Estimates of School Enrollment by Grade in the American Community Survey, the Current Population Survey, and the Common Core of Data

Kurt Bauman and Jessica Davis

Education and Social Stratification Branch
Social, Economic and Housing Statistics
Division, U.S. Census Bureau
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INTRODUCTION

The American Community Survey (ACS) began to collect data on single years of school enrollment in 2008. Prior to this, the ACS grouped enrollment in grades 1 to 8 into ranges (grades 1-4, grades 5-6, and grades 7-8), based on a question first used in Census 2000. In an effort to explore the quality of the 2008 enrollment data, we compared the ACS estimates to two other sources of enrollment data: the Current Population Survey (CPS) and the National Center for Education Statistic's Common Core of Data (CCD). The focus of this report is on enrollment through the high school level. The ACS and CPS do capture college enrollment, but the CCD is designed to measure enrollment only in public elementary and secondary schools. The National Center for Education Statistics collects college and other postsecondary enrollment in a separate data system.

FEATURES OF THE THREE DATA SOURCES

The ACS and CPS are both household surveys conducted by the Census Bureau, and both collect similar data on enrollment. The ACS, part of the Census Bureau's re-engineered 2010 Census program, looks at a wide range of social, economic, housing, and demographic characteristics for the population, including school enrollment. The ACS samples approximately 3 million households annually, or 1.7 percent of the nation's population each year, by paper forms, telephone and personal interviews. The ACS is administered year-round to the entire resident population, which includes those living in institutions and group quarters. The ACS is a valuable data source for exploring social and demographic characteristics by varying levels of geography, including places with small populations.

The CPS samples about 72,000 housing units each month. Unlike the ACS, the reference population is the civilian noninstitutionalized population, which is to say people living in institutions are not included. Estimates of school enrollment from the CPS are based on a special supplement administered each October. CPS data on enrollment have been collected each year since 1947, allowing the construction of a time series of trends for school enrollment. The CPS is collected through telephone and personal interviews. The CPS is best suited for national level estimates of enrollment and it is a significant source for historical data.

The CCD is not a survey, but an administrative data collection system serving as the Department of Education's primary source for public elementary and secondary school enrollment data. The CCD is collected annually from state education departments, and provides information on number of students enrolled each Fall in public elementary and secondary schools. Most of the data are obtained from records maintained by the state education agencies.

COMPARISON – NATIONALLY BY GRADE

Comparing estimates between the three data sources is accomplished by looking at enrollment for the 2009-2010 school year in public schools (private school enrollment is not covered in CCD). Since the period of data collection for the ACS does not match the school year, it is helpful to look at data collected in 2009 and in 2010 to gauge the extent to which differences might be due to time of data collection. Overall, the enrollment estimates from these sources are close but not identical (each is statistically different from the others).[1] The CCD estimates a total of 47.9 million public school students

[1] The estimates from the ACS and CPS in this report are based on samples of the population. As such, these estimates have sampling error, the difference between an estimate based on a sample and the corresponding value that would be obtained if the estimate were based on the entire population (as from a census). All comparative statements in this report have undergone statistical testing, and comparisons are significant at the 90 percent level unless otherwise noted.

in kindergarten through 12th grade, the ACS shows 48.0 million in 2009 and 48.9 million in 2010, while the Fall 2009 CPS estimate is 48.4 million.[2]

Table 1 shows a comparison of the data sources by level of enrollment. The same data are shown in Figure 1, which includes ACS 2009 data not shown in the table. The four data sources estimate from 32.6 to 33.3 million students total in kindergarten through-8th grade. The CCD estimates about 3.7 million students enrolled at each grade level in 2009-2010.[3] The CPS and ACS estimates vary from 3.5 million to 3.9 million at each grade from 1st to 8th.

Comparisons between data sources at the high school level show differences between the ACS and CPS estimates on the one hand, and the CCD estimates on the other. To begin with, total high school enrollment (grades 9 to 12) is higher in each of the two sample surveys (ACS and CPS) than in CCD. CPS estimates 15.3 million public high school students, ACS estimates 15.6 million, and CCD estimates 14.9 million. Just as important, they differ in pattern. CCD data show high school enrollment reaching a peak in 9th grade, while the other data sets have peak enrollment in 12th grade. So, while both ACS and CPS show greater than 500 thousand additional students in 12th grade, they both show fewer students in 9th grade than recorded in CCD.

To summarize the picture emerging from Table 1 and Figure 1, the data sources are very close for the total of kindergarten through 8th grade at the national level, but show divergence at the high school level.[4] Before turning to a more detailed look at high school enrollment, the following section looks at variation across states.

[2] We don't compare nursery school enrollment levels between the sources because the CCD collects only a limited amount of nursery and preschool enrollment. The CCD definition of pre-kindergarten is "part of a public school program taught during the year or years preceding kindergarten, excluding Head Start students unless part of an authorized public education program of a local education agency" (see Keaton 2012).

[3] The estimates for 6th grade and 8th grade enrollment round to 3.6 million.

[4] Although differences were small, they were statistically significant for all comparisons except CPS versus CCD for grades K-8.

STATE LEVEL ESTIMATES

The ACS is a powerful source of data for examining sub-national geographies and we wanted to see how its single year of enrollment estimates compared to the CCD estimates at the state level. Because of its smaller sample size, the CPS is not used by the Census Bureau for state-level enrollment estimates.

Starting with a comparison at a typical elementary school grade level, Figure 2 shows the distribution of 6th grade enrollment by state in the ACS and CCD data. The overall agreement between the data sources is good, with most of the variation related to the size of the state. The close agreement between ACS and CCD across the states results in a very high correlation between the two (rounding to .999 or higher) for every grade but 12th grade, as shown in Table 2.

The high correlations between the two sources across states for the same grades, show agreement between ACS and CCD. However, there are still differences between the two data sources. For example, ACS and CCD estimates of sixth grade enrollment have a mean difference (across states) of 1,820 and a standard deviation of 4,035, which indicates that most ACS estimates ranged from around 2,000 less than the CCD estimate to around 6,000 more. This size of a difference is relatively small in a state like California with over 400 thousand sixth graders, but is large relative to smaller states like North Dakota or Vermont, which each have 7,000 or fewer sixth grade students.

In the next section we take a look at patterns of differences among states as an initial way to look for explanations for differences that we see. If there are patterns of differences among states, they may reflect differences in state reporting systems to the CCD, or they may be differences between state populations sampled by the ACS and CPS.

State-level reporting problems

A good way to see the extent to which the data sources match up well across states is to measure the statistical difference between the estimates, which can be done using a chi-squared

goodness-of-fit test. At each grade level, the distribution of students across states is treated as a multinomial distribution, with the ACS estimates contrasted against the CCD estimates. In this analysis we used ACS replicate weights to estimate variance, while the CCD estimates were treated as fixed reference values. A bonferroni correction was applied for the comparison across 51 states and the District of Columbia. States whose ACS enrollment estimates were significantly different (at the 0.10 level) from the expected value based on CCD are listed in Table 3.

