

# THE ACCURACY OF TEACHERS' SELF-REPORTS ON THEIR POSTSECONDARY EDUCATION

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This study compared teachers' self-reports of their academic qualifications, as provided on survey questionnaires, with the use of data from teachers' college transcripts. Teachers' self-reports are subject to problems with bias and recall, but the collection and analysis of transcripts, though more accurate, is also more complex. The U.S. Bureau of the Census conducted the initial mail and telephone survey of the teachers, and Westat, Inc. conducted the transcript portion of the study.

## Data Collection

The 1990-91 Schools and Staffing Survey (SASS) was sent to 835 eligible teachers at 174 eligible schools, divided roughly equally between public and private schools, and between elementary and secondary schools. Of the 637 responding teachers, 45 either refused participation in the transcript portion of the study, or failed to supply information on which colleges they attended. Teachers who refused were left out of the transcript study.<sup>1</sup> This left a total of 592 teachers.

The SASS survey collected teachers' self-reports of their degrees earned, their majors and minors, the number of courses or credits taken in teacher education and in the teachers' two main teaching areas, and the number of courses taken in science and mathematics (among teachers who taught at least one course in science or mathematics). Teachers were also asked to list all colleges (both undergraduate and graduate) that they attended, whether or not they graduated from those colleges, and transcripts were sought from all colleges listed.

The total number of school responses was 1,658 out of 2,003 identifiable transcript

requests, or 83 percent. At least one transcript was received for 92 percent of the teachers, and complete data were obtained for 51 percent of the teachers.

## Teachers' Reports of the Schools they Attended

For 7 percent of the teachers, the teacher reported attendance at a college but the college stated the teacher never attended.<sup>2</sup> Some of these discrepancies may be due to differences in definitions of attendance. For example, one teacher said she listed a college where she had taken *noncredit* courses, because she felt the courses enhanced her perspective as an educator. Additionally, for 11 percent of teachers, colleges were unable to locate the teacher's transcripts; some of these may also represent teacher errors in listing the colleges attended.

Another type of error -- a failure of the teacher to list all colleges attended -- could sometimes be identified if other college transcripts included transfer credits from the missing college(s). For 9 percent of teachers, additional colleges were identified besides those listed on the questionnaire. These errors might be attributed either to poor memory on a teacher's part, or to the relative unimportance of the teacher's attendance at the college (*e.g.*, a single course during the summer). These estimates provide lower bounds on the number of omissions, since other omissions may not have been detected.

Overall, 23 percent of the teachers had at least one of the problems listed above, indicating that teachers' lists contain a significant amount of error.

## Teacher Item Response Levels

Item nonresponse may lower data quality sufficiently to make transcript data preferable to questionnaire data. Also, if item nonresponse is due to teachers' inability to provide a correct response, an attempt to produce higher item response rates through increased followup may result in increased numbers of other errors.

Item response rates varied depending on the level of detail requested. They were highest for

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<sup>1</sup>There is some evidence that teachers who refused had weaker backgrounds: 30 percent of teachers not in the transcript study said they had master's degrees, compared with 37 percent of those in the study, and 20 percent reported one undergraduate course or less in teacher education, compared with 14 percent of those in the study. (Neither relationship was statistically significant.) Bias might occur if teachers with lower qualifications were more reluctant to have their records reviewed. However, the fact that refusing teachers did report slightly lower academic qualifications might indicate they were willing to report their backgrounds accurately.

<sup>2</sup>Cases where colleges were found to have improperly reported that teachers never attended are excluded from these statistics.

general information about degrees earned (97 percent or higher). For other items, teachers generally were more likely to respond about *whether* they took courses in a subject area and whether a semester or quarter system was used than about the *number* of courses they took (Table 1). Teachers more often provided data on the number of graduate courses taken than the number of credits earned, although little difference appeared at the undergraduate level. Teachers were more likely to provide course data at the undergraduate level than the graduate level for courses in teaching methods and in the main teaching assignment, but there was little difference for courses in mathematics and science.<sup>3</sup> Possibly, the undergraduate level generally was more salient because of how graduation requirements are defined for a major, and because undergraduate courses are more likely to be taken over a compact time period, while responses still could be easier for the graduate level if teachers were highly likely to have taken *no* courses in a subject area.

