

## CHAPTER 5

### THE TEACHER SURVEY

#### 5.1 Introduction

In the Teacher Survey, data are collected from a sample of classroom teachers in each of the public and private schools that were included in the sample for the School Survey. Data for schools and teachers are collected for the same school year (1987-88 for Round 1 of SASS and 1990-91 for Round 2). In the following school year, data are collected in the Teacher Followup Survey for all sample teachers who have left the sample school and for a subsample of those still teaching in the same school.

This chapter follows our standard structure for presenting information on each of the component surveys of SASS. The survey design and procedures are described for the Round 2 Teacher Survey, along with information on significant changes between Rounds 1 and 2. Information on the quality of data is presented for both rounds. The four sections which follow cover the main phases of the survey: frame development and sampling (5.2); data collection procedures and associated errors (5.3); data processing and estimation (5.4); and evaluation of estimates (5.5). The Teacher Survey design and procedures for the public and private school sectors are quite similar, so they will be described as a single survey, with differences noted where they exist.

The topics covered in the Teacher Survey questionnaires for Rounds 1 and 2 were similar. They include: current teaching status and work load; past teaching experience; education and training; perceptions and attitudes toward teaching; incentives and compensation; demographic characteristics; and tracing information needed to locate teachers included in the Teacher Followup Survey.

There were some changes in specific items, especially in the questionnaire section on perceptions and attitudes toward teaching. In an initial item asking teachers about their agreement or disagreement with each of a series of statements relating to their teaching environment, the number of such statements was reduced from 23 in Round 1 to 14 in Round 2. Conversely, for an item asking teachers to evaluate the relative seriousness, in their school, of various kinds of problems, the number of categories was increased from 13 to 22. A new item asking teachers to rank the relative importance of various educational goals was added in Round 2.

In the questionnaire section on teacher training, items on membership in professional organizations and participation in teacher induction programs (assistance to new teachers by mentor or master teachers) were added in Round 2. Under the heading of incentives and compensation, a Round 1 item on incentives asked, with respect to each of several possible kinds of pay incentives, whether teachers favored them and whether they were receiving them. In Round 2, teachers were asked only to report which ones they were receiving.

There were separate questionnaires for public and private school teachers in both rounds, but the contents were nearly identical. In Round 2, different lists of the organizations endorsing the two surveys were presented on the front page of the public and private school versions. One item, asking whether the teacher was working at the school on a contributed service basis (less than full salary or no salary), was used only for private school teachers in Round 2.

The initial samples for the Round 2 Teacher Survey consisted of 56,051 public school teachers and 9,166 private school teachers. Of these, 7.1 percent of the public school teachers and 12.4 of the private school teachers were later found to be ineligible for the survey, and completed questionnaires were not obtained for all of those who were eligible. Further details on sample sizes and response rates are given in Tables 5.1 to 5.5.

## **5.2 Frame development and sampling**

The target population The target population for the Round 2 Teacher Survey consisted of regular full-time and part-time teachers whose primary assignment was teaching in kindergarten or any of grades 1 to 12 during school year 1990-91. Also included were long-term substitutes who were filling the role of a regular teacher on a long-term basis and itinerant teachers (those teaching regularly in more than one school).

If a school was considered ineligible for the School Survey (see Chapter 2, Section 2.2), that school's teachers were ineligible for the Teacher Survey. Also excluded from the Teacher Survey target population were: short-term substitutes, teacher's aides, student teachers, administrators, and other non-teaching professional and support staff, as well as teachers no longer working at the school from which they had been selected.

Ineligible persons could be screened out at three stages. The instructions called for them to be excluded from the teacher lists requested from the sample schools for use in selecting a sample. Any persons who had been incorrectly included on a school's teacher list should have been identified by the first item on the Teacher Survey questionnaires, which asked for the respondent's main assignment at the school during the current school year. Respondents in categories, such as student teacher, that made them ineligible for the Teacher Survey were instructed to mail back their questionnaires without completing the remaining items. Finally, if a full questionnaire was returned for an ineligible person, it would normally be classified as out-of-scope in the interview status edit (see Section 5.4).

Sample design objectives and considerations The goals that guided the design of the Teacher Survey in Round 2 of SASS were:

(1) *Provide estimates of acceptable precision for specified domains of analysis.* These domains included: (1) experienced and new teachers in public schools by state and level (elementary, secondary or combined) and in private schools by association category, level and Census region; (2) bilingual/ESL teachers for California, Florida, Illinois, New York, Texas, and all other states as a group; (3) Asian or Pacific Islander teachers; and (4) American

Indian or Alaskan native teachers. To meet this goal required oversampling (relative to other groups) of new teachers in private schools and of each of the last three domains. The last two domains were new in Round 2; the first two were targeted in both rounds. New teachers were those in their first, second or third year of teaching; all others were classified as experienced. Bilingual/ESL teachers were those who (1) were using native language to varying degrees to instruct students with limited English proficiency or (2) providing intensive instruction in English to students with limited English proficiency.

(2) *Place limits on the number of teachers selected from each sample school.* At least one teacher was to be selected from every sample school. The number to be selected from a school was not allowed to exceed either 20 or twice the average allocation of teachers per school for the stratum in which the school was included, if that value was less than 20.

(3) *Make the sample approximately self-weighting within each of the main analytical domains.* This goal was accomplished by using within school sampling fractions for selection of teachers that, when multiplied by the schools' selection probabilities, would produce approximately the same teacher selection probabilities for all schools in a domain or stratum, for example, public elementary schools in a state. It was expected that this design would be close to optimum with regard to the sampling errors of estimates for each domain.

(4) *Ensure that the target sample sizes would be achieved for each analytical domain.* In advance of sample selection, there were no reliable estimates available for the numbers of bilingual/ESL, Asian and Pacific Islander, and American Indian teachers. The goal was achieved by using initial sampling fractions expected to produce larger than needed samples for each domain, randomly assigning the selected samples into 101 equal size "reduction groups", and then deleting reduction groups as needed to achieve the target sample size in each domain.

The teacher sampling frame for Round 2 In early October 1990, advance letters and forms for listing teachers were mailed from the Census Bureau's Jeffersonville processing facility to all sample schools. The listing forms contained instructions for listing eligible teachers. For each teacher, the school was asked to report first and last name, teaching experience, race, participation in ESL/bilingual programs, and teaching specialty by level. The forms were to be mailed back to Jeffersonville.

Starting in mid-October, Census Bureau field representatives telephoned sample schools which had not yet returned their teacher listing forms. They asked these schools to (in order of preference): mail in their completed forms; mail in a list of their teachers; give the list of teachers over the telephone; or, if the school objected to providing a complete list of teachers, select a sample of teachers as instructed by the field representative and provide information for the selected teachers over the telephone.