Looking at Table 3, most grade levels had at most one or two states whose ACS enrollment estimate was significantly different from its expected value. The exceptions were grades 6 and 11 where there were three states, and grade 12 where eleven states were identified as having ACS enrollment larger or smaller than expected. Most of the 19 states on the list appeared only once or twice, with New York being the exception at 4 appearances, and each time the New York ACS estimates were higher than those from CCD.

The presence of outliers indicates that aspects of ACS or CCD data collections don't meet the assumptions involved in setting up a chi-squared test. In particular, the test assumes simple, normally-distributed error in ACS and the absence of error in CCD data collection. The most likely reason that ACS would fail to have a simple normal distribution would be systematic differences between the populations of different states. However, there are no obvious differences separating the outlier states in Table 3, which include states both large and small, urban and rural, and from all regions of the country.

The most likely reason for error in CCD data would be state-level policies and data collection procedures. Since the CCD is reported by state departments of education, differences in state-level policies and procedures would not be surprising.

Administrative data are subject to missing data and misreport, just as are individual data. In an administrative data system such as CCD, when a school or set of schools fail to report data, the total

may be lowered by the missing amount, or it may be filled in with an assumed amount. The type of thing we might expect to see is evident in changes between "preliminary data," and updated or final versions of data released by CCD. For example, a preliminary 2009-10 NCES report of 9,820 pre-kindergarteners in Utah was later revised downward to 8,225, a change of 16 percent.

State-based reporting may be affected by incentives built into administrative requirements and funding formulas. For example, Michelle Fine noted that per-pupil funding formulas influenced some New York City schools to encourage students to postpone official dropout from school until after the date at which student counts were submitted (Fine 1991). The number of children a school reports as being enrolled might affect many aspects of its funding and staffing in various ways. These may include how the school is expected to meet requirements for tests, how it reports graduation rates, how its pupil-teacher ratios are reported to the public, how teachers are assigned to a school, and how the school is funded. The way these possible incentives might play out in any given school system or state is difficult to determine. However, state governments do have a large influence on processes such as these, and the number of students in CCD might very well be expected to vary across states for these reasons.

Turning back to the results reported in table 3, the differences between ACS and CCD estimates don't show a pattern implying consistent under-reporting or over-reporting for any one state, with the possible exception of New York. New York ACS estimates were higher than CCD estimates for grade 2, grade 6, grade 11 and grade 12. For most other states that show up more than once as outliers, they have appearances on both the positive and negative sides of the ledger, which means that any systematic influence would need to be working in complex ways to explain the pattern of the data.

It is beyond the scope of this paper to explore these patterns further, but as it stands, New York seems to be the only state that shows obvious evidence of possible state level institutional or systematic factors influencing CCD reports.

To summarize the consideration of state-level data, it seems that differences between ACS data and CCD are not large, and those that exist don't show any clear systematic pattern. The presence of a few outliers in the chi-squared test shows that there are a few states with measurement errors in one or the other data source. There is nothing here, however, to indicate a major issue with state-level data that might influence overall differences between ACS and CCD.

HIGH SCHOOL ENROLLMENT

The rest of the analysis in this paper will focus on the one place where there are clear differences between data sources, both at the national level and among the states: high school. There are two aspects to this. First is total high school enrollment is higher in ACS and CPS than in CCD. Second, the distribution of enrollment across the four grades differs markedly between the data sources, with higher enrollment estimates from CCD for grade 9 and higher estimates from the ACS and CPS for grades 11 and 12. The following is a list of some of the possible explanations that occurred to us as we examined these differences between CCD and ACS/CPS. We have already reviewed one possible explanation for these differences, and concluded that systematic reporting problems in CCD across states probably do not contribute greatly to the overall differences we see.

1. Timing of data collection
2. Perception of grade of enrollment
3. Under-report of non-attendance
4. Misreport due to confusion between enrollment and attainment
5. Enrollment of older adults

These five explanations are examined below.

Timing of data collection

A concern about collecting enrollment data in ACS is the timing of data collection. Unlike CCD and CPS, which collect information on enrollment in October of each year, ACS data are collected year-round. Rather than asking about current enrollment or fall enrollment, the ACS questionnaire asks if the person has been enrolled in the past three months. As a result, each year's ACS statistics are based on an average of two school years, making it possible that overall enrollment and some details of enrollment would be different between ACS and the two other sources.

Looking at the enrollment counts, however, shows a large gap between CCD and the two surveys, and less of a gap between 12th grade enrollment estimates in the ACS and CPS. Moreover, the two years of ACS data are very close in their pattern of enrollment by grade despite differences in time of collection. We conclude that timing differences in data collection do not explain the differences between data sources.

Perception of grade level

As was pointed out before, ACS estimates of 9th grade enrollment are lower than CCD estimates, while ACS estimates of 11th and 12th grade enrollment are higher (Table 1). The 2010 ACS estimates 189 thousand fewer 9th graders than does the 2009-2010 CCD, while estimating 588 thousand more 12th graders. The 2009 CPS has 368 thousand fewer 9th graders than CCD, and 762 thousand more 12th graders.

Previous research on patterns of high school enrollment indicates that the higher CCD number for 9th grade may be due to a high rate of grade retention at this level (see, for example, Mishel and Roy 2009, Davis and Bauman 2010). Retention leads to higher counts of students, because those who are retained in grade get counted as 9th graders twice – in the first year they attend and then again in the second. One way to estimate the amount of retention taking place is to compare 9th grade enrollment

to 8th grade enrollment, because the latter is not subject to high retention rates. Mishel and Roy report that 9th grade enrollment was 14 percent higher than 8th grade enrollment in 2002-2003.

The reasons for higher 12th grade enrollment in the ACS and CPS relative to CCD aren't clear, but one explanation would be that they simply represent the flip side of the same phenomenon. That is to say, students are recorded by their schools as being in the 9th grade might record themselves as being in higher grades. That would imply that places where there is an overestimate of 9th grade enrollment in CCD relative to the ACS, would be the same places where there is an underestimate of 12th grade enrollment. This turns out to be the case. The difference between ACS and CCD enrollment levels across states at the 9th grade is correlated -0.75 with the difference at the 12th grade.

Students who perceive they are in grades 10-12 but are actually lacking in credits could identify themselves on the ACS or CPS as enrolled in grades higher than what administrative records would document. This might be especially common if the student continues to take some classes at a higher grade level along with his or her peers, which may happen in the high school setting. A student may also have failed to complete a required course or pass a required test but may otherwise be on track to complete school at the same time as his or her peers, leading to uncertainty about the proper classification.

