

An Exploration of GED Standard Score Stability: 2001 Through 2005

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Running head: GED® STANDARD SCORE STABILITY

An Exploration of GED® Standard Score Stability: 2001 Through 2005

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An Exploration of GED® Standard Score Stability: 2001 through 2005

The present investigation was aimed at exploring the stability of the standard score distributions on the GED Tests taken by U.S. high school seniors in equating studies conducted by GED Testing Service during the span of 5 years from 2001 (the norming year) to 2005. Three questions were addressed by this exploration: First, are the characteristics of the norming sample representative? Second, have self-reported characteristics of high school seniors changed since 2001, the year of standardization/norming of the new test series? Third, are there any trends in test performance during these years that suggest high school seniors are mastering the content of the GED Tests or are otherwise becoming ignorant of the content?

High School Senior Characteristics

The chief demographic variable used to address the question of population characteristics was self-reported ethnicity. Figure 1 displays the population estimates for ethnic breakdown of U.S. high school students who graduated during the 2001-2002 school year (National Center for Education Statistics [NCES], 2005). Whites were the largest group at 69% of the total number of graduates, followed by African Americans at 13%. Hispanics made up 12% of the total graduates whereas other ethnicities including Asians comprised only 6%. As for the ethnic breakdown of the GED Tests equating samples, Figures 2 through 6 display the percentage distributions of ethnic categories across the 5 years for each GED Test: Language Arts, Writing; Social Studies; Science; Language Arts, Reading; and Mathematics, respectively. With few exceptions, the ethnic composition of the equating samples is in line with the NCES estimates. In 2004, the percentage of Whites was higher than national estimates for the Social Studies and Math Tests, and the percentage of Hispanic

and African American were lower than national estimates. Nevertheless, ethnic diversity was achieved in all the equating samples, and they appear to be representative of the target population.

Another variable considered in the present study was the self-reported grades for classroom subject areas that corresponded to test content, e.g., English composition grades for those who took the Writing Test were examined to determine whether grade percentage distributions had changed over the 5 years considered. Figures 7 through 11 display the self-reported grades across for English composition, social studies, science, English literature, and math courses, respectively. Comparison of the grade distributions of 2001 and 2002 to 2003 through 2005 indicate a greater percentage of reported letter grade A, a greater percentage leaving the question blank, and a lower percentage of reported letter grade B in the later years, particularly in 2004.

GED® Test Performance

Performance on each test was measured by average standard scores and pass rates using a cutoff score of 410. Figures 12, 14, 16, 18, and 20 display a line graph of the average standard scores over time on the Writing, Social Studies, Science, Reading, and Math Tests, respectively. Average standard scores for the U.S. candidates are also displayed (indicated by a dashed line) starting with 2002, the year the new series became operational. Error bars at each point represent 95% confidence intervals. Sample sizes and forms taken by the high school seniors are displayed just above the *x*-axis. An alternate forms study was conducted in 2004; all other years involved equating study designs. Individuals who did not respond to more than one third of the questions or did not correctly answer any questions on a test were

excluded from the analyses. Pass rates for the five tests are displayed in Figures 13, 15, 17, 18, and 21.

Average performance on all tests but the Language Arts, Writing Test decreased from 2001 to 2002; for three of the tests—Social Studies, Language Arts, Reading, and Mathematics—the average performance never achieved the level observed in 2001; for the Science Test, the year 2004 was the only year in which the average performance surpassed (by 4 standard score points) the performance observed in the norming year 2001.

Language Arts, Writing Test

The average standard score for the Language Arts, Writing Test was fairly consistent across years except for an increase in 2004. The pass rate ranged from 77% to 79% except for in 2003 when it fell to 72%. Grade distributions were examined to explore the increase in average score in 2004 and the decrease in pass rate for 2003. The grade distribution was consistent for the years 2003, 2004, and 2005; differences in average scores and pass rates are not easily explained by differences in grade distributions. A comparison of essay score distributions in 2002 and 2004 for Forms D, E, and F (Table 22) revealed a greater percentage of essay scores at the 3 and 4 levels in 2004 than in 2002 (the same forms were administered those years); an increase of 1 point on an essay translates to approximately 40 standard score points.

Social Studies Test

The average standard scores for the Social Studies Test in 2002-2005 was consistently and statistically significantly lower than in 2001. Pass rates for the Social Studies Test dropped from 82% in 2001 and from 68% to 71% in the years 2002 to 2005. Differences in self-reported grades were more substantial in 2001-2002 vs. 2003-2005;

differences in average scores and pass rates are not easily explained by differences in grade distribution.

Science Test

For the Science Test, average standard scores dropped in 2002 and then further dropped (32 points) in 2003. The pass rate was at 82% for 2001 and then ranged from 61% to 79%. Grade distributions were similar for 2001 and 2002, and the years 2003 and 2005; in 2004 vs. other years, a greater percentage of high school seniors reported having earned mostly letter A grades in their science courses.

Language Arts, Reading Test

The average standard score for the Language Arts, Reading Test decreased from 2001 to 2002 and were stable for the years of 2002 through 2005. This decrease is mirrored by the decrease in the pass rate from 2001 to 2002 from 83% to 73%. The pass rate remained steady at 78% 2003 to 2005.

Mathematics Test

For the Mathematics Test, average standard scores decreased in 2002 and 2003, but the scores rose to above 500 in 2004. Pass rates display the same fluctuation over time. The pass rate decreased from 83% in 2001 to a range of 72% to 74% in years 2002 and 2003, and they then increased to 81% before dropping to 76% in 2005.

Distribution of Observed GED® Standard Scores

Estimates of standard scores associated with the 90%, 75%, 50%, 25%, and 10% quartiles from 2001 to 2005 were calculated. The results were plotted along with the normal distribution (N.D.) expectation, which was the distribution imposed during the scaling. Overall, the percentage of scores observed in one or both of the tails of the standard score

distributions varied not only from the normal distribution imposed during scaling but also varied from the distribution observed during the year of norming.

Language Arts, Writing Test

The Language Arts, Writing Test showed signs of the standard score distribution bunching at the lower end of the score scale. For example, instead of the 90th percentile at 630 under a normal distribution, the observed standard score at the 90th percentile ranged from 650 to 690. The 75th percentile under N.D. would be at 570; for 2 years it was observed at 590 and 620. The 10th percentile under N.D. would be at 370; for 3 years it was observed at 400.

Social Studies Test

The Social Studies Test showed signs of the distribution shifting towards the lower end of the score scale. For example, the 75th percentile under N.D. would be at 570; for the 5 years it was observed ranging from 540 to 560. The 25th percentile under N.D. would be at 430; for 2002-2005 it was observed ranging from 380-390.

Science Test

The Science Test showed signs of the distribution bunching at the low end of the score scale. For example, the 25th percentile under N.D. would be at 430; for 2002-2005 it was observed at 360-420. The 10th percentile under N.D. would be at 370; for 2002-2005 it was observed ranging from 310-350.

Language Arts, Reading Test

The Language Arts, Reading Test showed signs of the distribution flattening. For example, the 90th percentile under N.D. would be at 630; for 2001-2005 it was observed at 660-720.

Mathematics Test

The Mathematics Test showed signs of the distribution bunching at the low end of the score scale for some years.

Summary

The following summarizations may be made based on the results of this study. Based on the similarity of the ethnicity distributions within the equating samples and national estimates, it appears that the equating samples were representative of the U.S. population of high school seniors. Average standard scores on the GED Tests over the years considered in this study do not suggest that high school seniors are mastering the content of the tests; however, there does appear to be a pattern in standard scores fluctuations. All tests reflected a drop in average performance from 2001 (the norming year) to 2002. Differences in self-reported grade distributions may explain the increase in the average Science Test score in 2004 but not the increase in 2003. One reason for the increase in average performance for nearly all tests in 2004 could be the ease of administration for the alternate forms study. In summary, both the differences in the percentages of standard scores observed in one or both of the tails of each test's 2002-2005 standard score distributions from that observed during the year of norming and the variability of the performance over time on several tests warrant a renorming study.

