

Year 2000 Update:
Accuracy of API Index and School Base Report Elements

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This reports supplements the main report "Accuracy of API Index and School Base Report Elements" with results and selected displays for the Year 2000 API data. Specifically, portions of the content in the year 1999 data report

- Part A "Standard Errors of School API"
- Part B "Hit Rate for Statewide Decile Ranks"

are updated with results for year 2000 data. Versions of Figures 1, 3 and 4 and Tables 1 and 3 from the year 1999 report are presented using the year 2000 data. For descriptive analyses of the year 2000 data see "Year 2000 Update: Interpretive Notes for the Academic Performance Index" available from this website. The presentation here presumes the reader is familiar with the discussion and presentation in the precursor "Accuracy of API Index and School Base Report Elements". As in the precursor report the motivation for studying the statistical properties of the quantities in the School Report is to address the question: How seriously can we regard these numerical values without (over)interpreting these numbers beyond the accuracy they can support?

Part A. Standard Errors of School API, Year 2000 Data

Descriptive statistics for the standard error of the API--s.e.(API)-- are shown in Table 1, first for each school type and below that the median standard error for each state decile. Further display of s.e.(API) is provided by the plots for Elementary, Middle and High Schools in Figure 1. Regardless of school type, schools have a wide range of values for s.e.(API). Magnitudes and patterns of s.e.(API) are quite similar to that seen with the 1999 data, and the full discussion is not repeated here. A major feature of s.e.(API) is the dependence on the number of students (denote by n) contributing to the school's API index. Although the dependence of s.e.(API), on the number of students is strong, the plots in Figure 1 also show some sizable differences for schools of the same size, mainly as a result of the additional dependence of s.e.(API) on the school's API score.

INSERT TABLE 1

INSERT FIGURE 1

Table 1: Standard Error of School API, Year 2000

Descriptive Statistics: s.e.(API)

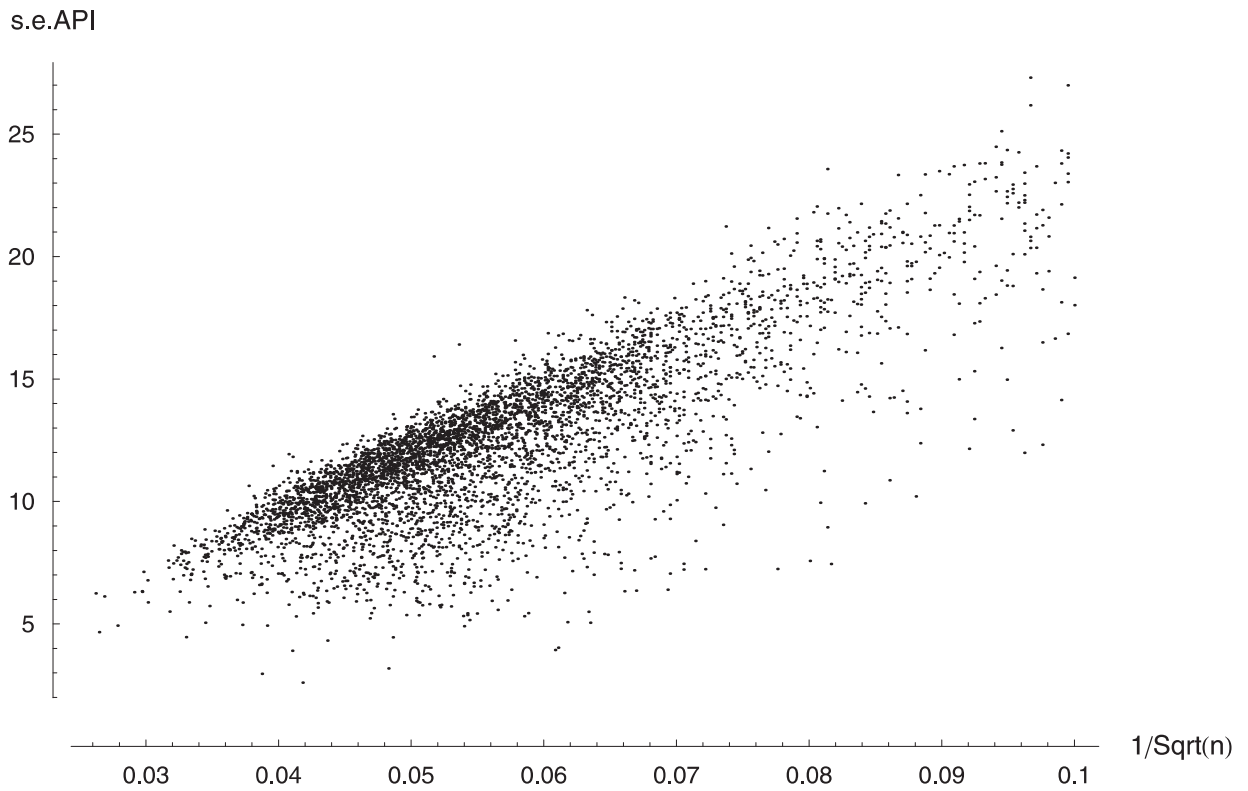
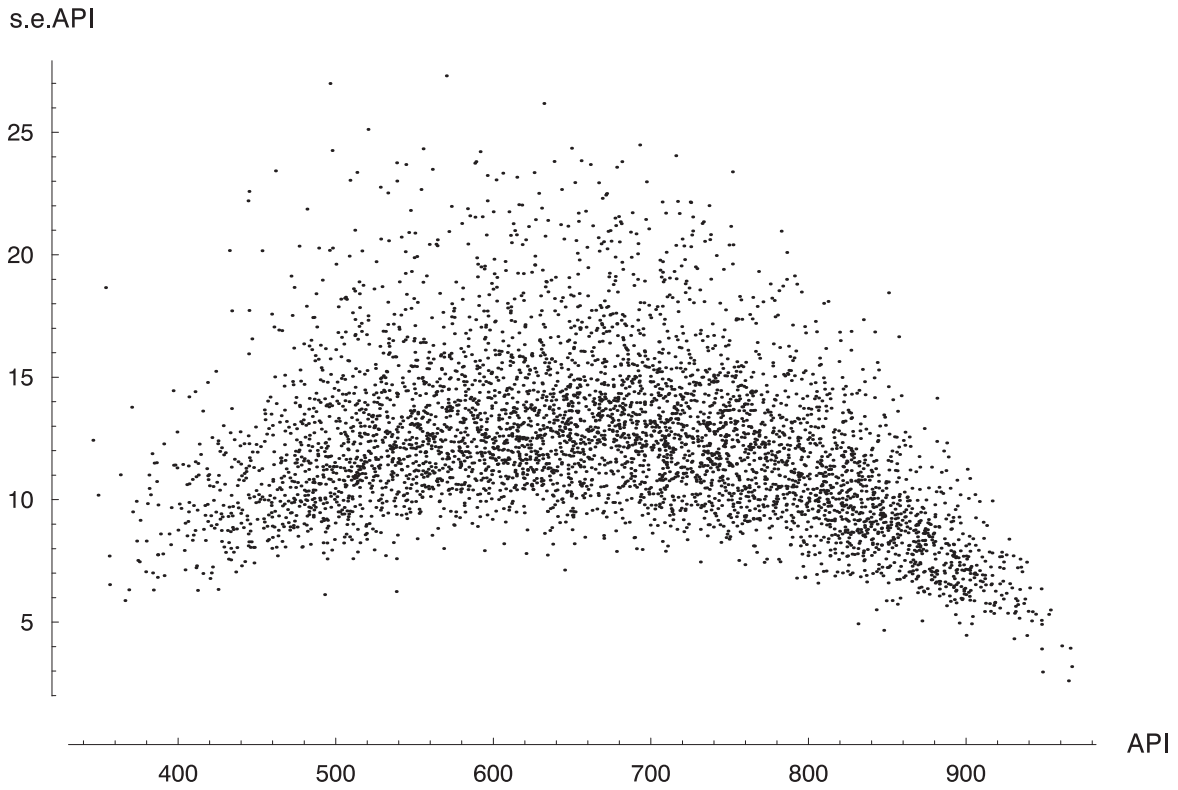
| | N | Median | Q1 | Q3 | Minimum | Maximum |
|------|------|---------------|--------|--------|---------|---------|
| Elem | 4776 | 11.964 | 10.062 | 14.049 | 2.603 | 27.305 |
| Mid | 1125 | 8.347 | 7.108 | 9.960 | 3.667 | 22.380 |
| High | 854 | 6.554 | 5.628 | 8.457 | 1.981 | 24.421 |