**Table 1. Item response rates**

Type of information collected	Number of teachers eligible	Response rate	
		Undergraduate	Graduate
<b>Courses in teaching methods</b>			
Took courses .....	637	98	--
Semester or quarter system .....	594	97	--
Number of undergraduate courses ...	323	92	85
Number of undergraduate credits ...	271	90	78
<b>Courses in main teaching assignment</b>			
Took courses .....	317	94	--
Semester or quarter system .....	304	91	--
Number of undergraduate courses ...	168	92	79
Number of undergraduate credits ...	136	89	71
<b>Courses in second teaching assignment</b>			
Took courses .....	160	59	--
Semester or quarter system .....	154	56	--
Number of undergraduate courses ...	78	54	42
Number of graduate credits .....	76	53	38
<b>Number of mathematics and science courses</b>			
Mathematics .....	179	86	88
Computer science .....	120	73	80
Biology or life sciences .....	150	77	79
Chemistry .....	132	74	74
Physics .....	120	73	63
Earth or space science .....	103	64	66
Other natural science .....	93	52	53

NOTE: The questionnaire did not differentiate between undergraduate and graduate levels for the term type and for whether teachers took courses in an area.

<sup>3</sup>Typically, for each of these types of comparisons, the majority of comparisons were statistically significant. However, the exception was in comparing responses on the number of courses to the number of credits: the results were significant only at the graduate level, and only for courses in teaching methods or education.

### Teachers' Reports on Their Degrees

Generally, teachers' self-reports on what degrees they earned showed a high correspondence with the transcripts, though up to 13 percent of the cases showed discrepancies for any particular degree.

Teachers' self-reports were most accurate on their bachelor's degrees. Essentially all teachers (528 of 538) reported they earned a bachelor's degree, and for all but 22 respondents, that report could be confirmed. Further, only partial data were received for 19 of the 22 cases, so it is possible that the receipt of additional transcripts would have confirmed those degrees. The remaining three teachers, plus three who failed to respond to the SASS question on bachelor's degrees, are the only teachers who can be clearly identified as providing incorrect or incomplete data on their bachelor's degrees.

A greater number of errors could be found for master's degrees. Nine teachers (2 percent) failed to report a master's degree, despite such an indication on their transcripts. Also, 57 teachers (11 percent) did not have their degrees confirmed: for 8 (1 percent) all transcripts were received, while for 49 (9 percent) the discrepancies may be caused by partial transcript data. Thus, the total proportion of teacher errors falls within the range of 3 to 12 percent.

Teachers displayed the same two errors for associate degrees as for master's degrees: 22 teachers (4 percent) failed to report an earned associate degree, and 16 teachers (3 percent) failed to have a self-reported degree confirmed. For 11 of the 16 teachers in the second group, only a partial set of transcripts was available.

Five teachers reported receiving doctoral degrees; of those, four degrees were confirmed, while only partial transcript data were available on the fifth. No other potential errors were detected concerning doctoral degrees.

**The year the degree was earned.** Teachers have more reason to err on the year of a degree. Sometimes a degree award is delayed until the next scheduled graduation ceremony, or a student may participate in a graduation ceremony with his/her peers before all requirements are met. Not surprisingly, then, the proportion of errors was higher than for listing degrees, ranging from 12 to 32 percent (Table 2). Most typically, teachers who made errors were off by 1 year.