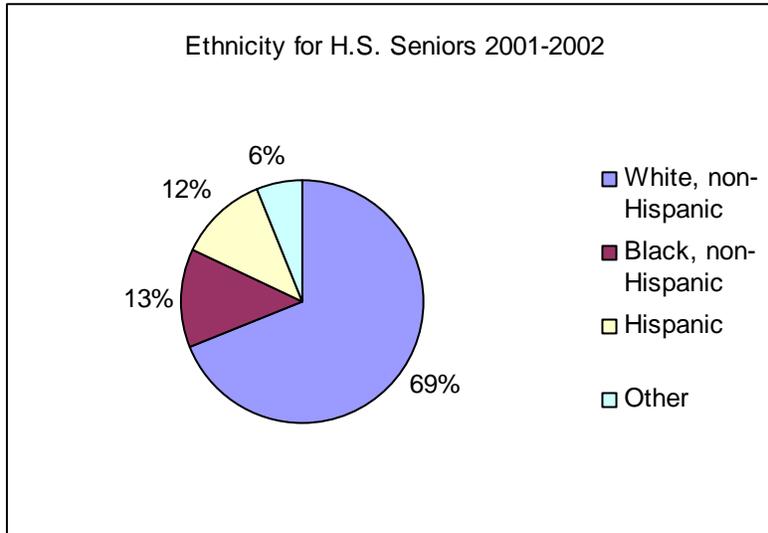


Figure 1. Population estimates (National Center for Education Statistics, 2005).

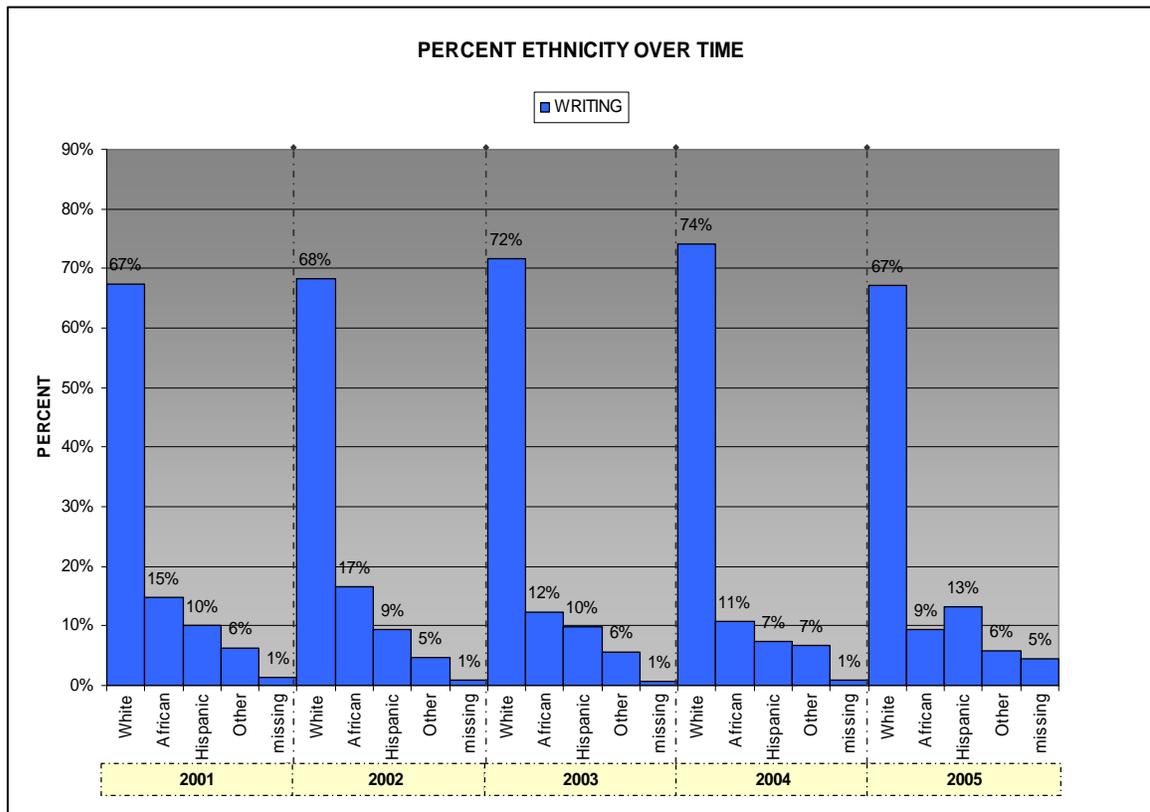


Figure 2. Ethnicity distribution for high school seniors taking the Language Arts, Writing Test.

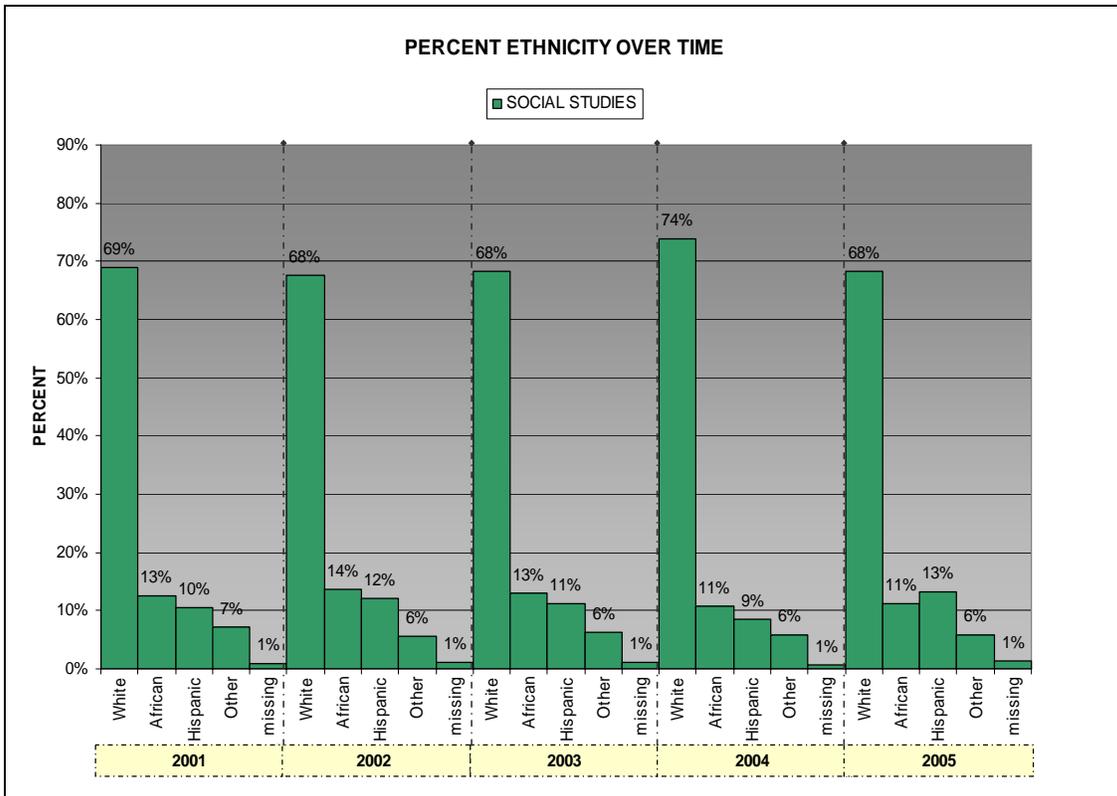


Figure 3. Ethnicity distribution for high school seniors taking the Social Studies Test.