Median s.e.(API) by CARank (state decile)

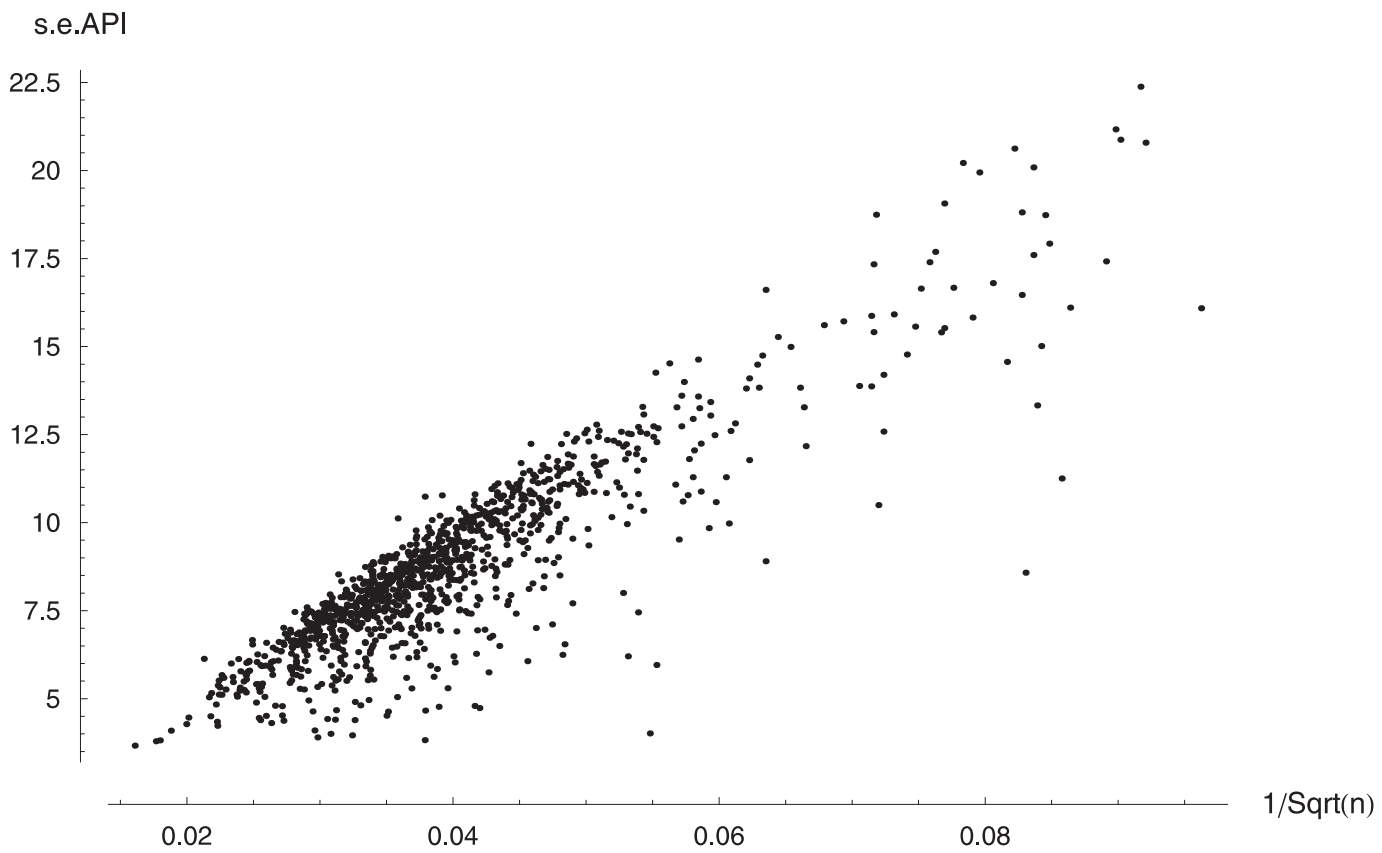
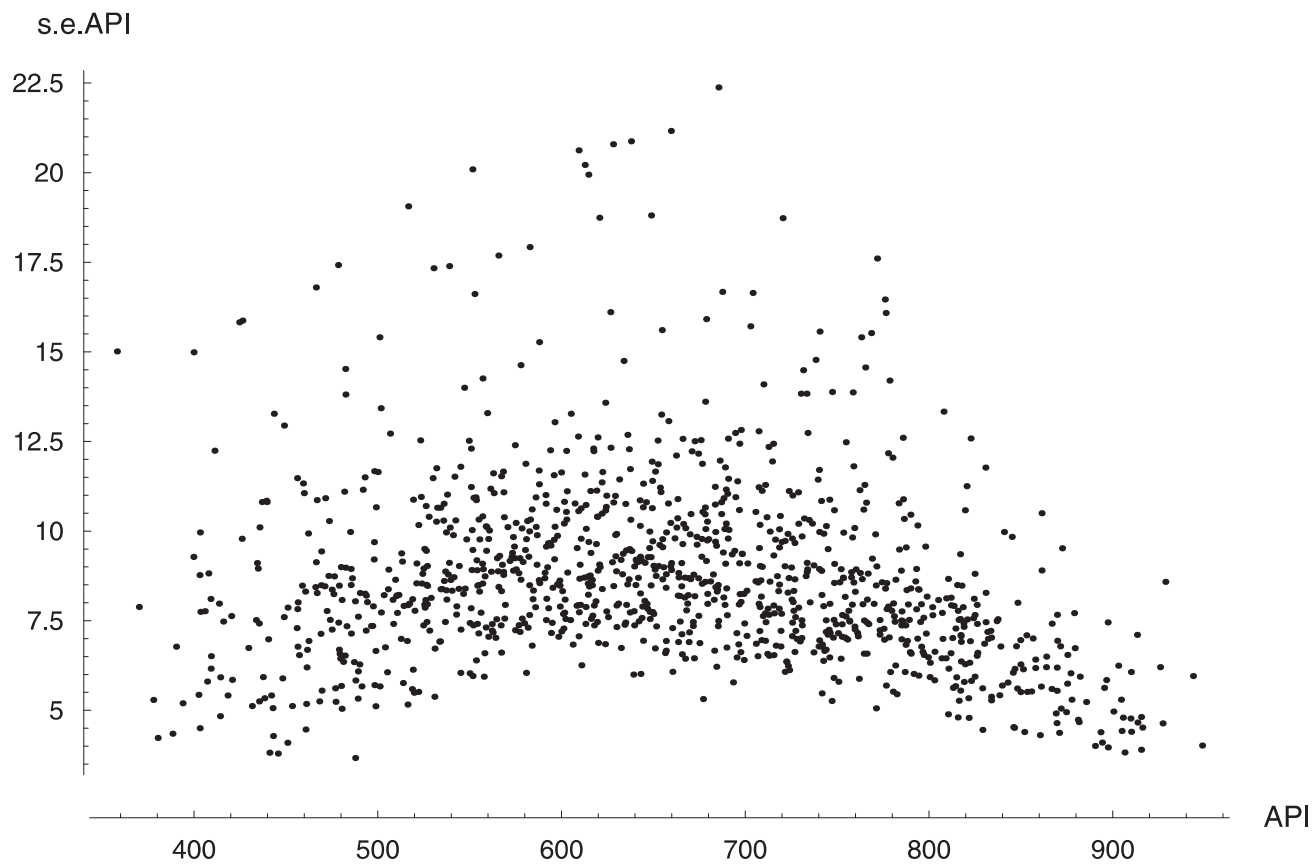
| CARank | Elem | | Middle | | High | |
|--------|------|--------|--------|--------|------|--------|
| | N | Median | N | Median | N | Median |
| 1 | 469 | 10.653 | 112 | 7.613 | 80 | 5.613 |
| 2 | 478 | 12.229 | 111 | 8.213 | 84 | 6.577 |
| 3 | 482 | 12.926 | 112 | 9.045 | 86 | 6.576 |
| 4 | 476 | 13.060 | 111 | 8.843 | 84 | 6.910 |
| 5 | 484 | 13.312 | 117 | 9.271 | 89 | 6.720 |
| 6 | 470 | 13.158 | 112 | 9.098 | 83 | 6.910 |
| 7 | 478 | 12.621 | 109 | 8.506 | 87 | 7.328 |
| 8 | 480 | 11.904 | 113 | 8.306 | 86 | 6.287 |
| 9 | 476 | 10.347 | 113 | 7.525 | 87 | 6.631 |
| 10 | 483 | 7.937 | 115 | 6.146 | 87 | 5.576 |

