Appendix A. Source and Reliability of the Estimates

SOURCE OF DATA

The estimates of school enrollment in 1980 are based on data obtained in October 1980 from the Current Population Survey (CPS) conducted by the Bureau of the Census. The CPS sample was initially selected from the 1970 census file and is updated continuously to reflect new construction where possible. The October sample was spread over 629 areas comprising 1,133 counties, independent cities and minor civil divisions with coverage in each of the 50 States and the District of Columbia. The sample is composed of approximately 66,000 occupied households that are eligible for interview. Of this number, about 2,500 occupied units were visited, but interviews were not obtained because the occupants were not found at home after repeated calls or were unavailable for some other reason. For a description of the CPS sample designs prior to 1980, see the detailed report for 1979 in this series.

The estimation procedure used for this survey involved the inflation of the weighted sample results to independent estimates of the civilian noninstitutional population of the United States by age, race and sex. These independent estimates are based on statistics from decennial censuses; statistics on births, deaths, immigration, and emigration; and statistics on the strength of the Armed Forces.

RELIABILITY OF THE ESTIMATES

Since the estimates in this report are based on a sample, they may differ somewhat from the figures that would have been obtained if a complete census had been taken using the same questionnaires, instructions, and enumerators. There are two types of errors possible in an estimate based on a sample survey—sampling and nonsampling. The standard errors provided for this report primarily indicate the magnitude of the sampling error. They also partially measure the effect of some nonsampling errors in response and enumeration, but do not measure any systematic biases in the data. The full extent of the nonsampling error is unknown. Consequently, particular care should be exercised in the interpretation of figures based on a relatively small number of cases or on small differences between estimates.

Use of school enrollment data for persons of Spanish origin. Methodological changes have occurred in 1980 resulting in relatively large increases in the estimated number and proportion of children 3 to 13 years old who are of Spanish origin. Consequently, when using school enrollment data for persons of Spanish origin, particular care should be exercised in comparing 1980 estimates of the total number of children enrolled in nursery school, kindergarten, and/or elementary school to those estimates from earlier years. These changes do not affect, however, school enrollment rates reported for persons of Spanish origin.

Sampling variability. The standard errors presented in tables A-1 and A-2 are primarily measures of sampling variability; that is, of the variations that occurred by chance because a sample rather than the whole of the population was surveyed. The sample estimate and its standard error enable one to construct interval estimates that include the average result of all possible samples with a known probability. For example, if all possible samples were selected, each of these surveyed under identical conditions using the same sample design; and an estimate and its standard error were calculated from each sample, then:

1. Approximately 68 percent of the intervals from one standard error below the estimate to one standard error above the estimate would include the average result of all possible samples.

2. Approximately 90 percent of the intervals from 1.6 standard errors below the estimate to 1.6 standard errors above the estimate would include the average result of all possible samples.

3. Approximately 95 percent of the intervals from two standard errors below the estimate to two standard errors above the estimate would include the average result of all possible samples.

The average result of all possible samples may or may not be contained in any particular computed interval. However, for a particular sample one can say with specified confidence that the average result of all possible samples is included within the constructed interval.

All statements of comparison in the text are significant at a confidence of 90 percent or better and most are significant at a confidence greater than 95 percent. This means that for most differences cited in the text, the estimated difference is greater than twice the standard error of the difference. Statements of comparison qualified in some way (e.g., by the use of the phrase, "some evidence") have a confidence coefficient between 90 percent and 95 percent.

Note when using small estimates. Percent distributions are shown in this report only when the base of the percentage is greater than 75,000. Because of the large standard errors involved, there is little chance that percentages would reveal useful information when computed on a smaller base. Estimated numbers of persons are shown, however, even though the relative standard errors of these numbers are larger than those for the corresponding percentages. These smaller estimates are provided primarily to permit those combinations of the categories which serve each user's needs.

Standard errors for data based on CPS. Since this is an advance report, standard errors are provided in tables A-1 and A-2 and standard error parameters are provided in table A-3 for estimated numbers of persons and estimated percentages for only certain characteristics which are considered the most important among the data in the report.