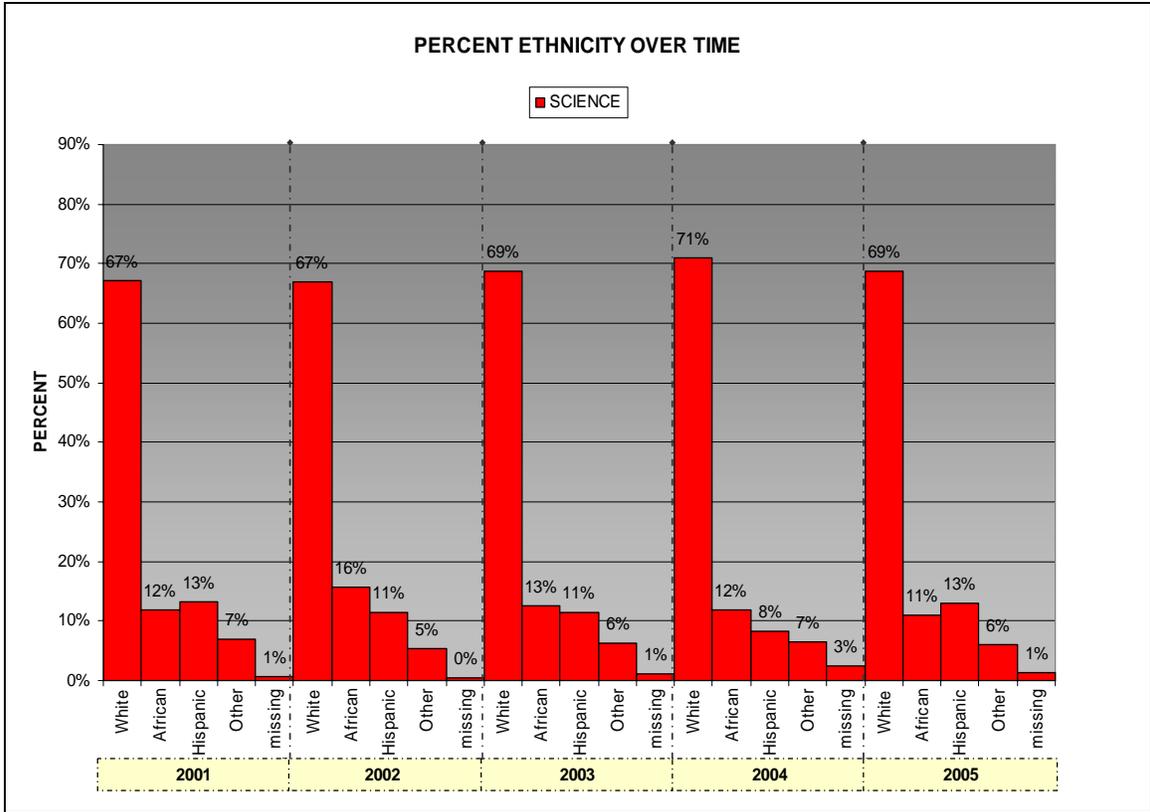


Figure 4. Ethnicity distribution for high school seniors taking the Science Test.

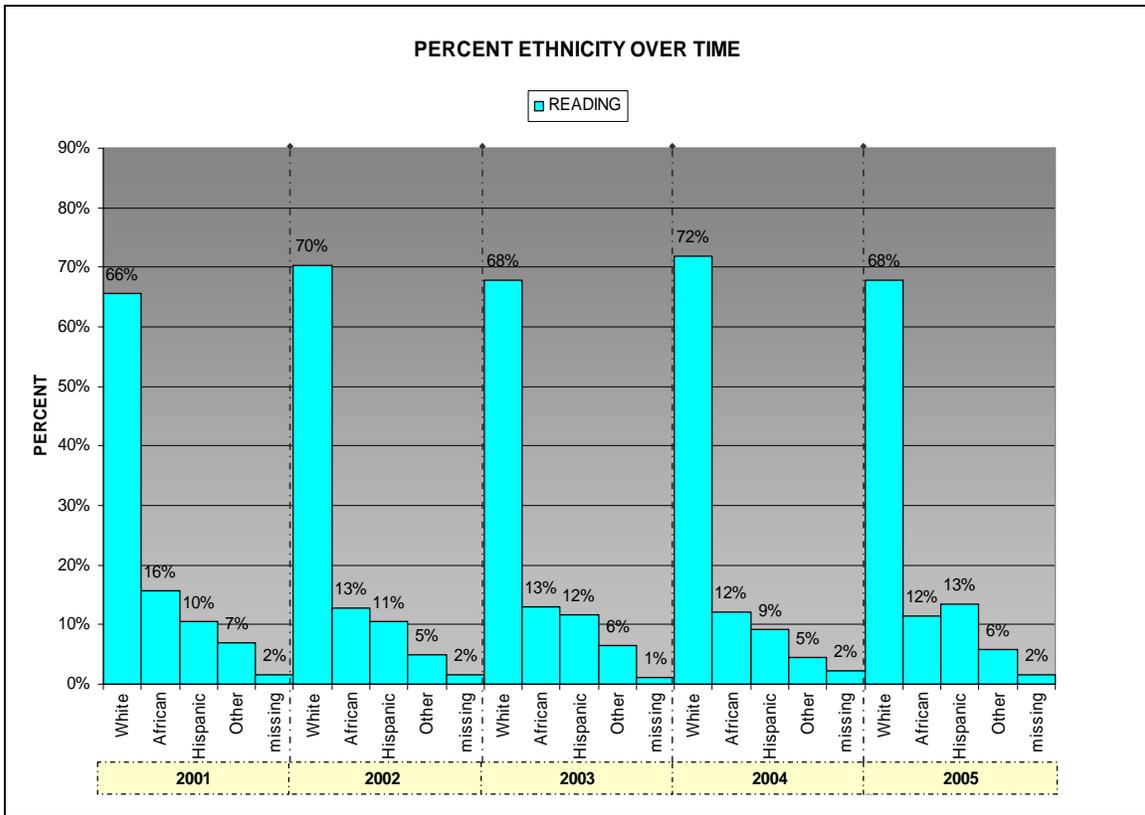


Figure 5. Ethnicity distribution for high school seniors taking the Language Arts, Reading Test.

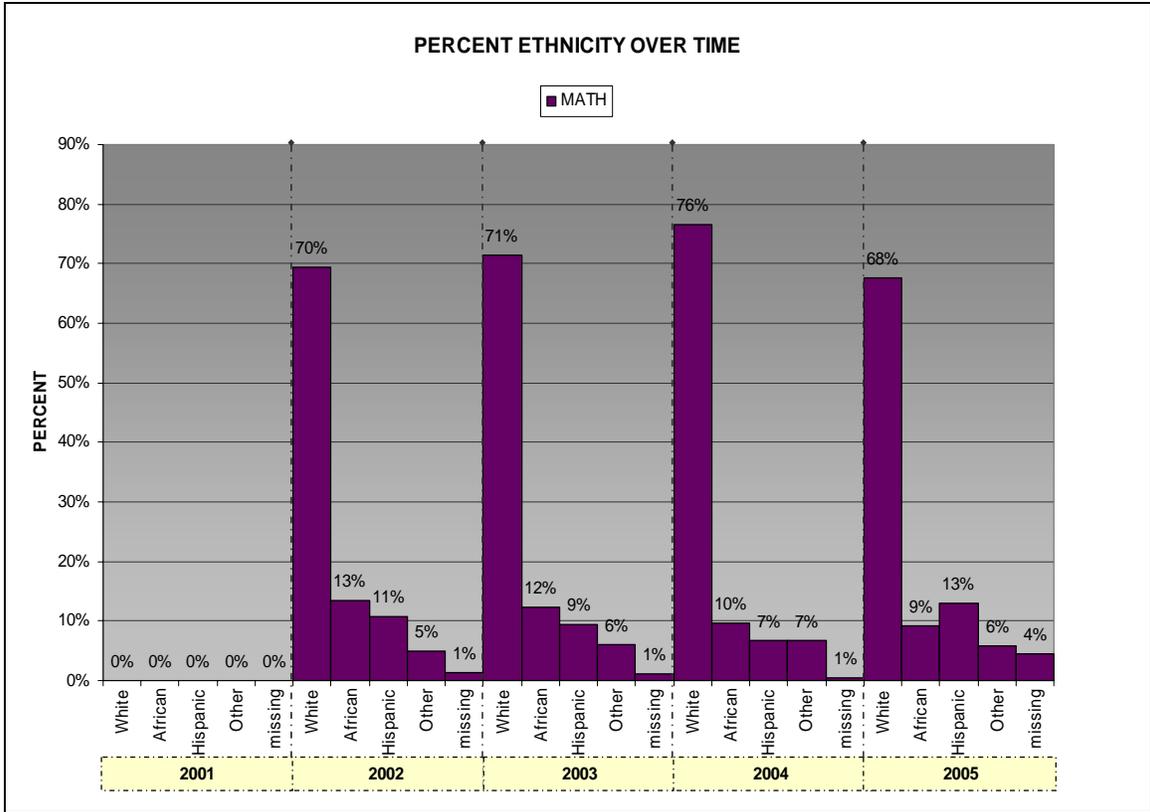


Figure 6. Ethnicity distribution for high school seniors taking the Mathematics.

