

DISCUSSION

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Diaries provide more extensive respondent burden than many other types of survey instruments. The papers we have just heard have explored several aspects of the effects of this burden. It is important to understand what kinds of biasing effects operate in order to properly interpret the data which we gather using diaries. We really need to know a priori what effects will operate, their type and magnitude, so that each study can be designed to ameliorate those conditions that can be reduced and to correct or adjust for those that remain.

The effects discussed by the authors of the previous two papers fall into two major groups: (1) those which induce an individual to refuse to take part in the survey, and (2) those which affect the way a respondent who has agreed to participate actually records. The first group, the nonresponse effects, were discussed primarily with regard to the travel studies. Those who drove little or not at all were less likely to respond because they didn't feel the survey applied to them; those who drove more frequently and for greater numbers of miles were less likely to respond because they were "too busy." The second group, the response conditioning effects, were several. In the prospective trip diary, fatigue over the week-long recording period produced a substantial decrease in reported number of trips and a smaller decrease in reported distance traveled. It appeared that reporting of shorter trips was omitted with increasing frequency as the week wore on. In the health diary, a sensitization to or increased awareness of one's good health produced a decrease in symptom reports and an improved and more self-reliant attitude toward health. Second, fatigue produced some skipping of recording days and dropping out, but had little effect on the quality of what was recorded.

The question I'd like to focus on briefly is: Why does fatigue reduce the quality of record-keeping in one study (the travel diary, for example) and not in another (the health diary)? I'd like to discuss it from two perspectives: one related to the structure of the instrument itself and one related to the difficulty of discriminating fatigue effects from sensitization effects.

Fatigue may produce problems in the quality of the recorded information primarily when omissions cannot be differentiated from true zeroes. That is, when the structure of the diary allows undetected omissions as opposed to clearly specified assertions of the absence of the behavior or other bit of information of interest, the effects of fatigue may be more likely to affect the quality of the recording and subsequent data reduction and interpretation. The health diary required an assertion that there were no symptoms, no medications taken, etc.; the travel diary required that a form be completed when a trip was taken. Thus a simple omission of a response (i.e., the completing of a trip description form) reduced the burden of recording in the travel diary, but not the health diary.

Clearly distinguishing between missing information and zeroes is a standard concern in instrument construction, and yet it may involve real ob-

stacles. The recording unit for the health diary was a day; symptoms, etc., were either present or absent for a day. This unit of record-keeping made the problem easier to handle; the respondent could readily assert that there were no symptoms that day and be done with that section of the diary. The travel diary presents a more difficult situation. In order to provide the respondent with the need to record the absence of a trip, one must break the time units for recording into something smaller than a day. Asserting that there were no trips in a day wouldn't reduce the problem substantially. Perhaps a log could be given the respondent in which each day was broken into hourly intervals (or some other relevant time period); for each hour in which no trip occurs, a notation of that fact is made. Such a mechanism would increase the recording burden for the respondent, but might help to clarify the fatigue bias. If we might generalize from the health diary we just heard about, one result may be a reduction in the effects of fatigue on the quality of the recording but an increase in sections of the diary which are left blank and/or an increase in the dropout rate during the survey. Such problems may, within limits, be more readily dealt with than the decrement in the quality of recording apparently so evident in the travel diary. Estimates based on information from those who at least begin data collection can be used to adjust for potential effects of missing data in the middle of diaries as well as of individuals who drop out of the study. Extra field efforts to maintain response can be utilized. This approach to handling the effects of fatigue in reducing the completeness of recording does assume that a respondent will simply leave an item blank rather than to inaccurately record a zero.

A large series of surveys of physicians recently completed by a team at the University of Southern California utilized a diary in which the physician was to record information on all patient encounters he or she engaged in over three days. There were several sections of the diary which required different forms of record-keeping. One section requested a running count of the numbers of encounters in different locations and with different categories of office staff (including the physician) by day of the week. Another section required a description of what took place in each consecutive encounter. A third section requested an accounting of the physician's time over the three days in 15 minute intervals. The data from the various sections were compared to estimate underreporting. The section of the diary in which encounters were described as they occurred was more subject to underreporting than the others.

Finally, I'd like to spend a moment emphasizing the point made relating to the potential confounding of fatigue and sensitization effects. You will remember in the health diary that it was concluded that the decreasing reporting of symptoms across the recording period was not a fatigue effect but a sensitization to good health. I would like to assert that there is an, at least somewhat plausible and similar, explanation which

one might offer for the decrement in number of trips recorded over the duration of the travel diary. Were the travel survey to have been conducted in the US rather than Canada I would be more certain of the appropriateness of this as an alternative explanation. Suppose for a minute that instead of becoming very weary of recording during the survey experience, the respondents became more acutely aware of their own travel patterns. At the time of the survey in the US the mass media were full of appeals to reorganize driving patterns, to plan one's day so that brief trips would be combined and that unnecessary trips would be eliminated so as to conserve gasoline. Could it not be that as the week of recording wore on, the respondents' awareness of their own patterns and the possibilities of conserving increased? If so, one might see just the sort of substantial decline in numbers of trips, but smaller decline in number of miles driven that were reported. The fact, however, that the

survey was conducted in Canada which was experiencing less of an acute situation with gasoline supplies takes a bit of the oomph out of this particular example. Were there media campaigns there at the time?

In any event, the potential for confusion between fatigue effects on underreporting of events and sensitization which will actually induce one to change behavior is present. Perhaps a wise addition to diary-based surveys would be a few questions throughout the reporting period and at the conclusion of the recording period about what the respondent felt occurred during the time the diary was kept. Did his or her behavior change as a result of increased awareness or the process of diary-keeping itself? How did fatigue affect record-keeping? The responses to such qualitative items could be used to shed light on the various alternative explanations for any such patterns in event-reporting over the diary period.