Figure 3 gives evidence on students' perception of grade repetition. CPS respondents were asked for their current grade of enrollment and also for their grade of enrollment last year. Although we have evidence that the most common high school grade for repetition is 9th grade, CPS respondents currently in the 12th grade were more likely to say they were in the same grade as last year than were 9th graders. This gives strong support to the idea that different notions of what grade a student is attending are responsible for some portion of the mismatch between enrollment levels in ACS and CPS on the one hand, and CCD on the other.

Although this evidence is not conclusive, it does appear that the different understanding of grade of enrollment by schools and by students contributes to the difference in grade reports from the two sources. On the other hand, this can't explain all the high school differences between CCD and the two surveys, because there remains an overall higher report of high school attendance regardless of grade. The next sections focus on factors that might help explain this overall difference.

Under-report of non-attendance

Students who have dropped out or otherwise no longer attend high school have been suspected of sometimes incorrectly reporting that they are enrolled, or, when proxy reports are involved, having this incorrect report made on their behalf. Warren and Halpern-Manners (2009), for example, observe that some families of high school aged children do report falsely that a child is enrolled.

The situation where survey respondents falsely report a favorable state of affairs is referred to as "social desirability bias." A common way to test for social desirability bias is to examine mode effects. Data collected in person or by telephone has generally been found to be more strongly influenced by social desirability than data from self-administered questionnaires (Tourangeau and Yan 2007). Figure 4 shows the patterns of response to the grade of enrollment question by mode of collection.[5] One point of caution in interpreting these results is that mode of interview is not randomly selected. People who are interviewed by telephone are those who did not return a mail response, and personal interviews are conducted of a sample of people who could not be reached by phone because of non-response, lack of information on telephone number (including some who lack a mailable address), or lack of telephone (U.S. Census Bureau 2009).

Figure 3 shows that the tendency to report higher levels of 12th grade enrollment differed by mode of data collection. The data in the figure exclude imputed cases to focus clearly on the effects of

[5] The sample for Figure 3 excludes people whose responses were imputed, in order to directly examine patterns of response to the questionnaire.

response mode. Among the total of people enrolled in kindergarten through 12th grade who responded by mail (presumed to be less affected by social desirability bias) a higher percentage (8.3 percent) reported they were in grade 9 than in grade 12 (8.0 percent). Among telephone respondents, the pattern was opposite. Those attending grade 9 were 8.0 percent of the total, while those attending grade 12 were 8.8 percent. The higher percentage reporting 12th grade enrollment among telephone respondents may reflect over-reporting of enrollment by older teenagers, due to social desirability bias. The case of persons with personal interviews is indeterminate.[6]

This brief examination of social desirability bias seems to show that some degree of this bias may be present in answers to questions on high school enrollment. It would require a much better examination than this to dismiss or confirm this hypothesis. For the time being, though, we can hold onto it as a potential contributing factor.

Another potential contributing factor related to under-report of non-attendance is the possibility that non-respondents are less likely to be attending school than respondents. If this were true, then our final weighted estimates of attendance would be biased upwards. Further examination of this point is beyond the scope of this paper. However, it does not seem likely that this bias would be concentrated so strongly on 12th grade enrollment as was found here.

Confusion between attainment and enrollment

Although social desirability bias might be part of the explanation for high levels of 12th grade enrollment in the ACS, aspects of questionnaires that create misunderstandings may also play a role.

In any survey, a certain amount of error is created when questions are misinterpreted by respondents. The Census Bureau, by policy, conducts in-depth psychological tests of questions with

[6] Enrollment in 12th grade was not higher than enrollment in 9th grade among people who were interviewed in person. It might have been expected to be lower if this group had a higher propensity to drop out. It is unclear if dropouts or the generally lower age distribution of in-person respondents was responsible for the overall lower proportion in high school.

respondents to minimize these errors. Those that remain are hoped to be offsetting -- that is, mistakes in one direction (over-reporting) are largely matched by mistakes in the other direction (under-reporting). However, it is important to look at individual questions and potential sources of misinterpretation that might lead to problems.

One thing that is sometimes unclear for respondents is the distinction between enrollment and attainment. In particular, respondents may indicate a grade of enrollment when they really mean to convey the grade of school that they completed. One indication that this may be taking place is that some respondents mark they are "not enrolled," but go on to check the box for a grade of enrollment. Prior to correction during the data editing process, 4 percent of 2010 ACS respondents over 18 marked a grade of enrollment while also reporting they were not enrolled.[7] While these cases were corrected in the editing process, there may have been other respondents who made two mistakes rather than one – incorrectly marking a grade of enrollment while also incorrectly marking that they were enrolled in school.

Another perhaps-related phenomenon is that respondents sometimes record both that they have completed high school and that they are attending 12th grade. Some of this contradiction is allowable because it is possible to be enrolled in high school while taking some college courses.[8] Also, since the enrollment question includes any enrollment within the past three months, it is possible in the summer after graduation to have completed high school and correctly mark being enrolled in 12th grade. However, out of 4.1 million public school students enrolled in 12th grade in the ACS in 2009, 420 thousand reported high school completion even though they were interviewed outside the summer months. A partial correction for potential over-reporting of 12th grade enrollment by editing these cases was implemented in 2010 (see discussion in a later section of this paper).

[7] This refers to the unweighted count of ACS respondents.

[8] In Census Bureau data, people who indicate they have completed some college are classified as having progressed beyond high school regardless of their actual high school completion status.

In short, a number of people recorded themselves as being in school, even while giving evidence through their answers to other questions that they might not have been enrolled. Many, but not all, have had their answers changed (fixed) through the data editing process.

Because of the offsetting nature of under-reports and over-reports, we have to pay attention to where the situation might be unbalanced. The majority of older adults are not enrolled, so there are fewer enrolled respondents that might mistakenly report non-enrollment, and, conversely, a large number of non-enrolled people who could mistakenly report enrollment. The net effect is that errors in answering the school enrollment question might lead to an over-report of enrollment among older adults. Since the majority of young people are enrolled in school, the opposite situation holds, and thus there would be an overall tendency to under-report enrollment for this group.

The fact that survey responses (ACS, CPS) match administrative records (CCD) for people in elementary and middle grades of school indicates that the pattern of response error does not cause serious problems at this level. Our major concern is with older adults who may be over-reporting enrollment, and this is explored in the next section.

High school enrollment of older adults

The age of students is not recorded in CCD data, but in ACS and CPS there are some students older than the typical age for high school. For example, according to the CPS there were roughly 209 thousand people aged 25 and older enrolled in public high school in 2009-10. There were around 310 thousand in ACS 2010. The CPS estimate is not precise enough to rule out that the 25 and older population explains the difference between CPS and CCD (407 thousand). However, the ACS number is not as large as the amount by which high school enrollment is higher ACS than in CCD (584 thousand).