More detailed standard error tables for each characteristic of interest for estimated numbers of persons and estimated percentages are provided in the detailed report for 1979 in this series. A more complete source and reliability statement for the 1980 data will be published with the forthcoming 1980 detailed report.

Standard errors of estimated numbers and estimated percentages. The approximate standard errors of estimated

Table A-1. Standard Errors of Estimated Numbers of Persons Enrolled in School for the Total, Black, and Spanish-Origin Population: October 1980

(Numbers in thousands)

Enrollment	Total		Black		Spanish origin	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total enrolled.........	57,348	256	8,250	102	4,263	126
Nursery.....................	1,987	54	294	22	146	24
Private...................	1,354	46	115	14	75	17
Kindergarten...............	3,176	65	490	29	263	32
Private...................	486	29	50	9	30	11
Elementary.................	27,449	211	4,259	92	2,363	95
Private...................	3,051	78	202	24	228	30
High school...............	14,556	163	2,200	72	1,048	63
College...................	10,180	139	1,007	51	443	41
Full time...............	7,147	118	723	44	294	34

Source: Estimates from table 1.

Table A-2. Standard Errors of Estimated Percentages of Persons 3 to 34 Years Old Enrolled in School for the Total, Black, and Spanish-Origin Population: October 1980

Age	Total		Black		Spanish origin	
	Estimate	Standard error	Estimate	Standard error	Estimate	Standard error
Total, 3 to 34 years...	49.7	0.2	53.9	0.7	49.8	1.1
3 and 4 years.................	36.7	0.8	38.2	2.1	28.5	3.6
5 and 6 years.................	95.7	0.3	95.4	0.9	94.5	2.0
7 to 9 years..................	99.1	0.14	99.4	0.3	98.4	0.8
10 to 13 years...............	99.4	0.09	99.4	0.3	99.7	0.3
14 and 15 years..............	98.2	0.2	97.9	0.7	94.3	1.9
16 and 17 years..............	89.0	0.5	90.6	1.4	81.8	3.2
18 and 19 years..............	46.4	0.8	45.7	2.5	37.8	3.9
20 and 21 years..............	31.0	0.7	23.4	2.2	19.5	3.3
22 to 24 years...............	16.3	0.5	13.6	1.5	11.7	2.2
25 to 29 years...............	9.3	0.3	8.8	1.0	6.9	1.4
30 to 34 years...............	6.4	0.3	6.8	1.0	5.1	1.3

Source: Estimates from table 6.

numbers and percentages can be computed directly with formulas (1) and (2) below, respectively. The formulas are:

$$\sigma_x = \sqrt{ax^2 + bx} \qquad (1)$$

where "x" is the size of the estimate and "a" and "b" are the parameters associated with the characteristic; and

$$\sigma_{(x,p)} = \sqrt{\frac{b}{x} \cdot p \cdot (100-p)} \qquad (2)$$

where "x" is the size of the subclass of the population which is the base of the percentage, "p" is the percentage ($0 < p < 100$), and "b" is the parameter associated with the characteristic.

Table A-3 provides the values of the "a" and "b" parameters that are used in formulas (1) and (2) to approximate standard errors of estimated numbers of persons and estimated percentages.

Standard error of a difference. For a difference between two sample estimates, the standard error is approximately equal to

$$\sigma_{(x-y)} \doteq \sqrt{\sigma_x^2 + \sigma_y^2} \qquad (5)$$

where σ_x and σ_y are the standard errors of the estimates x and y; the estimates can be numbers, percents, ratios, etc.

This will represent the estimated standard error quite accurately for the difference between two estimates of the same characteristic in two different areas, or for the difference between two separate and uncorrelated characteristics in the same area. If, however, there is a high positive (negative) correlation between the two characteristics, the formula will overestimate (underestimate) the true standard error.

Table A-3. Parameters to be Used for Each School Enrollment Characteristic for the Direct Computation of Standard Errors

Characteristic	Parameters	
	a	b
Educational attainment and school enrollment:		
Total or White.........	–0.000016	2064
Black or other.........	–0.000186	2792
Spanish origin.........	–0.000025	3851
Kindergarten and nursery school enrollment:		
All races.............	–0.000126	1738
Spanish origin.........	–0.000025	3851