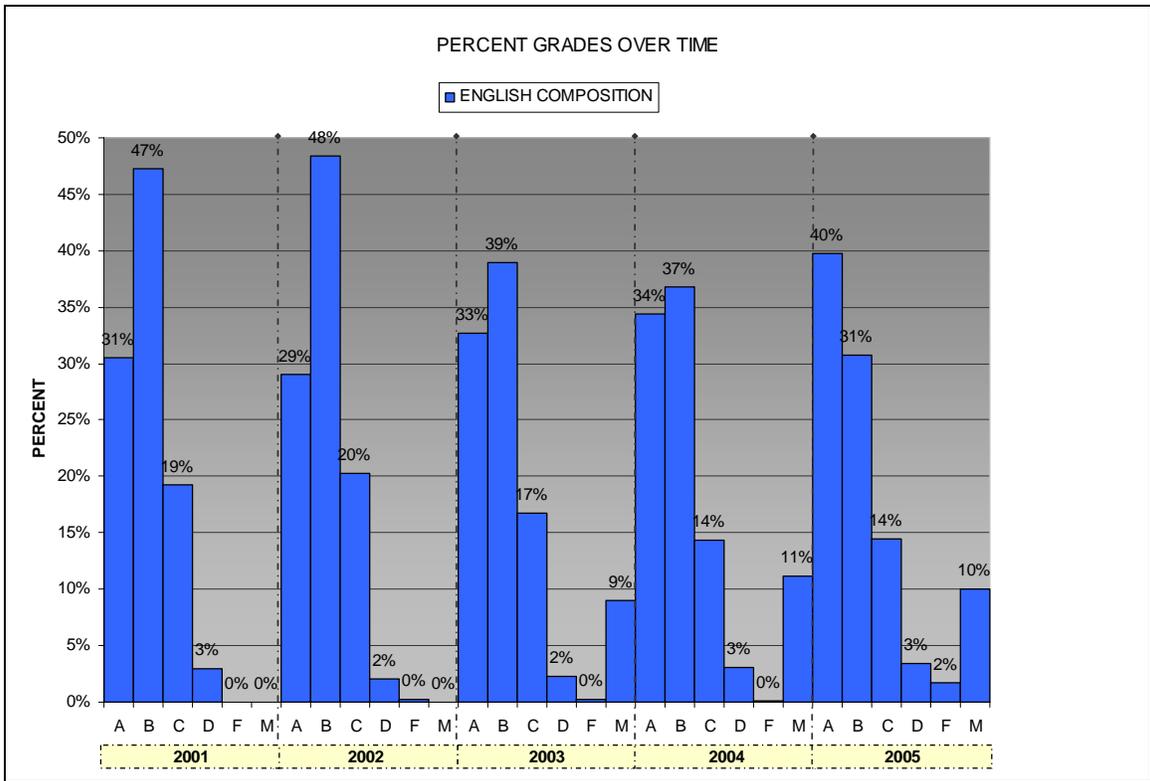


Figure 7. Percentage of high school seniors indicating overall grade in English Composition.

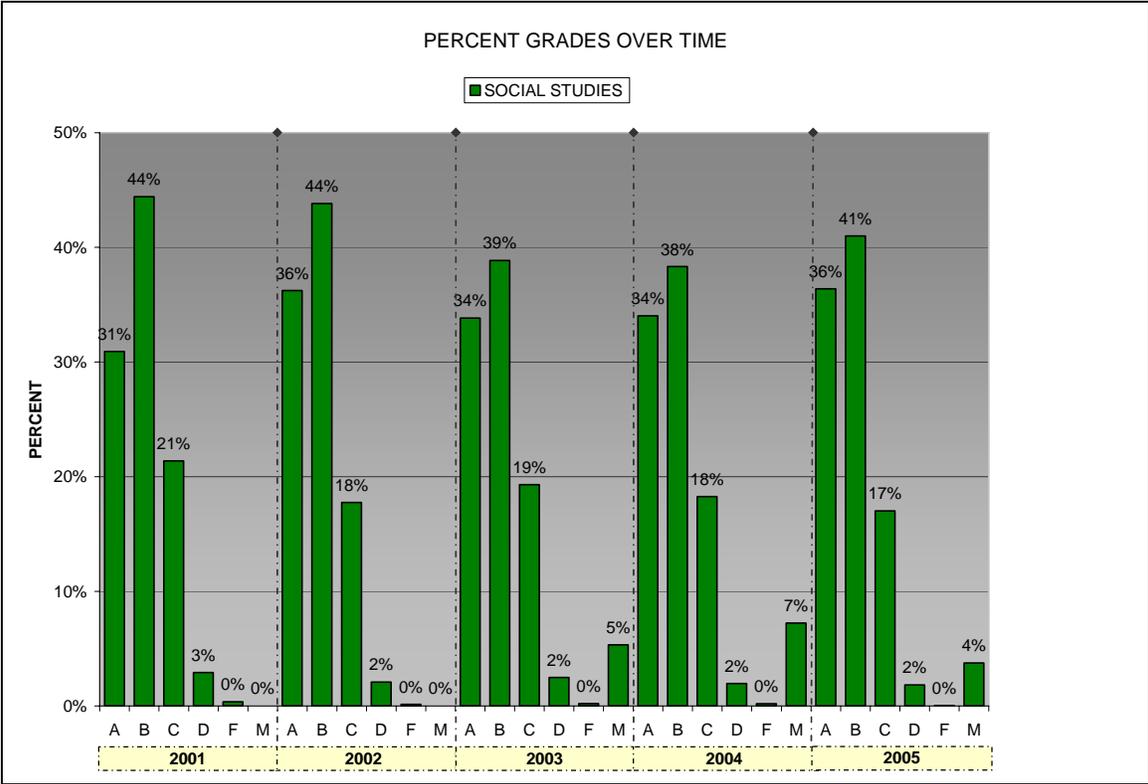


Figure 8. Percentage of high school seniors indicating overall grade in Social Studies.

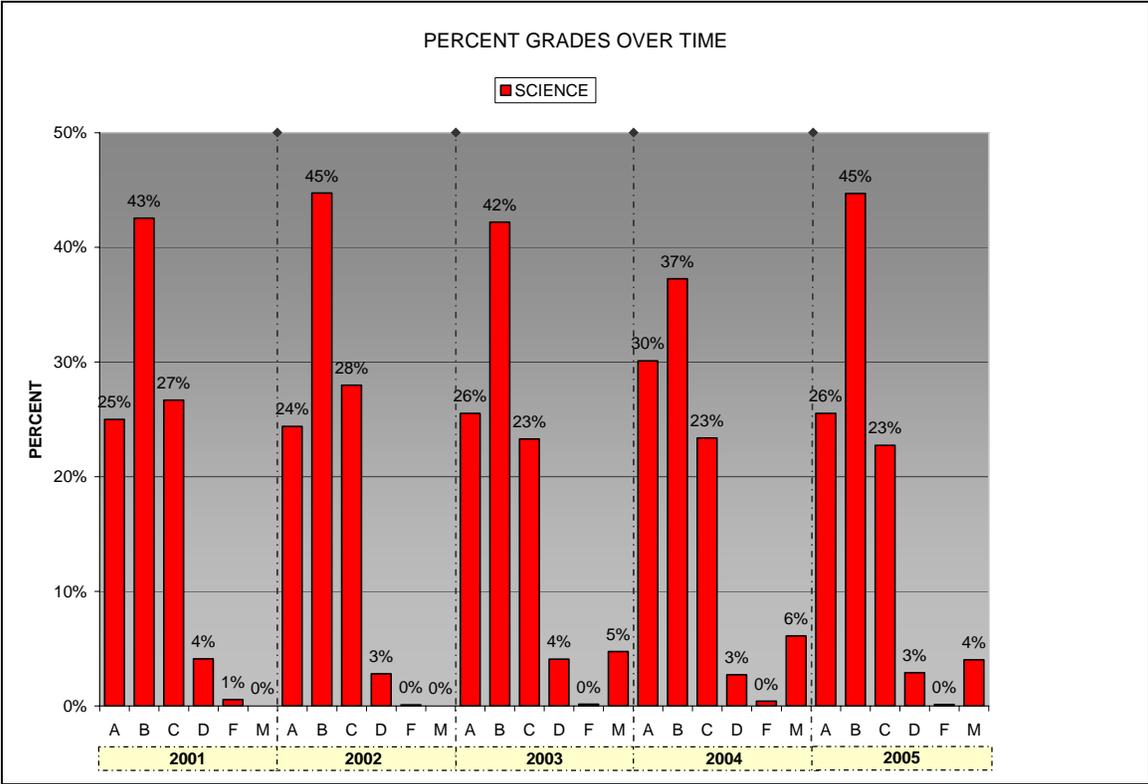


Figure 9. Percentage of high school seniors indicating overall grade in Science.

