

- Morton-Williams, J. *Interviewer Approaches*. Brookfield, Vt.: Dartmouth, 1993.
- Oksenberg, L., and Cannell, C. "Effects of Interviewer Vocal Characteristics on Nonresponse." In R. M. Groves, P. P. Biemer, L. E. Lyberg, J. T. Massey, W. L. Nicholls, and J. Waksberg (eds.), *Telephone Survey Methodology*. New York: Wiley, 1988.
- Oldendick, R. W., and Link, M. W. "The Answering Machine Generation: Who Are They and What Problem Do They Pose for Survey Research?" *Public Opinion Quarterly*, 1994, 58, 264-273.
- Pearson, R. W., Ross, M., and Dawes, R. M. "Personal Recall and the Limits of Retrospective Questions in Surveys." In J. M. Tanur (ed.), *Questions About Questions: Inquiries into the Cognitive Bases of Surveys*. New York: Russell Sage, 1992.
- Schuman, H., and Presser, S. *Questions and Answers in Attitude Surveys: Experiments on Question Form, Wording, and Context*. San Diego: Academic Press, 1981.
- Schwartz, N., and Sudman, S. (eds.). *Context Effects in Social and Psychological Research*. New York: Springer-Verlag, 1992.
- Schwartz, N., and Sudman, S. (eds.). *Autobiographical Memory and the Validity of Retrospective Reports*. New York: Springer-Verlag, 1994.
- Singer, E., von Thurn, D. R., and Miller, E. R. "Confidentiality Assurances and Response: A Quantitative Review of the Experimental Literature." *Public Opinion Quarterly*, 1995, 59, 66-77.
- Stokes, L. A., and Yeh, M. "Searching for Causes of Interviewer Effects in Telephone Surveys." In R. M. Groves, P. P. Biemer, L. E. Lyberg, J. T. Massey, W. L. Nicholls, and J. Waksberg (eds.), *Telephone Survey Methodology*. New York: Wiley, 1988.
- Sudman, S., and Bradburn, N. M. *Asking Questions: A Practical Guide to Questionnaire Design*. San Francisco: Jossey-Bass, 1982.
- Sudman, S., Bradburn, N. M., and Schwarz, N. *Thinking About Answers: The Application of Cognitive Processes to Survey Methodology*. San Francisco: Jossey-Bass, 1996.
- Xu, M., Bates, B. J., and Schweitzer, J. C. "The Impact of Messages on Survey Participation in Answering Machine Households." *Public Opinion Quarterly*, 1993, 57, 232-237.
- Yammarino, F. J., Skinner, S. J., and Childers, T. L. "Understanding Mail Survey Response Behavior: A Meta-Analysis." *Public Opinion Quarterly*, 1991, 55, 613-639.

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*A new theoretical perspective proposes that various survey response patterns occur partly because respondents shortcut the cognitive processes necessary for generating optimal answers and that these shortcuts are directed by cues in the questions.*

## Satisficing in Surveys: Initial Evidence

Jon A. Krosnick, Sowmya Narayan, Wendy R. Smith

Since the first surveys were conducted in the early part of this century, questionnaire designers have recognized that a structured interview can impose a significant cognitive burden on respondents. As a result, even the earliest textbooks on survey methods (for example, Patten, 1950) encouraged researchers to minimize the time and effort required to complete a questionnaire by using short, simple words with clear meanings in as few and as concise questions as possible. Since these books were published, however, remarkably little evidence has been collected on the parameters determining the amount of cognitive burden a respondent experiences, the consequences of such a burden, or methods to prevent it.

In this chapter, we describe some of our recent work exploring these issues, work that has its roots in the relatively new interface between the survey methods literature and cognitive and social psychology. The interplay between these two scholarly domains has, in a sense, been long-standing, because many leading survey methodologists trained extensively in psychology. But a new era of especially enthusiastic interchange began in the mid 1980s, exploring why seemingly small changes in question wording, format, or ordering could at times produce sizable changes in responses.

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The natural place for this effort to begin was with *question order effects*, also called *context effects*. Many experimental studies had shown that responses to a question could be pushed one way or another by asking a prior question on a related topic. Because psychologists had done much work on contrast and assimilation effects, they were armed with a set of tools with which to explain such effects, and this effort was quite fruitful (see Tourangeau and Rasinski, 1988).

The focus of the work we describe in this paper is a different set of response effects that have been well documented but only minimally understood: response order effects, acquiescence effects, no-opinion filter effects, and status quo alternative effects. All these effects occur in closed-ended questions and hinge upon how the response alternatives are presented. *Response order effects* occur when the order in which response options are presented affects people's choices among them. *Acquiescence* is the tendency to agree with assertions made in survey items, without regard to content. *No-opinion filter effects* occur when a "don't know" option is explicitly offered to respondents. The presence of this option dramatically increases the proportion of people who say they have no preference on an issue. *Status quo alternative effects* occur when respondents endorse no social change on some issue (for example, "keep defense spending the same as it is now") in greater numbers than they otherwise would as the result of being offered this response option explicitly.