ACS data, because of year-round collection, are not suitable for detailed examination of grade of enrollment by age (Shin 2007). CPS data work much better for this purpose and are shown in Figure 5. CCD enrollment by grade is highest in 9th grade, at 4.1 million, falling to 3.4 million in 12th grade. CPS

data climb from 3.7 million in 9th grade to 4.2 million in grade 12. However, many of the 12th graders are older than the typical age, with 414 thousand being 19 or older. If we exclude students age 19 and over, the number of 12th graders falls to 3.8 million – not significantly different from the 3.7 million 9th graders under the age of 19.

Table 4 shows high school enrollment by grade in the CCD, CPS and ACS, with detail on older students – students 25 or older – in CPS and ACS. Although the vast majority of people over age 25 are no longer enrolled in secondary programs, there are a few who are. Some are enrolled in federally-sponsored adult secondary education programs supported by the Office of Vocational and Adult Education (OVAE) in the Department of Education. The OVAE enrollments are not included in CCD data, so it is appropriate to add them to the CCD totals as is done in the top panel of Table 4. Another group of older secondary students are those enrolled in programs in jails, prisons and other institutional facilities. The bottom panel shows ACS data that exclude the incarcerated and other institutionalized populations. Most high school programs in correctional facilities also get reported through separate data systems from CCD.

All told, there were 115 thousand students 25 or older enrolled in secondary education in the OVAE data, compared with 209 thousand students 25 or older in CPS, and 310 thousand in ACS excluding the institutionalized population. The numbers from ACS and CPS are higher, clearly, but the totals from administrative counts confirm that some of these adults over 25 may actually be in school.

After taking account of OVAE program enrollment and the institutionalized population, the total high school enrollment gaps that remain are a 131 thousand difference between CPS and CCD, which is less than the margin of error for the CPS estimate, and a 308 thousand difference between ACS and CCD. There are several potential explanations for the remaining gap. First, the OVAE data do not include secondary training that is not funded through federal adult education grants, such as state programs and some private schools. Rough estimates from analysis by the GED testing service indicate

that more than 100 thousand GED test takers each year take some type of classes in a public school or community college to prepare for the exam (McLaughlin et al. 2009). It is unknown what portion of these are covered in the OVAE counts. Much larger than the federal secondary education programs are federal programs for basic skills training and English language acquisition. These are also supported by OVAE, but are not secondary programs. They might also be a source of misreporting based not on misrepresenting enrollment, but on misrepresenting the type or grade of enrollment. In the end, however, some respondents may be people who are misreporting themselves as students. Some may be claiming enrollment out of "social desirability bias," but this may not be applicable to students beyond the age of 19 or 20. Others may be confused between enrollment and attainment, as described above.

CONCLUSION

This paper has examined the quality of data on grade of enrollment from the ACS and CPS relative to the Department of Education's CCD collection system. In general, the three data sources line up very well, even looking at specific grades in specific states. The major differences are at the 9th grade level, where CCD estimates are systematically higher due to grade retention, and the 12th grade level, where various types of student misreport and misunderstandings contribute to a higher recorded level of enrollment in ACS and CPS.

We found evidence in support of nearly all the possible explanations for discrepancies we found, with no strong indication that one or another of these is primarily responsible. However, the pattern of disagreement across states between ACS and CCD does provide some indication that errors in the CCD collection system related to state-specific incentives or practices are not an important explanation. What we are left with can be summed up in three different explanations.

1. Students who are not currently enrolled in 12th grade report enrollment due to their desire to provide a "socially desirable" response.
2. Students who are not currently enrolled in 12th grade report enrollment due to confusion about whether the questionnaire is asking about being enrolled in high school or having completed high school.
3. Students report higher grades of enrollment than reported by schools because of different understandings about what grade they are attending.

Past analyses, such as those of Warren and Halpern-Manners (2007), have focused on the first of these explanations. We feel that the evidence we have brought to bear gives at least equal weight to the last two explanations. As should be evident at this point, the evidence is far from definitive, and further work will need to be done to improve our understanding of the response patterns and how they can be improved.

References:

Fine, Michelle. 1991. *Framing Dropouts: Notes on the Politics of an Urban Public High School.* Albany, NY: State University of New York Press.

Keaton, P. 2012. *Elementary and Secondary School Student Enrollment and Staff Counts From the Common Core of Data: School Year 2010–11* (NCES 2012-327). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

McLaughlin, Joseph W., Gary Skaggs, and Margaret Becker Patterson. 2009. "Preparation for and Performance on the GED Test." Washington, DC: GED Testing Service

Shin, Hyon B. 2007. *Comparison of Estimates on School Enrollment from the ACS and the CPS: 2003*. ACS Subject Matter Comparison Reports. Washington, DC: U.S. Census Bureau. Accessed from http://www.census.gov/acs/www/library/by_series/acs_subject_matter_comparison_reports/.

Tourangeau, Roger, and Ting Yan. 2007. "Sensitive Questions in Surveys." *Psychological Bulletin* 133(5): 859-883.

U.S. Census Bureau. 2009. *Design and Methodology, American Community Survey*. ACS-DM1. Washington, DC: U.S. Census Bureau. (April) Chapter 7.

Warren, John Robert, and Andrew Halpern-Manners. 2007. "Is the Glass Emptying or Filling Up? Reconciling Divergent Trends in High School Completion and Dropout." Educational Researcher. 36(6): 335-343

APPENDIX: ADJUSTMENT TO THE 2010 ACS

Prior to 2010, the ACS enrollment edit allowed conflicting information in the variables SCHG ('grade level attending') and SCHL ('educational attainment') for some enrolled in 12th grade. While this is acceptable for respondents who answer the ACS questionnaire in the 3 months after graduation, It does not seem plausible that someone interviewed during the traditional school year (September to May) to have both completed 12th grade and still be enrolled in school. We adjusted the education edit to reflect the following assumptions:

1. Summer interviewees may be both enrolled in 12th grade and high school graduates but respondents interviewed during the school year (outside summer months) cannot, and
2. Among these school year respondents, it is appropriate to rely on level of education completed rather than grade of enrollment.

The changes to the ACS edit produced an estimate of 12th grade enrollment closer to the CCD estimate of 3.4 million. Table 5 shows the comparison of 2009 to 2010. , the ACS estimate of students in 12th grade fell from 4.1 million to 4.0 million. This is unlikely to be due to decrease in the actual number of students, as the number increased from 2009 to 2010 for grades 9 through 11.

