Appendix C. Source and Reliability of the Estimates

SOURCE OF DATA

Most of the estimates in this report are based on data collected in November 1986 from the Current Population Survey (CPS) of the Bureau of the Census. Some data were obtained from published November reports from earlier years dating back to 1964. These reports are noted at the bottom of the text tables.

The monthly CPS deals mainly with labor force data for the civilian noninstitutional population. Questions relating to labor participation are asked about each member in every sample household. In addition, supplemental questions are asked about voting and voter registration during the month of November in election years.

The following table provides a description of some aspects of the CPS sample designs in use during the referenced data collection periods.

Description of the Current Population Survey

Time period	Number of sample areas[1]	Housing units eligible	
		Interviewed	Not interviewed
November 1986	729	54,500	2,500
November 1984	629	58,000	2,500
November 1982	629	59,000	2,500
November 1980	629	64,000	2,500
November 1972-76	461	45,000	2,000
November 1968-70	449	48,000	2,000
November 1964-66	357	33,500	1,500

[1]These sample areas were chosen to provide coverage in each of the 50 States and the District of Columbia.

The estimation procedure used in this survey involved the inflation of the weighted sample results to independent estimates of the total civilian noninstitutional population of the United States by age, race, sex and Hispanic/non-Hispanic categories. These independent estimates are based on statistics from decennial censuses of population; statistics on births, deaths, immigration, and emigration; and statistics on the strength of the Armed Forces. The independent population estimates used to obtain data for November 1982 and later years are based on the 1980 decennial census. Data for 1972 to 1980 were obtained using independent population estimates based on the 1970 decennial census; and data for 1964 to 1970 were obtained using independent population estimates based on the 1960 decennial census.

The estimates in this report for 1986 are based on a revised Hispanic weighting procedure. In previous years the estimation procedures used in this survey involved the inflation of weighted sample results to independent estimates of the noninstitutional population by age, sex, and race. There was, therefore, no specific control of the survey estimates for the Hispanic population. During the last several years, the Bureau of the Census has developed independent population controls for the Hispanic population by sex and detailed age groups and has adopted revised weighting procedures to incorporate these new controls. It should be noted that the independent population estimates include some, but not all, undocumented immigrants.

RELIABILITY OF THE ESTIMATES

Since the CPS estimates were 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 accuracy of a survey result depends on both types of errors, but 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. The standard errors provided for the CPS estimates primarily indicate the magnitude of the sampling error. They also partially measure the effect of some nonsampling errors in responses and enumeration, but do not measure any systematic biases in the data. (Bias is the difference averaged over all possible samples, between the estimate and the desired value.)

Nonsampling variability. Nonsampling errors can be attributed to many sources, e.g., inability to obtain information about all cases in the sample, definitional difficulties, differences in the interpretation of questions, inability or unwillingness on the part of respondents to provide correct information, inability to recall information, errors made in data collection such as in recording or coding the data, errors made in processing the data, errors made in estimating values for missing data, and failure to represent all units with the sample (undercoverage).

Undercoverage in the CPS results from missed housing units and missed persons within sample households. Overall undercoverage as compared with the level of the 1980 decennial census is about 7 percent. It is known that CPS undercoverage varies with age, sex, and race. Generally, undercoverage is larger for males than for females and larger for Blacks and other races combined than for Whites. Ratio estimation to independent age-sex-race-Hispanic population controls, as described previously, partially corrects for the bias due to survey undercoverage. However, biases exist in the estimates to the extent that missed persons in missed households or missed persons in interviewed households have different characteristics from those of interviewed persons in the same age-sex-race-Hispanic group. Further, the independent popula-

tion controls used have not been adjusted for undercoverage in the 1980 census.

For additional information on nonsampling error including the possible impact on CPS data when known, refer to Statistical Policy Working Paper 3, *An Error Profile: Employment as Measured by the Current Population Survey,* Office of Federal Statistical Policy and Standards, U.S. Department of Commerce, 1978; and Technical Paper 40, *The Current Population Survey: Design and Methodology,* Bureau of the Census, U.S. Department of Commerce.

