INDIVIDUAL DIFFERENCES
OR
INDIVIDUAL DIFFERENCE

Dr. Gerald Tindal

College of Education

University of Oregon

Marshall McLuhanisms

Why is it so easy to acquire the solutions of past problems and so difficult to solve current ones?

The answers are always inside the problem, not outside.

Mud sometimes gives the illusion of depth.

You mean my whole fallacy's wrong?

I may be wrong, but I'm never in doubt.

The National Assessment Program - Literacy and Numeracy

- Federal Education Minister Simon Crean said 90 per cent of students are at or above the national minimum standard in "almost all areas tested".

- "We are beginning to see the benefits of national testing in literacy and numeracy. NAPLAN exposes our school system to the light and allows us to identify where things are going well - and more importantly - it helps to identify the areas of under-performance which demand further attention."

- The Minister said the NAPLAN data was useful for assessing success in improving the levels of literacy and numeracy among WA school students, but was best used in conjunction with a range of assessment methods to plan effective numeracy and literacy programs.

- http://www.perthnow.com.au/news/western-australia/wa-ranks-poorly-in-national-test/story-e6frg13u-1225917391872

Latest Results

NAPLAN Year 3 Reading

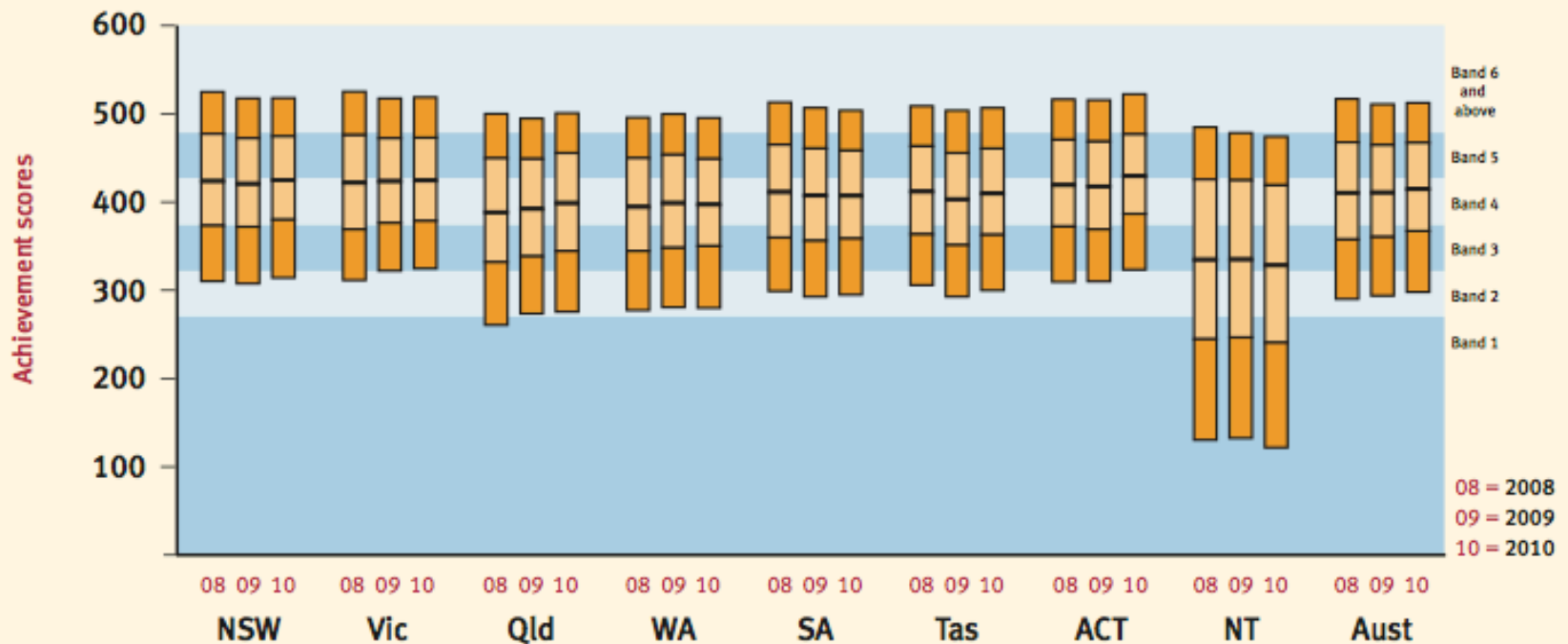Figure 1a: Achievement of Year 3 Students in Reading, by State and Territory, 2010.