### The Notion of Satisficing

In starting to think about these effects, one of the present authors (Krosnick, 1991) came upon a set of theoretical predictions that seemed potentially quite useful: Herbert Simon's (1957) concept of *satisficing*. Simon did not elaborate this concept into a set of structured hypotheses; he simply offered it as a general metaphor to describe conventional decision making. He saw the *satisficing* notion as an alternative to the common economic assumption that people expend whatever effort is required in order to maximize the profits they reap from their decisions. When faced with a demanding information-processing task, Simon suggested, people often expend only the effort necessary to make a satisfactory or acceptable decision. Thus, people presumably attempt only to ensure that their profits are above a minimal threshold of acceptability. For example, rather than doing whatever is necessary to identify the best-quality car on the market and to buy it for the lowest possible price (a strategy called *optimizing*), car buyers routinely seek a car of sufficient quality (defined subjectively) at a sufficiently affordable cost.

In thinking about people answering questions in a survey, it seems quite plausible that similar sorts of processes might unfold. Some respondents may indeed be motivated by the goals of helping science advance knowledge or helping an interviewer or researcher complete his or her project. But most respondents are not powerfully motivated to provide high-quality data for these or other reasons.

One indicator suggesting problems with respondent motivation is the decline in survey response rates seen in recent years (Brehm, 1993). Many people are quite reluctant to be interviewed, and experienced survey firms have crack staffs of "refusal conversion" interviewers who are skilled at persuading reluctant individuals to answer questions. It would be dangerous to assume that such respondents are inclined to devote a great deal of effort to answering questions carefully. And even respondents who do quickly agree to be interviewed probably often do so simply as the result of compliance, an automatic "click-whirr" decision that occurs with little motivation to do the job well (see Cialdini, 1993). For anecdotal evidence of this, one need look only at comments written by field interviewers, which remarkably often describe how an interview could only be obtained under circumstances clearly indicating minimal respondent interest (see Converse and Schuman, 1974). When a respondent is interviewed while underneath a car doing repairs or while cooking dinner and watching three children, it is hard to imagine that he or she will expend great effort in the interest of maximizing data quality.

**Defining Satisficing.** In order to understand the likely effects of such conditions, it is useful first to consider what respondents must do to provide high-quality data. This process, which we dub *optimizing*, entails effortful execution of the four stages of question answering (see Cannell, Miller, and Okkenberg, 1981; Tourangeau and Rasinski, 1988). Respondents must carefully interpret the meaning of each question, search their memories extensively for all relevant information, integrate that information carefully into summary judgments, and respond in ways that convey those judgments' meanings as clearly and precisely as possible.

*Satisficing* involves compromising one or more of these steps, and it can be conceived of as taking two forms: weak and strong. *Weak satisficing* entails executing all four of the stages just described, but being less than thorough in doing so. Respondents engaged in weak satisficing as compared to optimizing may be less thoughtful about a question's meaning, they may search their memories less thoroughly, they may integrate retrieved information more carelessly, and/or they may select a response choice more haphazardly. Instead of attempting to generate an optimal answer, the first answer a respondent considers that seems acceptable is the one he or she offers.

*Strong satisficing* involves omitting the retrieval and judgment steps from the response process altogether. That is, respondents may interpret each question only superficially and select what they believe will appear to the interviewer and/or researcher to be a reasonable answer without referring to any internal psychological cues specifically relevant to the attitude, belief, or event of interest. Instead, they use cues in the question itself to identify a response that seems easily defensible with little thought.

In this chapter, we focus on four response strategies that might constitute satisficing (for details, see Krosnick, 1991). Two of these strategies are forms of weak satisficing: (1) selecting the first alternative in a closed-question that is acceptable (thus yielding response order effects) and (2) acquiescence

(whereby the respondent agrees with assertions offered in agree/disagree, true/false, or yes/no questions).<sup>1</sup> Both of these response effects can be thought to occur because respondents primarily attempt to generate reasons in favor of selecting an answer choice rather than reasons not to select it and because respondents settle for the first choice they consider for which they can generate enough supportive reasons. The remaining two strategies are forms of strong satisficing: (1) selecting a status quo option when offered, because it is easy to defend keeping things as they are now, and (2) selecting a no-opinion option when offered, because it is easy to claim ignorance on a topic.

**Regulators of Satisficing.** Stated in general terms, the likelihood that a given respondent will satisfice when answering a particular question is a function of three factors. The first is the inherent *difficulty of the task* that the respondent confronts. The second is the respondent's *ability to perform the required task*. And the third is the respondent's *motivation to perform the task*. The greater the task difficulty and the lower the respondent's ability and motivation to optimize, the more likely satisficing is to occur.