**Table 2. The year a degree was earned**

Comparisons of self-reports and transcript data	Bachelor's degree	Master's degree	Associate degree	Doctoral degree
Number of teachers with complete data .....	427	137	19	4
Percentage of teachers with error .....	12	28	32	0
Too recent.....	5	14	11	0
Too early.....	7	15	21	0
Off by 1 year.....	7	20	26	0
More than 1 year.....	6	9	5	0

NOTE: Percentages may not sum to totals because of rounding.

Among the 427 teachers for whom the year of receiving a bachelor's degree was available, 12 percent made an error. The discrepancies were split between teachers who made an error of 1 year and those who off by more years, and between those who stated too early of a year and those who stated too late of a year.

A greater proportion of errors occurred for master's and associate degrees (28 and 32 percent, respectively), though most were off by only 1 year. Again, the errors were roughly evenly split between those who reported years that were too recent and those that reported years that were too early. Possibly, associate degrees were less salient. Graduate degrees are often earned part-time over many years, so the year may be less easily remembered; thus, though the relationship was not statistically significant, there were proportionally more errors if the master's degree was earned 6 to 10 years after the bachelor's degree than if it was earned earlier (38 percent versus 23 percent). However, the error rate was also lower (25 percent) if the master's degree was earned more than 10 years after the bachelor's degree, possibly because a recent degree was easier to remember.

**Majors and minors.** Teachers were asked to provide a code for their major for each degree. Such coding may have increased the potential for error. For example, a teacher might not notice that separate codes were provided for mathematics and mathematics education. Also, teachers might base their coding on their planned use of the major (*e.g.*, to become a mathematics teacher) rather than on the major alone.

For 65 percent of teachers earning bachelor's degrees, the major was correctly coded. Another 10 percent made errors only in whether the

subject was listed as a separate discipline (*e.g.*, music) or as an area within education (*e.g.*, music education). For 12 percent, the teachers correctly reported majors within education, but gave the wrong specialty; typically, these involved differences in interpretation (*e.g.*, high school mathematics teachers listing secondary education rather than mathematics education), rather than radically different fields.

The remaining 13 percent made the greatest errors. Some errors were quite large (*e.g.*, reporting a major in biology/life science, while the transcript showed a major in art), but often they were a matter of judgment (*e.g.*, reporting an education major in counseling and guidance, while the transcript showed a major in psychology). Some errors were from poor coding (*e.g.*, classifying geography as geology/earth science rather than as a social science).

#### Teachers' Reports on the Courses they Took

Teachers were asked about courses they had taken in teacher education and their two main teaching assignments. Half were asked for the number of *courses* while the others were asked the number of *credits*. For the two main teaching assignments, the top two categories (*e.g.*, 5-9 courses and 10 or more courses) were designed to match common requirements for majors and minors. For teacher education courses, the top category was 4 or more courses. Teachers were also asked whether the courses were taken using a semester system, a quarter system, or both.

When coding the transcripts, ambiguous cases were assumed to have been counted by a teacher. If a course might be classified within two separate disciplines, only one of which was covered in the questionnaire, teachers were assumed to have included it in their response. This coding procedure was chosen as the method of best approximating how teachers might answer the SASS questionnaire, but may result in overestimates of the courses taken.

**Teacher education.** Because of the questionnaire design, one might expect high accuracy in teachers' self-reports on teacher education: teachers were likely to be able to choose 4 or more courses without having to count the exact number of courses, and if they had taken fewer courses, only a small number of courses needed to be remembered and counted.

Overall, 68 percent of the teachers gave responses that matched their transcripts at the undergraduate level (Table 3).<sup>4</sup> The greatest accuracy was in the category *4 or more courses*, with 81 percent giving responses that could be directly confirmed (not shown). The next highest accuracy was among teachers who reported taking no courses in teacher education; this answer may have been easier than counting the exact number of courses. Among the other two categories, a majority understated the number of teacher education courses they had taken. These categories were probably the most difficult: an error of a single course could make a teacher's response incorrect, and teachers may have difficulty remembering those areas where they took only a small number of courses.