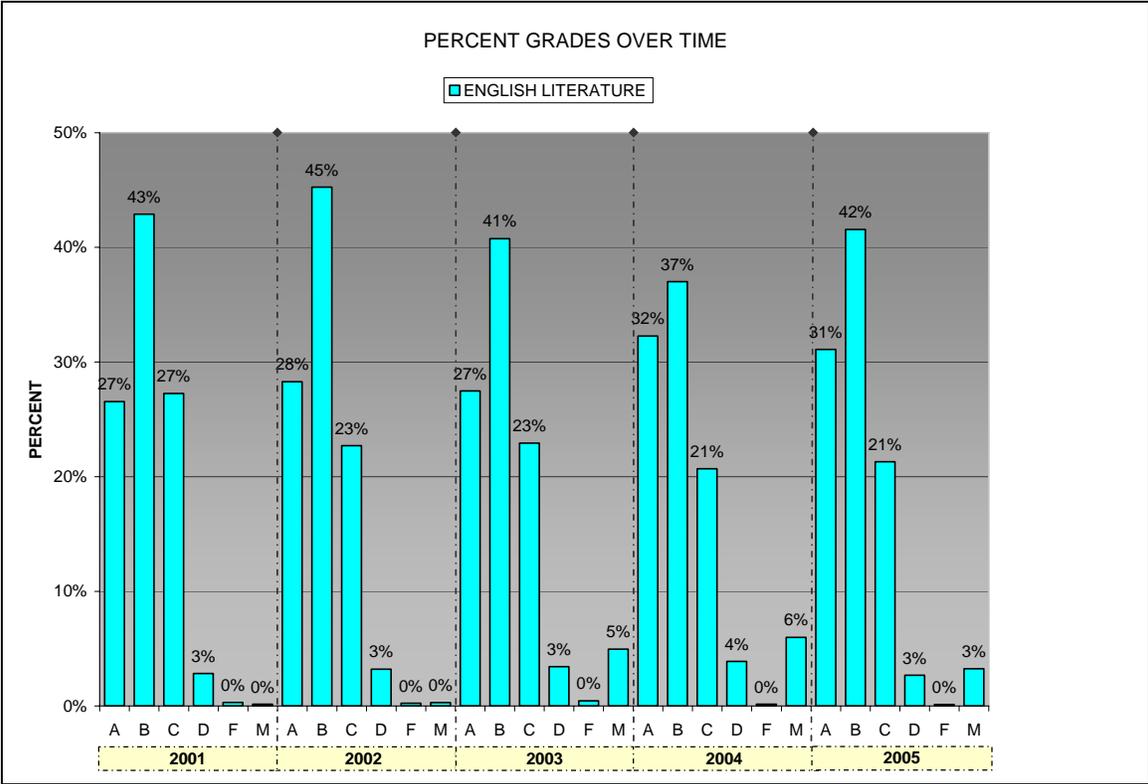


Figure 10. Percentage of high school seniors indicating overall grade in English Literature.

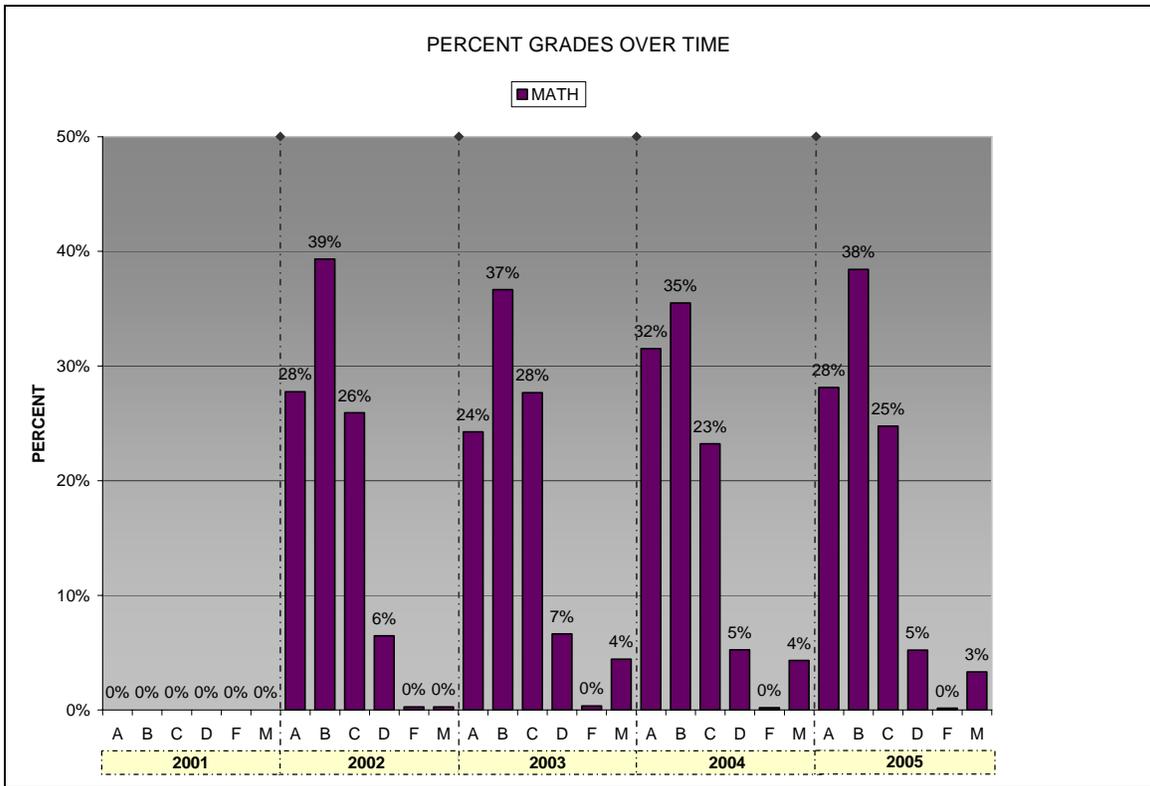


Figure 11. Percentage of high school seniors indicating overall grade in Mathematics.

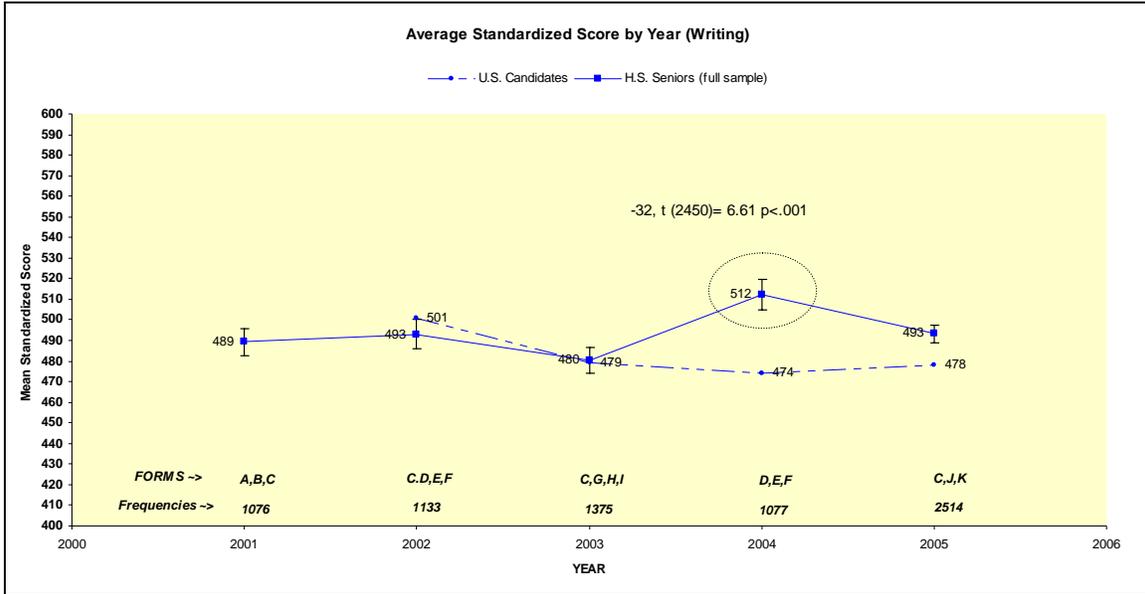


Figure 12. Average Language Arts, Writing Test standard scores.