Some schools that selected their own samples objected to providing the names of sample teachers, so they were asked to label the ones they had selected as T1, T2, T3, etc. The

questionnaires for these teachers were subsequently mailed to the contact person for the sample school labelled with these identifiers (Bureau of the Census, 1990). This procedure was used for about 1 percent of the public schools and about 3 percent of the private schools.

Frame evaluation Because the teacher listings were obtained near the beginning of school year 1990-91, only those teachers who were on the school's rolls at that time would have been listed and eligible for sampling. A school's roll of teachers might have included some teachers who were on leave during the initial part of the school year; however, the instructions for the teacher listing forms did not specify whether or not teachers on leave should be included.

In Round 2 of SASS, teacher lists or samples were not provided by 5 percent of the eligible public schools and 10 percent of the eligible private schools that responded in the School Survey. No teachers were selected for these schools (Gruber, Rohr and Fondelier, 1993, Chapter VI). The corresponding figures for Round 1 were 4 percent for public schools and 12 percent for private schools (Kaufman, 1991, p.37).

The count of eligible teachers from the school questionnaire was not always the same as the number of teachers recorded on the listing form for the same school. In Round 1, in the average state, there were 5 percent fewer teachers recorded on the listing forms than were reported on the school questionnaires (Kaufman, 1991, p.67). If school questionnaire counts were correct, the teacher weights used in Round 1 would have resulted in underestimates of the number of teachers. As explained in Section 5.4, the teacher weights for Round 2 included a factor to benchmark the estimates to the school counts of teachers. The values of these factors by weighting cell indicate that, on the average, fewer teachers were recorded on the listing forms than were reported on the school questionnaires.

To explore the reasons for these discrepancies and to determine which counts are more accurate, a Teacher Listing Validation Study was undertaken in school year 1992-93 (Royce and Schreiner, 1994). That study has verified that some teachers, especially those working part-time, are missed by the teacher listing operation, but it does not provide a basis for estimating what proportion are missed. Further details are given in Chapter 7, Section 7.3.

Sample selection for Round 2 The main steps in the selection of the sample of teachers for Round 2 were as follows:

- (1) Determine the total number of teachers to be selected from the list provided by each sample school. These numbers were chosen according to a formula that satisfied two requirements: (a) make the product of the school's selection probability and the sampling fraction for teachers within the school constant within each stratum, and (b) make the average number of teachers selected from schools in that stratum equal to a target number established for schools of that sector (public or private) and level (elementary, secondary or combined).

- (2) Allocate the sample for each school between experienced and new teachers. In public schools, they were allocated in proportion to the number of teachers of each type, as determined from the teacher listing forms. In private schools, new teachers were oversampled by a factor of 1.8 (in Round 1 a factor of 1.6 had been used), in order to ensure a sufficiently large sample from this category in both the Teacher and Teacher Followup Surveys.
- (3) For each school, sort the teachers into five groups, as follows: (a) Asian or Pacific Islander teachers, (b) American Indian or Alaskan native teachers, (c) bilingual/ESL teachers, (d) new teachers, and (e) experienced teachers. Teachers falling in more than one of these categories were to be placed in the first one listed. Within each of these groups, sort teachers by primary field of teaching, as recorded on the teacher listing form for the school.
- (4) Within each school and group, select a systematic (every nth) sample of teachers at the rate determined for that group as a result of steps (1) and (2).
- (5) For the first three groups in step (3), randomly assign the sample teachers to 101 subsamples (reduction groups). For each of these three groups eliminate subsamples as needed to produce a sample of approximately the size specified for that group.

The resulting teacher sample sizes were as follows:

Asian or Pacific Islander	1,511
American or Alaskan native	1,529
Bilingual/ESL	2,121
New	7,972
Experienced	<u>52,084</u>
Total	65,217

### 5.3 Data collection procedures and associated errors

Data collection procedures for Round 2 Questionnaires were mailed to the sample teachers at their schools during January and February of 1991. In February and March, a second questionnaire was sent to each sample teacher who had not yet responded. In March, telephone followups to nonrespondents were initiated by Census Bureau field representatives, calling either from their homes or from the Census Bureau's regional offices. Telephone followups continued through June 1991.

The field representatives were instructed to call teachers at the schools to attempt interviews during non-teaching hours, for example, 8:00 to 9:00 a.m. and 3:00 to 5:00 p.m. For teachers unable to be interviewed at those times, they were to ask whether it would be possible to conduct the interview during a planning or free period.

Special procedures were necessary for schools whose sample teachers had been identified only by alphanumeric indicators (T1, T2, etc.). For these schools, the initial and followup questionnaires were mailed to the principal or other contact person at the school for distribution to the sample teachers. When telephone followups were necessary, the Census field representative was instructed to call the principal or other contact person and ask that the teacher(s) who had not responded be requested to call the field representative in order to complete their interviews.

Changes between Rounds 1 and 2 In Round 1, because of the relatively large number of teachers who did not mail back their questionnaires, the telephone followups were conducted only for a sample of the nonrespondents. In Round 2, all nonrespondents were followed up by telephone.

In Round 1, a school coordinator was appointed for each school to assist with the distribution of questionnaires for the Teacher Survey and the followup of nonresponding teachers. About 10 days after the initial mailing of questionnaires to the sample teachers, a letter was sent to each coordinator, listing the sample teachers and asking the coordinator to remind them to complete and return their questionnaires. About 6 weeks after the first mailing, replacement questionnaires for the nonresponding teachers were sent to the coordinator in a package. The coordinator was also contacted by telephone and asked to distribute the questionnaires to the teachers and encourage them to complete and return their forms (NCES, 1992).

The school coordinator procedure used in Round 1 was based on the findings from a test of alternative methods of using school coordinators, which had demonstrated that response rates were higher for schools with coordinators, but that payment versus nonpayment of coordinators had no measurable effect on the results (Schwanz, 1987; Kaufman, 1988). The procedure was dropped in Round 2 in order to protect, to the greatest degree possible, the identity of the sample teachers in each school and, hence, the confidentiality of the data they were providing in the survey.

Census Bureau field staff comments on collection procedures Following completion of field work for Round 2 of SASS and again after the completion of the 1992 pretest for Round 3, each Census regional office was asked to submit its comments and suggestions on how the survey instruments and collection procedures could be improved. Among the most frequent suggestions relating to the Teacher Survey were the following (Bureau of the Census, 1991a, 1992):

- Distribute the questionnaires earlier in the school year, so that teachers and school administrators would not be asked to complete them during the period leading up to graduation, which is one of their busiest times of year.
- Develop a procedure for conducting telephone followup interviews with teachers by calling them at their homes. Completing telephone interviews during school hours

proved difficult because of the length of the questionnaire, the sensitivity of some of the items, and limited access to telephones in many schools.