Task difficulty is likely to be a function of the complexity and familiarity of the language and concepts involved in a question, the extent of the retrieval process entailed, the complexity of the information to be integrated into a summary judgment, and the ease with which such judgments can be expressed with the response alternatives offered. In addition, task difficulty can be enhanced if an interviewer reads questions and records answers at a quick pace or if the interview situation involves significant distraction.

At least three aspects of respondent ability may be related to satisficing and optimizing. First, optimizing should be easier for respondents adept at retrieving information from memory and integrating that information into verbally expressed summary judgments. Second, ability is presumably high among individuals who have had practice in thinking about the topic of a particular question. And third, people who have stored in memory a preconsolidated answer to precisely the question being asked are presumably better able to answer it optimally.

There are many sources of respondent motivation potentially relevant to satisficing. For example, respondents differ from one another in terms of their *need for cognition*, the degree to which they enjoy thinking (Cacioppo and Petty, 1984). Respondents high in need for cognition are presumably least likely to satisfice. In addition, the more personally important the topic of a question is to a respondent, the more likely he or she presumably is to optimize. The more valuable or useful a respondent perceives a survey to be, the more likely he or she is to optimize. The more an interviewer encourages optimizing by explicit directions requesting careful reporting, the more likely such behavior presumably is. The more a respondent feels potentially accountable to defend his or her answers, the more likely those answers are to be formulated effortfully (for example, Tetlock, 1983). Finally, the longer an interview has been underway, the lower the respondent's motivation to optimize presumably becomes, because of increasing fatigue.

The various hypotheses outlined above constitute a series of explanations for the presumed main effects of task difficulty, respondent ability, and respondent motivation on satisficing. Although these main effects may simply be additive, their relations are more likely to be multiplicative, in one of two ways. On the one hand, satisficing may only occur or may be especially likely when more than one of the following conditions are present: high task difficulty, low ability, and low motivation. On the other hand, the presence of any one of those conditions may be sufficient to induce satisficing, in which case *optimizing* will only occur when task difficulty is low and ability and motivation are both high. Either of these possibilities implies the following formulation of the probability of satisficing:

$$p(\text{Satisficing}) = \frac{\alpha_1 (\text{Task Difficulty})}{\alpha_2 (\text{Ability}) \times \alpha_3 (\text{Motivation})}$$

During the last four years, we have been conducting a series of empirical tests of these hypotheses, and in the remainder of this chapter, we will describe the initial results of those tests from three studies. The first, a reanalysis of existing data, tested the hypothesis that cognitive skills regulate satisficing. The second study involved collection of new data to test the cognitive skills hypothesis more precisely. And the final study explored a range of possible additional causes of satisficing.

### Study 1: Reanalysis of Schuman and Presser's Experiments

Before we could think of beginning to collect new data to explore the satisficing notion, we were forced to confront a sizable body of published evidence that seemed to disconfirm a central hypothesis in the theory.

Between 1972 and 1980, Schuman and Presser (1981) conducted over 130 experiments, each one varying the form, wording, or context of a single question. These experiments were incorporated in thirty-four telephone and face-to-face surveys of representative national and regional samples of U.S. adults and documented several response effects, including response order effects, acquiescence effects, status quo alternative effects, and no-opinion filter effects, on issues likely to be familiar to most respondents. A primary hypothesis tested in these studies was that more educated respondents might be less likely to manifest all varieties of response effects, including those we believe may be due to satisficing. Because educational attainment is very strongly correlated with cognitive skills (see Ceci, 1991), our reasoning would certainly anticipate such a predictive role for education.

Schuman and Presser (1981) estimated the impact of their many question manipulations separately among respondents with low, moderate, and high levels of education. In only a few cases was the relation between education and response effect size statistically significant, so Schuman and Presser concluded

that there was no consistent evidence for the hypothesis that education generally moderates response effects.

However, the item-by-item analysis approach employed by Schuman and Presser (1981) may have hampered their ability to detect a significant overall education effect across all their experiments. In fact, the advent of meta-analysis in recent years has alerted researchers to the value of analyzing sets of empirical studies in tandem (for example, Rosenthal, 1988). Using this method, researchers can evaluate whether an expected relation holds across a number of independent studies by combining the effect sizes or significance levels obtained in them (Rosenthal, 1988). The effect of education in any single experiment by Schuman and Presser might not have appeared to be reliable, but pooled results might indicate otherwise. For this reason, we conducted a meta-analysis of their experiments to re-examine the education hypothesis.

**Meta-Analysis Methods.** Among the experiments included in our meta-analysis were those using conventional procedures to assess four of the response effects implicated by the satisficing theory: response order, acquiescence, status quo alternative, and no-opinion filter effects. In the response order experiments, half the respondents received a question with one order of response alternatives, and the other half received the same question but with the order of some or all alternatives reversed (these questions usually offered only two or three response alternatives). For the acquiescence experiments, half the respondents were forced to choose between two statements expressing two opposing points of view on an issue, whereas the other half were asked to agree or disagree with the first of the two statements. Status quo alternative effects were gauged by asking half the respondents a question with a status quo alternative and the other half the same question without that alternative. Similarly, no-opinion filter effects were assessed by asking half the respondents a question with an explicit "no opinion" response option and half the same question without the option.

