

TOUCH-TONE DATA ENTRY FOR HOUSEHOLD SURVEYS: RESEARCH FINDINGS AND POSSIBLE APPLICATIONS

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Introduction

In the mid-1980's, the Bureau of Labor Statistics (BLS) pioneered the application of touch-tone data entry (TDE) to business establishment surveys. The success of TDE to improve response rates and timely reporting for the Current Employment Statistics (CES) has been well-documented (Clayton et al, 1989). More recent work has documented increased respondent satisfaction and reduced survey costs for TDE reporters in the CES (Rosen et al, 1993).

The success of TDE for establishment surveys, not only at BLS but the Bureau of the Census (Bond et al, 1993), led us to explore the possible application of this mode of data reporting to household surveys. In late 1991, work was begun on a pilot TDE instrument for household survey reporters. The BLS survey utilized for this research was a short form of the redesigned Current Population Survey (CPS). The wording of the questions in the short form of CPS is identical to that in regular CPS.

The short form of the CPS questionnaire asks the minimum number of questions necessary to assign household members to one of three labor force categories: Employed; Unemployed; Not In Labor Force. The shortest possible series, for those who did any paid work last week, is 2 questions long. Approximately 58% of respondents will be classifiable as to labor force status after answering the 2-question series.

The CPS Touch-tone Data Entry program allows the respondent to answer open-ended questions as well as those be answered by "yes" and "no." Cognitive research on the pilot version indicated that respondents of widely-differing educational status followed the same rules as CPS interviewers in coding their open-ended responses. After the respondent has answered the minimum number of questions necessary to be classified as to labor force status, the program assigns labor force status to that respondent.

Thus, if a respondent indicates that he/she could not have returned to work last week, the program will request that the respondent state the reason for this inability*. After speaking the reason into the telephone, the respondent will be asked to self-code his/her open-ended answer as to why he/she could not have returned to work. If the respondent codes the open-ended answer as meaning that he/she was ill, and presses "1," the program classifies the respondent as "Unemployed." If the respondent codes the answer as "2," a reason other than illness, the program classifies the respondent as "Not In Labor Force."

The first phase of cognitive laboratory research on the CPS-TDE instrument was conducted in 1993. Nineteen respondents were interviewed using the short form of the CPS questionnaire, following which the respondents were asked to complete the same survey by keying their responses to a telephone version of the interview. Two respondents unwittingly pressed incorrect keys during their data entry, found themselves on the wrong paths, and were not able to complete their reports. In addition, respondents had a great deal of difficulty in recognizing the "line number" when using the "TDE Reporter's Guide" to report their household roster. The TDE instrument and "TDE Reporter's Guide" were revised to correct these problems.

METHOD

Subjects

The revised TDE instrument and Reporter's Guide were tested with 35 subjects in April, 1994. Thirty respondents were recruited by means of a Washington Post classified ad; five respondents were BLS staff not involved in the TDE research. The thirty subjects recruited from outside the BLS were each paid twenty-five dollars at the conclusion of their visit to the BLS Behavioral Science Laboratory. BLS staff were not paid.

The demographic characteristics of the respondents were as follows: there were twice as many females as males, educational levels ranged from High

School graduate to Ph.D., and the respondents ranged in age from 19 to 66 years of age.

Procedure

Respondents were first interviewed in a face-to-face interview using the short form of the CPS questionnaire. Following that interview, respondents were provided with a "Touch-tone Reporter's Guide" and the interviewer explained how to report their CPS data by TDE. Respondents then completed the same CPS interview as the first by keying their answers in to the telephone version of the interview. After completing the TDE interview, respondents were paid their \$25 and requested to call a toll-free number that evening and complete the TDE interview from their homes.

Materials

Respondents were offered a choice of telephone instruments, with keypad in the hand-held receiver or in the telephone base, and asked to choose the type of telephone used in their home. For respondents who used telephones with the keypad in the hand-held receiver, we recommended that they place the telephone receiver face up on the table in front of them for ease of keying answers while listening to the questions. (We had recorded the telephone script at a very loud volume. Thus, it was possible to hear the questions even though the ear piece/receiver was two to three feet away from the respondent's ear)

Results

TDE In the Laboratory

Thirty respondents were able to complete their interviews in one trial. Five respondents required a second trial to complete their interviews. Two of the five experiencing difficulty were pressing the keys too lightly. Instructing these respondents to press the keys with more force enabled them to successfully complete their interviews on a second trial.