Figure 1 Plots for API Standard Errors

Year 2000 Elementary Schools

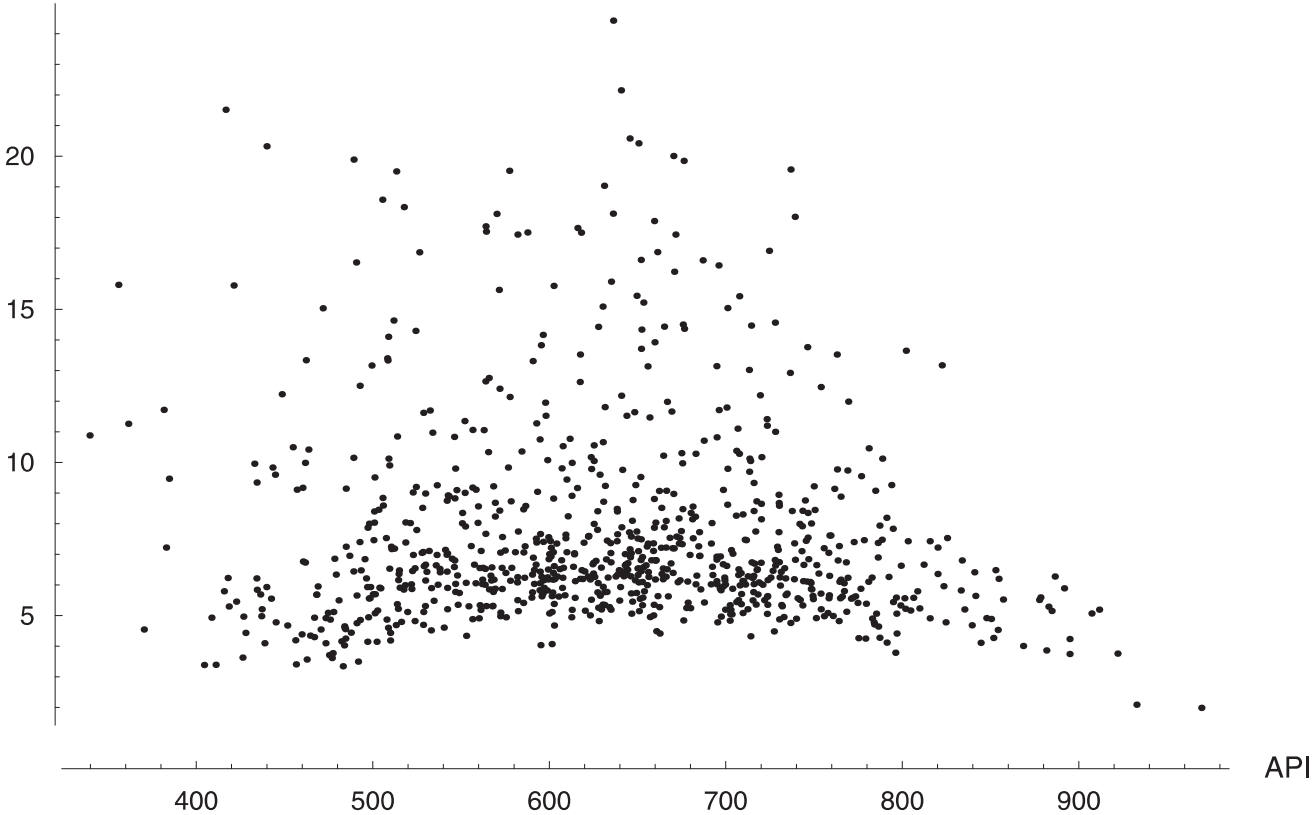


Year 2000 Middle Schools

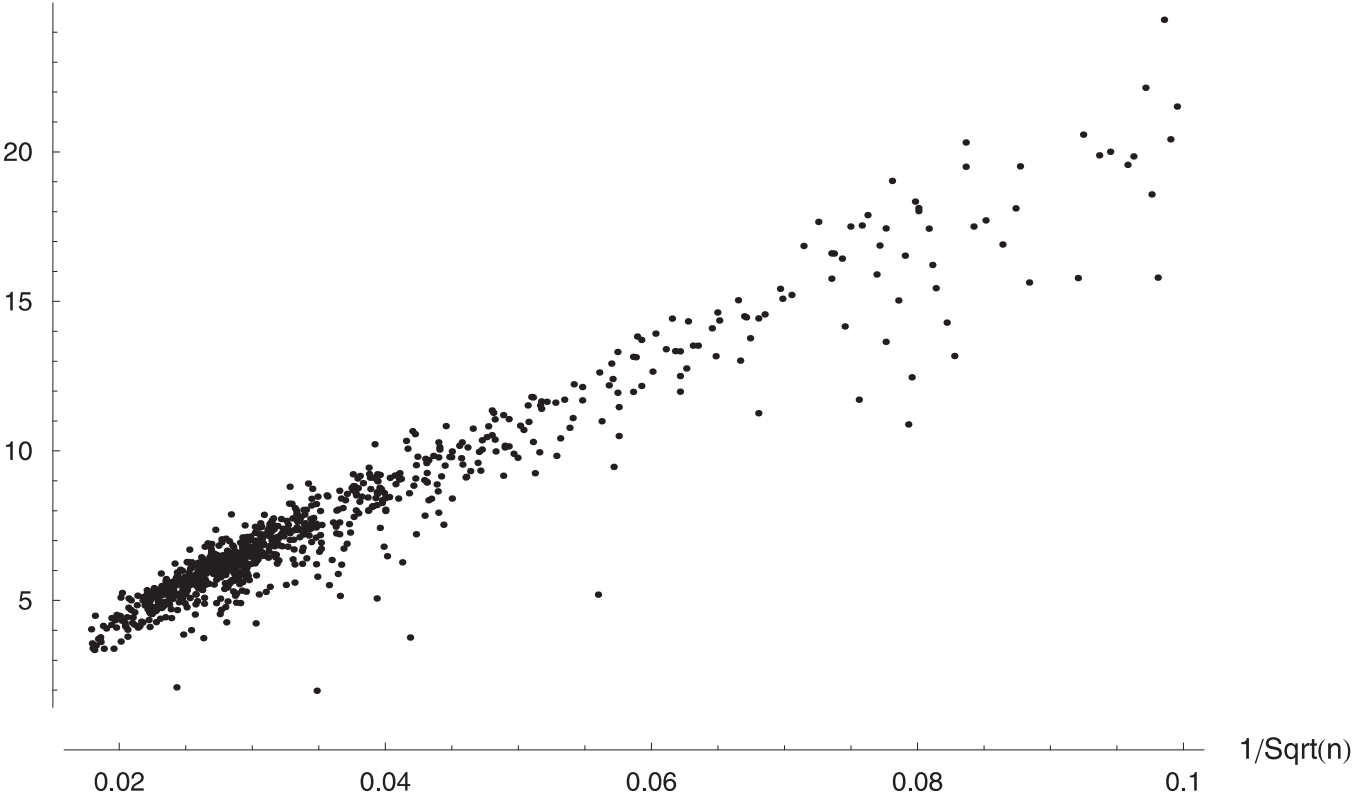


Year 2000 High Schools

s.e.API



s.e.API



Part B. Hit Rate for Statewide Decile Ranks.

As with the precursor report for the 1999 data, the accuracy of the use of the school API score to determine the reported statewide rank is quantified by the hit-rate:

$$\text{decile accuracy hit-rate} = 1 - \text{Prob}\{\text{sampling variability in API score moves the school out of its assigned decile}\}.$$

The decile accuracy hit-rate quantifies an answer to the question: What is the effect of the statistical variability (wobble) in the school API score on the statewide rank? The median hit-rate for Elementary schools is .81 and for High Schools .89. Quartiles and median values for the hit-rates are broken down by state decile in Table 2. These values are similar in magnitude and pattern to those discussed for the 1999 data.

INSERT TABLE 2

As discussed in the precursor report, a school with an API score near a decile boundary will have a much larger probability of statistical variability moving the API score into the adjoining