We performed the meta-analysis according to a standard procedure described by Rosenthal (1988), using the computer package *Advanced BASIC Meta-Analysis* (Mullen, 1989). For each experiment, we first calculated a  $X^2$  for the manipulation's effect within each of three education groups: respondents who had not completed high school (the low education group), high school graduates (the medium education group), and people who had attended at least some college (the high education group). These  $X^2$ 's were then converted into measures of effect size (Cohen's  $d$ ) for the individual education groups. The meta-analysis then compared the average effect sizes among the three education groups.

**Results.** The meta-analysis yielded strong support for the expectation that people with less formal education would be more susceptible to three of the response effects (see Table 3.1). The response order, acquiescence, and no-opinion filter effects were significantly stronger for the low education group than for the high education group. Interestingly, the pattern of effect sizes for the medium education group varied across these three response effects. In the response order and acquiescence experiments, the effect sizes for the medium

**Table 3.1. Average Effect Sizes and Significance Tests for Differences Among Three Education Groups (Study 1)**

Response Effect	Number of Experiments (or Item Analyses)	Average Effect Sizes			Significance Tests for Group Differences		
		Low	Medium	High	Low vs. High	Low vs. Medium	Medium vs. High
Response order	7	.36	.15	.18	.01	2.43	.01
Acquiescence	11	.33	.19	.18	.00	3.07	.00
Status quo alternative	6	.35	.46	.44	.07	1.70	.05
No-opinion filter	20	.67	.63	.44	.00	1.21	.12
						5.80	.00

education group were significantly smaller than those for the low education group and were equivalent to those for the high education group. But in the no-opinion filter experiments, the effect size for the medium group was significantly greater than that for the high education group and was equivalent to that for the low education group.

The two response effects for which the medium education group behaved like the high education group are both presumably forms of weak satisficing (response order and acquiescence effects), whereas no-opinion filter effects are purportedly forms of strong satisficing. This pattern suggests that respondents of moderate educational level (and, by implication, moderate cognitive skills) do have the cognitive capacity to optimize, but whether they actually do so depends on the satisficing strategy suggested by the particular question involved. When a question offers an easy satisficing opportunity by providing a cue, moderately educated respondents behave like the least educated. But when a question does not offer such an obvious easy answer, moderately educated respondents apparently exert the effort to optimize and thus behave like highly educated respondents. Additional studies on the weak-strong distinction are certainly necessary before any conclusive statement can be made, but the results suggest that this distinction is potentially a useful one.

Surprisingly, the status quo effect was apparently stronger among more educated respondents than among less educated respondents. This unexpected result challenges the notion that status quo responses may be the result of satisficing.

## Study 2: Further Investigation of the Cognitive Skills Hypothesis

Although the meta-analysis provided evidence consistent with the notion that cognitive skills regulate susceptibility to some response effects, educational attainment is clearly an indirect index of cognitive skills and one that is confounded with various other factors. Consequently, another study was conducted in which 721 undergraduates at Ohio State University (OSU) completed self-administered questionnaires. This study assessed the impact on the use of several response strategies of more precise measures of cognitive skills: the sixty-item Raven's Standard Progressive Matrices (RSPM) (Raven, Court, and Raven, 1982) and three subsists of the Sternberg Triarchic Abilities Test (STAT), measuring verbal and quantitative skills (Sternberg, 1990).

We also obtained the college student respondents' scores on the Scholastic Aptitude Test (SAT) and the American College Testing Program's Test (ACT) from the university registrar's office. The students had generally taken only one of these two tests; however, scores on one can be converted to the scale of the other (see Marco, 1992). Therefore, we calculated a single score for each respondent, representing his or her performance on the mathematics part of either the SAT or the ACT, and we calculated a single score representing each

respondent's performance on the verbal part of the SAT or the reading part of the ACT.

Exploratory and confirmatory factor analyses revealed three principal factors underlying the test scores. The verbal tests loaded on one factor; the math tests loaded on a second factor; and the RSPM loaded on a third factor. We therefore treated these three dimensions as separable aspects of cognitive skills.