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Aust
Mean scale score/(S.D.)	421.7 (81.6)	430.7 (77.7)	392.7 (79.5)	398.9 (85.8)	401.6 (79.2)	414.1 (87.8)	438.9 (83.0)	328.2 (121.7)	414.3 (83.4)

Results Over Time

NAPLAN Year 3 Writing

Figure 5b: Achievement of Year 3 Students in Writing, by State and Territory, 2008–2010.

An Assumption: Standardization

- Test administration of tests –most public and visible aspect of testing.

- Much of the standardization of testing conditions relates to the quality of test administration...

- Standardization is a common method of experimental control for all tests.

- Every test (and each question or stimulus within each test) can be considered a mini experiment (van der Linden & Hambleton, 1997).

- The test administration conditions – standard time limits, procedures to ensure no irregularities, environmental conditions conducive to test taking, and so on – all seek to control extraneous variables in the "experiment" and make conditions uniform and identical for all examinees.

- Without adequate control of all relevant variables affecting test performance, it would be difficult to interpret examinee test scores uniformly and meaningfully (Downing, 2006, p.15).

An Aside: Accommodations

- Test Administration Authorities are responsible for the implementation and administration of the NAPLAN tests in their jurisdiction. Permission for variation of dates for testing, for use of scribes and other special provisions must be sought from the Test Administration Authority and approval received by schools prior to the national test period.

Measures of Change – Two Views

- Norm-referenced AND individual-referenced distributions

- Use in resource allocation at group and individual level

- Related to other measures

- Potential for connecting intercept and slope

- Sensitive to interventions

- Fosters development of causal inferences

Individual Differences

- Sir Francis Galton

Oral Reading Fluency

2002 NAEP Assessment

Figure 2-2. Average reading scale scores in relation to the achievement levels, by degree of reading accuracy, grade 4: 2002
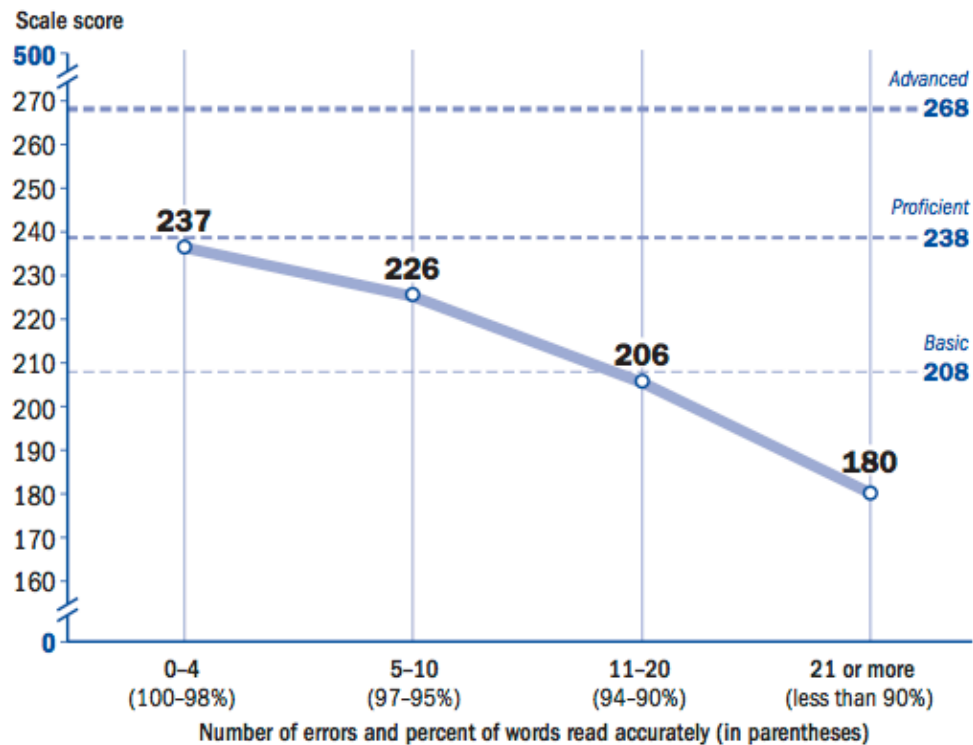
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Oral Reading Study.