decile. That motivates plotting hit-rate versus position in the decile shown in Figure 2 and Figure 3. Figure 2 shows the hit rate for 2000 schools in statewide deciles 2 through 9; Figure 3 shows separate plots for each state decile. Schools in the middle of a decile have very high hit-rates, except for the smallest schools. (Note: minimum school size for these plots is 100; schools with the "S" designation are not included.) For example, high school decile 6 in Figure 3 shows some very low hit-rate values, and these are the smaller high schools.

INSERT FIGURE 2 AND FIGURE 3

Table 2

Decile Accuracy Hit Rates by School type and Decile, Year 2000 Data

decile accuracy hit-rate =

1 - Prob{sampling variability in API score moves the school score out of its assigned decile}.

Elementary Schools

| Decile | Median Hit-rate | Lower Quartile | Upper quartile |
|--------|-----------------|----------------|----------------|
| 1 | 0.999 | 0.876 | 1. |
| 2 | 0.833 | 0.703 | 0.934 |
| 3 | 0.799 | 0.65 | 0.891 |
| 4 | 0.75 | 0.623 | 0.852 |
| 5 | 0.737 | 0.625 | 0.832 |
| 6 | 0.7 | 0.606 | 0.797 |
| 7 | 0.744 | 0.626 | 0.846 |
| 8 | 0.807 | 0.668 | 0.912 |
| 9 | 0.872 | 0.725 | 0.948 |
| 10 | 1. | 0.95 | 1. |