**Measuring Response Effects.** Among many other questions, the survey contained sixteen experiments on individual target items, measuring the four satisficing-related response effects from Study 1 (response order, acquiescence, status quo alternative, and no-opinion filter effects) with four items each, most of which replicated Schuman and Presser's experiments or similar ones by other investigators. Eleven of the sixteen experiments yielded significant overall effects (one response order experiment; two acquiescence experiments; all four status quo experiments; and all four no-opinion filter experiments), and we conducted further analyses to see whether these effects were regulated by cognitive skills. To do so, we calculated measures of the frequency of selecting the first response, of acquiescing, of selecting status quo, and of saying "don't know" in response to the items tapping these respective tendencies. In ordinary least squares regressions, these four dependent variables were then simultaneously predicted by (1) the three dimensions of cognitive skills, (2) a dummy variable representing the item's experimental manipulation (for example, coded 0 for one response order and 1 for the other order, 0 for the question form omitting the "don't know" option and 1 for the form offering it, and so on), and (3) interactions between cognitive skills and the question form's dummy variable.

**Results.** Regression analyses were conducted separately to assess the impact of the three cognitive skills factors on each of the four response effects. Interestingly, cognitive skills were significantly associated with three of the effects in ways that replicated our reanalysis of Schuman and Presser's (1981) data (see Table 3.2). Response order effects were significantly greater among individuals who scored lower on the math factor but were unrelated to the other two skills. Acquiescence effects were significantly greater among people who scored lower on the RSPM and were unrelated to the other two factors. And the no-opinion filter effects were significantly greater among people who scored lower on the verbal factor and were unrelated to the other two factors. These patterns are all consistent with the general notion that lower cognitive skills lead to a greater tendency for satisficing and, thus, appearance of the various effects.

Furthermore, subsequent analyses revealed that nonlinearities in these three significant relations replicated the nonlinearities that had appeared in our analysis of Schuman and Presser's (1981) data. For response order effects and acquiescence, people with moderate skills showed relatively weak effects, resembling the people with the highest skills more than the people with the lowest skills. And for no-opinion filter effects, people with moderate skills

**Table 3.2. Multiple Regressions Predicting Response Effects with Measures of Cognitive Skills (Study 2)**

Independent Variable	Response Effects			No-Opinion Filter
	Response Order	Acquiescence	Status Quo Alternative	
Question form	.15 <sup>b</sup>	.27 <sup>b</sup>	.46 <sup>b</sup>	.30 <sup>b</sup>
Verbal	.00	-.01	.00	.00
Math	.07 <sup>b</sup>	-.01	.00	.00
RSPM	.03	.00	.00	.00
Form x Verbal	.00	.00	.01	-.04 <sup>b</sup>
Form x Math	-.08 <sup>a</sup>	.02	-.01	.00
Form x RSPM	.00	-.05 <sup>a</sup>	.03 <sup>a</sup>	.00
R <sup>2</sup>	.04	.16	.61	.41
N	719	721	721	721

Note: Table entries are unstandardized regression coefficients.

<sup>a</sup> $p < .10$

<sup>b</sup> $p < .05$

showed relatively strong effects, resembling the people with the lowest skills more than those with the highest skills. These patterns further reinforce the apparent value of a distinction between weak and strong satisficing.

Again challenging the satisficing hypothesis, we found that status quo alternative effects were significantly greater among people who scored higher on the RSPM factor, and they were unrelated to the other two cognitive skills factors (see Table 3.2). Furthermore, the nonlinear shape of the RSPM effect here matched that of education level in our meta-analysis: moderately skilled respondents exhibited the same strong effect of the status quo alternative as the highly skilled respondents did.

**Study 2 Conclusions.** Although educational attainment is clearly different from cognitive skills, the results here are perfectly consistent with our meta-analysis of Schuman and Presser's (1981) data. The consistency of the surprising status quo effect results suggests that the observed relation is robust. One possible explanation for it is that status quo responses may have been optimal answers for many respondents and that the most cognitively skilled were most precise regarding the selection of that alternative. Further research is clearly needed to investigate this finding, particularly research that employs measures of the cognitive processes we hypothesize to be directly involved with satisficing and optimizing: question interpretation, information retrieval, integration, and answer selection.

### Study 3: An Exploration of Mental Coin Flipping and Nondifferentiation

Our final study explored the two remaining response strategies hypothesized to reflect satisficing: mental coin flipping and nondifferentiation. This study also expanded the set of predictors examined to include not only cognitive skills but also prior thought about the topic (an aspect of ability) and four aspects of respondent motivation: the respondent's need for cognition, the respondent's perceptions of the survey's value, the presence of instructions requesting accuracy, and the placement of the question early or late in the questionnaire.

**Measuring Mental Coin Flipping and Nondifferentiation.** In designing this investigation, we first had to decide how to operationalize mental coin flipping and nondifferentiation. If a respondent were to implement mental coin flipping, then we would expect little correspondence between his or her answers to the same question on multiple occasions. We therefore interviewed our respondents twice and repeated certain questions on both occasions. We could then construct an index of respondents' *temporal consistency*. It is possible that this index might reflect attitude change between interviews as well as mental coin flipping, but if we find that temporal consistency is related to most of the predictors we have identified as potential causes of coin flipping, then satisficing is a plausible interpretation of our results.