- Make the cover page of the Teacher Survey questionnaire "friendlier" by including more information specifically addressed to the teacher, such as the letter from the Commissioner of NCES.

A procedure for conducting telephone followup interviews with teachers at their homes was tested in the pretest for Round 3, as described below.

Test of new followup procedure In Rounds 1 and 2, Census field representatives often had difficulty contacting and conducting telephone interviews with teachers at school. Many teachers do not have easy access to telephones or are not able to use them for the time necessary to complete an interview. In a pretest for Round 3, conducted early in 1992, a postcard was sent to each sample teacher who had not responded within about two weeks of the second mailing. The message included the following:

If we do not receive your completed questionnaire by mail within two weeks, we will contact you by telephone at your school to collect this information. If you prefer to be contacted at home, please provide your home telephone number on the attached postcard and return it in the next few days.

Teachers who supplied their telephone numbers were contacted for interviews at their homes (Ferrell, 1992). Only a small proportion of teachers returned the postcards; therefore, this procedure has not been formally adopted for nonresponse followups in Round 3.

Time required for completion of questionnaire The teacher questionnaires for Round 2 included a final question "Not counting interruptions, how long did it take to complete this survey?" For questionnaires completed and returned by mail, this item was completed by the responding teacher; for questionnaires completed in followup telephone interviews, the item was completed by the interviewer. The median time for completion was 45 minutes for public school teachers and 40 minutes for private school teachers, with interquartile ranges of 30 minutes for both groups. About 99 percent of all teachers completed the questionnaire in less than 2 hours.

Supervision and quality assurance As in most of the other SASS surveys, the two primary methods of controlling the quality of the data collection operations were *regional office reviews* of the questionnaires completed by telephone for nonrespondents and *reinterviews* of respondents for a sample of completed questionnaires.

In the regional office reviews, the first four Teacher Survey questionnaires completed by each field representative were checked. If the total number of errors (including omissions) for the four questionnaires was ten or more, additional questionnaires were reviewed until there were four consecutive questionnaires with a total of fewer than ten errors. For the other three basic

surveys, the standard used for this review was fewer than ten total errors in two questionnaires (Gruber, Rohr and Fondelier, 1993, Chapter VII).

For both rounds of SASS, reinterviews were attempted for about 1,100 teachers, or about 1.65 percent of the total. They were successfully completed for about 75 percent of the eligible cases in Round 1 and 83 percent in Round 2. All reinterviews of teachers in both rounds were conducted by telephone. Findings from reinterviews are presented below, under the heading "Measurement error, findings from reinterviews".

Nonresponse error For the Teacher Survey, unit nonresponse could occur for two reasons: (1) a sample school failed to provide a list of teachers for use in selecting a sample (or, alternatively, to select a sample of teachers itself), or (2) an acceptable questionnaire was not obtained for a sample teacher. We will refer to these two sources of nonresponse as school nonresponse and teacher nonresponse. The product of the two types of response (the complement of nonresponse) is an indicator of overall teacher response rates. Table 5.1 shows these overall response rates, for public and private schools, for Rounds 1 and 2. The school response rates (proportion of schools providing teacher lists) are unweighted; the teacher response rates are weighted.

Table 5.1 shows that there were higher response rates, at both stages and in both rounds, for public schools. Overall response rates for public schools were 13 percentage points higher than those for private schools in Round 1 and 11 percentage points higher in Round 2. Mainly due to higher teacher response rates in Round 2, the combined rates were higher for both public schools (3 percentage points) and private schools (5 percentage points). Based on the results of the Round 1 pretest experiment with coordinators, one might have predicted lower teacher response rates in Round 2, when no coordinators were used, but the reverse occurred.

Table 5.2 shows unweighted and weighted *teacher* response rates for both rounds, for public and private schools. Weighted response rates take into account the probabilities with which schools in various strata were selected and are therefore a better indicator of the potential effects of nonresponse on the survey estimates. Table 5.3 shows weighted teacher response rates for public schools by state for Rounds 1 and 2. For Round 1 the rates ranged from a low of 68.6 percent in the District of Columbia to a high of 94.7 percent in South Dakota. Four states, Hawaii, Maryland, New York and Rhode Island, and the District of Columbia had response rates below 80.0 percent. For Round 2 the rates ranged from a low of 69.3 percent in the District of Columbia to a high of 96.8 percent in Wyoming. No states had response rates below 80 percent.

Table 5.4 shows Round 1 weighted teacher response rates for private schools by association group. The lowest rate observed, 58.1 percent, was for teachers in schools included in the area sample. For the list sample, response rates ranged from 61.2 percent to 86.6 percent. Round 2 response rates by association group are not available. Weighted response rates for affiliation groups in Round 2 were 87.9 percent for Catholic schools, 80.3 percent for other

religious schools and 78.1 percent for non-sectarian schools (Gruber, Rohr and Fondelier, 1993, Table VI-4).

The base for each of the teacher response rates presented in Tables 5.2 to 5.4 was the number of sample teachers who turned out to be eligible for the Teacher Survey. It excludes all teachers in schools that did not provide lists for sampling and it excludes school staff who were sampled but did not turn out to meet the survey definition of teacher or were no longer teaching at the sample school at the time the questionnaires were distributed. Table 5.5 shows the percentages of the initial sample that were excluded for such reasons.

Table 5.6 shows unweighted item response rates for public and private school teachers in Rounds 1 and 2. Because of changes in questionnaire content, the rates for the two rounds are not exactly comparable. In Round 2, the proportion of items with response rates of 90 percent or better declined somewhat, but the lowest observed item response rates were higher than they had been in Round 1. The patterns of item nonresponse were fairly similar for public and private school teachers.

In Round 1, two questionnaire items had response rates lower than 75 percent, for both public and private schools. The first of these was an item asking for second major or minor field of study for each degree reported. Teachers responding to the questionnaire were asked to enter a code 00 if they had no second major or minor field. Apparently, many of them simply left the item blank.

The second item with low response was the space for entering the total of a set of items asking for teachers to report their hours spent in school, during the most recent full week, on 5 categories of school-related activities. Because of data reporting problems, the data for this entire set of items, which also covered time spent on school-related activities after school hours, were excluded from the public-use data tapes for the Teacher Survey.

Most of the low item response rates observed on the Round 2 Teacher Survey questionnaires were for items that asked teachers who had answered "yes" to a question to report a related number or amount. For example, in an item on teacher training, several teachers who reported that they had taken courses in one or more of the subjects listed failed to enter the number of such undergraduate and graduate courses that they had taken (or to check the box for "none" in one of these categories). Similarly, teachers who reported that they had received certain types of income frequently failed to report the amounts.