Sampling variability. The standard errors given in the following tables are primarily measures of sampling variability, that is, of the variations that occurred by chance because a sample rather than the entire population was surveyed. The sample estimate and its standard error enable one to construct confidence intervals, ranges that would include the average results of all possible samples with a known probability. For example, if all possible samples were selected, each of these being surveyed under essentially the same general conditions and using the same sample design, and if an estimate and its standard error were calculated from each sample, then:

1. 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.
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.

The average estimate derived from all possible samples is or is not contained in any particular computed interval. However, for a particular sample, one can say with specified confidence that the average estimate derived from all possible samples is included in the confidence interval.

Standard errors may also be used to perform hypothesis testing, a procedure for distinguishing between population parameters using sample estimates. The most common type of hypothesis appearing in this report is that the population parameters are different. An example of this would be comparing registered males to registered females. Tests may be performed at various levels of significance, where a level of significance is the probability of concluding that the characteristics are different when, in fact, they are identical.

To perform the most common test, let x and y be sample estimates for two characteristics of interest. Let that standard error on the difference x-y be σ_{DIFF}. If the ratio $R= (x-y)/\sigma_{DIFF}$ is between -2 and +2, no conclusion about the difference between the characteristics is justified at the 0.05 level of significance. If, however, this ratio is smaller than -2 or larger than +2, the observed difference is significant at the 0.05 level. In this event, it is commonly accepted practice to say that the characteristics are different. Of course, sometimes this conclusion will be wrong. When the characteristics are, in fact, the same, there is a 5 percent chance of concluding that they are different. All statements of comparison in the text have passed a hypothesis test at the 0.10 level of significance or better, and most have passed a hypothesis test at the 0.05 level of significance or better. This means that, for most differences cited in the text, the estimated difference between characteristics is greater than twice the standard error of the difference. For the other differences mentioned, the estimated difference between characteristics is between 1.6 and 2.0 times the standard error of the difference. When this is the case, the statement of comparison is qualified, e.g., by the use of the phrase "some evidence."

Comparability of data. Data obtained from the CPS and other sources are not entirely comparable. This is due in large part to differences in interviewer training and experience and in differing survey processes. This is an additional component of error not reflected in the standard error tables. Therefore, caution should be used in comparing results between these different sources.

Caution should also be used when comparing estimates for 1981 and later, which reflect 1980 census-based population controls, with estimates from earlier years. This change in population controls had relatively little impact on summary measures such as means, medians, and percent distributions, but did have a significant impact on levels. For example, use of 1980-based population controls results in about a 2-percent increase in the civilian noninstitutional population and in the number of families and households. Thus, estimates of levels for 1981 and later will differ from those for earlier years by more than what could be attributed to actual changes in the population and these differences could be disproportionately greater for certain subpopulation groups than for the total population.

Note when using small estimates. Summary measures (such as medians and percent distributions) are shown only when the base is 75,000 or greater. Because of the large standard errors involved, there is little chance that summary measures would reveal useful information when computed on a smaller base. Estimated numbers are shown, however, even though the relative corresponding percentages. These smaller estimates are provided primarily to permit such combinations of the categories as serve each data user's needs. Also, care must be taken in the interpretation of small differences. For instance, even a small amount of nonsampling error can cause a borderline difference to appear significant or not, thus distorting a seemingly valid hypothesis test.

Standard error tables and their use. In order to derive standard errors that would be applicable to a larger number of estimates and could be prepared at a moderate cost, a number of approximations were required. Therefore, instead of providing an individual standard error for each estimate, generalized sets of standard errors are provided for various types of characteristics. As a result, the sets of standard errors provided give an indication of the order of magnitude of the standard error of an estimate rather than the precise standard error.