We also assessed the *cross-sectional consistency* of ratings made of different objects on the same scale. A respondent who chooses to minimize cognitive effort by nondifferentiating will manifest a high level of such consistency. That is, if asked to rate a series of issues in terms of how important they are, a nondifferentiating respondent might rate most or all of them as "very important." Such consistency might also reflect genuinely equivalent evaluations of the various objects, but once again, converging evidence across predictors will lend support to the satisficing perspective. Interestingly, this perspective predicts that respondent ability and motivation will have reversed relationships with temporal consistency and cross-sectional consistency respectively, because the former is thought to reflect optimizing and the latter presumably reflects satisficing.

**Method.** A representative sample of 425 adults living in the Columbus, Ohio, metropolitan area were interviewed by telephone on two occasions by trained survey interviewers, and 177 of them agreed to be reinterviewed and were recontacted approximately one month later.

The first wave of the survey included thirty-nine measures of attitudes on social and political issues, and twenty of these attitude items were measured in the second wave as well (these items involved two, three, four, or ten response choices). Temporal consistency was assessed by comparing answers to these twenty questions during the initial and follow-up surveys. The more inconsistency a respondent manifested, the lower his or her temporal consistency score was.

**Table 3.3. Multiple Regressions with Between-Respondent Main Effects Predicting Temporal Consistency and Cross-Sectional Consistency (Study 3)**

Predictors	Dependent Variable	
	Temporal Consistency	Cross-Sectional Consistency
Education	.20 <sup>c</sup>	-.23 <sup>d</sup>
Value of the survey to OSU researchers	.20 <sup>b</sup>	-.07 <sup>c</sup>
Value of the survey to U.S. citizens	.08	-.06
Value of the survey to Ohio residents	-.37 <sup>d</sup>	.28 <sup>d</sup>
Need for cognition	.11 <sup>a</sup>	-.01
Accuracy instructions	.12 <sup>b</sup>	-.05
R <sup>2</sup>	.18	.12
N	161	396

Note: Table entries are unstandardized regression coefficients.

<sup>a</sup>*p* < .10

<sup>b</sup>*p* < .05

<sup>c</sup>*p* < .01

<sup>d</sup>*p* < .001

Cross-sectional consistency was assessed by the variance of responses to items asking for ratings of a set of objects on a common ten-point response scale. Five sets of four items using the same scale each yielded a variance estimate, and these variances were averaged to yield a single cross-sectional consistency score for each respondent. For example, one set of items asked respondents to report how good or bad U.S. relations with four other countries were, on a scale ranging from "extremely bad" to "extremely good."

Various hypothesized predictors of satisficing were measured during the initial interview. Specifically, educational attainment was used as a proxy variable to assess cognitive skills. Prior thought was gauged by asking people how much they had thought previously about the topics of some questions. Beliefs about the value of the survey were gauged by questions asking how valuable respondents felt the survey would be to researchers at the Ohio State University, to citizens of the United States, and to residents of Ohio. And need for cognition was measured using a subset of Cacioppo and Petty's scale (1984).

Half of the respondents were randomly selected to receive a set of instructions encouraging them to think hard in order to provide as accurate answers as possible, whereas the remaining respondents received no such instructions. Finally, the questions were presented to respondents in one of four orders (determined randomly), so that each question's placement was varied (across respondents) from very early to very late in the interview.

**Results.** Our initial analyses assessed main effects of hypothesized predictors and found a series of them to be statistically significant. We first conducted ordinary least squares regressions including only the predictors that varied between respondents (that is, excluding prior thought and question placement, which varied across items within respondents). Temporal consistency was significantly or marginally significantly lower among people low in education, people who perceived little value to OSU researchers, people low in need for cognition, and people who did not receive accuracy instructions (see Table 3.3, column 1). Surprisingly, greater perceived value to Ohio residents was associated with less temporal consistency. Separate repeated-measures regression analyses of the predictors that varied within respondents revealed that less prior thought on a topic led to less temporal consistency (results not shown; for details on this analytic method, see Judd and McClelland, 1989, chap. 14).

Cross-sectional consistency was significantly or marginally significantly higher (suggesting satisficing) among people with less education, people who perceived the survey to be less valuable to OSU researchers, and people who felt the survey was more valuable to Ohio residents (see Table 3.3, column 2).

We then added all possible interactions between the predictors to these regressions to explore the prospect of synergistic interplay. In brief, these analyses revealed some interactions among variables already found to have main effects, and they revealed additional effects: low perceived value to OSU researchers and question placement later in the questionnaire exacerbated temporal inconsistency (in combination with other factors already found to have

significant main effects). Also, low need for cognition and low perceived survey value for U.S. citizens significantly exacerbated cross-sectional consistency (in combination with other factors). Surprisingly, item placement earlier in the questionnaire also exacerbated cross-sectional consistency (in combination with other factors).