Measurement error: findings from reinterviews The first reinterviewing for the Teacher Survey occurred in conjunction with a large-scale pretest for Round 1 of SASS in the early part of 1987. The pretest, which covered 10 states, included 2,300 teachers in 220 public schools and 600 teachers in 75 private schools. A systematic sample of 127 teachers interviewed in the pretest was selected and telephone reinterviews were attempted by Census Bureau field representatives. Reinterviews were successfully conducted for 121 of them, for a 95 percent completion rate. In the reinterviews the teachers were asked how they had

interpreted and answered selected questionnaire items, the extent to which they used or could have used records in responding, how much confidence they had in the accuracy of their responses and whether they had any recommendations for improving the questionnaire.

The report of the reinterviews (Nash, n.d.) included several recommendations for improvements in specific questionnaire items:

- In answering questions about college level courses taken, about half of the teachers reinterviewed said they had referred to records and a large proportion of the rest said they had records available. As a result of this finding, an instruction was added to the relevant items on the final questionnaire for Round 1, "Please refer to records if you cannot accurately recall your coursework." (For further information on the accuracy of responses to questions about degrees and courses taken, see "Measurement error, the Teacher Transcript Study", later in this section.)
- The pretest question on mathematics and science courses asked for number of credit hours completed. Most teachers felt it would be easier to report number of courses, and this recommendation was followed on the final questionnaire for Round 1.
- For a question on how the teacher's classes were organized, comments in the reinterviews led to the addition of a new category, pull-out classes (where teachers provide instruction to students who are released from their regular classes), to the final version of this item for Round 1.
- For an item on time spent in school-related activities, the reinterview showed that about 2 in 5 teachers, in responding, had not included time spent away from school on such activities. As a result, separate sub-items covering time for certain kinds of activities away from school were added to the final version.

*(Note: For the following discussion of reinterview results, readers not familiar with the interpretation of statistical measures of response variance developed from reinterviews may wish to refer to the side bar explaining these measures, in Chapter 2, p. 2.14.)*

As stated earlier, telephone reinterviews were conducted, covering selected items from the questionnaire, for slightly over one percent of the sample school teachers interviewed in each round of SASS. There were many differences between Rounds 1 and 2 in the topics covered in the Teacher Survey reinterviews. In particular, the number of opinion items covered was much smaller in Round 2 than it had been in Round 1. Four topical areas were covered in both rounds -- educational attainment, full and part-time teaching experience by sector (public and private), current teaching assignment and plans to continue teaching. Even for these areas, however, there were some significant changes in question wording or format in Round 2.

Table 5.7 shows reinterview findings for both rounds for the questions on teachers' educational attainment. The format for these questions was substantially revised between Rounds 1 and 2. As was the case for the School Administrator Survey (see Chapter 3, Section 3.3 and Table 3.6), the data suggest that the revisions led to more reliable and accurate reporting on bachelor's and master's degrees in Round 2, even though deficiencies in Round 1 for teachers had been less serious than for school administrators. The same could not be said for the reporting of associate degrees and educational specialist or professional diplomas; in fact, the index of inconsistency for associate degrees was somewhat higher in Round 2.

Table 5.8 shows Round 1 and Round 2 reinterview results for questions on years of teaching experience, full and part-time, in the public and private sectors. In both rounds, the two full-time questions had relatively low response variance, but this was not true for the questions on part-time teaching. Despite the use of a redesigned format for the part-time questions in Round 2, no significant improvements were noted and the gross difference rate for part-time teaching in private schools actually increased somewhat.

It is difficult to compare the reinterview results for Rounds 1 and 2 for the questions on teaching assignment, since they were substantially changed. For plans to remain in teaching, the same question was used in both rounds and the estimates of the gross difference rate and the index of inconsistency were both significantly higher for Round 2. The gross difference rate rose from 39.5 percent to 46.8 percent and the index of inconsistency rose from 55.4 to 66.6.

Table 5.9 shows the distribution of estimated indexes for *all* items covered in the Teacher Survey reinterviews in each round. In Round 1, about two-thirds of the items included were opinion questions and, as shown in the table, nearly all of them had indexes in the high range (values of 50 and over). These items covered teachers' views about topics like problems in their schools, their influence on school and classroom policies and practices, and the extent to which school administrators and other teachers had been helpful to them. In Round 2, only three opinion items were covered in the Teacher Survey reinterviews. As noted in Chapter 3, Section 3.3, it was felt that reinterview results for factual questions would be of more value for identifying problem questions and guiding efforts to improve their wording and format.

One of the factual items included in the reinterviews in Round 2 asked teachers to report the grade levels for their current classes. There were 16 possible response categories, with an instruction to mark each one that applied. For the purpose of estimating indexes of inconsistency, each of the 16 categories had to be treated as a separate item. All of the 13 categories for which estimates could be made had indexes in the low range, which was not surprising for such a relatively straightforward item. The data in Table 5.9 for factual items in Round 2 are shown with and without this item. When it is excluded, the distributions for factual items in Rounds 1 and 2 are somewhat similar.

Aside from the opinion items and the topics covered in reinterviews for both rounds, which we have already discussed, the topics with high response variability, as measured by reinterviews, were pay incentives in Round 1 and non-teaching income, courses and certification in Round 2. Further information about the accuracy of self-reported information on courses and certification is available from a record-check study, which is described in the next subsection.

Measurement error: the Teacher Transcript Study In Round 2 of SASS, an experiment was undertaken to compare the accuracy of teachers' self-reports about their educational backgrounds with data obtained from transcripts of their college records (Chaney, 1993a,b). The data items to be compared for the two methods included degrees awarded, year of award, major and minor fields of study and number of courses taken or credit hours earned in four separate areas: education, area of main teaching assignment, area of second teaching assignment, and science and mathematics.

The study was carried out "off-line", that is, a separate sample of teachers was used for the experiment. Two versions of the Teacher Survey questionnaire were administered, one asking for information on number of courses taken and one asking for information on number of credit hours earned in the relevant fields. Out of the initial sample of 867 teachers, 32 were later found to be ineligible for the study. Of the 835 eligible teachers, 592 (71 percent) agreed to participate in the study and provided names of the colleges they had attended, so that transcripts could be requested from these colleges.

The teacher questionnaires were administered by the Census Bureau, using the standard mailing and telephone followup procedures. The request for permission to obtain respondents' transcripts came at the end of questionnaire. Thus for telephone interviews, the knowledge that this was to be done was unlikely to have influenced responses about degrees and courses. It is possible that some of the mail respondents could have gone back and checked their responses to these items after they discovered that their transcripts would be obtained.