TABLE 1

Enrollment in Public Schools by Grade, and Differences Between Estimates from the Common Core of Data (CCD), the American Community Survey (ACS), and the Current Population Survey (CPS), 2009-2010

	Estimates of Enrollment by Grade					Difference from CCD	
	CCD 2009-10	ACS 2010		CPS 2009		ACS 2010	CPS 2009
	Number	Number	Margin of Error	Number	Margin of Error	Number	Number
Total	47,929,619	48,892,818	60,101	48,400,327	151,304	963,199 *	470,708 *
Kindergarten to 8th grade	33,067,818	33,250,113	52,690	33,131,508	266,456	182,295 *	63,690
Kindergarten	3,677,971	3,675,452	28,989	3,766,990	142,023	-2,519	89,019
1st grade	3,728,773	3,602,449	33,019	3,573,233	138,596	-126,324 *	-155,540 *
2nd grade	3,664,697	3,648,473	31,344	3,723,476	141,263	-16,224	58,779
3rd grade	3,707,038	3,727,532	28,147	3,864,224	143,701	20,494	157,186 *
4th grade	3,700,530	3,694,547	32,939	3,640,323	139,795	-5,983	-60,207
5th grade	3,652,134	3,731,550	31,205	3,690,227	140,679	79,416 *	38,093
6th grade	3,644,057	3,736,861	32,746	3,528,927	137,796	92,804 *	-115,130
7th grade	3,651,276	3,718,940	29,419	3,614,346	139,332	67,664 *	-36,930
8th grade	3,641,342	3,714,309	30,585	3,729,762	141,373	72,967 *	88,420
9th to 12th grade	14,861,801	15,642,705	47,723	15,268,819	250,100	780,904 *	407,018 *
9th grade	4,080,016	3,890,493	33,802	3,711,128	141,046	-189,523 *	-368,888 *
10th grade	3,809,135	3,923,057	26,405	3,647,346	139,920	113,922 *	-161,789 *
11th grade	3,540,964	3,809,349	25,423	3,715,708	141,127	268,385 *	174,744 *
12th grade	3,431,686	4,019,806	39,130	4,194,637	149,212	588,120 *	762,951 *

* Indicates that estimates are different from the CCD estimates at the .90 confidence level

Source: U.S. Department of Education, Common Core of Data; U.S. Census Bureau, American Community Survey 2009 and 2010, Current Population Survey 2009. For more information on confidentiality protection, sampling error, nonsampling error, and definitions, see the ACS Accuracy of the Data document: http://www.census.gov/acs/www/data_documentation/documentation_main/, and the CPS technical documentation: http://www.census.gov/prod/techdoc/cps/cpsoct09.pdf.

TABLE 2

Summary Measures of Comparison of ACS and CCD Estimates of Enrollment by Grade Across 51 States and the District of Columbia, 2009-2010

		Difference (ACS - CCD)		Percent difference	
	Correlation	Mean	Standard deviation	Mean	Standard deviation
Kindergarten	0.999	-49	4,399	-1.6	7.6
Grade 1	1.000	-2,477	3,312	-3.6	6.2
Grade 2	0.999	-318	3,994	-0.3	7.2
Grade 3	0.999	402	3,546	0.3	5.6
Grade 4	0.999	-117	2,900	0.6	6.5
Grade 5	0.999	1,557	3,494	1.7	8.8
Grade 6	0.999	1,820	4,035	2.6	7.6
Grade 7	0.999	1,522	2,872	2.9	6.7
Grade 8	1.000	1,236	3,211	0.7	5.1
Grade 9	0.999	-3,716	6,162	-4.2	6.7
Grade 10	0.999	2,234	4,276	4.2	7.3
Grade 11	0.999	5,262	8,485	6.6	8.9
Grade 12	0.997	11,532	18,407	16.5	15.4

Source: U.S. Department of Education, Common Core of Data; U.S. Census Bureau, American Community Survey 2010. For more information on confidentiality protection, sampling error, nonsampling error, and definitions, see the ACS Accuracy of the Data document: http://www.census.gov/acs/www/data_documentation/documentation_main/.

TABLE 3

States Whose Share of Enrollment at Each Grade Level is Extremely Low or High in the American Community Survey (ACS) Relative to the Common Core of Data (CCD), 2009-2010

	ACS estimates lower than CCD estimates		ACS estimates higher than CCD estimates	
Kindergarten	Michigan		Wisconsin	
Grade 1				
Grade 2	Georgia		New York	
Grade 3			Maryland	
Grade 4				
Grade 5				
Grade 6	California		New York	Oregon
Grade 7				
Grade 8				
Grade 9			Tennessee	
Grade 10			Delaware	
Grade 11	Alaska	Michigan	New York	
Grade 12	Minnesota	Oregon	District of Columbia	Florida
	Pennsylvania	Washington	Georgia	Nevada
	Wisconsin		New York	South Carolina

Source: U.S. Department of Education, Common Core of Data; U.S. Census Bureau, American Community Survey 2010. For more information on confidentiality protection, sampling error, nonsampling error, and definitions, see the ACS Accuracy of the Data document: http://www.census.gov/acs/www/data_documentation/documentation_main/.

TABLE 4

Grade of High School Enrollment in CCD, and by Grade and Age in ACS and CPS							
			Grade 9	Grade 10	Grade 11	Grade 12	Total
Administrative data							
	CCD 2009-2010	All ages	4,080,016	3,809,135	3,540,964	3,431,686	14,861,801
	Adult Education (OVAE)	All ages	--	--	--	--	275,760
		25 or older	--	--	--	--	115,025
	CCD + OVAE	All ages	--	--	--	--	15,137,561
Current Population Survey							
	CPS 2009	All ages	3,711,128	3,647,346	3,715,709	4,194,637	15,268,820
		Margin of error	141,046	139,920	141,127	149,212	250,100
		25 or older	30,907	32,308	42,959	102,640	208,814
		Margin of error	13,346	13,645	15,733	24,305	34,632
American Community Survey							
	ACS 2010	All ages	3,890,493	3,923,057	3,809,349	4,019,806	15,642,705
		Margin of error	33,802	26,405	25,423	39,130	47,723
		25 or older	23,875	37,022	49,819	198,824	309,540
		Margin of error	33,020	10,272	5,931	7,220	9,956
	ACS 2010 -- Household Population Only	All ages	3,859,737	3,879,021	3,769,815	3,936,627	15,445,200
		Margin of error	33,324	26,613	25,618	38,904	45,511
		25 or older	19,160	27,131	38,173	164,352	248,816
		Margin of error	2,514	3,132	3,851	6,591	8,605

Source: U.S. Department of Education, Common Core of Data; U.S. Census Bureau, American Community Survey 2009 and 2010, Current Population Survey 2009. For more information on confidentiality protection, sampling error, nonsampling error, and definitions, see the ACS Accuracy of the Data document: http://www.census.gov/acs/www/data_documentation/documentation_main/, and the CPS technical documentation: http://www.census.gov/prod/techdoc/cps/cpsoct09.pdf.