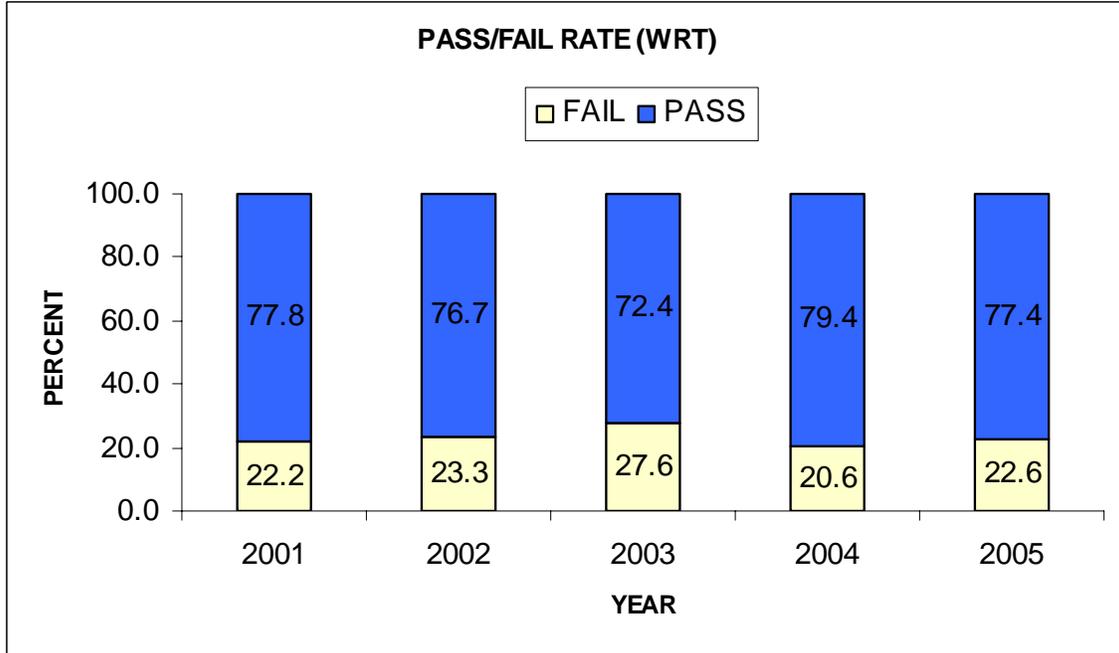


Figure 13. Pass rates for the Language Arts, Writing Test.

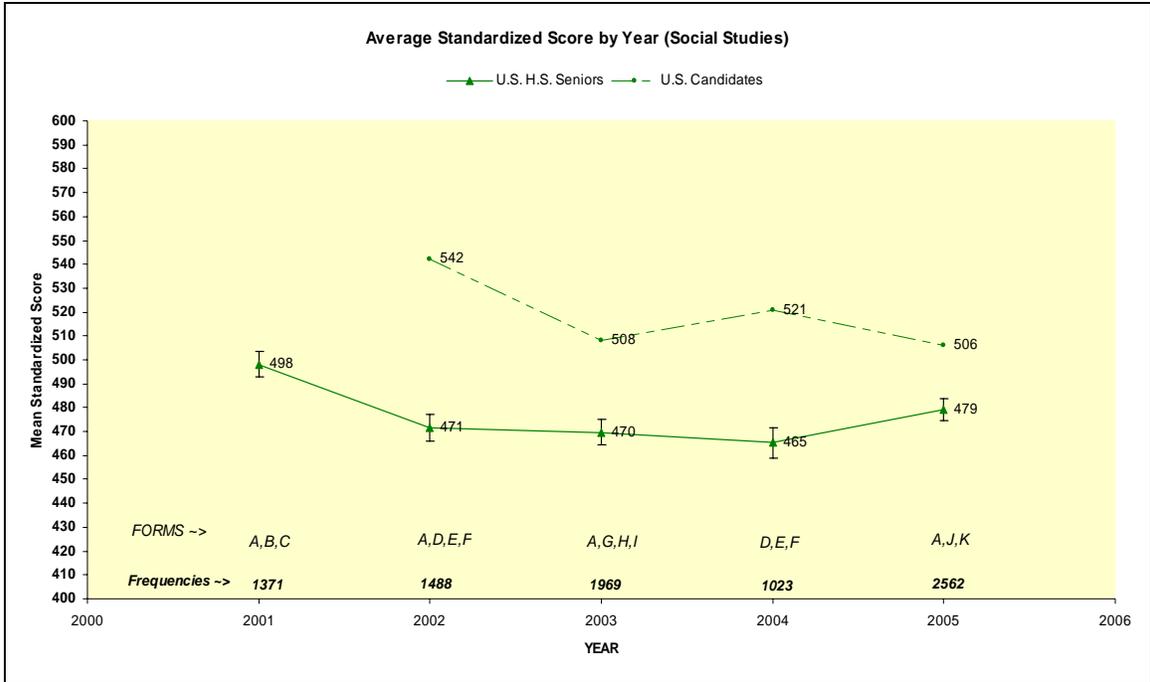


Figure 14. Average Social Studies Test standard scores.

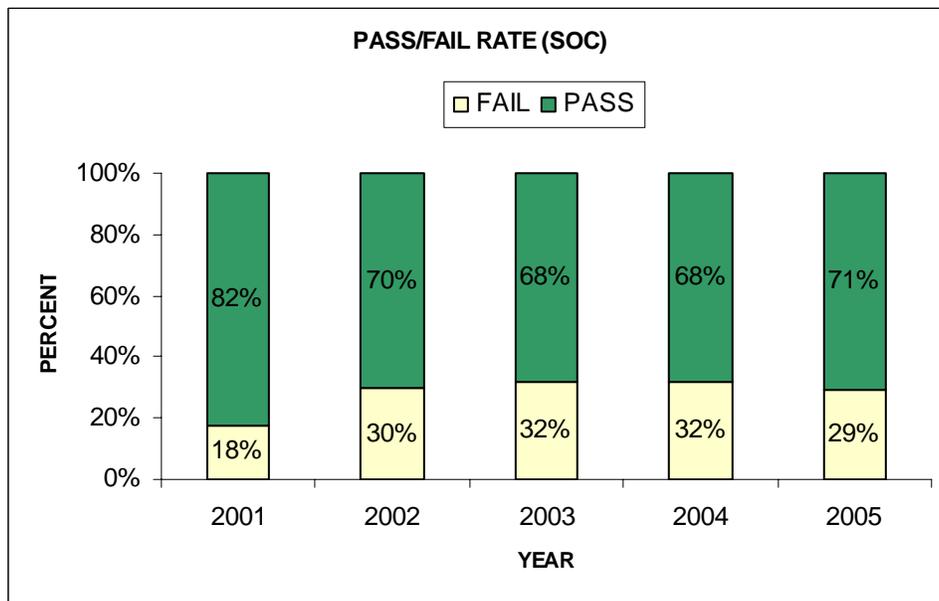


Figure 15. Pass rates for the Social Studies Test.