A total of 1,835 transcripts was requested. A transcript was provided for 74 percent of these cases and for 3 percent the college said it had no record of the identified person having attended. (For about one-third of the latter group, the teacher's attendance at the college could be confirmed on the basis of transfer notations on another college's transcript.) In 4 percent of the cases the college said it could not locate the records and for the remaining 19 percent the college did not respond to the request. The colleges also provided 168 transcripts that were not requested. These were generally instances where the same person had both undergraduate and graduate work at the institution, but did not report both on his or her questionnaire.

For the 592 sample teachers who participated in the study, all requested transcripts were obtained for 51 percent, some but not all transcripts were obtained for 41 percent and no transcript information was obtained for the remaining 8 percent. For some of the data items,

such as degrees awarded, partial transcript information was sufficient to confirm self-reported data. However, if a teacher's self-reported degree was not confirmed, it would be difficult to conclude that the self-report was incorrect unless all requested transcripts for that teacher had been received.

The data from the comparisons indicated that self-reports of types and years of degrees earned and major fields were, for the most part, accurate. However, information on numbers of courses and credit hours was less accurate. The study report says:

Other errors appeared to show bias on the part of the respondent. For example, though there were errors in both directions, the general pattern was for teachers to overstate their preparation in their second teaching assignment and in mathematics and science as compared with the records on their transcripts. Since courses were coded as falling within the specified areas if there were any ambiguity, this overstatement is the reverse of what might be expected if there were simply differences between the teachers and coders in how to classify courses (Chaney, 1993a, p.20).

Any proposal to rely on transcripts as the primary source of information on courses for sample teachers would, of course, have to take into account the additional costs associated with the collection of transcript data and the likelihood of higher item nonresponse resulting from failure of teachers to report all of the colleges where they had taken courses and failure of some colleges to supply the requested transcripts.

Measurement error: cognitive research In the spring of 1990, Census Bureau staff members, using an early version of the 1990 pretest questionnaire, conducted "think-aloud" interviews with twenty teachers, ten from public schools and ten from private schools, representing various grade levels and specialties (Bates and DeMaio, 1990). The teachers were asked to verbalize their thoughts while they completed the self-administered questionnaires. The Census staff members asked questions as needed to understand how the teachers were interpreting the questions and what they were including in their answers. Findings from these interviews and from the subsequent pretest significantly influenced the development of the final questionnaires for the Round 2 Teacher Survey.

Common occurrences noted by the Census interviewers were that teachers often failed to follow skip instructions (telling them to pass over questions that did not apply to them) and that they frequently failed to check boxes for "none", either leaving the item blank or entering "0" in the space reserved for an amount or number. For the most part, these errors were unlikely to bias the survey estimates, because the correct responses could be inferred, during data processing, from other entries on the questionnaire. However, attempting to answer questions that did not apply was observed to be frustrating to responding teachers and might in some instances lead to a decline in the perseverance of their efforts to provide complete and correct answers as they proceeded through the questionnaire.

One possible solution to the problem of the failure to skip inapplicable questions is to use

redundant instructions, for example, using both a skip instruction next to the answer spaces in the item where the skip begins (the branching item) and an instruction at the beginning of each item that only applies to respondents with certain characteristics. The pretest questionnaire had some redundancy of this kind; the Census Bureau staff interviewers recommended additional uses of redundant instructions.

Numerous problems were observed with an item for teachers who were teaching subject matter (departmentalized) courses to different groups of students. This item asked responding teachers to enter, in a matrix format, several items of information for each separate class they had taught in the most recent full week of teaching. The instructions for the items to be reported for each class appeared on the page preceding the matrix for recording the items.

The word "class" itself caused difficulty because some teachers interpreted it to mean class period rather than, as was intended, a group of students receiving instruction in a subject during one or more class periods in the reference week. One of the specific items requested for each class was the number of graduation units associated with it. The instructions for this item asked the teacher to enter a code (0 for no credit, 1 for less than one unit, 2 for one unit, etc.), but some teachers entered the actual number of units rather than the code, an error not likely to have been corrected in data processing.

Difficulties were also observed for an item about hours spent on school-related activities during and after school hours. As noted earlier in this chapter, a similar item in Round 1 had numerous response problems and the results were not included in the public-use data tapes. The main kinds of problems noted were:

- Answering in terms of hours per day, rather than for a reference week.
- Errors due to misunderstanding of the question format, which called for reporting time spent during and after school hours separately and, in each case, providing a total and a breakdown into two or more categories.

This content of this item was substantially reduced and modified in the final questionnaire for Round 2.

The Census Bureau staff report on these interviews included several recommendations for changes in specific items and for additional research on some of the kinds of response problems that were observed.

Measurement error: findings from other sources Additional indications of measurement error, some systematic and some anecdotal, were provided by reviews of unedited and edited questionnaires and reviews of outputs from processing operations (clerical edit, computer pre-edit, computer edit and imputation). Such findings generally supported and extended what was learned in more formal evaluations through reinterviews, cognitive interviews and record checks.

Over 900 Teacher Survey questionnaires from the 1990 SASS field test were reviewed to identify items that were misunderstood by respondents or were difficult for them to answer (Fondelier and Bynum, 1990). The reviewers found several indications that respondents were concerned about the length of the questionnaire: notes to this effect on the forms, partially completed questionnaires and information on reasons for refusals. They also observed that the quality of data for mail responses appeared to be much better than that of the responses obtained by telephone followup. This was attributed in part to the unsuitability of the questionnaire design and format for telephone interviews, especially when the interviews had to be completed with teachers at their places of work, and in part to failure of the telephone interviewers to follow skip instructions and to complete items correctly and legibly.

The specific item found by the reviewers to have the most problems was the one asking for information about classes taught in departmentalized courses (see also the comments on this item in the preceding discussion of cognitive interviews). Several respondents misinterpreted the meaning of "class" and several clearly failed to read the instructions that appeared on the page preceding the one on which the answers were to be recorded. For some elementary music, art and physical education teachers, insufficient lines were provided to record the data requested for each of their classes.

The reviewers made numerous specific proposals for changes in the wording and format of questions and instructions. Many of their recommendations, as well as some of those emanating from the cognitive interviews, were followed in the final questionnaires for Round 2.

Information on both measurement and item nonresponse error is available from a 1992 review of post-edit item response rates, pre-edit reject rates and edit change tallies from Round 2 of SASS (Jenkins, 1992a). This review, which covered all four of the basic surveys, showed that, in comparison with the other surveys, pre-edit reject rates for the Teacher Survey were relatively low, but that item nonresponse rates were somewhat higher than for the other surveys. Nonresponse was relatively high for several parts of the item on classes in departmentalized courses. This item had already been identified, in cognitive interviews and questionnaire reviews prior to data processing, as having significant response problems. The edit change tallies showed that, as had been observed at earlier stages, respondents frequently answered items that did not apply to them.