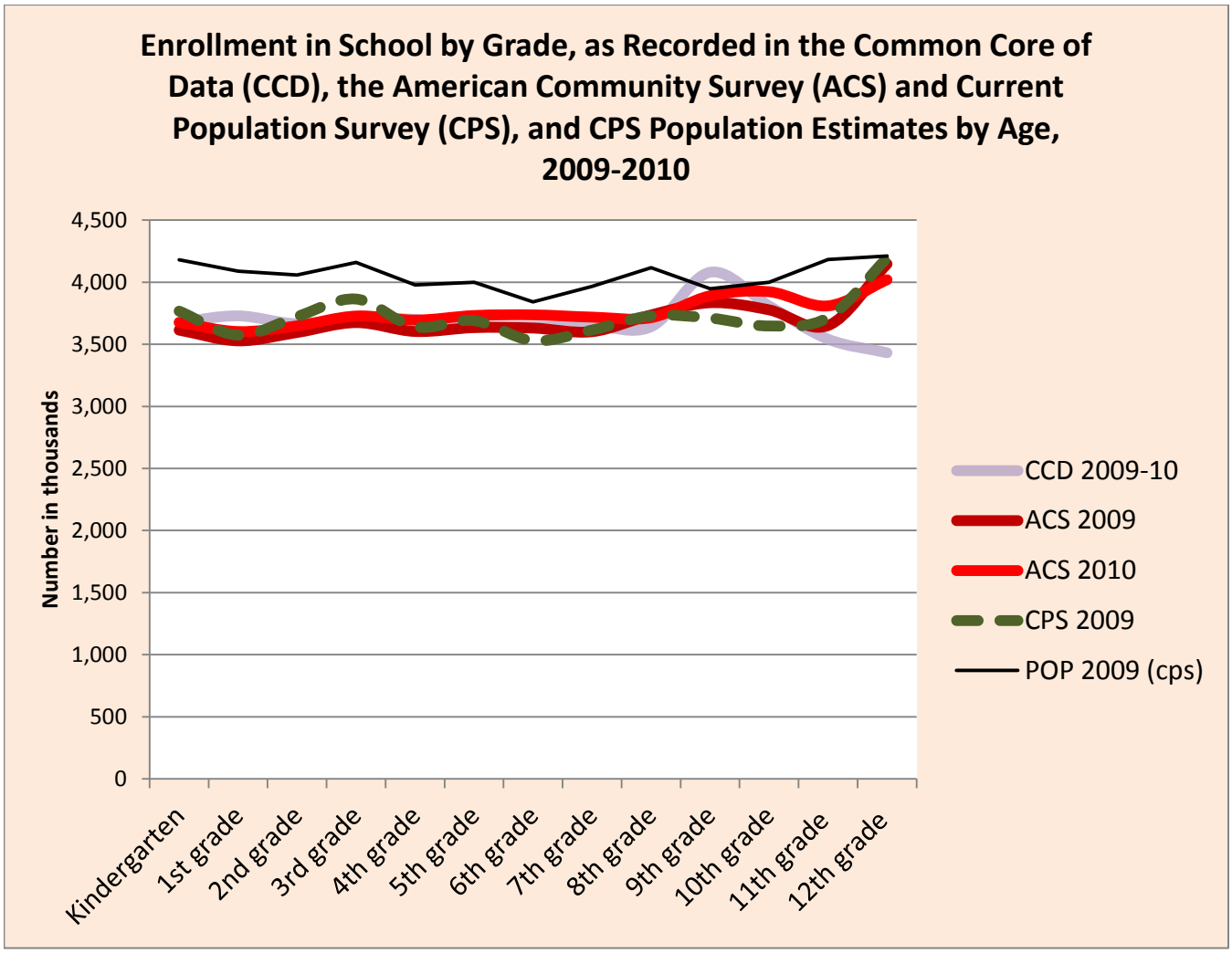
TABLE 5

Reported Enrollment in the 12th Grade, by Attainment and Month of Data Collection, ACS 2009 and 2010

	ACS 2009		ACS 2010	
	Number	Margin of Error	Number	Margin of Error
Total	4,146,471	32,147	4,019,806	39,345
	Did not complete high school			
Total	2,989,537	27,219	3,235,200	34,943
Month of data collection				
Summer months	355,023	9,266	403,114	11,250
Outside summer months	2,634,514	26,051	2,832,086	31,780
	Completed high school or higher education			
Total	1,156,934	18,556	784,606	14,952
Month of data collection				
Summer months	653,173	12,554	625,601	14,789
Outside summer months	503,761	12,149	159,005	5,603

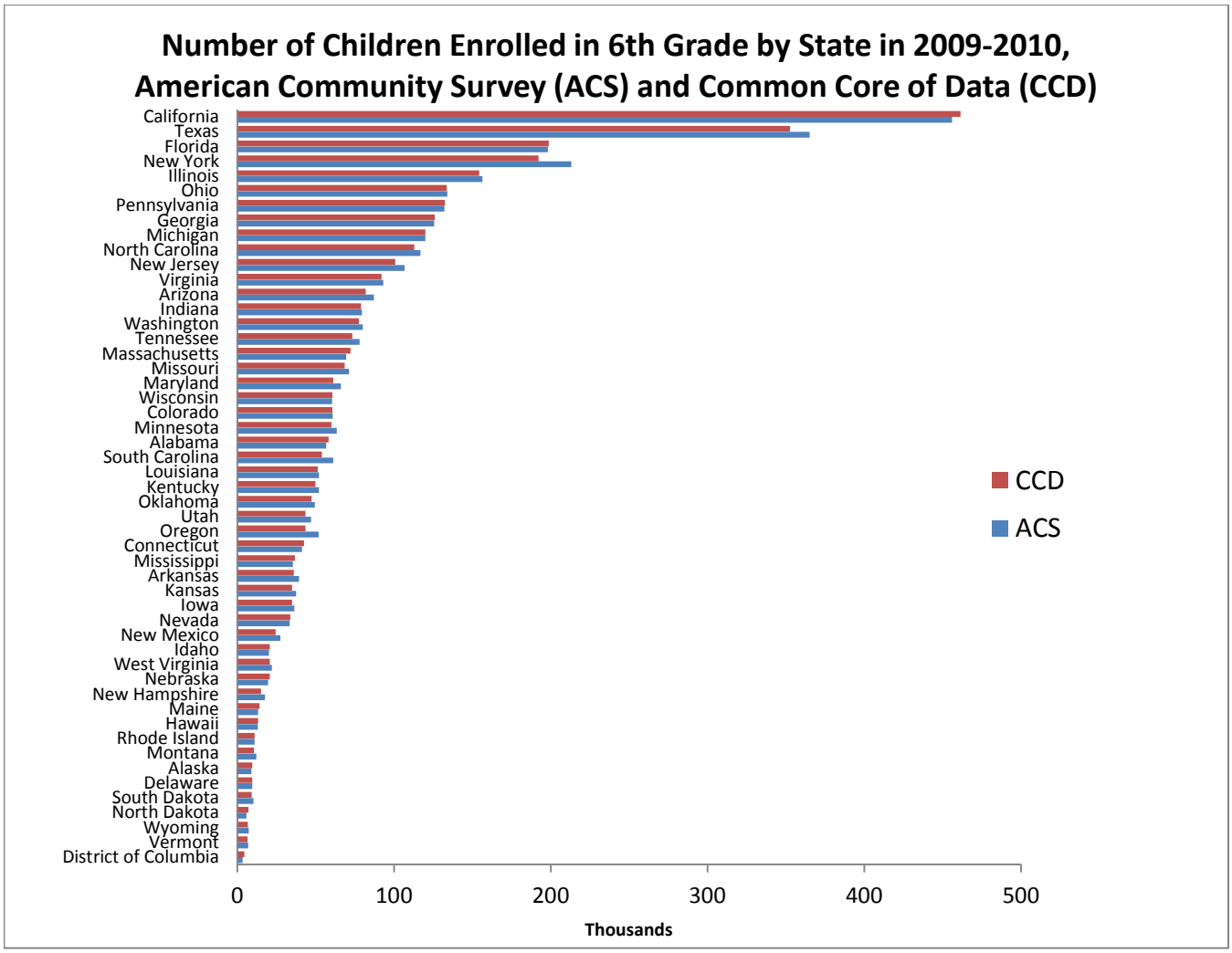
Source: U.S. Census Bureau, American Community Survey 2009 and 2010. For more information on confidentiality protection, sampling error, nonsampling error, and definitions, see the ACS Accuracy of the Data document: http://www.census.gov/acs/www/data_documentation/documentation_main/.