**Table 3. Courses and credits earned**

Comparisons of self-reports and transcript data	Number of courses		Number of credits	
	Under-graduate	Graduate	Under-graduate	Graduate
<b>Teacher education</b>				
Number of teachers .....	280	250	228	196
Percent of teachers				
Report confirmed (total)	68	59	58	64
Partial tran. data .....	24	26	18	27
Teacher underestimate ..	14	18	22	12
Teacher overestimate ....	18	23	19	24
Partial tran. data .....	14	14	17	15
<b>Main teaching assignment</b>				
Number of teachers .....	141	118	111	91
Percent of teachers				
Report confirmed (total)	53	42	42	46
Partial tran. data .....	22	17	14	19
Teacher underestimate ..	11	3	17	7
Teacher overestimate ....	35	55	41	47
Partial tran. data .....	18	31	25	25
<b>Second assignment</b>				
Number of teachers .....	30	22	29	19
Percent of teachers				
Report confirmed (total)	37	45	14	37
Partial tran. data .....	10	9	3	21
Teacher underestimate ..	10	5	21	0
Teacher overestimate ....	53	50	66	63
Partial tran. data .....	27	32	21	21

NOTE: Percentages may not sum to 100 because of rounding.

Roughly the same patterns of accurate versus inaccurate responses were found in teachers' reports of the number of credit hours taken, and

<sup>4</sup>For 24 percent of the teachers, it is possible that some teachers took more courses than were identified from the transcripts, because at least one transcript was never received. However, their reports are consistent with the data that are available. Also, two-thirds of these teachers fell within the category of those who reported taking 4 or more courses in teacher education; in their case, it is not possible for an additional transcript to conflict with their response, because there is no upper limit for this category.

in their reports on graduate courses in education. However, one difference is that teachers were less likely to underestimate the number of graduate credit hours taken, and more likely to overestimate the amount.

**Teachers' main teaching assignment.** The accuracy was lower than for teaching education, with 53 percent giving responses that could be confirmed at the undergraduate course level.<sup>5</sup> Generally, the balance between underestimates and overestimates changed, possibly due to the change in categories used. The percentage who overestimated the number of courses was much higher than for teacher education (35 percent); though half of these (18 percent) may be due to incomplete transcript data, the remainder was higher than for teacher education. While overestimates were more likely, underestimates were less likely. Excluding the highest category (where underestimates were impossible), teachers were less likely to give underestimates of the number of courses (from 30 to 50 percent) than in teacher education (from 44 to 63 percent).

Again, the results for teachers' self-reports on credit hours were not substantially different from those on the number of undergraduate courses taken. However, teachers were somewhat less accurate in their counts of graduate courses, with more overestimates and fewer underestimates.

**Teachers' second teaching assignment.** Few teachers reported a second teaching assignment, so the differences were not statistically significant.

Proportionally more errors were found for undergraduate courses than for the main assignment, with only 37 percent of the responses being confirmed. The largest group of errors was of overestimates; even excluding teachers whose transcript data were incomplete, 26 percent overestimated the number of courses. An even higher error rate was found among for the number of undergraduate *credits* earned, with 45 percent providing confirmed overestimates.

**Semester and quarter systems.** Teachers who reported that all courses were within the semester system were almost always correct (93 percent within teacher education), but teachers who reported all courses were within the quarter system were about equally likely to be

<sup>5</sup>All comparisons in this paragraph are statistically significant.

correct (53 percent) or incorrect (47 percent; Table 4). Finally, 44 percent of teachers who reported *both* semester and quarter systems had their responses fully confirmed, and 32 percent might have had their responses confirmed if all transcripts were available.<sup>6</sup>