**Study 3 Conclusions.** The results of this study are generally consistent with our expectations. Greater education, greater value to OSU researchers, greater value to U.S. citizens, higher need for cognition, the inclusion of accuracy instructions, and prior thought were associated (through main effects or interactions) with more temporal consistency and/or less cross-sectional consistency. We also found interactions indicating that cross-sectional consistency was greater at the beginning of the questionnaire and temporal consistency was lower later in the survey. This suggests that the tendency to optimize might be strongest at a point partway through a telephone interview, rather than at the very start. Our respondents seemed to progress from satisficing to optimizing, and back to satisficing (in a different form) as the survey proceeded.

The biggest surprise in our results was that respondents who felt the survey was more valuable to Ohio residents evidenced less temporal consistency and more cross-sectional consistency. Although this measure was intended to tap beliefs about the extent of the benefits that Ohio residents would gain from the survey's results, it may instead have gauged respondents' perceptions of how

much value other respondents would ascribe to participating in the survey (the question wording was: "How valuable would you say the survey that you are participating in now will be for the residents of the State of Ohio?"). If a respondent believed that other potential respondents (that is, Ohio residents) would think the survey was valuable, he or she might have presumed that these individuals would invest lots of effort in order to answer the questions optimally. Therefore, the respondent might have felt it was not necessary to do the same himself or herself and might have been more likely to satisfice as a result. This would constitute a form of *social loafing* (Sweeney, 1973).

### Conclusion

The findings reported here constitute evidence consistent with many hypotheses derived from the satisficing perspective. We found that educational attainment can be used to identify respondents who are most susceptible to four satisficing-related response effects, though in the opposite direction to our expectations regarding status quo alternative effects. Our second study indicates that the association between education and response effect magnitude is likely to be due at least partly to the fact that respondents with higher levels of cognitive skills are less susceptible to three of these effects and more susceptible to one of them. Our third study documented the impact of additional predictors beyond education, including perceived value of the survey to others, need for cognition (through a significant interaction though not a main effect), and instructions requesting accuracy. Furthermore, the interactions observed in this last study supported the notion that sources of ability and motivation may at times combine multiplicatively in regulating response strategy use.

In light of this evidence, it seems quite plausible that people engage in various response strategies to reduce cognitive effort, especially under conditions thought to foster satisficing. Clearly, much more investigation of these issues is needed before researchers will have a detailed and complete portrait of the processes of satisficing in surveys. But our work lays a foundation to justify such efforts in the future and, we hope, will help to promote a better understanding of how to design more effective surveys to maximize the quality of the data obtained.

In addition to documenting the ability of hypothesized antecedents to predict which respondents will implement particular response strategies under particular circumstances, future research should also seek to document the cognitive processes through which satisficing occurs. This is likely to be difficult, for a few reasons. Most importantly, the interpersonal dynamic of satisficing involves deception by the respondent: presenting an image of himself or herself to the interviewer and/or researcher as providing reasonably accurate answers, yet not doing the cognitive work that would be required to actually do so. Consequently, researchers cannot hope that respondents will openly inform them about these cognitive processes. Sophisticated methodologies will

be required to get behind the self-presentational curtain and to illuminate the processes unfolding there.

Although it is probably premature to offer strong suggestions regarding optimal survey design, some possibilities do seem plausible at this point. Most generally, if satisficing does indeed compromise data quality, then survey designers will want to maximize respondent motivation and minimize task difficulty. Respondent ability and some aspects of motivation (for example, need for cognition) are presumably not subject to manipulation via a questionnaire, so they offer less promise as handles for good questionnaire design. But motivation can presumably be enhanced somewhat by providing instructions requesting accuracy and by informing respondents why a survey is valuable and how its results will be used constructively. Inducing accountability (Tetlock, 1983) by asking people to justify their answers every so often may also enhance motivation. Task difficulty can presumably be reduced by such techniques as decomposing questions requiring complex mental processes into simpler questions, each requiring less intensive effort (see, for example, Krosnick and Berent, 1993). And, of course, minimizing the difficulty and unfamiliarity of the language and grammatical structures used in questions and answer choices seems likely to minimize task difficulty. Krosnick (1991) outlined these and other such strategies in more detail, and the studies reviewed here suggest that such strategies may well be worth implementing.

Our focus here has been on questions measuring attitudes and beliefs. Yet there is every reason to believe that satisficing will be manifest when respondents are answering questions about past behavior, factual knowledge, and other constructs regularly measured in surveys as well. Indeed, it seems quite plausible that when answering a question about visits to a doctor, for example, a satisficing respondent might choose to select the first plausible response option, to agree with an assertion or simply to say "don't know," just as he or she would in answering an attitude question. This logic suggests that the same satisficing-relevant handles for improving the quality of attitudinal data may also improve data quality for other questions, and this logic encourages future research on satisficing in these other domains as well.