FIGURE 1



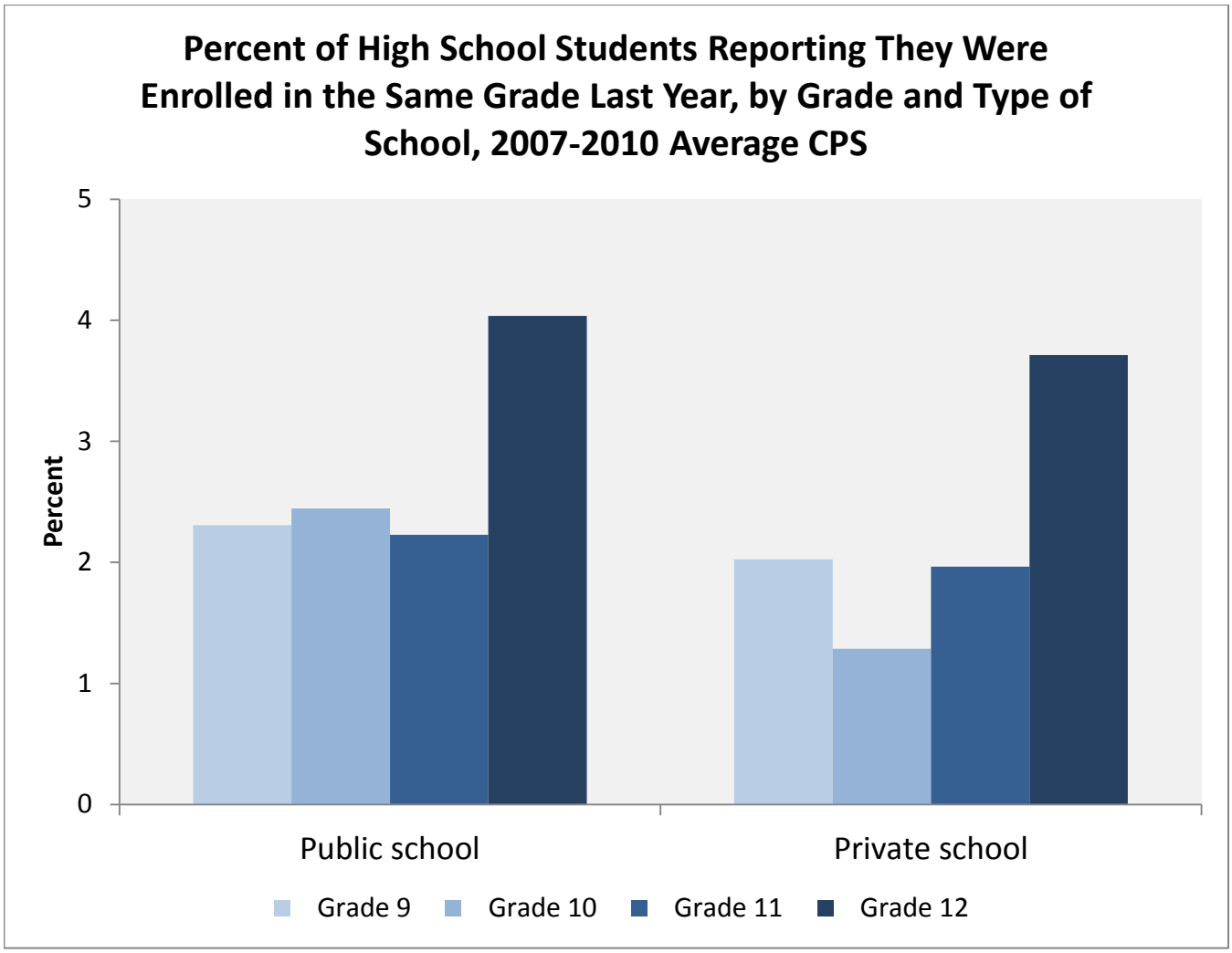
Source: U.S. Department of Education, Common Core of Data; U.S. Census Bureau, American Community Survey 2010, Current Population Survey 2009.