2002 NAEP Assessment

Figure 2-6. Average reading scale scores in relation to the achievement levels, by degree of reading accuracy when only counting meaning-change errors, grade 4: 2002
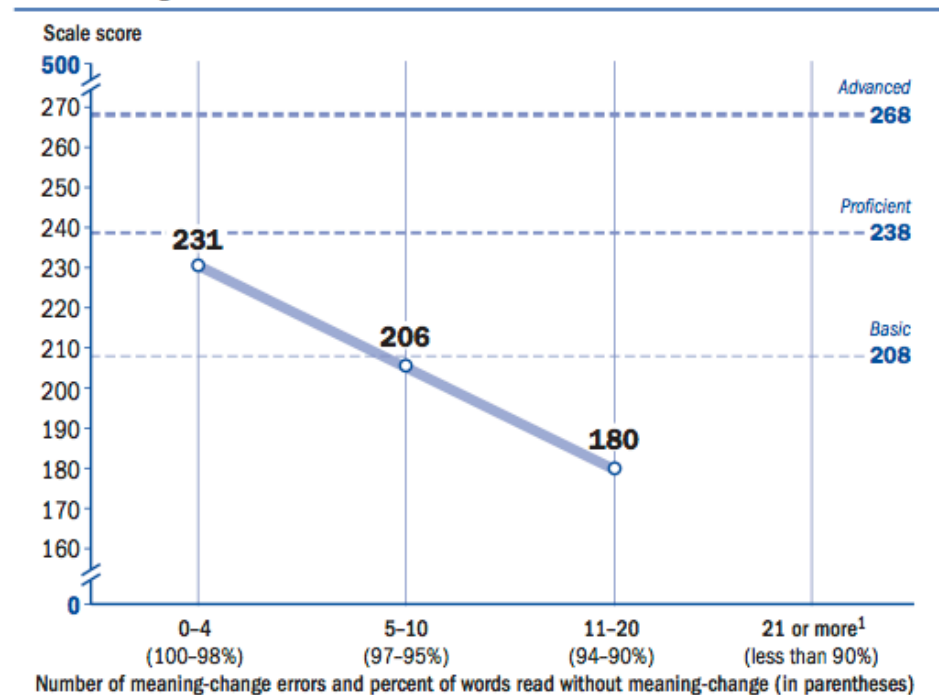
[1] Sample size was insufficient to permit a reliable estimate for students with 21 or more errors that resulted in a change of meaning.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Oral Reading Study.