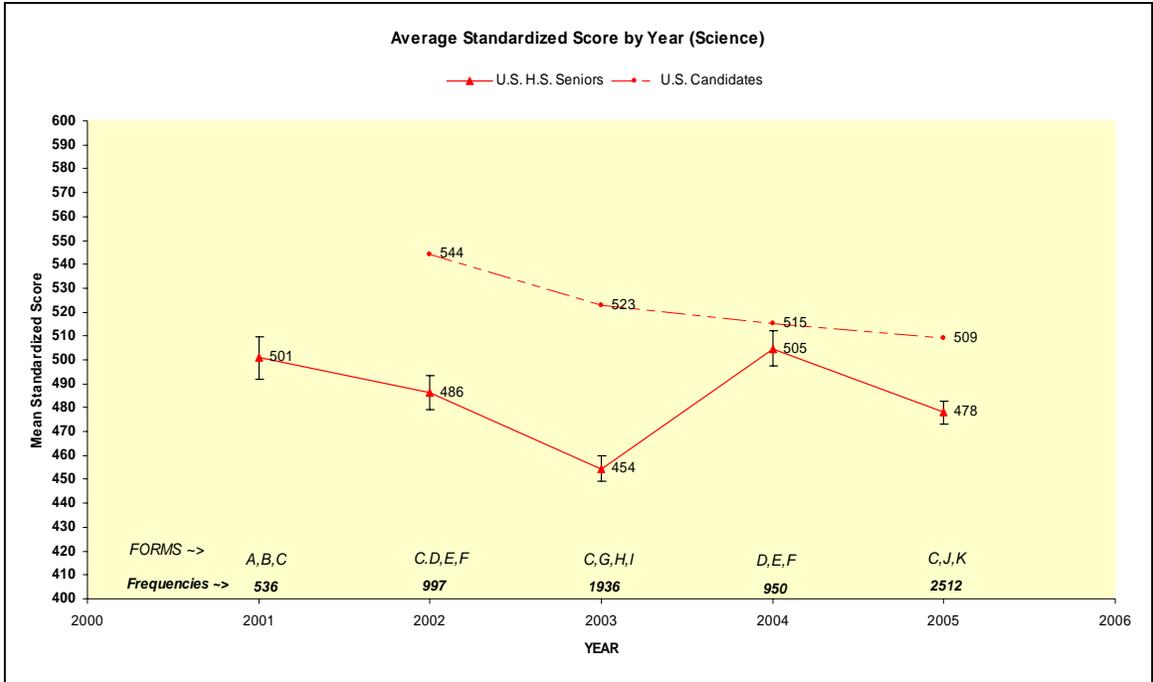


Figure 16. Average Science Test standard scores.

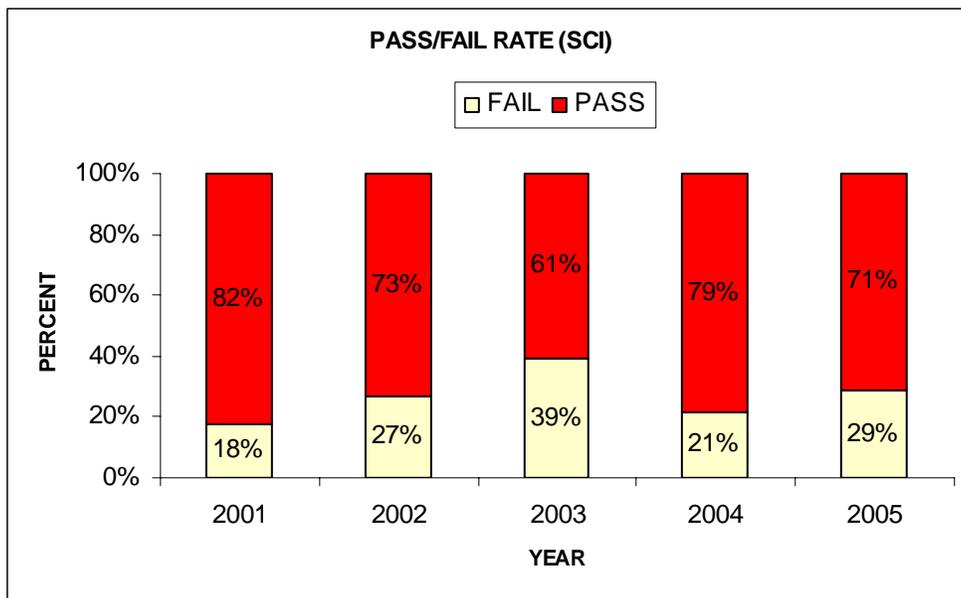


Figure 17. Pass rates for the Science Test.

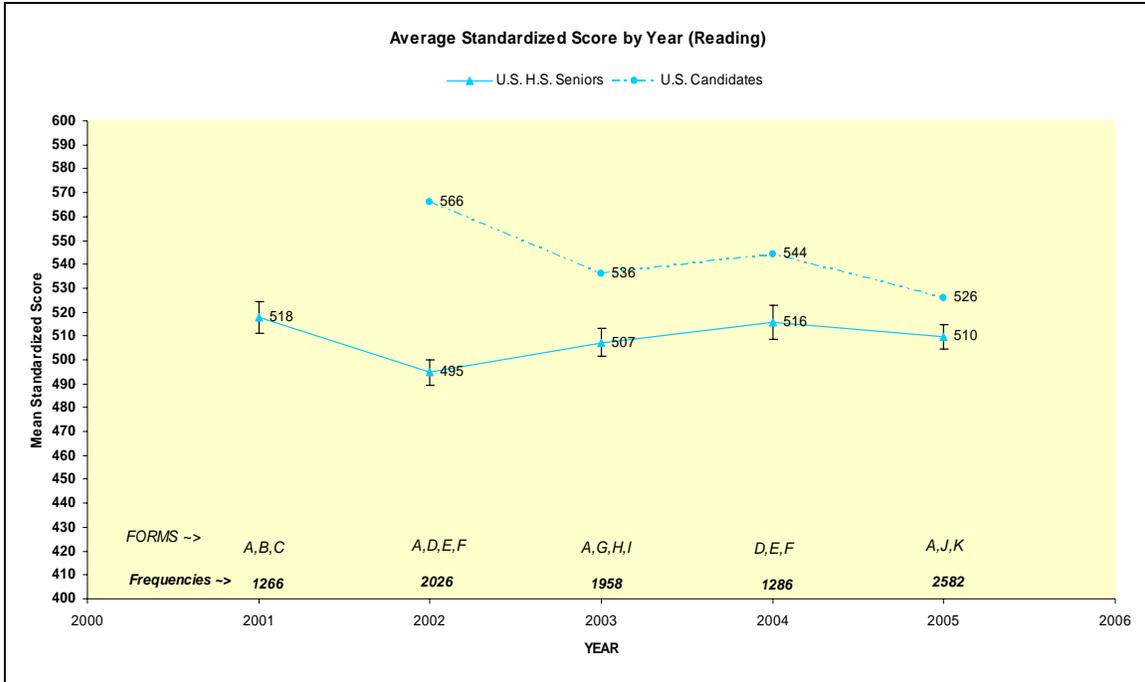


Figure 18. Average Language Arts, Reading Test standard scores.

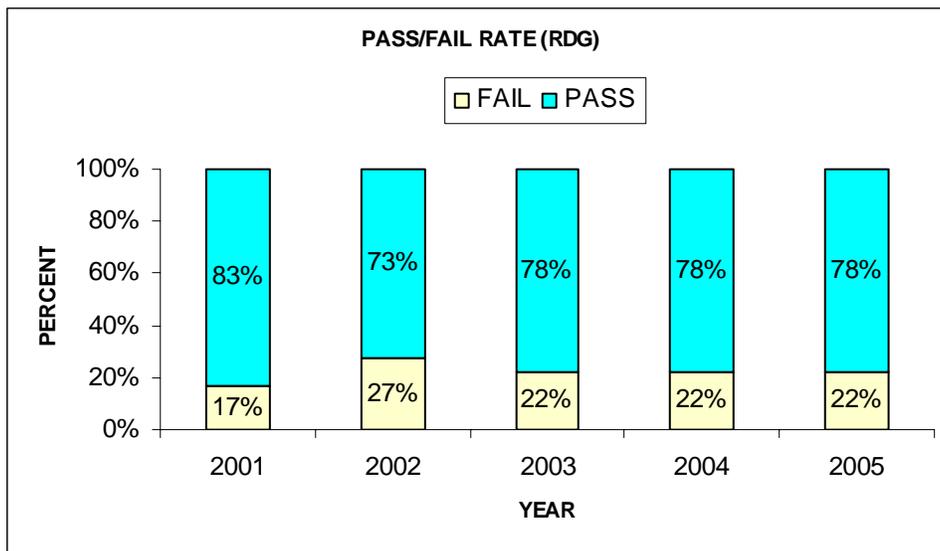


Figure 19. Pass rates for the Language Arts, Reading Test.

