

# Grade Equivalency Score Differential Analysis

Tim Kassel - July 26, 2005

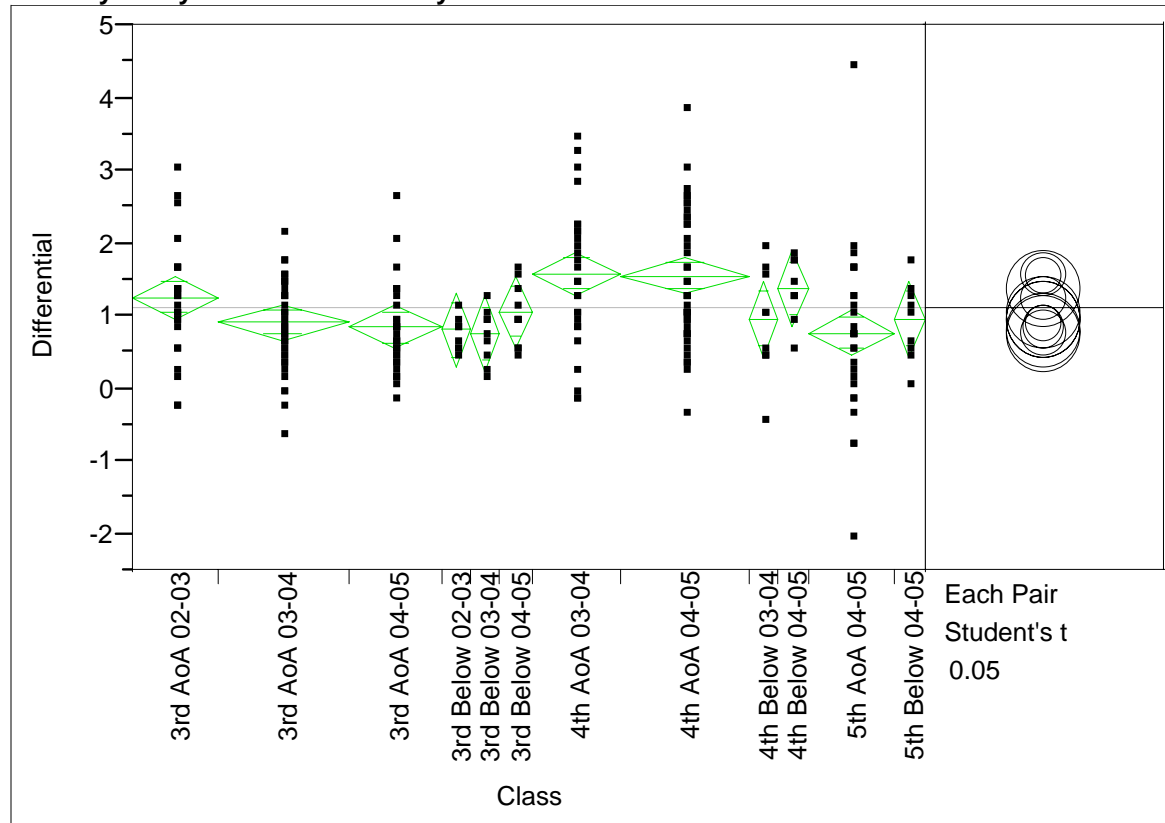
The chart below represents the means comparisons for the grade equivalency differential data provided. The groups are denoted by grade level, reading group and school year. For example, 3<sup>rd</sup> AoA 02-03 is the grade equivalency difference between 2<sup>nd</sup> and 3<sup>rd</sup> grade for students in the 3<sup>rd</sup> grade during the 02-03 school year and grouped at-or-above (AoA) grade level reading competency.

## Interpreting the Chart

The horizontal line represents the grand mean of all the data points (1.12). The diamond shapes on each set of data points are called mean diamonds. The horizontal centerline in each diamond represents the mean for that group. The upper and lower points of each diamond represent the 95% confidence interval for the mean of each group, based on the variation and size of each sample. The actual values for these parameters are given in the table below the chart.

The group of circles to the right is a graphical representation used to display groups with statistically significant differences. However with this many groups, it is difficult to interpret these without live interaction with the software. The *Means Comparisons* table below summarizes the same information.

**Oneway Analysis of Differential By Class**



## Oneway Anova

### Means for Oneway Anova

Level	Number	Mean	Std Error	Lower 95%	Upper 95%
3rd AoA 02-03	27	1.25185	0.15221	0.9520	1.5517
3rd AoA 03-04	40	0.92000	0.12505	0.6736	1.1664
3rd AoA 04-05	29	0.84828	0.14686	0.5589	1.1376
3rd Below 02-03	9	0.81111	0.26363	0.2917	1.3305
3rd Below 03-04	9	0.76667	0.26363	0.2473	1.2861
3rd Below 04-05	10	1.06000	0.25010	0.5673	1.5527
4th AoA 03-04	27	1.58148	0.15221	1.2816	1.8814
4th AoA 04-05	40	1.55250	0.12505	1.3061	1.7989
4th Below 03-04	9	0.96667	0.26363	0.4473	1.4861
4th Below 04-05	9	1.38889	0.26363	0.8695	1.9083
5th AoA 04-05	27	0.77037	0.15221	0.4705	1.0702
5th Below 04-05	9	0.96667	0.26363	0.4473	1.4861