**Table 4. Semester or quarter systems**

Subject area	Total	Semester	Quarter	Both
<b>Teacher education</b>				
Number of teachers (total).	479	305	64	110
Percentage of teachers				
Report fully confirmed..	50	56	31	44
Partially confirmed .....	34	37	22	32
<b>Main teaching assignment</b>				
Number of teachers (total).	200	128	30	42
Percentage of teachers				
Report fully confirmed..	50	58	33	36
Partially confirmed .....	36	38	23	38
<b>Second assignment</b>				
Number of teachers (total).	41	26	9	6
Percentage of teachers				
Report fully confirmed..	46	58	22	33
Partially confirmed .....	29	27	22	50

NOTE: Percentages may not sum to totals because of rounding. *Partially confirmed* refers to transcripts that are consistent with the teachers' report, but the receipt of additional transcripts might confirm or deny the report.

The high error rate might be explained by teachers failing to consider all schools attended, and only considering where they took the most courses in the subject. Because semester systems were so common (75 percent of all courses for this study), teachers could often report using only the semester system and be correct. However, if they reported only using the quarter system, there is a good chance that at least one course was taken using the semester system.

**Mathematics and science courses.** Teachers who taught at least one course in science or mathematics (whether or not it was one of their main assignments) were asked to state the total number of courses taken in mathematics, computer science, biology or life science, chemistry, physics, earth or space science, and other natural science. For these questions, teachers were asked the *exact number* of courses.

<sup>6</sup>However, partial confirmations have less meaning in this case. When a teacher reports that all courses were taken within a single term type, then partial transcript data can confirm that, *at least as far as we know*, the teacher's report is correct. However, when a teacher reports that both term types were used and partial data shows only one term type, it would be at least as accurate to say that *as far as we know* the teacher's report is incorrect as to say an additional transcript could confirm the teacher's report.

The proportion who correctly stated the exact number ranged from 30 percent in mathematics to 71 percent in physics (Table 5).<sup>7</sup> However, teachers who had taken no courses within the discipline may have found it easy to respond. If these zeroes are excluded, the proportion giving correct answers was much lower, and ranged from 8 percent to 44 percent.<sup>8</sup>

**Table 5. Mathematics and science courses**

Subject area	Percent confirmed exactly		Mean number of courses		Mean total difference
	All teachers	Excluding teachers with zero courses	Teachers	Transcripts	
<b>Undergraduate</b>					
Mathematics	30	25	6.5	5.7	2.1
Comp. sci. ...	61	26	1.6	1.3	1.0
Life science .	49	34	3.5	3.2	1.3
Chemistry ...	66	44	1.8	2.0	0.5
Physics .....	71	35	1.8	1.6	0.6
Earth/space science.....	62	20	1.1	0.8	0.6
Oth. nat. sci	66	8	0.8	0.8	1.3
<b>Graduate</b>					
Mathematics	70	11	1.2	0.8	0.8
Comp. sci. ...	82	12	0.4	0.2	0.3
Life science .	85	8	0.5	0.4	0.4
Chemistry ...	88	25	0.8	0.4	0.5
Physics .....	89	11	0.8	0.9	0.5
Earth/space science.....	93	17	0.6	0.4	0.3
Oth. nat. sci	91	14	0.2	0.1	0.1

NOTE: Mean total difference is based on the absolute value of the difference between the teachers' self-reports and the transcripts.

The general tendency was to overstate the number of courses they had taken in a discipline. The difference was largest in mathematics, with teachers' reporting a mean of 6.5 undergraduate courses while the transcripts showed a mean of 5.7. Also, this understates the degree of teacher errors. Because some teachers gave overestimates and others gave underestimates, the errors partially balance out. If only the size of the difference between the teachers' self-reports and the transcripts is considered, the difference tends to be much larger: for example, for

<sup>7</sup>Because of the emphasis on exact responses in this section, only teachers for whom all transcripts were available (or for whom full records were available if transfer courses were included) were included in the analysis.