#### **5.4 Data processing and estimation**

Data processing procedures The sequence and nature of the data processing operations for the Round 2 Teacher Survey were similar to those described for the other three basic surveys in Chapters 2 to 4 (see Exhibit 2.1 in Chapter 2). As part of the clerical edit, codes were assigned to occupation and industry entries for teachers whose prior job had been outside the field of education. One difference for the Teacher Survey was that data entry keying was verified for a sample of one-third of the questionnaires, whereas 100 percent verification was used for the other surveys.

In some instances, the clerks who reviewed the questionnaires that were rejected in the computer pre-edit operation were required to contact the teachers in an attempt to resolve discrepancies and omissions for critical items. The most frequent reasons for pre-edit rejection of questionnaires were inconsistencies in responses relating to full-time and part-time employment status and failure to respond to a question on main teaching assignment.

Following the main computer edit and prior to imputation, an interview status edit was performed. Questionnaires were classified as out-of-scope if, for any reason, they were not members of the target population for the Teacher Survey (see Section 5.2, above). Questionnaires for in-scope teachers were classified as non-interview and excluded from the tabulations if one or more of the following conditions was not met:

- The teacher reported the year that he or she started working as an elementary or secondary teacher.
- At least one part of the educational background section had an acceptable response.
- The teacher reported his or her main assignment field and whether or not he or she was certified in that field.
- The teacher reported at least one grade level of students currently being taught by him or her.
- There were responses for at least 30 percent of the minimum items that a teacher should complete.

Teachers whose questionnaires did not meet these minimum requirements were treated as nonrespondents in computing the unit response rates presented in Section 5.3, above.

Imputation Round 2 imputation procedures for the Teacher Survey followed the same general pattern as imputation for the School Survey (Chapter 2, Section 2.4). Some missing or inconsistent values were imputed during the computer edit and, in a few cases where the correct entry was obvious, items were changed without contacting respondents in the initial clerical edit and the resolution of rejected cases from the computer pre-edit. However, most of the imputation was done in a computer operation following the computer edit. Computer imputation proceeded in two stages. In the first stage, missing or previously blanked values for selected items were imputed by using other information for the same teacher or making assumptions about the respondent's intended answer, for example, that not answering a question implied a response of "no". In the second stage, a hot deck procedure was used to impute the remaining missing values. The matching variables used to form imputation groups for each item and the order of their collapsing (when necessary to form sufficiently large imputation groups) are described in Part VIII of the Round 2 *Data File User's Manual*.

In Round 1 of the Teacher Survey, there was no imputation of missing or blanked values following the computer edit and no flags were assigned to items imputed during the computer edit or earlier stages of processing. In Round 2, flags were assigned to all items imputed in the computer imputation operation. Items imputed in the first phase were flagged with code 1, for "internal imputation" and those imputed in the second phase were flagged with code 2, for "donor-based" imputation. Items imputed prior to the computer imputation were not flagged.

Weighting The overall weights for teachers in Round 2 were the product of six components. The *basic sampling weight* was the inverse of the teacher's overall selection probability, that is, the product of the school selection probability and the probability of selecting the sample teacher within the school. The *sample adjustment factor* accounted for unusual circumstances, such as mergers, splits or duplications, that had affected the school's probability of selection.

Two components were designed to minimize nonresponse bias: a *school nonresponse adjustment factor* to account for schools that did not provide teacher lists for sampling and a *teacher nonresponse adjustment factor* to account for sample teachers for whom acceptable questionnaires were not obtained. The *frame ratio adjustment factor* was designed to reduce sampling error by adjusting sample estimates based on frame counts of teachers in sample schools to agree with the corresponding frame counts based on data for all schools. Finally, a *teacher adjustment factor* was used to force agreement between estimates of total number of teachers based on the School and Teacher Survey questionnaires. Unlike the other five components, this adjustment factor had not been used for teacher weights in Round 1 of SASS.

Each of the last four factors was computed and applied within weighting cells comprised of schools or teachers with similar characteristics. Detailed descriptions of the weighting cells and the rules for collapsing them when necessary are provided by Kaufman and Huang (1993).

In a review of the teacher weights for Round 2, some of the CCD teacher counts used in the numerator of the frame ratio adjustment factor were found to be one-tenth of the correct values, possibly as a result of data keying errors. The problem was worst in Iowa and the teacher weights for that state were recomputed. The problem may have existed in other states, but, given the difficulty of identifying these cases and the late stage at which the problem was discovered, no other corrections were made (Kaufman and Huang, 1993).

The teacher adjustment factors used in Round 2 showed substantial variation by adjustment cell:

<u>Type of school</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Median</u>
Public	1.498	0.711	1.074
Private	1.478	0.850	1.153

The maximum and minimum values for these adjustment factors were constrained by collapsing rules, which required that any cell with a factor outside the range from 0.667 to 1.500 be collapsed with another cell according to prescribed rules. For the majority of cells, the teacher adjustment factors were greater than 1.000, indicating that teacher counts reported in the School Survey exceeded the number of teachers included on the teacher listing forms for the same schools. (For information about recent research on the completeness of teacher listings, see the discussion of "Coverage improvement" in Chapter 7, Section 7.3.)

Variance estimation A balanced half-sample replication procedure (see Chapter 2, Section 2.4 for details) is used to estimate sampling errors for all SASS surveys. Replicate weights for use in such estimates of sampling error are included on all SASS public-use and other microdata files. For sample teachers in schools not selected with certainty, the teacher replicates are the same as the school replicates. Sample teachers in certainty schools were split into two half-samples for the purpose of forming replicates for use in variance estimation.

## **5.5 Evaluation of estimates**

This section describes comparisons of Teacher Survey estimates with data from other sources, including the School Survey, the Common Core of Data (CCD) and, to a limited extent, data available from other organizations. Some of these comparisons were made as part of pre-publication reviews; others were made subsequent to publication.

Evaluation of estimates: Round 1 Prior to publication, estimates of full-time equivalent (FTE) teachers by state based on the Teacher Survey were compared with estimates from the School Survey. For most states, the Teacher Survey estimates were lower. One reason for this was that the number of teachers listed on the form used to sample teachers was often less than the count of teachers reported for the same school in the School Survey. In addition, there was evidence that many schools provided counts of FTE teachers that were too high. In the average state, 19 percent of the schools with some part-time teachers reported the same counts for total and FTE teachers (Choy, Medrich, Henke and Bobbitt, 1992). The extent of this phenomenon varied by state, from 10 percent in Alaska and Hawaii to 31 percent in Colorado (Kaufman, 1990). Consideration was given to the possibility of adjusting the Teacher Survey estimates to force agreement with CCD counts, but such an adjustment would not have resolved the discrepancies between the FTE teacher counts from the School and Teacher Surveys.