The figures presented in table C-1 are approximations to the standard errors of estimated numbers of persons. To obtain the approximate standard error for a specific characteristic the appropriate standard error in tables C-2 through C-5 must be multiplied by the factor for that characteristic given in tables C-6 and C-7. These factors must be applied to the generalized standard errors in order to adjust for the combined effect of the sample design and the estimating procedure on the value of the characteristic.

Standard errors for intermediate values not shown in the generalized tables of standard errors may be approximated by linear interpolation.

Two parameters (denoted "a" and "b") are used to calculate standard errors for each type of characteristic; they are presented in tables C-6 and C-7. These parameters were used to calculate the standard errors in tables C-1 through C-5 and to calculate the factors in tables C-6 and C-7. They also may be used directly to calculate the standard errors for estimated numbers and percentages. Methods for computation are given in the following sections.

Standard errors of estimated numbers. The approximate standard error, Sx, of an estimated number shown in this report can be obtained in two ways. It may be obtained by use of the formula

$$S_x = fs \qquad (1)$$

where f is the appropriate factor from table C-6 or C-7 and S is the standard error on the estimate obtained by interpolation from table C-1. Alternatively, the standard error may be approximated by formula (2) from which the standard errors in table C-1 were calculated. Use of this formula will provide more accurate results than the use of formula (1) above

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

Here x is the size of the estimate and a and b are the parameters in table C-6 or C-7 associated with the particular characteristic.

Illustration of the computation of the standard error of an estimated number. Table E of this report shows that 916,000 Black persons 18 to 24 years old reported that they voted in the November 1986 election. Using formula (2) with a = -0.000206 and b = 4,718 from table C-6, the approximate standard error is

$$\sqrt{(-0.000206)\ (916{,}000)^2 + (4{,}718)\ (916{,}000)} = 64{,}400^1$$

The 90-percent confidence interval for the number of Black persons 18-24 years old who reported they voted in the November 1986 election is from 813,000 to 1,019,000. Therefore, a conclusion that the average estimate derived from all possible samples lies within a range computed in this way would be correct for roughly 90-percent of all possible samples. Similarly, we could conclude with 95-percent confidence that the number of Black persons 18-24 years old who reported they voted in November 1986 lies within the interval from 787,000 to 1,045,000 (using twice the standard error).

Standard errors of estimated percentages. The reliability of an estimated percentage, computed using sample data for both numerator and denominator, depends upon both the size of the percentage and the size of the total upon which this percentage is based. Estimated percentages are relatively more reliable than the corresponding estimates of the numerators of the percentages, particularly if the percentages are 50 percent or more. When the numerator and denominator of the percentage are in different categories, use the factors or parameters from tables C-6 and C-7 indicated by the numerator. The approximate standard error, S(x,p), of an estimated percentage can be obtained by use of the formula:

$$S_{(x,p)} = fs \qquad (3)$$

In this formula, f is the appropriate factor from table C-6 or C-7 and S is the standard error on the estimate from tables C-2 through C-5. Alternatively, it may be approximated by the following formula from which the standard errors in tables C-2 through C-5 were calculated. Use of this formula will give more accurate results than use of formula (3) above.

$$S_{(x,p)} = \sqrt{(b/x)\ (p)\ (100-p)} \qquad (4)$$

Here x is the size of the subclass of persons or families which is the base of the percentage, p is the percentage (0 p 100), and b is the parameter in table C-6 or C-7 associated with the particular characteristic in the numerator of the percentage.

Illustration of the computation of the standard error of a percentage. Table E also shows that of the 21,957,000 White persons 18 to 24 years old, 4,746,000 or 21.6 percent reported they voted in November 1986. Using formula (4) and b = 3,223 from table C-6, the approximate standard error on an estimate of 21.6 percent is

$$\sqrt{\frac{3{,}223}{21{,}957{,}000}\ (21.6)\ (100\text{-}21.6)} = 0.5 \text{ percent}^2$$

Thus, the 90-percent confidence interval around the difference is from 20.8 to 22.4 percent, i.e. 21.6 + (1.6 x 0.5). The 95-percent confidence interval from 20.6 to 22.6 percent (twice the standard error).