<sup>8</sup>However, a side effect of excluding the zeroes is also to exclude measurement of another type of error: 25 teachers stated that they had taken no courses within one of the listed disciplines, but a transcript showed they had taken such a course. Still, these errors were less common than errors in reporting the exact non-zero number of courses taken.

undergraduate courses in mathematics, the average difference is then 2.1 (rather than 0.8).

Teachers' reports on graduate courses showed a similar pattern, except that teachers often had taken no graduate courses in the discipline. If the zeroes are excluded, teachers were actually less accurate in reporting on graduate courses than in reporting on undergraduate courses. (For example, 12 percent or less gave correct responses for mathematics, computer science, biology or life science, and physics, compared with 25 percent or more at the undergraduate level.) Also, perhaps because teachers tended to take fewer graduate courses in mathematics and science, the total distance between their self-report and their transcripts was sometimes smaller (especially for mathematics, computer science, and biology).

### Teacher Characteristics and Accurate Reports

No teacher characteristic showed a consistent pattern with relation to teacher accuracy for every statistic (Table 6).<sup>9</sup> For example, while female teachers were sometimes more accurate than male teachers (*e.g.*, 80 percent of female

**Table 6. Percentage giving accurate responses**

Teaching area and teacher characteristic	Undergraduate		Graduate	
	Number of courses	Number of credits	Number of courses	Number of credits
<b>Teacher education</b>				
<b>Gender</b>				
Male.....	64	61	59	76
Female.....	80	67	68	69
<b>Recency of bachelor's degree</b>				
In last 10 years.....	79	60	68	75
11 - 20 years.....	75	69	65	59
Over 20 years ago.....	73	66	65	72
<b>Institutional control</b>				
Public.....	73	65	71	72
Private.....	78	66	56	64
<b>Main teaching assignment</b>				
<b>Gender</b>				
Male.....	66	49	68	63
Female.....	63	60	59	65
<b>Recency of bachelor's degree</b>				
In last 10 years.....	62	55	57	71
11 - 20 years.....	49	48	61	53
Over 20 years ago.....	78	62	67	62
<b>Institutional control</b>				
Public.....	61	55	60	56
Private.....	63	50	60	69

NOTE: Only teachers for whom complete transcript data were available were included.

<sup>9</sup>With only three exceptions, the relationships were also statistically insignificant. For this section, cases where teachers' accuracy could not be clearly determined because of incomplete transcript data were excluded.

teachers gave accurate responses on the number of teacher education courses, compared with only 64 percent among male teachers), for three of the eight statistics male teachers showed a higher accuracy rate. One might expect that teachers who received their bachelor's degree relatively recently could provide more accurate answers than those who had to recall their course backgrounds over longer periods of time, but again no consistent trend was found. Finally, the results were mixed based on the institutional control (public/private) of the schools where teachers taught.

### Summary

For some types of data, such as general information on what degrees were earned, teachers showed high response rates and gave highly accurate data. There is little need to collect transcripts to verify these types of data, and the administration of a questionnaire is likely to be both simpler and less expensive. For more detailed data, the questionnaires were less useful. Non-response presented greater difficulties, and teachers were less likely to be accurate. One possible research strategy would be to redesign questionnaires to allow for these difficulties, while another would be to use some other source of data (such as institutional records).

In general, it appears better to request information on the number of courses than on the number of credits, given the lower item response rates and accuracy rates for credits. Teachers were also most accurate when relatively large categories were used (*e.g.*, four courses or more in teacher education) or when identifying that they had not taken any courses in a field; they were not as effective in counting the exact number of courses. Finally, for some areas questionnaires may not provide reliable data. For areas that were not highly salient (such as the second teaching assignment), the levels of inaccuracy and nonresponse were sufficiently high that the administration of survey questionnaires seems inappropriate. For areas that might be complicated (*e.g.*, specifying term types), teachers' responses were also less reliable: given the predominance of semester systems, it would be roughly as accurate to assume all courses were semester courses as to use the teachers' responses.