Std Error uses a pooled estimate of error variance

### Means Comparisons

Level				Mean
4th AoA 03-04	A			1.5814815
4th AoA 04-05	A			1.5525000
4th Below 04-05	A	B		1.3888889
3rd AoA 02-03	A	B		1.2518519
3rd Below 04-05	A	B	C	1.0600000
5th Below 04-05		B	C	0.9666667
4th Below 03-04		B	C	0.9666667
3rd AoA 03-04		B	C	0.9200000
3rd AoA 04-05		B	C	0.8482759
3rd Below 02-03		B	C	0.8111111
5th AoA 04-05			C	0.7703704
3rd Below 03-04		B	C	0.7666667

Levels not connected by same letter are significantly different

### What this data is saying:

This data can be used to make a variety of comparisons. All of the following can be said to be true with 95% statistical certainty:

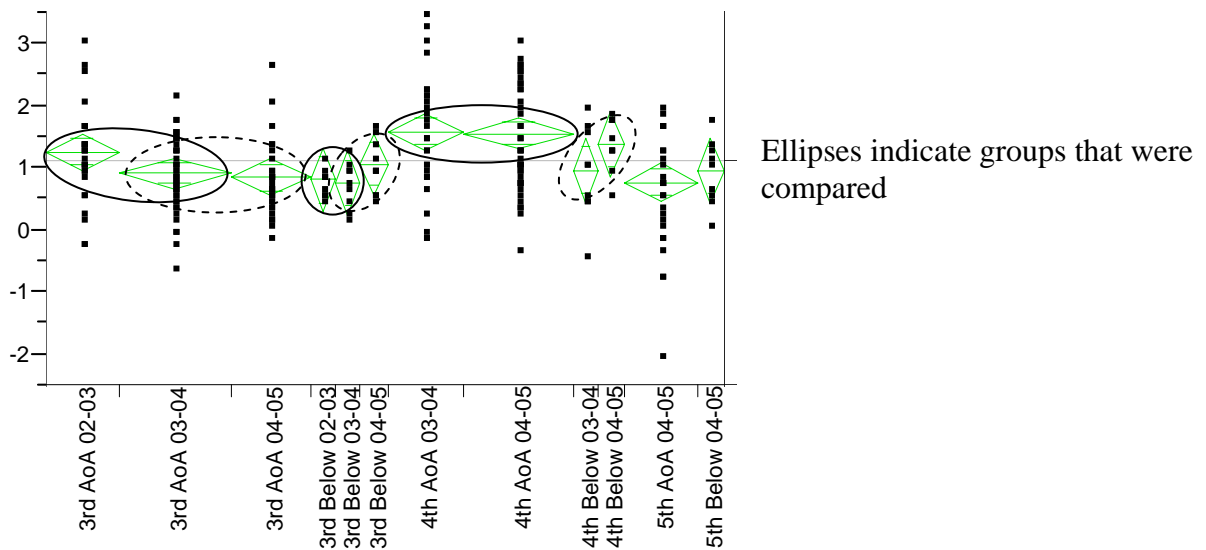
1. Comparing the rate of advancement between “AoA” and “Below” groups at each grade level...

“AoA” group showed greater improvement than “Below” group	No Difference between “AoA” and “Below”	“Below” showed greater improvement than “AoA” group
3rd 02-03	3rd 03-04	
	4th 03-04	
	3rd 04-05	
	4th 04-05	
	5th 04-05	

For the 3<sup>rd</sup> grade class of 02-03, the “AoA” group advanced more than the “Below” group in grade equivalency. Since then, there has been no statistically significant difference in the advancement rates between the two groups.

2. Year after year comparison of advancement within the same grade level - i.e. comparing the advancement of the 3<sup>rd</sup> grade “AoA” group of 03-04 to that of the 3<sup>rd</sup> grade “AoA” group of 04-05.

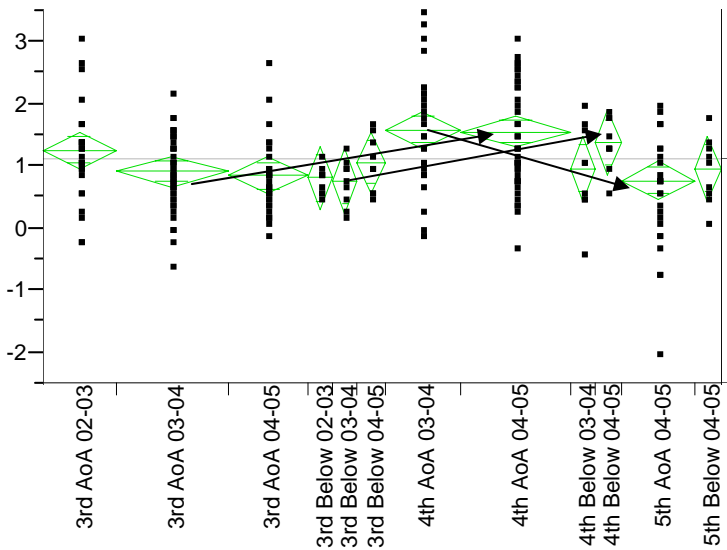
	02-03 to 03-04	03-04 to 04-05
3rd “AoA”	no diff.	no diff.
4th “AoA”		no diff.
3rd “Below”	no diff.	no diff.
4th “Below”		no diff.