Middle Schools

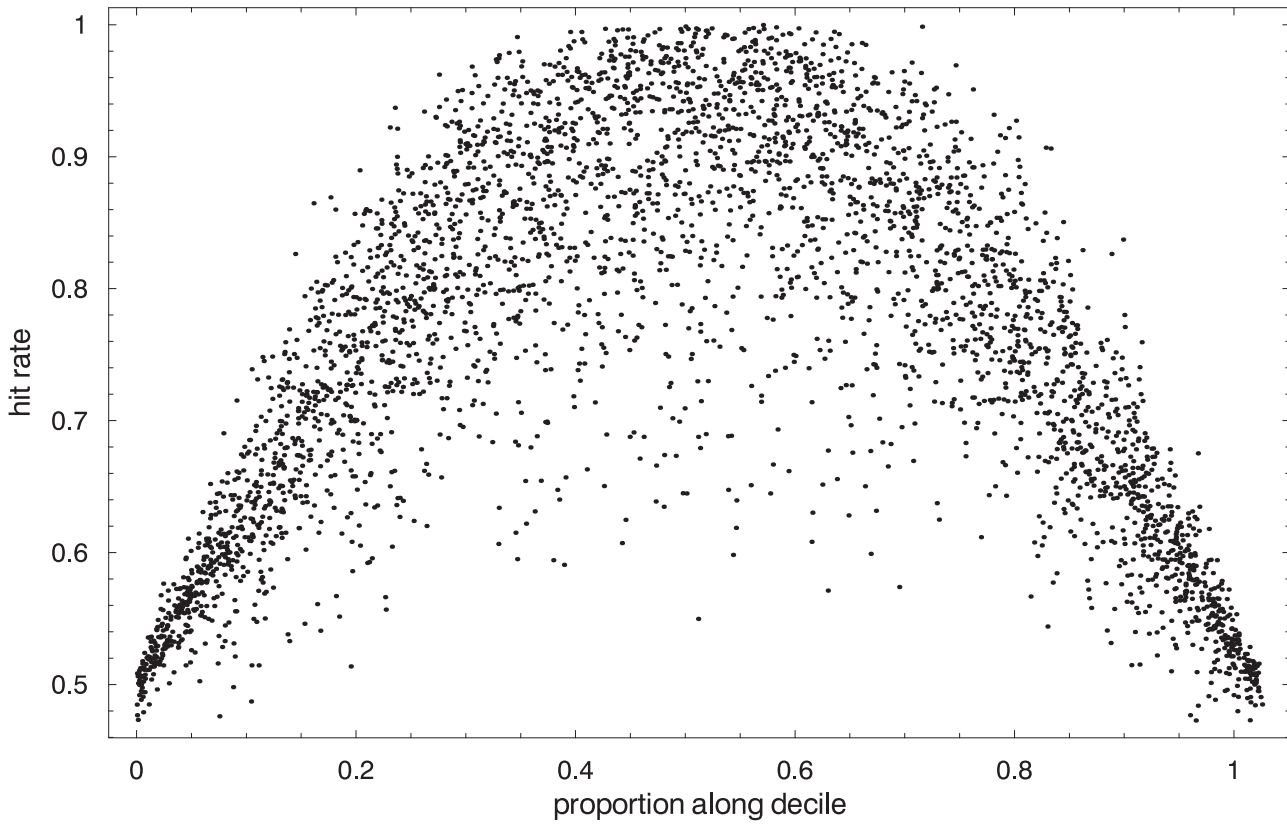
| Decile | Median Hit-rate | Lower Quartile | Upper quartile |
|--------|-----------------|----------------|----------------|
| 1 | 1. | 0.927 | 1. |
| 2 | 0.923 | 0.771 | 0.993 |
| 3 | 0.892 | 0.72 | 0.964 |
| 4 | 0.819 | 0.654 | 0.918 |
| 5 | 0.83 | 0.637 | 0.934 |
| 6 | 0.812 | 0.626 | 0.893 |
| 7 | 0.841 | 0.69 | 0.928 |
| 8 | 0.907 | 0.73 | 0.978 |
| 9 | 0.914 | 0.733 | 0.988 |
| 10 | 1. | 0.973 | 1. |

High Schools

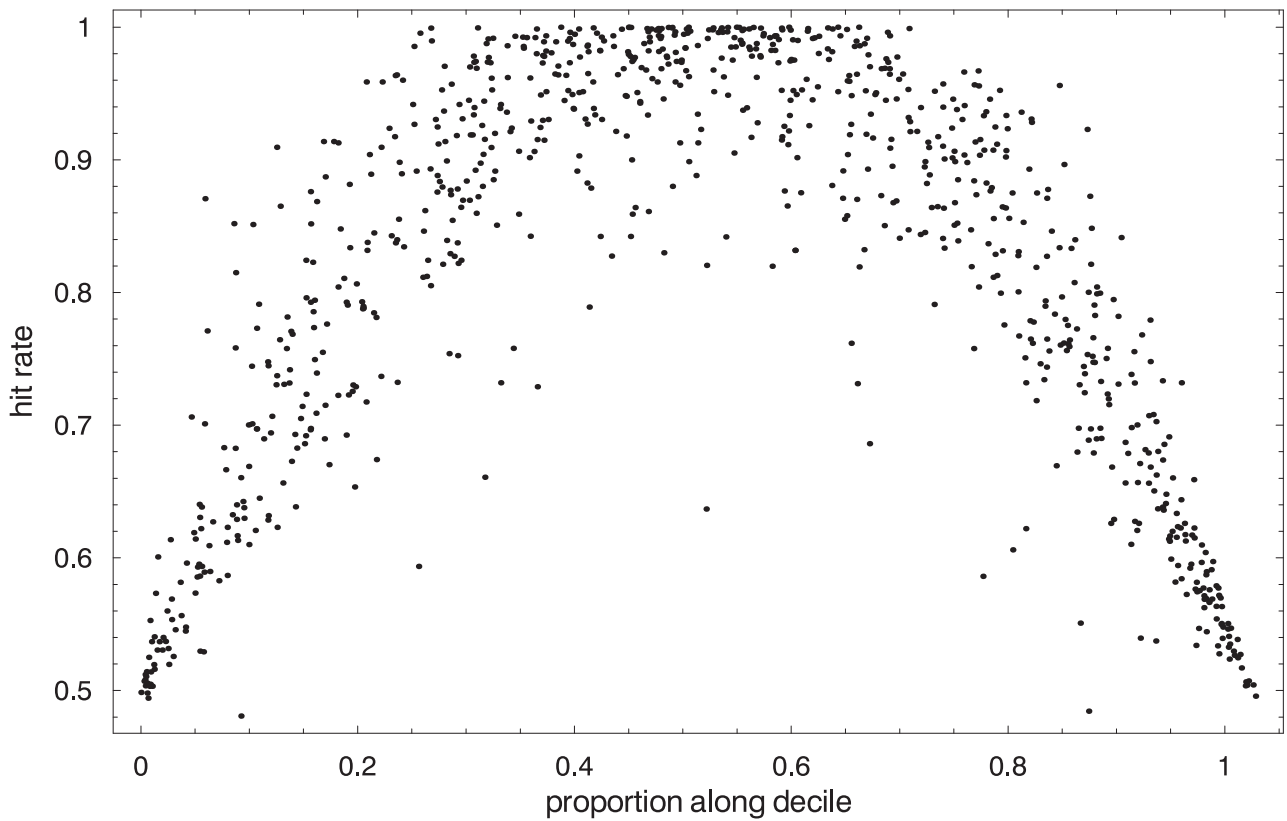
| Decile | Median Hit-rate | Lower Quartile | Upper quartile |
|--------|-----------------|----------------|----------------|
| 1 | 1. | 0.989 | 1. |
| 2 | 0.917 | 0.733 | 0.988 |
| 3 | 0.915 | 0.737 | 0.98 |
| 4 | 0.749 | 0.607 | 0.911 |
| 5 | 0.82 | 0.669 | 0.941 |
| 6 | 0.77 | 0.617 | 0.882 |
| 7 | 0.792 | 0.643 | 0.955 |
| 8 | 0.87 | 0.695 | 0.961 |
| 9 | 0.896 | 0.706 | 0.989 |
| 10 | 1. | 0.992 | 1. |

