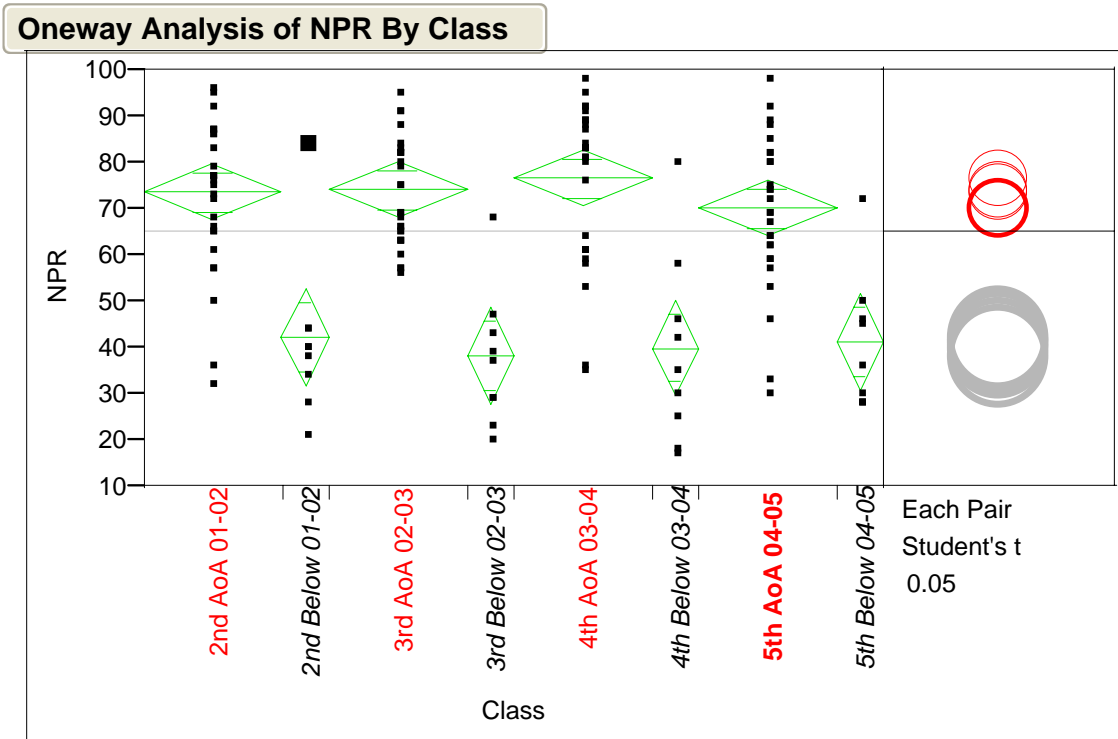


## Longitudinal NPR Analysis

Tim Kassel – August 11, 2005

T-test results, comparing National Percentage Rank scores from one year to the next for the 04-05 5<sup>th</sup> grade class are shown below. No statistically significant difference in the means is detected at 95% confidence for the at-or-above grade level group. The same can be said for the year-after-year means of the below grade level group.