2002 NAEP Assessment

Figure 3-2. Average reading scale scores in relation to the achievement levels, by average number of words read per minute, grade 4: 2002
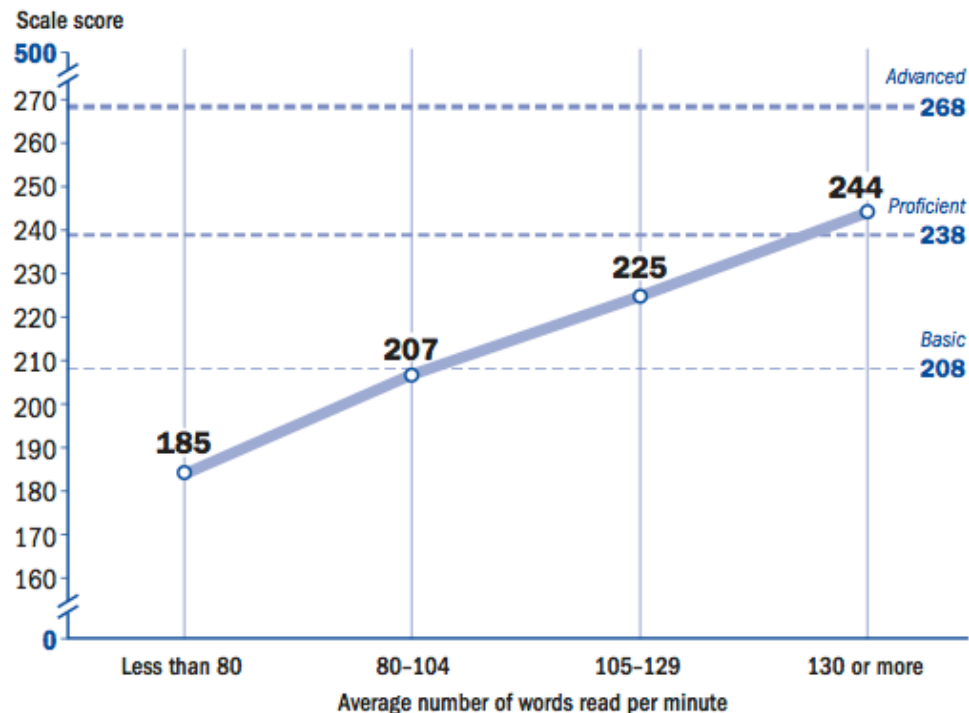
NOTE: The oral reading study passage comprises 198 words.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Oral Reading Study.

2002 NAEP Assessment

Figure 3-5. Percentage of students, by number of words read in the first minute of oral reading and average number of words read per minute, grade 4: 2002
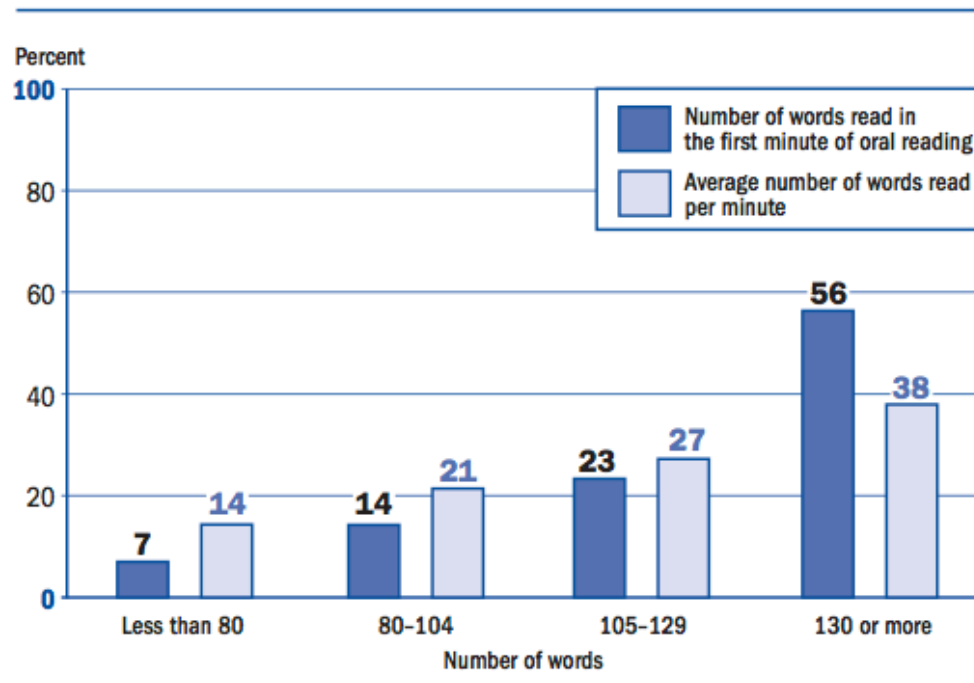
NOTE: Detail may not sum to totals because of rounding. The oral reading study passage comprises 198 words.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Oral Reading Study.