[1]Using formula (1), table C-1, and the appropriate factor, 1.0, from table C-6, the approximate standard error is 64,300.

[2]Using formula (3), table C-2 and the appropriate factor from table C-6, the approximate standard error is 0.5 percent.

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

$$S_{(x-y)} = \sqrt{S_x^2 + S_y^2} \qquad (5)$$

where S_x and S_y are the standard errors of the estimates x and y, respectively. The estimates can be of numbers, percents, ratios, etc. This will represent the actual standard error quite accurately for the difference between two estimates of the same characteristic in two different areas or for the difference between 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.

Illustration of the computation of the standard error of a difference. Table D of this report shows that 47.0 percent of the 149,899,000 White persons and 43.2 percent of the 19,020,000 Black persons of voting age reported that they voted in the November 1986 election. Thus, the apparent difference between the percent of White and of Black voters is 3.8 percent. Using formula (4) and the appropriate b-parameters[3] from table C-6, the standard errors on 47.0 and 43.2 percent are approximately 0.2 and 0.8 percent, respectively. Therefore, using formula (5), the standard error of the estimated difference of 3.8 percent is about

$$\sqrt{(0.2)^2 + (0.8)^2} = 0.8 \text{ percent}$$

Thus, the 90-percent confidence interval around the difference between the percent of White and Black persons who reported that they voted in November 1986 is from 2.5 to 5.1 percent, i.e. 3.8 ± (1.6 x 0.8). The 95-percent confidence interval is from 2.2 to 5.4 percent (twice the standard error). Since zero is not contained in the confidence interval, we may conclude with 95-percent confidence that in the November 1986 elections more White persons voted than Black persons.

[3]b=3,223 and 4,718 for White and Black persons, respectively.

Table C-1. Standard Errors of Estimated Numbers of Persons

(Numbers in thousands)

Estimate	Total or White (1980 to present)	Black 1980 to (present)	Hispanic	
			1976-84[1]	1986
25	9	11	15	14
50	13	15	22	19
75	16	19	27	24
100	18	22	31	27
250	28	34	49	43
500	40	48	69	61
750	49	59	84	75
1,000	57	67	97	86
2,500	89	103	153	136
5,000	125	136	215	190
7,500	152	154	262	231
10,000	174	163	300	265
15,000	210	156	362	320
20,000	238	109	(X)	(X)
25,000	262	(X)	(X)	(X)
50,000	337	(X)	(X)	(X)
75,000	367	(X)	(X)	(X)
100,000	364	(X)	(X)	(X)
110,000	353	(X)	(X)	(X)
150,000	237	(X)	(X)	(X)

(X) Not applicable.

[1]For standard errors of data for 1964 through 1968, multiply the above figures by 1.17; for 1970 through 1974 data, multiply the above figures by 0.78.

Note: For a particular characteristic see tables C-6 and C-7 for the appropriate factor to apply to the above standard errors. For reference, the standard errors in tables C-1 through C-4 were calculated using a = -0.000019 and b = 3,223 for total or White; a = -0.000206 and b = 4,718 for Black; and a = -0.000056 and b = 9,560 for Hispanic in table C-4; and a = 0.000072 and b = 12,237 for Hispanic in table C-5.

Table C-2. Standard Errors of Estimated Percentages of Total or White Persons

(1980 to present)