The Round 1 Teacher Survey estimate of average hours spent in a week on school and school-related activities proved to be substantially below the corresponding estimate from the 1985 Public School Survey, 40.3 hours versus 50.4 hours. There were several differences between the two surveys in the questionnaire items used to produce these two estimates. In addition, the Round 1 Teacher Survey estimates may have been low because there was no imputation when responses were provided for some but not all of the relevant items.

On the basis of this comparison, it was decided that no data on this topic would be published or included in the public-use microdata files (Hammer, 1990).

Teacher Survey estimates of salary were compared with data available from private organizations. The Teacher Survey estimate of average base salary for public school teachers was \$26,231, somewhat below the average salaries (\$28,071) reported by the American Federation of Teachers, *Survey and Analysis of Salary Trends, 1989*, (F. Howard Nelson, 1990) and the National Education Association, *Rankings of the States, 1989*. The higher figures from the latter 2 sources are believed to result from the inclusion, by some states, of other kinds of instructional expenditures in the category that covers teachers' salaries (Choy, Medrich, Henke and Bobbitt, 1992; Fowler, 1990).

Evaluation of estimates: Round 2 The use of a teacher adjustment factor as one component of the Teacher Survey weights for Round 2 guaranteed that teacher estimates from the Teacher and School Surveys would agree for each of the weighting cells. However, as described in more detail in Chapter 2, Section 2.5, comparisons of School Survey public school FTE teacher estimates with counts from the CCD showed that estimates for nine states were at least 15 percent higher than the CCD counts. Investigation of this problem led to a series of additional processing and reweighting steps to make SASS state estimates of the number of public schools more consistent with the CCD counts and to make enrollment and teacher count data consistent with the CCD on a school-by-school basis. These steps included reclassifying, as out of scope, teacher file records for teachers who taught only grades that were no longer considered part of a sample school and reinstating records for teachers at sample schools previously classified as out-of-scope because of apparent mergers (Fondelier, 1992).

Final School Survey estimates, by state, of full-time equivalent teachers were compared with counts from the 1990-91 CCD. At the national level, the SASS estimates exceeded the CCD count by 2.8 percent. The SASS estimates for South Dakota and Wisconsin were 31.7 percent and 17.1 percent, respectively, above the CCD counts for those states. For 9 states, differences were in the range from 10 to 15 percent, with SASS being higher in all 9 states. For all other states, differences were less than 10 percent. The SASS and CCD data by state are shown in Chapter XII of the *Round 2 Data File User's Manual* (Gruber, Rohr and Fondelier, 1993).

**Table 5.1 Teacher Survey Overall Response Rates**

<b>Sector</b>	<b>School Response Rate<sup>1/</sup></b>	<b>Teacher Response Rate<sup>2/</sup></b>	<b>Overall Response Rate<sup>3/</sup></b>
<b>Round 1</b>			
<b>Public</b>	<b>96</b>	<b>86.4</b>	<b>83</b>
<b>Private</b>	<b>88</b>	<b>79.1</b>	<b>70</b>
<b>Round 2</b>			
<b>Public</b>	<b>95</b>	<b>90.3</b>	<b>86</b>
<b>Private</b>	<b>90</b>	<b>83.6</b>	<b>75</b>

**Notes:**

1. Percent of all in-scope schools providing teacher lists for sampling, unweighted.
2. Percent of eligible sample teachers responding, weighted.
3. Product of school and teacher response rates.

**Sources:**

NCES (1991c).  
 Gruber, Rohr and Fondelier (1993).

**Table 5.2 Teacher Survey Response Rates<sup>1/</sup>**

	Round 1 (1988)		Round 2 (1991)	
	Unweighted	Weighted	Unweighted	Weighted
<b>Public</b>	<b>86.5</b>	<b>86.4</b>	<b>91.5</b>	<b>90.3</b>
<b>Private</b>	<b>77.0</b>	<b>79.1</b>	<b>83.1</b>	<b>83.6</b>

**Notes:**

- 1. Percent of eligible teachers in sample who responded.**

**Sources:**

**Round 1 Unweighted: Kindel (1989).**

**Round 1 Weighted: NCES (1991c).**

**Round 2: Gruber, Rohr, and Fondelier (1993).**

**Table 5.3 Teacher Survey Weighted Response Rates for Public Schools by State**

State	Response Rate		State	Response Rate	
	Round 1	Round 2		Round 1	Round 2
Alabama	90.1	90.6	Montana	90.6	95.0
Alaska	90.1	89.8	Nebraska	93.1	92.9
Arizona	90.9	94.9	Nevada	91.1	88.5
Arkansas	90.8	94.1	New Hampshire	85.2	92.5
California	83.8	87.9	New Jersey	80.9	86.3
Colorado	88.9	95.2	New Mexico	84.9	90.0
Connecticut	80.2	85.6	New York	74.6	79.3
Delaware	86.2	95.6	North Carolina	88.6	96.0
District of Columbia	68.6	69.3	North Dakota	93.3	95.8
Florida	87.3	88.7	Ohio	87.7	87.8
Georgia	87.1	93.3	Oklahoma	89.8	93.8
Hawaii	74.1	88.3	Oregon	94.3	91.3
Idaho	92.6	95.2	Pennsylvania	88.2	93.3
Illinois	90.7	95.6	Rhode Island	75.4	87.4
Indiana	92.3	95.3	South Carolina	89.0	91.1
Iowa	93.0	96.2	South Dakota	94.7	95.2
Kansas	90.6	95.6	Tennessee	85.1	92.9
Kentucky	86.0	88.8	Texas	87.3	91.5
Louisiana	81.3	93.1	Utah	89.9	97.9
Maine	91.8	89.7	Vermont	86.9	95.6
Maryland	74.2	90.2	Virginia	87.0	90.7
Massachusetts	84.7	84.4	Washington	89.9	88.1
Michigan	86.4	84.5	West Virginia	87.7	94.8
Minnesota	89.8	94.1	Wisconsin	88.6	95.3
Mississippi	88.3	93.3	Wyoming	91.2	96.8
Missouri	87.9	91.2	TOTAL	86.4	90.3

Source: NCES (1991c) and Gruber, Rohr and Fondelier (1993).

**Table 5.4 Teacher Survey Weighted Response Rates for Private Schools by Association Group: Round 1**

Association Group	Response Rate (Percent)
<b>Total</b>	79.1
<b>Area Sample</b>	58.1
<b>Association of Military Colleges and Schools - US</b>	85.4
<b>Catholic</b>	84.3
<b>Friends</b>	84.6
<b>Episcopal</b>	81.7
<b>Jewish</b>	63.8
<b>Lutheran</b>	86.7
<b>Seventh-day Adventists</b>	81.4
<b>Christian Schools International</b>	86.6
<b>American Association of Christian Schools</b>	61.2
<b>National Association of Private Schools for Exceptional Children</b>	71.3
<b>American Montessori Society</b>	79.4
<b>National Association of Independent Schools</b>	82.9
<b>Other</b>	74.3

Source: NCES (1991c).