FIGURE 2



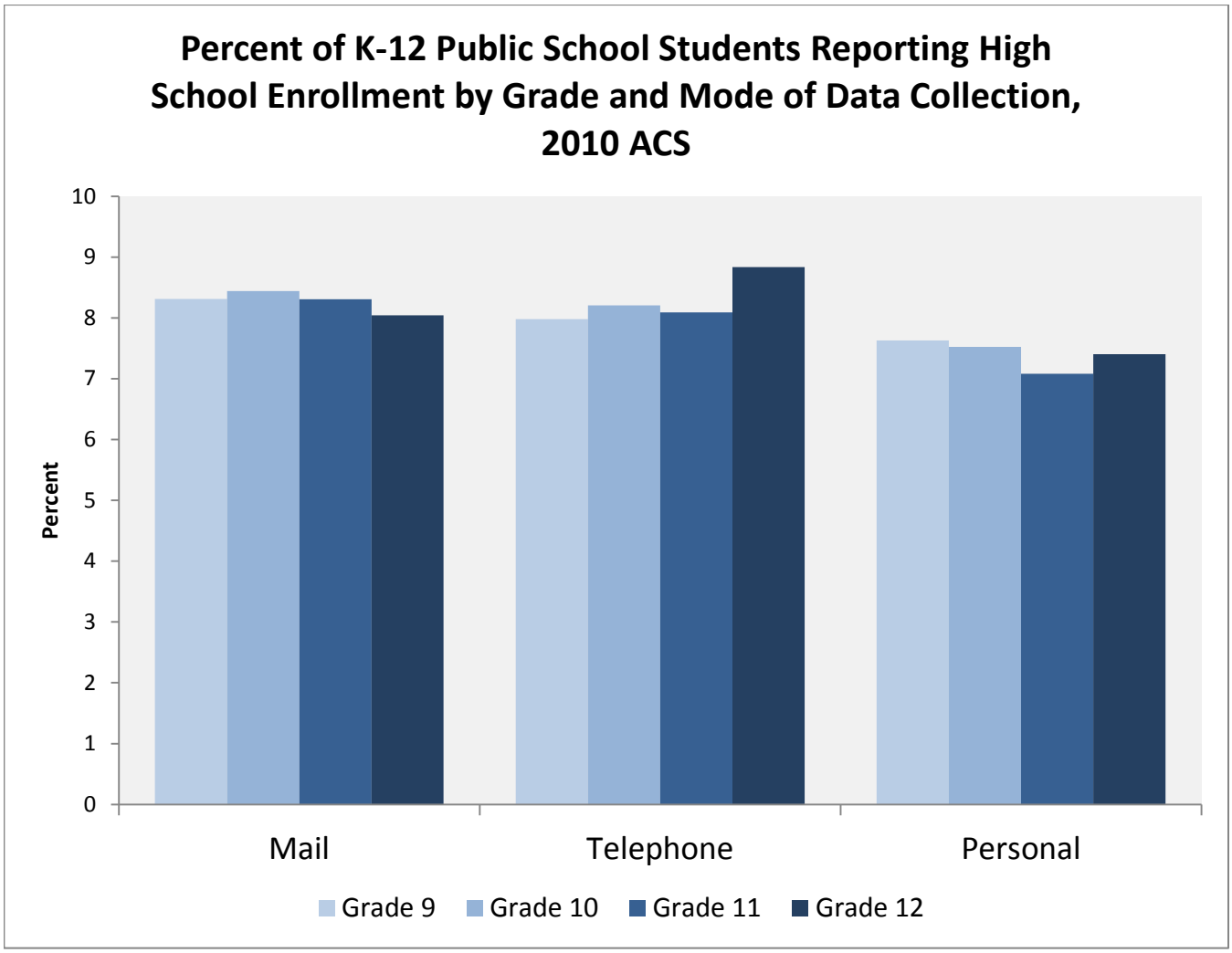
Source: U.S. Census Bureau, American Community Survey 2010.

FIGURE 3



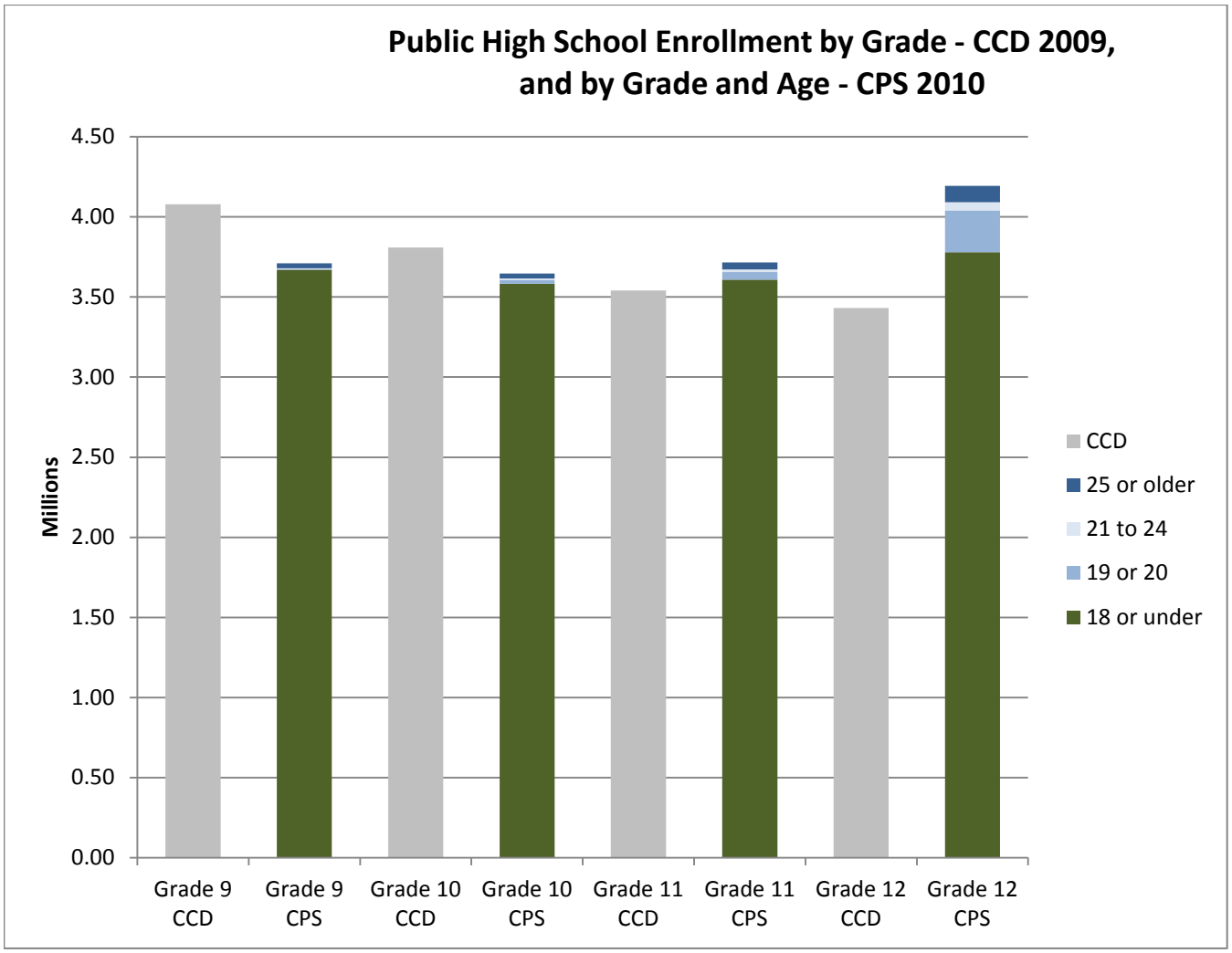
Source: U.S. Census Bureau, Current Population Survey 2009.

FIGURE 4



Source: U.S. Census Bureau, American Community Survey 2010.

FIGURE 5



Source: U.S. Department of Education, Common Core of Data; U.S. Census Bureau, Current Population Survey 2009.