Base of estimated percentages (in thousands)	Estimated percentage					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
25	5.0	7.8	10.8	14.4	15.6	18.0
50	3.6	5.5	7.6	10.2	11.0	12.7
75	2.9	4.5	6.2	8.3	9.0	10.4
100	2.5	3.9	5.4	7.2	7.8	9.0
250	1.6	2.5	3.4	4.5	4.9	5.7
500	1.1	1.8	2.4	3.2	3.5	4.0
750	0.9	1.4	2.0	2.6	2.8	3.3
1,000	0.8	1.2	1.7	2.3	2.5	2.8
2,500	0.5	0.8	1.1	1.4	1.6	1.8
5,000	0.4	0.6	0.8	1.0	1.1	1.3
7,500	0.3	0.5	0.6	0.8	0.9	1.0
10,000	0.3	0.4	0.5	0.7	0.8	0.9
15,000	0.2	0.3	0.4	0.6	0.6	0.7
20,000	0.2	0.3	0.4	0.5	0.6	0.6
25,000	0.2	0.3	0.3	0.5	0.5	0.6
50,000	0.11	0.2	0.2	0.3	0.4	0.4
75,000	0.09	0.14	0.2	0.3	0.3	0.3
100,000	0.08	0.12	0.2	0.2	0.3	0.3
110,000	0.08	0.12	0.2	0.2	0.2	0.3
150,000	0.06	0.10	0.14	0.2	0.2	0.2

NOTE: 1. For standard errors of 1964 data, multiply the above figures by 1.1; for 1966–78 data, multiply the above figures by 0.88.
2. For a particular characteristic see table C-6 for the appropriate factor to apply to the above standard errors. For reference, the standard errors in table C-2 were calculated using a = -0.000019 and b = 3,223.

Table C-3. Standard Errors of Estimated Percentages of Black Persons

(1980 to present)

Base of estimated percentages (in thousands)	Estimated percentage					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
25	6.1	9.5	13.0	17.4	18.8	21.7
50	4.3	6.7	9.2	12.3	13.3	15.4
75	3.5	5.5	7.5	10.0	10.9	12.5
100	3.0	4.7	6.5	8.7	9.4	10.9
250	1.9	3.0	4.1	5.5	6.0	6.9
500	1.4	2.1	2.9	3.9	4.2	4.9
750	1.1	1.7	2.4	3.2	3.4	4.0
1,000	1.0	1.5	2.1	2.8	3.0	3.4
2,500	0.6	1.0	1.3	1.7	1.9	2.2
5,000	0.4	0.7	0.9	1.2	1.3	1.5
7,500	0.4	0.6	0.8	1.0	1.1	1.3
10,000	0.3	0.5	0.7	0.9	0.9	1.1
15,000	0.3	0.4	0.5	0.7	0.8	0.9
20,000	0.2	0.3	0.5	0.6	0.7	0.8

NOTE: 1. For standard errors of 1964 data, multiply the above figures by 1.1; for 1966–1978 data, multiply the above figures by 0.88.
2. For a particular characteristic see table C-6 for the appropriate factor to apply to the above standard errors. For reference, the standard errors in table C-3 were calculated using a = -0.000206 and b = 4,718.

Table C-4. Standard Errors of Estimated Percentages of Hispanic Persons: 1980 through 1984

Base of estimated percentages (in thousands)	Estimated percentage					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
25	7.7	11.9	16.4	21.9	23.7	27.3
50	5.4	8.4	11.6	15.5	16.7	19.3
75	4.4	6.9	9.5	12.6	13.7	15.8
100	3.8	6.0	8.2	10.9	11.8	13.7
250	2.4	3.8	5.2	6.9	7.5	8.6
500	1.7	2.7	3.7	4.9	5.3	6.1
750	1.4	2.2	3.0	4.0	4.3	5.0
1,000	1.2	1.9	2.6	3.5	3.7	4.3
2,500	0.8	1.2	1.6	2.2	2.4	2.7
5,000	0.5	0.8	1.2	1.6	1.7	1.9
7,500	0.4	0.7	1.0	1.3	1.4	1.6
10,000	0.4	0.6	0.8	1.1	1.2	1.4
15,000	0.3	0.5	0.7	0.9	1.0	1.1

NOTE: For a particular characteristic see table C-7 for the appropriate factor to apply to the above standard errors. For reference, the standard errors in table C-4 were calculated using a = -0.000044 and b = 7,469.