Three of the respondents experiencing difficulty had problems with the concept of "Person Number" on the Household Roster page of the TDE Reporter's Guide. Although we had changed the term "Line Number" on the Household Roster to "Person Number" for ease of recognition, one respondent tried to enter the year of birth for that person, and the other two were baffled and did not attempt to enter any number. All three were able to complete their TDE interviews on the second trial after the "Person Number" was

explained in greater detail and highlighted in bright yellow in the Reporter's Guide.

TDE Reporting From Home

Before they left the laboratory, respondents were given a set of instructions on how to report by TDE from home. We removed the 5 BLS staff members from the "Eligible Sample" used to study TDE reporting from home because they might be favorably inclined to report from home. In addition, two of the remaining thirty subjects were to call in their data on an evening when a power outage brought the TDE system down, and we have no way of knowing whether these respondents called. Eliminating these two leaves an "Eligible Sample" of 28 respondents.

Twenty-three of this "Eligible Sample" reported from home, yielding a response rate of slightly better than 82 percent. In analyzing the demographic characteristics of the respondents and non-respondents among the "Eligible Sample," we were pleased to learn that we did not lose the oldest respondents nor the respondents with fewer years of education.

Along with response rate, we were concerned with reliability or the consistency of data reported in the face-to-face interview, the TDE report in the laboratory, and the TDE report from home. For the 35 cases for which we had face-to-face and TDE reports in the laboratory, there was one case in which the respondent answered one question differently in the personal and the TDE interviews.

For the 23 cases for which we have three CPS reports, the personal interview and TDE interview in the lab as well as a TDE report from home, there were two discrepancies. In one case in which the respondent provided the same data in the personal and TDE reports in the lab, but reported very differently from home, the respondent left a voice note saying that he was an inveterate computer hacker who could not resist the temptation to explore other paths in the computer program! In the second case, the respondent who answered one question differently in the personal interview and the TDE report in the laboratory, made the same TDE error from home.

Future research is planned. We plan to develop a text-to-speech component to read the names of persons on the household roster to the reporter. That should eliminate reporters' problems with recognizing the "line number" or "person number" of persons on the household roster. We plan to revise the instructions for

coding the response given to the open-ended TDE question on job search strategies.

Finally, we will ask respondents to report their household's labor force information for four consecutive months. This will give some clues to potential problems in respondent retention of the knowledge necessary to execute the TDE report as well as some indication of response rates over time.

Applications

One possible application of TDE to a BLS survey is its potential use for CPS sample expansion. Heightened recognition of the need to improve State labor force estimates goes back to the 1960s work of the Gordon Commission. The current State sample sizes are too small to detect what some believe are meaningful changes in month-to-month unemployment rates. BLS and Census staff have offered several alternative expansion plans over the years, all calling for substantial increases in the sample, which were not implemented because of the high cost of using traditional data collection methods. The selective use of TDE for data collection would reduce survey costs and enable CPS sample expansion

Another possible application of Touch-tone Data Entry is its use for special CPS labor force studies of targeted non-English speaking populations. Whereas bilingual interviewers may be difficult to obtain and train for extended studies, the TDE instrument for CPS can be adapted to any language.

Notes

*There is no voice recognition capability in the CPS TDE instrument as yet. Spoken answers are recorded for subsequent analysis of the correspondence between a spoken response and the code that the respondent assigns to that response.

References

Bond, D., Cable, G. and Andrews, S. (1993) "Improving Response Rates by Touchtone Data Entry on the Manufacturers' Shipments, Inventories, and Orders Survey," *Proceedings of the International Conference on Establishment Surveys*, Alexandria, VA: American Statistical Association, pp. 484 - 489.

Clayton, R.L. and L.J. Harrell, Jr. (1989). "Developing a Cost Model of Alternative Data Collection Methods:

MAIL, CATI, and TDE," *Proceedings of the Section on Survey Research Methods, American Statistical Association*, pp. 264-269.

Rosen, R.J., R.L. Clayton, and L.L. Wolf (1993), "Long term Retention of Sample Members Under Automated Self-Response Data Collection," *Proceedings of the Section on Survey Research Methods, American Statistical Association*.