Figure 2 Plots of API State Decile Hit Rates, Year 2000

Elementary Schools, Deciles 2- 9



Middle Schools, Deciles 2- 9



High Schools, Deciles 2- 9

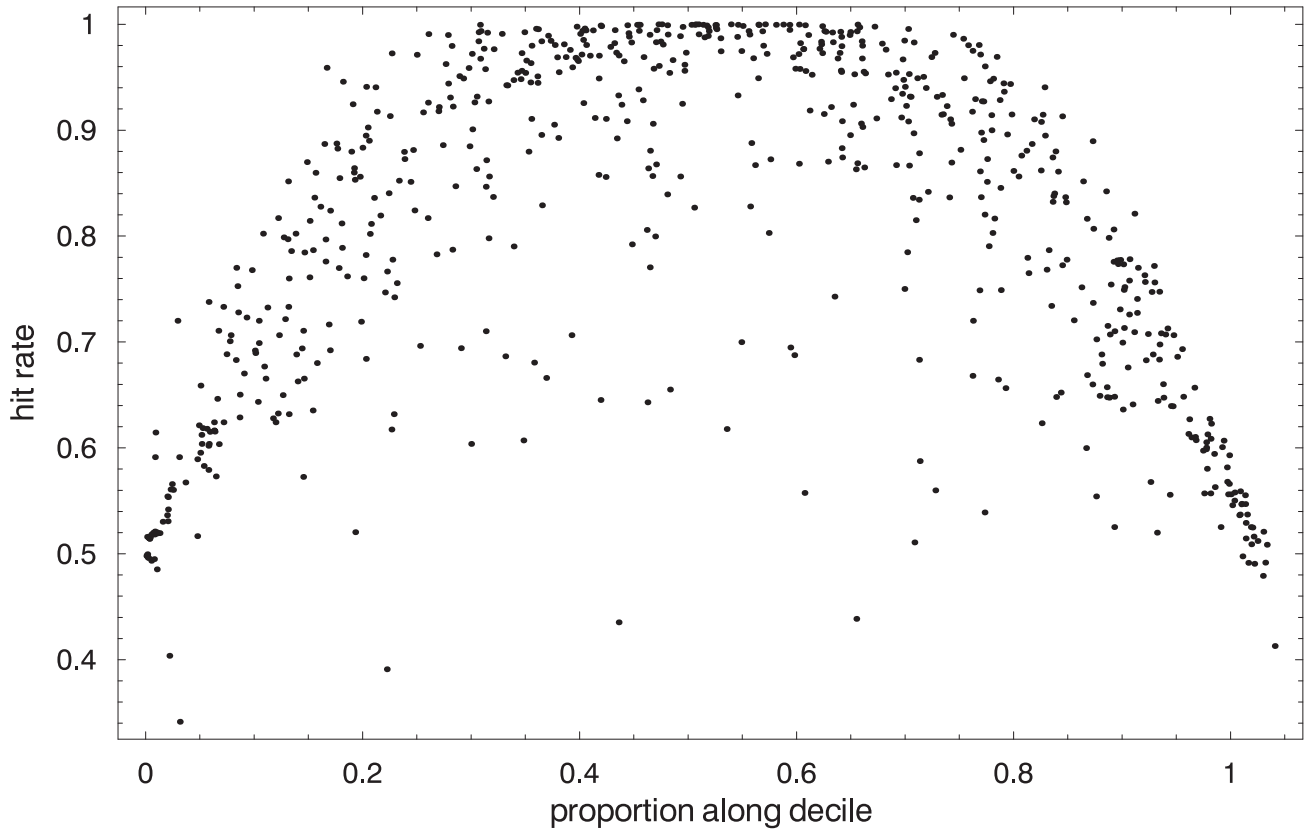
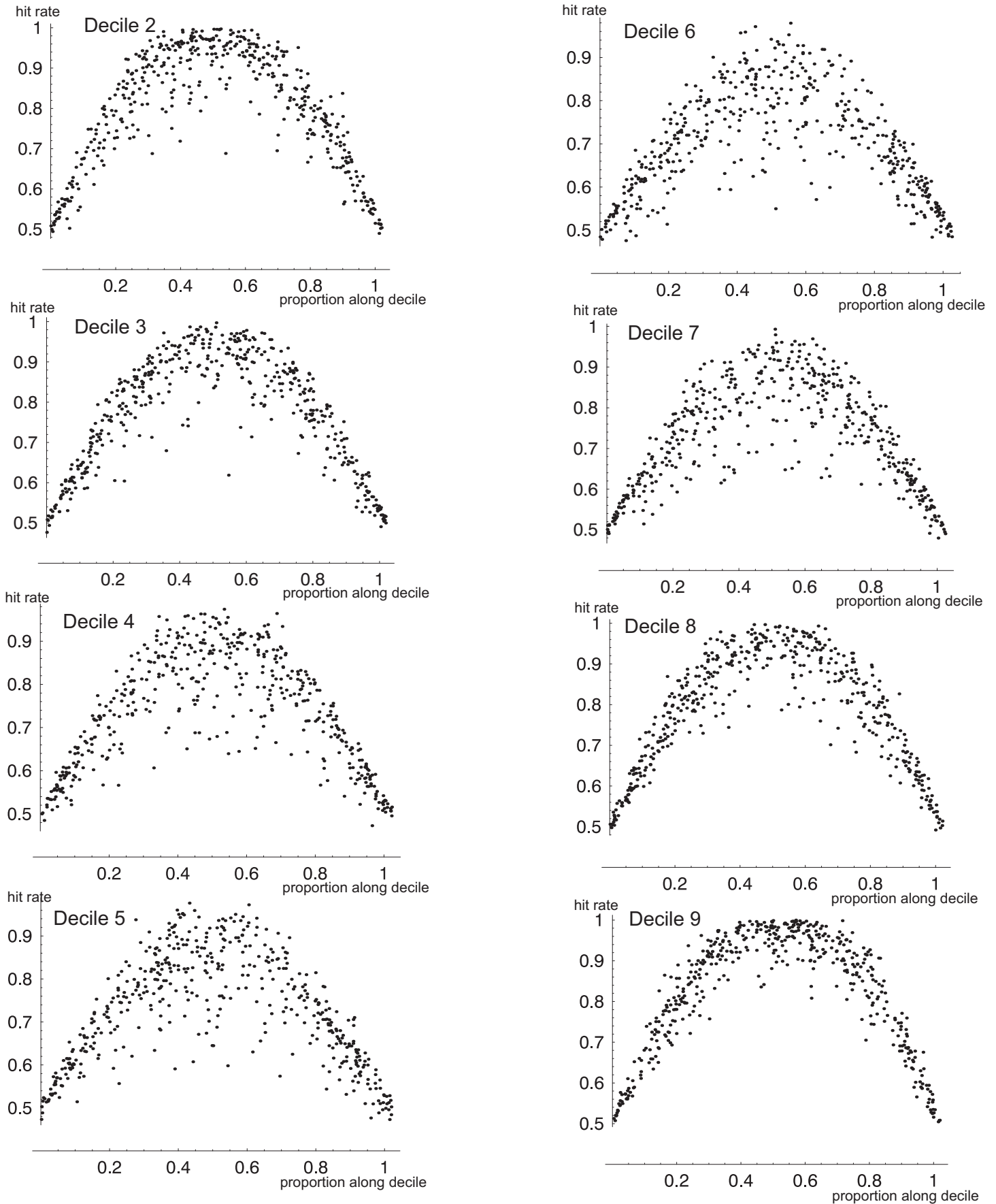
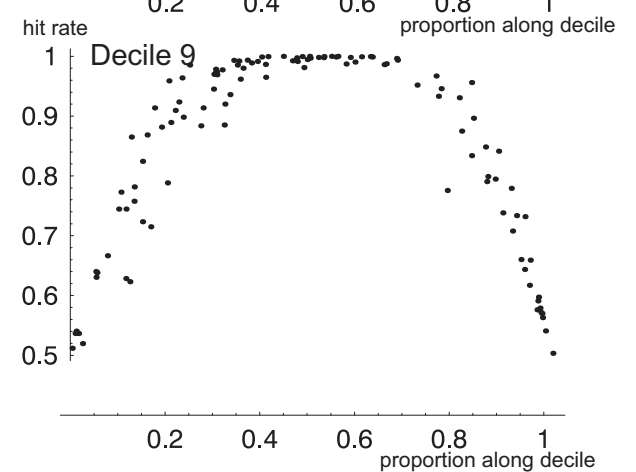