This result indicates that there has been no significant difference in the advancement rates between one 3<sup>rd</sup> group class to the next, or between one 4<sup>th</sup> grade group and the next.

3. Longitudinal tracking of the same group of students as they progress from one grade to the next.

		3rd to 4th	4th to 5th
"AoA"	Beginning 02-03	no diff.	declined
	Beginning 03-04	improved	
"Below"	Beginning 02-03	no diff.	no diff.
	Beginning 03-04	improved	

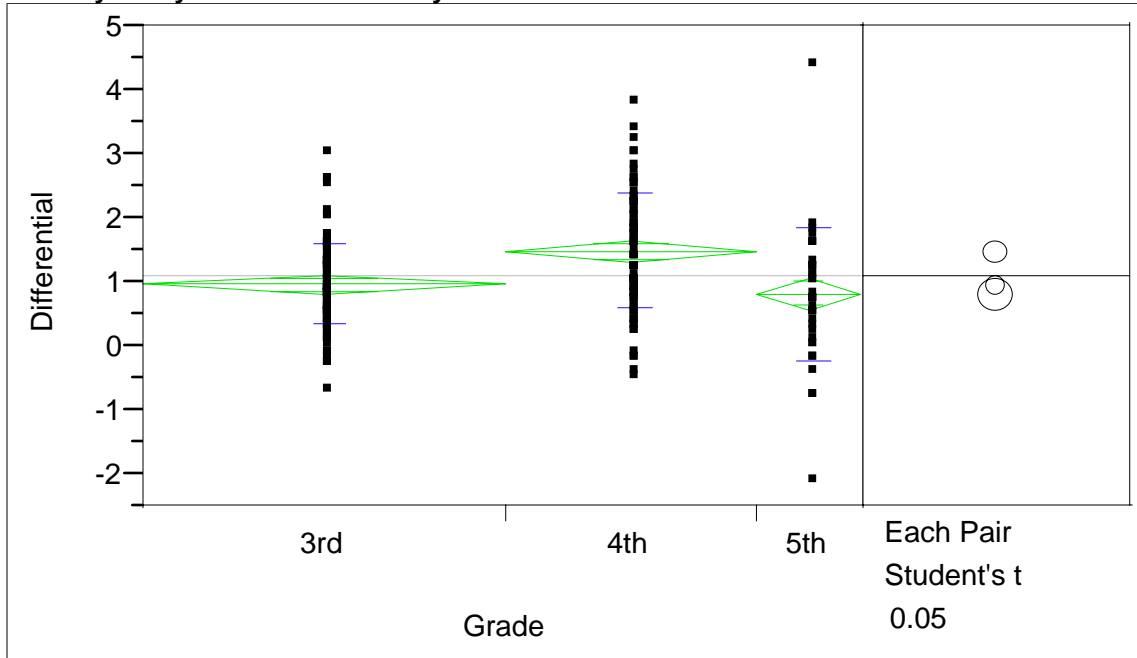


There was a statistically significant improvement in the advancement rates for the entire 04-05 4<sup>th</sup> grade class. There was also a statistically significant decline in the advancement rates for the 04-05 5<sup>th</sup> grade "AoA" group.

**Non-Reading Group Related Observations**

From the graphical results above, there appears to be a consistent peak in advancement rates in the 4<sup>th</sup> grade across most years and groups. To confirm this statistically, another analysis was performed to compare the overall results of each grade level across all years and groups.

**Oneway Analysis of Differential By Grade**



**Oneway Anova  
Means Comparisons**

Level			Mean
4th	A		1.4823529
3rd		B	0.9677419
5th		B	0.8194444

Levels not connected by same letter are significantly different

**Ordered Differences**

Level	- Level	Difference	Lower CL	Upper CL	Difference
4th	5th	0.6629085	0.352176	0.9736410	
4th	3rd	0.5146110	0.294568	0.7346540	
3rd	5th	0.1482975	-0.147540	0.4441346	

This result indicates a significant increase in advancement rates at the 4<sup>th</sup> grade level over the 3<sup>rd</sup>, and then a significant decline at the 5<sup>th</sup> grade level. The ordered differences table indicates that the decline that occurs at the 5<sup>th</sup> grade level may actually exceed the increase that occurs at the 4<sup>th</sup> grade level.