2002 NAEP Assessment

Figure 3-6. Average reading scale scores in relation to the achievement levels, by number of words read in the first minute of oral reading, grade 4: 2002
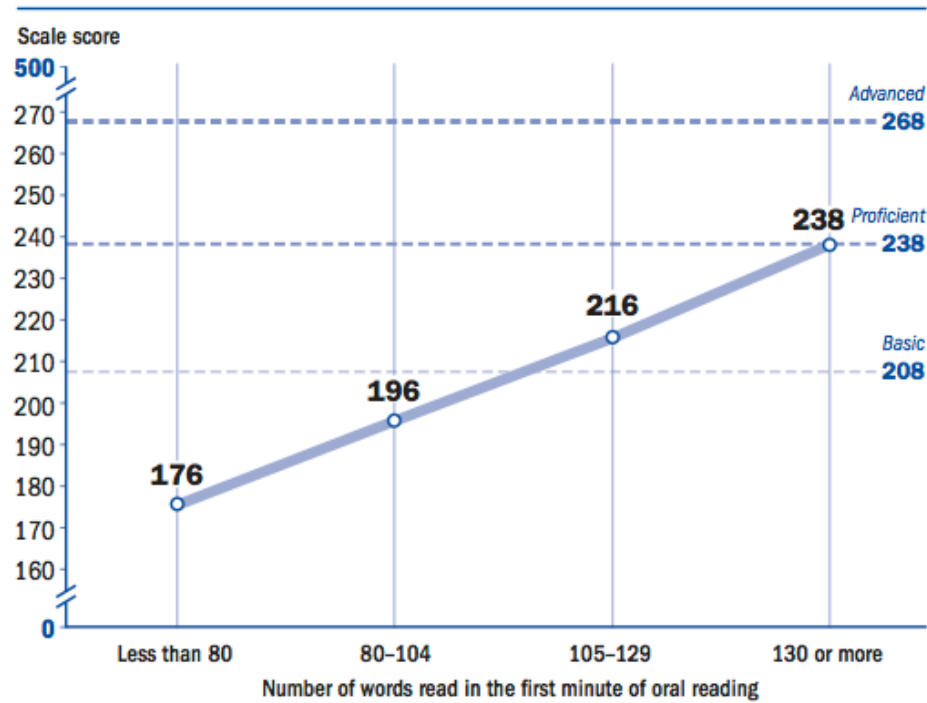
NOTE: The oral reading study passage comprises 198 words.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Oral Reading Study.