Table C-5. Standard Errors of Estimated Percentages of Hispanic Persons: 1986

Base of estimated percentages (in thousands)	Estimated percentage					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
25	8.7	13.5	18.6	24.7	26.8	30.9
50	6.1	9.5	13.1	17.5	18.9	21.9
75	5.0	7.8	10.7	14.3	15.5	17.9
100	4.3	6.7	9.3	12.4	13.4	15.5
250	2.7	4.3	5.9	7.8	8.5	9.8
500	1.9	3.0	4.2	5.5	6.0	6.9
750	1.6	2.7	3.4	4.5	4.9	5.7
1,000	1.4	2.1	2.9	3.9	4.2	4.9
2,500	0.9	1.6	1.9	2.5	2.7	3.1
5,000	0.6	1.0	1.3	1.8	1.9	2.2
7,500	0.5	0.8	1.1	1.4	1.6	1.8
10,000	0.4	0.7	0.9	1.2	1.3	1.6
15,000	0.4	0.6	0.8	1.0	1.1	1.3

NOTE: For a particular characteristic see table C-7 for the appropriate factor to apply to the above standard errors. For reference, the standard errors in table C-5 were calculated using a = -0.000056 and b = 9,560.

Table C-6. Factors to be Applied to Generalized Standard Errors in Tables C-1 through C-5 and "a" and "b" Parameters for Various Characteristics: 1980 to Present

(Total or White and Black)

Characteristic	Total or White			Black		
	a	b	f[1]	a	b	f[2]
Voting, registration, reasons for not voting or registering:						
CPS counts	-0.000019	3,223	1.0	-0.000206	4,718	1.0
Official counts	(X)	(X)	(X)	(X)	(X)	(X)
Citizenship, household relationship, family heads by presence of children, marital status, duration of residence, tenure	-0.000019	3,223	1.0	-0.000206	4,718	1.0
Educational level, employment status, family income of persons and occupation group	-0.000019	3,223	1.0	-0.000206	4,718	1.0
Characteristics of all persons:						
Marital status	-0.000025	4,480	1.2	-0.000265	6,426	1.2
Education of persons	-0.000028	2,312	0.8	-0.000129	2,600	0.7
Education of family head	-0.000010	1,778	0.7	-0.000066	1,606	0.6
Employment, not in labor force, occup.	-0.000016	2,327	0.8	-0.000144	2,327	0.7
Unemployment	-0.000015	2,206	0.8	-0.000150	2,536	0.7
Persons by family income	-0.000018	3,770	1.2	-0.000154	4,310	1.0
Duration of residence, tenure	-0.000025	4,480	1.2	-0.000265	6,426	1.2
Household relationships:						
Head, wife of head	-0.000010	1,778	0.7	-0.000066	1,606	0.6
Nonrelative or other relative of head	-0.000025	4,480	1.2	-0.000265	6,426	1.2

(X) Not applicable.

[1]Factors in this column are to be applied to tables C-1 and C-2, to obtain appropriate standard errors of a characteristic.
[2]Factors in this column are to be applied to tables C-1 and C-3, to obtain appropriate standard errors of a characteristic.

NOTE: For standard errors of 1964 data, multiply parameters by 1.2 or factors by 1.1; for 1966-78 data, standard errors are obtained by multiplying parameters by 0.78 or factors by 0.88.

Table C-7. Factors to be Applied to Generalized Standard Errors in Tables C-1 through C-5 and "a" and "b" Parameters for Various Characteristics: Hispanic Origin