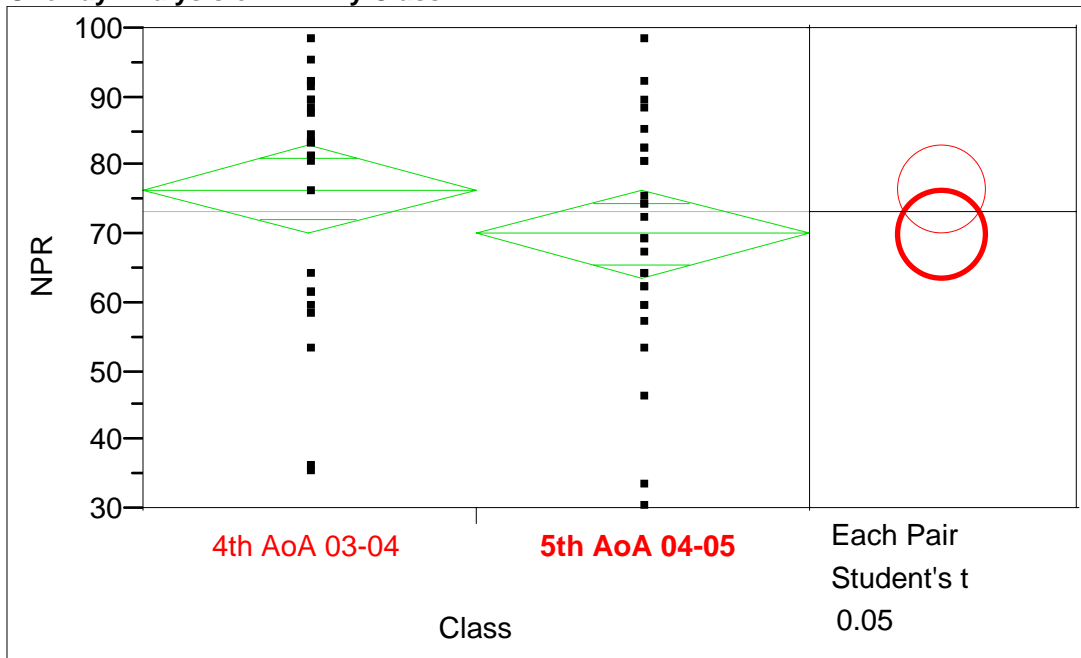
### Means Comparisons

Level		Mean
4th AoA 03-04	A	76.66667
3rd AoA 02-03	A	74.11111
2nd AoA 01-02	A	73.66667
5th AoA 04-05	A	70.074074
2nd Below 01-02	B	42.333333
5th Below 04-05	B	41.333333
4th Below 03-04	B	40.000000
3rd Below 02-03	B	38.222222

Levels not connected by same letter are significantly different

To take a more focused look at the data sets for the 4<sup>th</sup> and 5<sup>th</sup> grade AoA groups, a power analysis is done on the just those two data sets.

**Oneway Analysis of NPR By Class**



**Power Details**

**Power**

Alpha	Sigma	Delta	Number	Power	AdjPower	LowerCL	UpperCL
0.0500	16.93304	3.296296	54	0.2895	0.1617	0.0500	0.9212

**Least Significant Number**

Alpha	Sigma	Delta	Number(LSN)
0.0500	16.93304	3.296296	103.824

**Least Significant Value**

Alpha	Sigma	Number	LSV
0.0500	16.93304	54	9.247813

Here, the Least Significant Value is of interest. This parameter tells us the smallest differential value that could be declared as significant between these sample sets at the current alpha value (confidence level.) Or, for this example, if there is actually a difference in the means, it is likely to be less than 9.3 percentage points... or from another perspective, could be as much as 9.3%.

Larger sample sizes will typically yield finer resolution for LSV. Given the significant difference we saw in advancement rates between these 4<sup>th</sup> and 5<sup>th</sup> grade classes, and the potential significance of a 9% decline in NPR, it is recommended to collect more data for analysis - possibly from the 02-03 4<sup>th</sup> and 03-04 5<sup>th</sup> grade classes if possible. The alternative is to wait for 05-06 data.

Finally, I tested the data sets for normality and generated distribution plots for each class.

The distributions for each class are shown with the below and at-or-above groups shown in red and blue respectively. Adding the two distributions together yields a representation of the entire class, shown in gray.

The smaller the gap between the two reading groups, the more “normal” the combined distribution appears. Stair steps (like the 3rd grade chart) or thick tails to the left (like the 4<sup>th</sup> grade chart) indicate more significant gaps.

The 5<sup>th</sup> grade chart appears return to a more “normal shaped distribution. This may be more due to a recession of the at-or-above group than an improvement of the below group.

Plots like these may be more meaningful on a grade equivalency scale rather NPR so that one could demarcate portion of the distribution that is below grade level.