**Table 5.5 Teacher Survey Losses from Initial Sample Selected: Round 2 (Unweighted)**

Type of School	Initial Sample	Percent Out of Scope	Percent In Scope	In Scope					
				Interview			Noninterview		
				Frequency	Percent of Sample	Percent of In Scope	Frequency	Percent of Sample	Percent of In Scope
Public	56,051	7.1	92.3	47,622	85.0	91.5	4,430	7.9	8.5
Private	9,166	12.4	87.6	6,662	72.7	83.0	1,364	14.9	17.0

Source: Gruber (1992).

**Table 5.6 Teacher Survey Unweighted Item Response Rates**

Sector	Range of Item Response Rates (Percent)	Percent of Items with Response Rates:	
		≥ 90%	< 75%
<b>Round 1</b>			
Public	64 - 100	90	1
Private	60 - 100	89	1
<b>Round 2</b>			
Public	76 - 100	84	0
Private	71 - 100	79	1

**Sources:**

NCES (1991c).

Gruber, Rohr, and Fondelier (1993).

**Table 5.7 Teacher Survey Extent of Consistency Between Survey Interview and Reinterview, on the Topic "Educational Attainment"**

Topic (Text of questions is presented below)	Percent Mention (Survey Interview)		Gross Difference Rate		Index of Inconsistency	
	Round 1 (1988)	Round 2 (1991)	Round 1 (1988)	Round 2 (1991)	Round 1 (1988)	Round 2 (1991)
Bachelor's Degree Point Estimate 90% Confidence Interval	97.6	98.1	7.5* 6.0-9.2	0.6* 0.3-1.3	79.5 64.2-98.5	Too Few Cases Did Not Mention
Master's Degree Point Estimate 90% Confidence Interval	41.5	41.4	4.3* 3.2-5.7	1.1* 0.6-1.9	8.9* 6.7-11.8	2.2* 1.2-3.9
Prof. Dipl./Ed. Spec. Point Estimate 90% Confidence Interval	4.4	4.7	7.0 5.6-8.7	5.2 4.1-6.8	69.8 56.0-87.1	62.7 48.2-81.6
Associate Degree Point Estimate 90% Confidence Interval	13.7	6.7	8.1 6.6-9.9	6.9 5.5-8.6	36.9* 30.1-45.3	54.2* 43.0-68.2

\*Statistically significant difference between Round 1 and Round 2 (at 90% confidence).

Source: Bushery, Royce, and Kasprzyk (1992).

**Round 1 Question for Bachelor's and Master's Degrees:**

Which of the following college degrees have you earned? (Mark (X) all that apply)

- \_\_\_ Associate degree or vocational certificate
- \_\_\_ Bachelor's degree
- \_\_\_ 2nd Bachelor's degree
- \_\_\_ Master's degree
- \_\_\_ 2nd Master's degree
- \_\_\_ Education specialist or professional diploma (at least one year beyond Master's level)
- \_\_\_ Doctorate (e.g., Ph.D., Ed.D.)
- \_\_\_ First professional degree (e.g., M.D., L.L.B., J.D., D.D.S.)
- \_\_\_ No degree or diploma

**Round 2 Questions for Bachelor's and Master's Degrees:**

Do you have a bachelor's degree?

- \_\_\_ Yes
- \_\_\_ No

Do you have a master's degree?

- \_\_\_ Yes
- \_\_\_ No

**Table 5.8 Teacher Survey Extent of Consistency Between Survey Interview and Reinterview, on the Topic "Years of Teaching"**

Topic  (Summary of questions is presented below)	Gross Difference Rate		Index of Inconsistency	
	Round 1 (1988)	Round 2 (1991)	Round 1 (1988)	Round 2 (1991)
<b>Full-time, Public</b> Point Estimate 90% Confidence Interval	7.6 6.1-9.5	7.0 8.7-13.4	10.8 8.7-13.4	9.8 7.7-12.4
<b>Part-time, Public</b> Point Estimate 90% Confidence Interval	9.0 6.7-12.0	6.6 5.0-8.6	44.4 33.2-59.3	42.5 32.5-55.7
<b>Full-time, Private</b> Point Estimate 90% Confidence Interval	5.2 3.6-7.4	5.3 3.3-8.7	12.4 8.7-17.7	8.8 5.4-14.4
<b>Part-time, Private</b> Point Estimate 90% Confidence Interval	3.4* 2.1-5.8	7.5* 4.8-11.6	38.5 23.0-64.4	37.8 24.4-58.4

\*Statistically significant difference between Round 1 and Round 2 (at 90% confidence).

Source: Bushery, Royce, and Kasprzyk (1992).

Round 1 question for years of teaching:

*Including the current school year, how many years have you been employed as a teacher in public and/or private schools at the elementary or secondary level?*

Schools	Years of full-time teaching	Years of part-time teaching
Public		
Private		

For round 2, four individual questions were used:

- ◆ years teaching full-time in public schools
- ◆ years teaching part-time in public schools
- ◆ years teaching full-time in private schools
- ◆ years teaching part-time in private schools

For this analysis, responses were grouped into four categories, as follows:

- ◆ less than three years
- ◆ three to nine years
- ◆ 10 to 20 years
- ◆ more than 20 years

**Table 5.9 Teacher Survey, Indexes of Inconsistency<sup>1/</sup> Estimated from Reinterviews**

Round and Type of Item	Number of Items	Index of Inconsistency			
		High >50	Medium 20-50	Low <20	NA <sup>2/</sup>
<b>Round 1</b>					
Factual	20	5	4	3	8
Opinion	42	39	3	--	--
<b>Round 2<sup>3/</sup></b>					
Factual, all	53	10	14	21	8
Factual, excl. item 29	37	10	14	8	5
Opinion	3	1	2	--	--

**Notes:**

1. Each item either had closed multiple-response categories or was converted to the equivalent by assigning class intervals to open-end responses. For items with more than 2 response categories, the L-fold index of inconsistency was estimated.
2. Did not meet the minimum requirements to compute a reliable estimate of the index of inconsistency.
3. Questionnaire item 29 asked about grade levels for the responding teacher's current classes, with 16 possible response categories. Since the teacher was asked to mark each category that applied, item 29 had to be treated as 16 separate items for the purpose of estimating indexes of inconsistency.

Sources: Newbrough (1989), Royce (1992).