Characteristic	1986			1980–84		
	a	b	f[1]	a	b	f
Voting, registration, reasons for not voting or registering:						
CPS Counts	-0.000056	9,560	1.0	-0.000044	7,469	1.0
Official Counts	(X)	(X)	(X)	(X)	(X)	(X)
Citizenship, household relationship, family heads by presence of children, marital status, duration of residence, tenure	-0.000056	9,560	1.0	-0.000044	7,469	1.0
Educational level, employment status, family income of persons and occupation group	(X)	4,319	0.7	(X)	3,762	0.7
Characteristics of all persons:						
Marital status	-0.000056	9,560	1.0	-0.000049	8,328	1.1
Education of persons	(X)	4,319	0.7	(X)	3,762	0.7
Ed. of family head	-0.000018	3,068	0.6	-0.000016	2,672	0.6
Employment, not in labor force, occup.	-0.000930	2,120	[2]	-0.000810	1,847	[2]
Unemployment	-0.001711	1,837	[2]	-0.001490	1,600	[2]
Persons by fam. inc.	-0.000067	10,112	1.0	-0.000061	9,193	1.1
Duration of residence, tenure	-0.000056	9,560	1.0	-0.000049	8,328	1.1
Household relationships:						
Head, wife of head	-0.000018	3,068	0.6	-0.000016	2,672	0.6
Nonrelative or other relative of head	-0.000056	9,560	1.0	-0.000049	8,328	1.1

(X) Not applicable.

[1]Factors in this column are to be applied to tables C-1 and C-4, to obtain appropriate standard errors of a characteristic.
[2]To obtain standard errors for these characteristics, use formula (2) only.

NOTE: For standard errors of 1964 data, multiply parameters by 1.2 or factors by 1.1; for 1966-78 data, standard errors are obtained by multiplying parameters by 0.78 or factors by 0.88.

Table C-8. State Voting Parameters

State, division, region	Parameters		State, division, region	Parameters	
	a	b		a	b
Alabama	-0.001299	5,060	Ohio	-0.000266	2,868
Alaska	-0.001203	483	Oklahoma	-0.000937	2,836
Arizona	-0.001340	3,642	Oregon	-0.001273	3,352
Arkansas	-0.001043	2,385	Pennsylvania	-0.000255	3,030
California	-0.000173	4,093	Rhode Island	-0.001259	1,193
Colorado	-0.001260	3,642	South Carolina	-0.000939	2,933
Connecticut	-0.000965	2,997	South Dakota	-0.000840	580
Delaware	-0.001193	709	Tennessee	-0.001032	4,738
District of Columbia	-0.001111	709	Texas	-0.000294	4,190
Florida	-0.000291	2,836	Utah	-0.001103	1,612
Georgia	-0.000926	5,060	Vermont	-0.001260	645
Hawaii	-0.001136	1,096	Virginia	-0.000922	4,931
Idaho	-0.001034	967			
Illinois	-0.000279	3,191	Washington	-0.001170	4,835
Indiana	-0.000699	3,835	West Virginia	-0.001008	1,966
Iowa	-0.000996	2,901	Wisconsin	-0.000979	4,609
Kansas	-0.000982	2,321	Wyoming	-0.001304	612
Kentucky	-0.001065	3,900			
Louisiana	-0.000996	4,190			
Maine	-0.001089	1,225	Census divisions:		
Maryland	-0.000780	3,287	New England	-0.000148	1,833
Massachusetts	-0.000287	1,644	Middle Atlantic	-0.000072	2,662
Michigan	-0.000271	2,514	East North Central	-0.000077	3,193
Minnesota	-0.000996	4,061	West North Central	-0.000177	3,049
Mississippi	-0.000985	2,482	South Atlantic	-0.000087	3,224
Missouri	-0.000780	3,835	East South Central	-0.000288	4,228
Montana	-0.001024	806	West South Central	-0.000161	3,835
Nebraska	-0.000944	1,483	Mountain	-0.000212	2,407
Nevada	-0.001611	1,289	Pacific	-0.000126	3,994
New Hampshire	-0.001400	1,289			
New Jersey	-0.000276	2,030	Regions:		
New Mexico	-0.001039	1,354	Northeast	-0.000049	2,420
New York	-0.000152	2,675	Midwest	-0.000050	2,957
North Carolina	-0.000290	1,708	South	-0.000044	3,305
North Dakota	-0.000889	580	West	-0.000080	3,463
			All except South	-0.000019	2,927