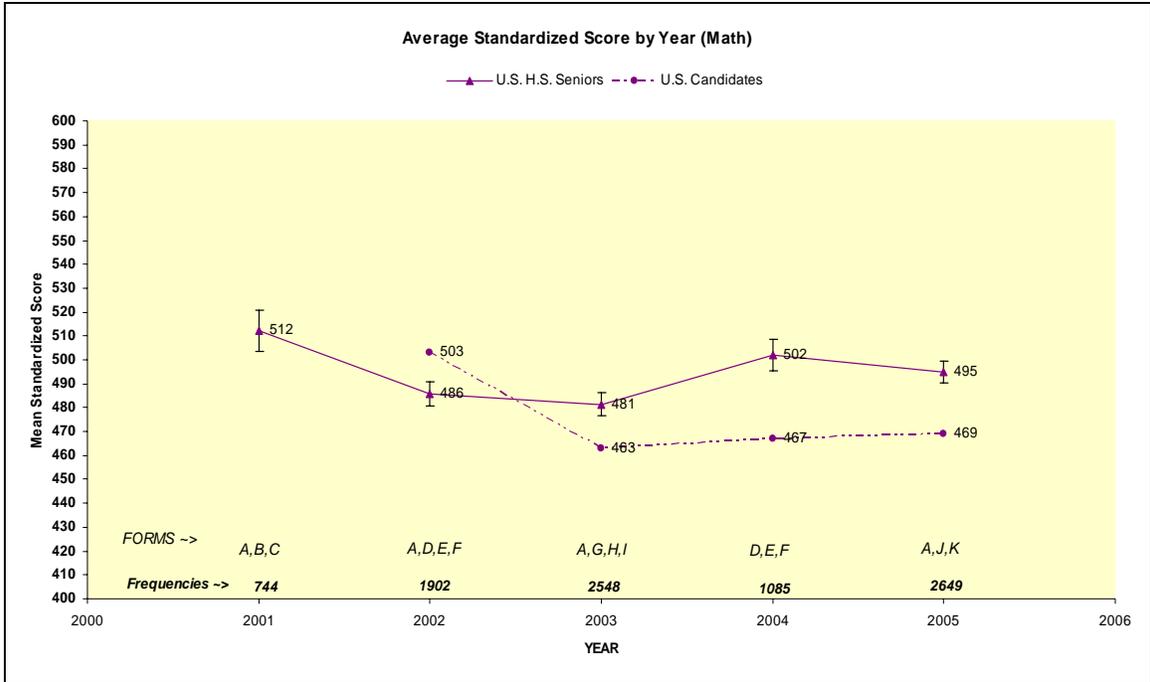


Figure 20. Average Mathematics Test standard scores.

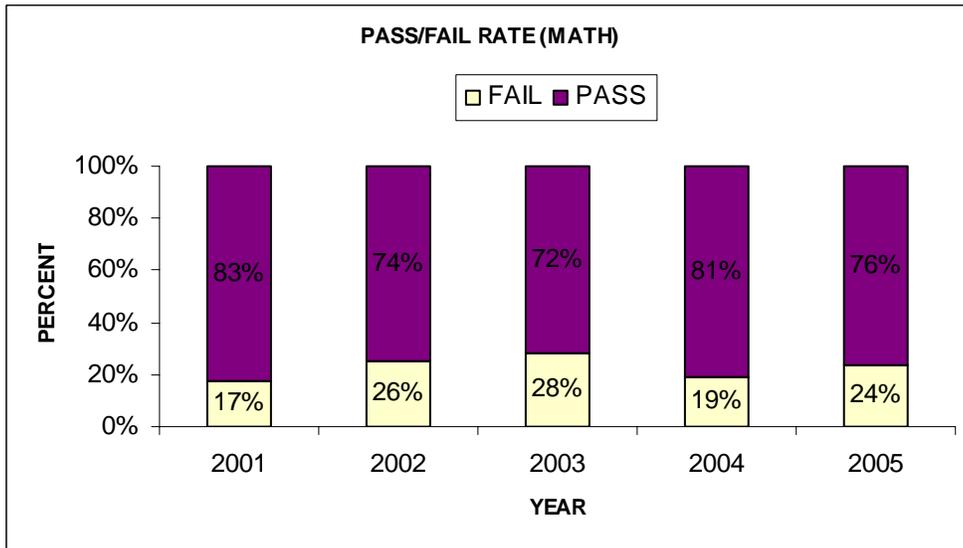


Figure 21. Pass rates for the Mathematics Test.

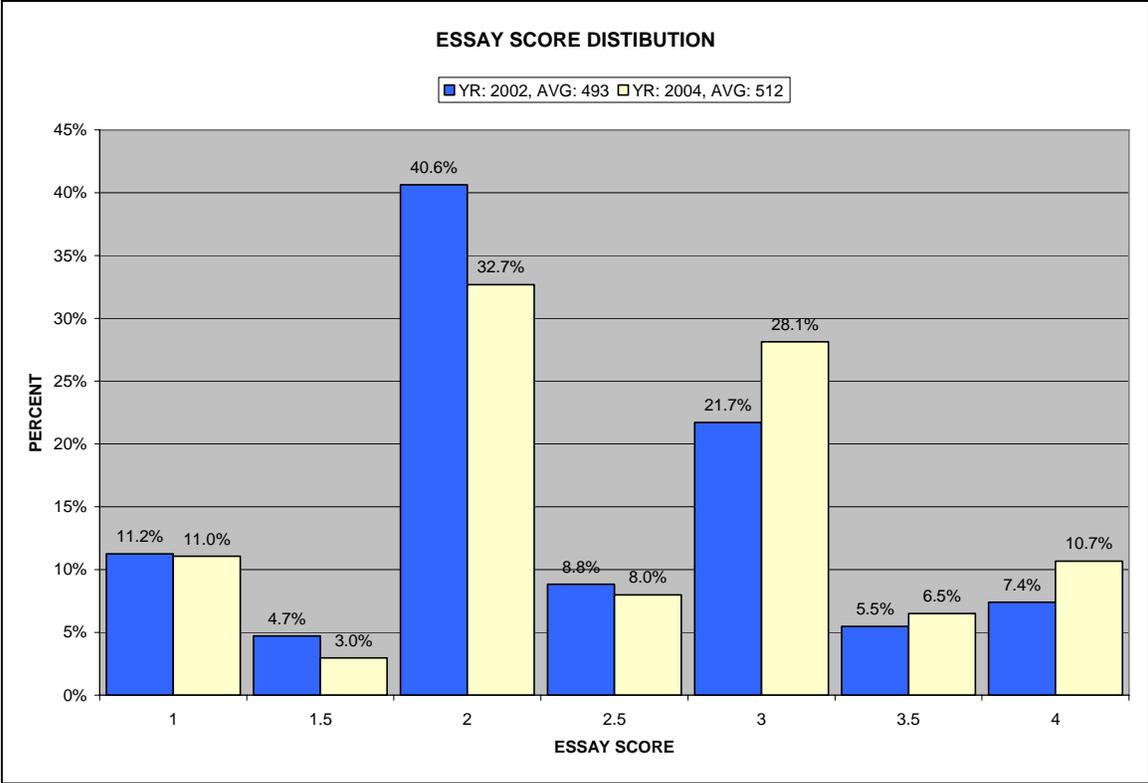


Figure 22. Comparison of essay score distributions in 2002 and 2004.

References

National Center for Education Statistics (2005). *Digest of Education Statistics*.

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