need for Cognition and the Need to Evaluate indexes for individual motivation account for a significant part of the variance in survey responses. They also find that interaction effects between respondents’ ability to process information and motivation influence responses to questions that are more difficult to process. One conclusion they reach is that *satisficing*, that is, respondents providing a quantity or quality of information adequate to meet perceived expectations, appears to limit respondents’ input. Presumably, this limit is lowered in the absence of an interviewer, who would otherwise personify expectations for greater data

quantity and quality and raise the level of respondent effort. To the extent that an interactional information system, as discussed in the previous article, can embody higher response expectations as well as increase respondent interest, the quality and quantity of satisfactory levels of response may rise as well.

The Christian, Parsons and Dillman article stresses that the interactive potential of web surveys gives them a hybrid character somewhere between self-administered and interviewer-administered surveys. In this context, where the interviewer controls some but not all aspects of survey presentation, the authors argue that survey researchers need to pay particularly close attention to the visual design of the instrument. The paper discusses a number of experiments related to the visual presentation of scalar questions. Experimental effects include reversing response categories, altering the orientation of response options, changing response labels and spacing, and the overall impact of a graphical representation of the scale. Experiments were conducted with over 3,000 undergraduate students who were presented with a variety of instruments designed to test these effects. Their analyses indicate specific ways that visual presentation of scalar items affects response patterns. More generally, they note that while survey researchers have typically stressed consistent wording of items across instruments to compare samples, they have not shown the same regard for consistent visual presentation of items. Visual layout is altered to meet space requirements or the design of a particular survey rather than to maintain consistency. This practice raises concerns that are particularly acute with mixed-mode surveys, where telephone, mail or web surveys are used to collect data from different samples and then combined as a single data set for analysis purposes. Finally, their paper shows how the use of web survey paradata, i.e., the timing between question presentation and response, affords researchers insight into the effects that different patterns of visual presentation have on respondent burden, even if variation in presentation has no impact on response patterns.

Taken together, the articles found in this special issue should convince the reader that Web-based survey research has reached a level of maturity such that it can be considered an essential part of the sociological tool kit. In addition to advances with this method, however, it should also be noted that Web survey research has reached a level of crisis, particularly as a tool of public opinion research.

Web Surveys and the Future of Public Opinion Research

In her recent book, *The Averaged American: Surveys, Citizens, and the Making of a Mass Public*, Sarah Igo (2007) argues that being the object of social science as well as being a consumer of social science research is part of our taken-for-granted worldview. Igo argues that in the mid-twentieth century, a variety of national studies used polls and surveys to map out the contours of mass society, helping to create that society while measuring its behavior and opinion. Igo maintains that these techniques were part of a new interest in the average American rather than degenerates and deviates—a project well suited to a culture and an economy geared to the mass media and mass marketing. Igo concludes by stating, “so statistical struggles over how to aggregate and disaggregate the United States will remain with us. And we will continue to live in a world shaped by, and perceived through, survey data” (2007:299).

Yet in today’s world, quality survey data on the average American are becoming increasingly difficult to collect. Part of the problem is methodological. Response rates to phone surveys have dramatically declined, and increasing numbers of Americans live in cell-phone-only households. Individuals may be reluctant to use “their minutes” to participate in a survey, and survey researchers for ethical as well as methodological reasons may hesitate to collect data from individuals who are out in the world and may be responding to the survey in a variety of personal and social contexts. Mail surveys have fewer coverage issues and with sufficient effort may still yield high response rates; however, there are limits to the extent to which branching and filtering may be used to tailor a survey to individual respondents.

It is at this final point, tailoring the survey to meet the individual, that the issue becomes conceptual as well as methodological. Survey research methods came of age in a particular cultural and economic context. That context, in large part through new forms of communication and information technology, has shifted dramatically. Media and markets of today are founded on narrowcasting and niche branding rather than broadcasting and mass manufacturing. In this world we have seen the emergence of a new form of public opinion: collective intelligence. In this world it may be more meaningful to speak of public opinions rather than public opinion.

Igo (2007) makes reference to studies such as those of Converse (1987) and Herbst (1993). Converse’s comprehensive history of survey research clearly shows how organizational context—including the U.S. Army, the

Office of War Information, and the U.S. Department of Agriculture as well as university-oriented research organizations such as the National Opinion Research Center, the Bureau for Applied Social Research at Columbia University, and the Institute for Social Research at the University of Michigan—had a profound impact on the development of the field. Herbst's work covers an even broader sweep of history, illustrating that at different times and different places, public opinion was defined and measured using a variety of techniques, from rhetoric to petitions, from straw polls and letters to the editor to sample surveys. For a number of important research questions—particularly intraorganizational studies that combine a well-defined study population and organizational resources to motivate response—survey methods, including Web-based survey research, remain an important tool. For this reason the findings presented in this volume are of great value. But for other research questions, however, other techniques may usher in a new era of public opinion research.

An ever-growing share of our twenty-first-century lives takes place in environments where our actions and interactions leave electronic footprints. Sophisticated network and cluster analysis techniques are being developed and used to mine the traces left by these footprints. Many observers have noted threats to privacy posed by such research that has the potential to leave us in a state of perpetual surveillance. Others question the wisdom of accepting “page rank” as an indicator of value. Setting aside these very real concerns, as sociologists we should be wary for methodological reasons as well. Robert Merton (1968:167), in his essay “The Bearing of Empirical Research on Sociological Theory,” makes an important observation about post–World War II sociological research:

Perhaps the most direct impact of research procedures upon theory has resulted from the creation of sociological statistics organized in terms of theoretically pertinent categories. . . . In the past the sociologist has largely had to deal with pre-collected series of statistics usually assembled for non-sociological purposes and, therefore, not set forth in categories directly pertinent to any theoretical system.

The point Merton makes is a critical one: At that historical juncture sociologists and other social scientists got control of the categories, how questions are asked, and how response options are defined. As a new era of public opinion research is dawning, we need to consider how to retain control over the categories. The risk is that we let the sheer accumulation of data define

these categories, rather than consciously defining them to meet our research interests.

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