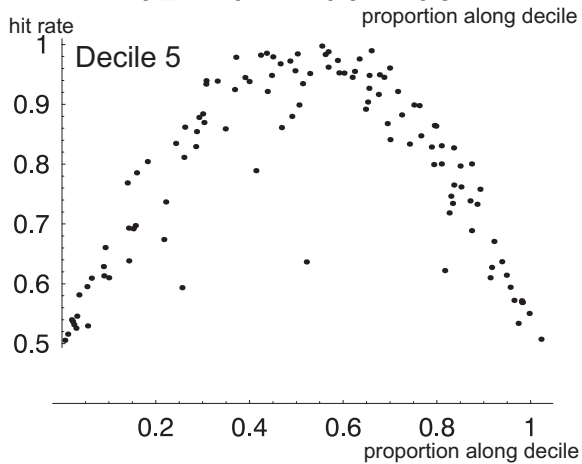
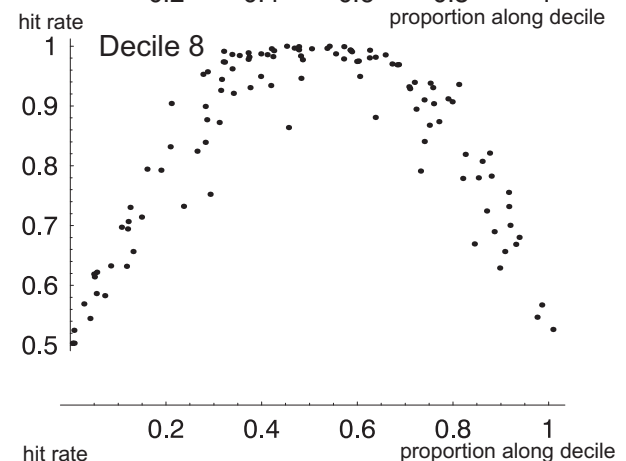
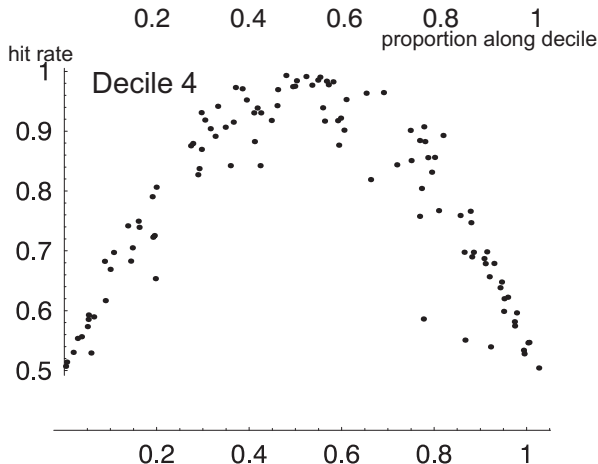
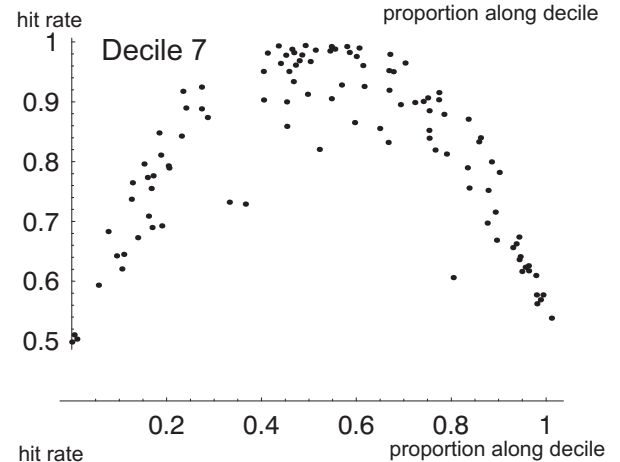
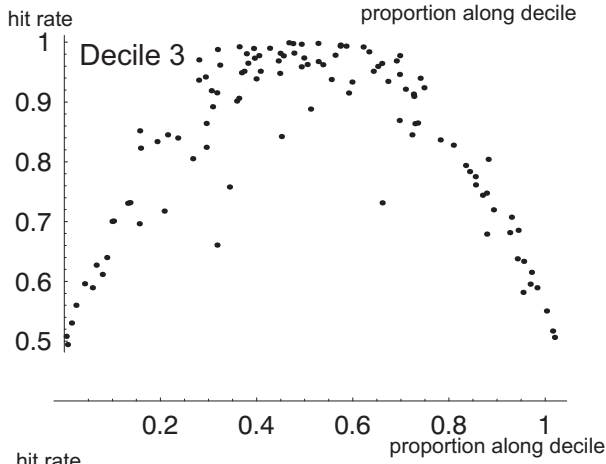
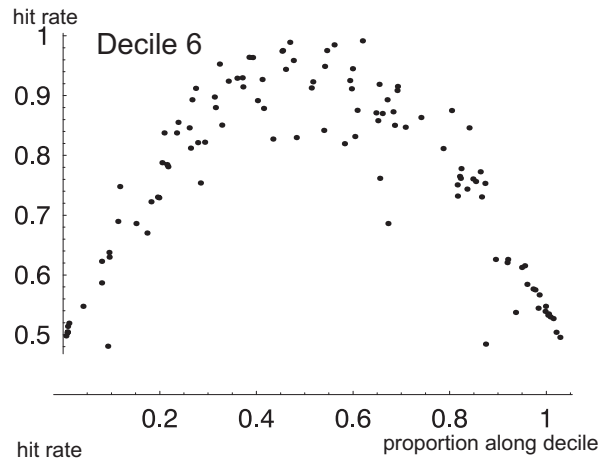
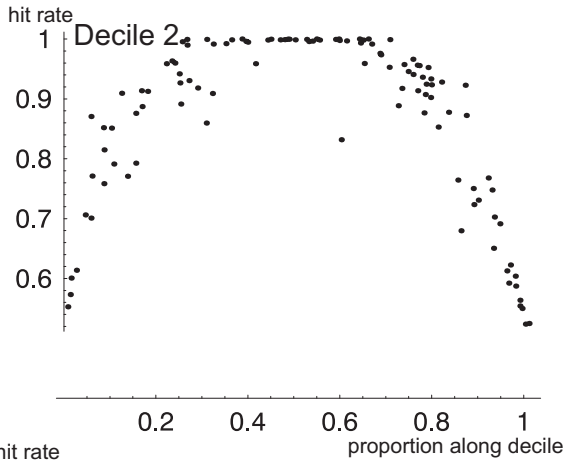