Finally, in the face of increasing reliance on telephone interviewing in survey research, our logic suggests a possible benefit of the (perhaps) dying art of face-to-face interviewing. Respondents presumably feel more genuine interpersonal connection with interviewers in their homes, as opposed to interviewers with whom they interact more minimally via telephones. Consequently, respondent motivation to optimize may be significantly higher in face-to-face interviews, thus maximizing data quality. Most studies of response effects have involved telephone interviewing (for example, Schuman and Presser, 1981), and few comparisons of response effects in telephone and face-to-face surveys have been conducted (see Chapter Four). Yet our research may ultimately form a basis for recommending that the costs and inconveniences of face-to-face interviewing may be well worthwhile in terms of data quality.

**Note**

1. One can also imagine that acquiescence might represent a strong form of satisficing, where respondents might choose to agree with any assertion without thinking about its merits in the least. However, our initial suspicion was that acquiescence is most often the result of minimal, confirmatory-biased evaluation of the stimulus question, and the data we describe are consistent with that presumption.

**References**

- Brehm, J. *The Phantom Respondents*. Ann Arbor: University of Michigan Press, 1993.
- Cacioppo, J. T., and Petty, R. E. "The Need for Cognition: Relationship to Attitudinal Processes." In R. McGlynn, J. Maddux, C. Stolltenberg, and J. Harvey (eds.), *Social Perception in Clinical and Counseling Psychology*. Lubbock: Texas Tech Press, 1984.
- Cannell, C. F., Miller, P. V., and Oksenberg, L. "Research on Interviewing Techniques." In S. Leinhardt (ed.), *Sociological Methodology 1981*. San Francisco: Jossey-Bass, 1981.
- Ceci, S. J. "How Much Does Schooling Influence General Intelligence and Its Cognitive Components? A Reassessment of the Evidence." *Developmental Psychology*, 1991, 27, 703-722.
- Cialdini, R. B. *Influence: Science and Practice*. (3rd ed.) New York: HarperCollins, 1993.
- Converse, J. M., and Schuman, H. *Conversations at Random: Survey Research as Interviews*. See It. New York: Wiley, 1974.
- Judd, C. M., and McClelland, G. H. *Data Analysis: A Model-Comparison Approach*. San Diego: Harcourt Brace Jovanovich, 1989.
- Krosnick, J. A. "Response Strategies for Coping with the Cognitive Demands of Attitude Measures in Surveys." *Applied Cognitive Psychology*, 1991, 5, 213-236.
- Krosnick, J. A., and Berent, M. K. "Comparisons of Party Identification and Policy Preferences: The Impact of Survey Question Format." *American Journal of Political Science*, 1993, 37, 941-964.
- Marco, G. L. *Methods Used to Establish Score Comparability on the Enhanced ACT Assessment and the SAT*. New York: College Entrance Examination Board, 1992. (ED 350 337)
- Mullen, B. *Advanced BASIC Meta-Analysis*. Hillsdale, N.J.: Erlbaum, 1989.
- Parten, M. B. *Surveys, Polls, and Samples: Practical Procedures*. New York: HarperCollins, 1950.
- Raven, J. C., Court, J. H., and Raven, J. A. *Manual for Raven's Progressive Matrices and Vocabulary Tests*. San Antonio, Tex.: The Psychological Corporation, 1982.
- Rosenthal, R. *Meta-Analytic Procedures for Social Research*. Newbury Park, Calif.: Sage, 1988.
- Schuman, H., and Presser, S. *Questions and Answers in Attitude Surveys: Experiments on Question Form, Wording, and Context*. San Diego: Academic Press, 1981.
- Simon, H. A. *Models of Man*. New York: Wiley, 1957.
- Sternberg, R. J. "T and T Is an Explosive Combination: Technology and Testing." *Educational Psychologist*, 1990, 23, 201-222.
- Sweeney, J. "An Experimental Investigation of the Free Rider Problem." *Social Science Research*, 1973, 2, 277-292.
- Tetlock, P. "Accountability and the Perseverance of First Impressions." *Social Psychology Quarterly*, 1983, 46, 285-292.
- Tourangeau, R., and Rasinski, K. A. "Cognitive Processes Underlying Context Effects in Attitude Measurement." *Psychological Bulletin*, 1988, 103, 299-314.
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*Because people sometimes answer similar questions differently in telephone and mail surveys, the increasing tendency to use both modes in survey designs makes an understanding of these patterns a pressing concern.*

## Understanding Differences in People's Answers to Telephone and Mail Surveys

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Evidence is accumulating that the answers people provide to survey questions asked in telephone interviews are sometimes different than those registered in mail or self-administered surveys. Although a number of experiments have been conducted in which such differences have been identified, results and the explanations for these differences have not always been consistent.

In this chapter, we review past research to describe seven types of mode effects. In doing so, we integrate what now appear in publications as disparate, sometimes contradictory and confusing literatures by showing interconnections among the likely causes of mode differences. We conclude that there is

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