Figure 3 Plots of Decile Hit Rates by Decile, Year 2000

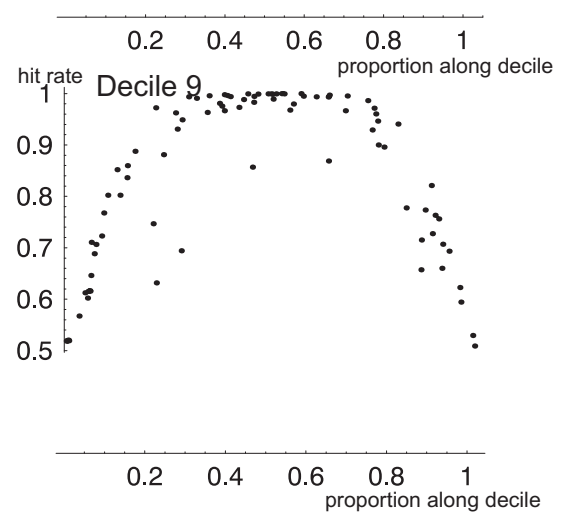
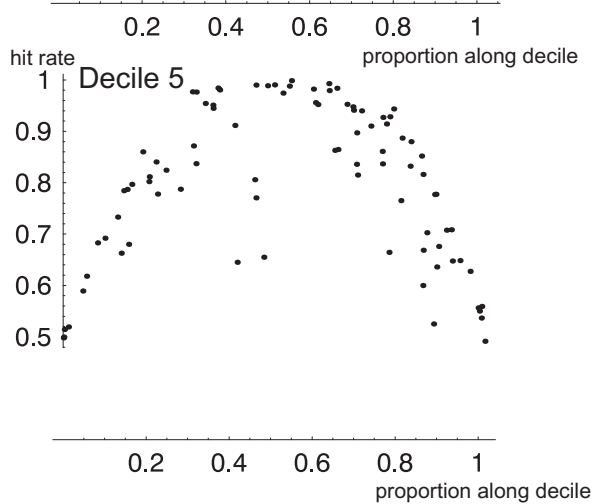
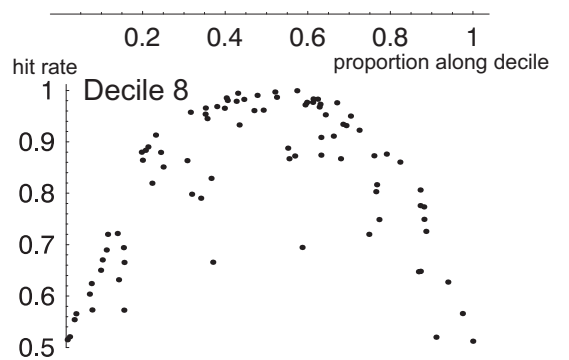
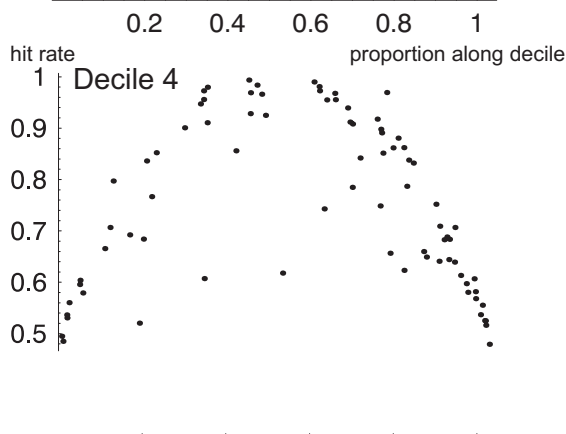
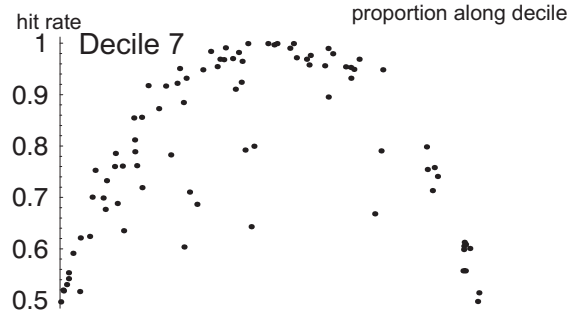
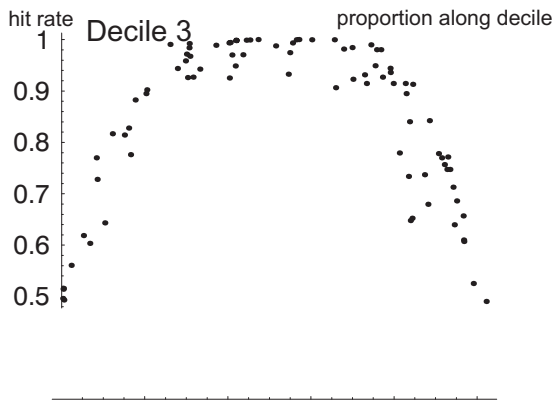
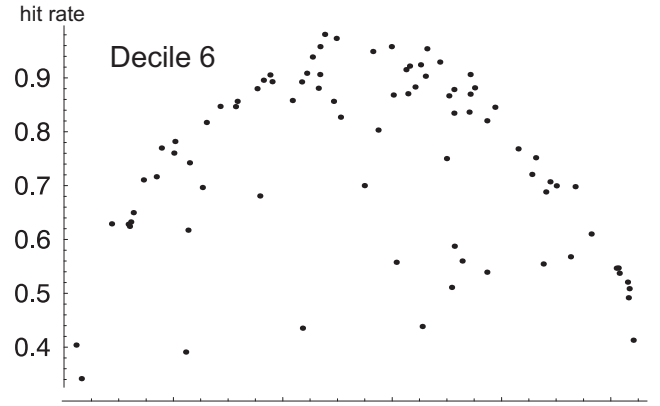
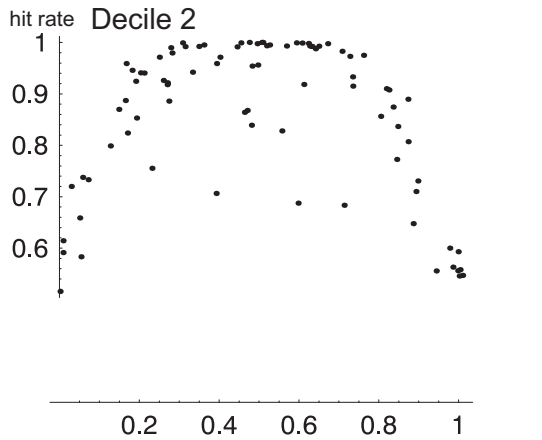
Elementary Schools, Hit Rate for Decile Rank by State Decile



Middle Schools, Hit Rate for Decile Rank by State Decile



High Schools, Hit Rate for Decile Rank by State Decile



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Appendix: Data File Archive

A file in .sasbdat7 format containing the various accuracy quantities from this report along with a readme file for variable definitions can be obtained at

<http://www-stat.stanford.edu/~rag/api/apiacc2k.zip>