2002 NAEP Assessment

Figure 4-3. Average reading scale scores in relation to the achievement levels, by NAEP reading fluency scale level, grade 4: 2002
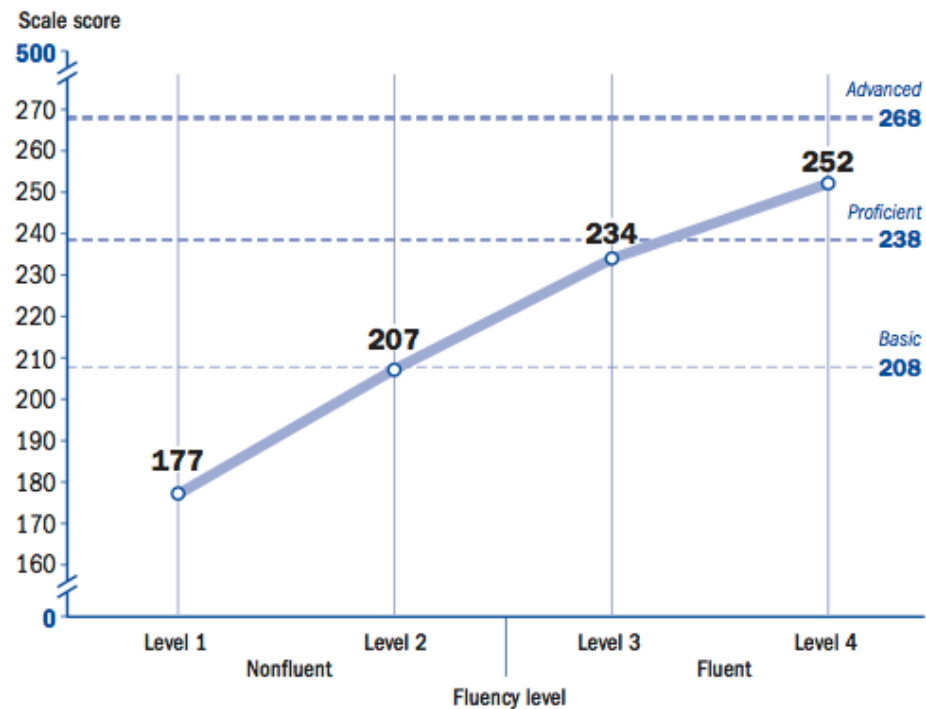
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2002 Oral Reading Study.

Standards

Grade:	1	2	3	4	5	6	7	8
Words/ Second	1.5	1.8	2.1	2.4	2.8	3.2	3.6	4.0
Words/ Minute	90	108	126	144	168	192	216	240

Norms Reported by Starch in 1915

Grade:	2	3	4	5
Words/Minute	94	114	118	128

Hasbrouck and Tindal in 1992

Grade:	1	2	3	4	5	6	7	8
Words/ Minute	59	89	107	125	138	150	150	150

In the 2002 NAEP study, the fourth-graders' (n=1,779) average reading rate across the entire passage was **119** words per minute.

Hasbrouck and Tindal in 2005

TABLE 1
Oral reading fluency norms, grades 1-8

Grade	Percentile	Fall WCPM	Winter WCPM	Spring WCPM
1	90		81	111
	75		47	82
	50		23	53
	25		12	28
	10		6	15
	SD		32	39
	Count		16,950	19,434
2	90	106	125	142
	75	79	100	117
	50	51	72	89
	25	25	42	61
	10	11	18	31
	SD	37	41	42
	Count	15,896	18,229	20,128
3	90	128	146	162
	75	99	120	137
	50	71	92	107
	25	44	62	78
	10	21	36	48
	SD	40	43	44
	Count	16,988	17,383	18,372
4	90	145	166	180
	75	119	139	152
	50	94	112	123
	25	68	87	98
	10	45	61	72
	SD	40	41	43
	Count	16,523	14,572	16,269
5	90	166	182	194
	75	139	156	168
	50	110	127	139
	25	85	99	109
	10	61	74	83
	SD	45	44	45
	Count	16,212	13,331	15,292
6	90	177	195	204
	75	153	167	177
	50	127	140	150
	25	98	111	122
	10	68	82	93
	SD	42	45	44
	Count	10,520	9,218	11,290
7	90	180	192	202
	75	156	165	177
	50	128	136	150
	25	102	109	123
	10	79	88	98
	SD	40	43	41
	Count	6,482	4,058	5,998
8	90	185	199	199
	75	161	173	177
	50	133	146	151
	25	106	115	124
	10	77	84	97
	SD	43	45	41
	Count	5,546	3,496	5,335

WCPM: Words correct per minute
SD: Standard deviation
Count: Number of student scores

An Example of ORF and OSA Grade 3

Regression Plot
Inclusion criteria: Gr3 from   FS_Gr345_OSAMergev4.sv

ORF_CW

Y = 201.046 + .197 * X; R^2 = .37

An Example of ORF and OSA Grade 8

Regression Plot
Inclusion criteria: Gr8 from   FS_Gr678_OSAMergev4.sv

$Y = 213.18 + .18 * X; R^2 = .393$

easy CBM
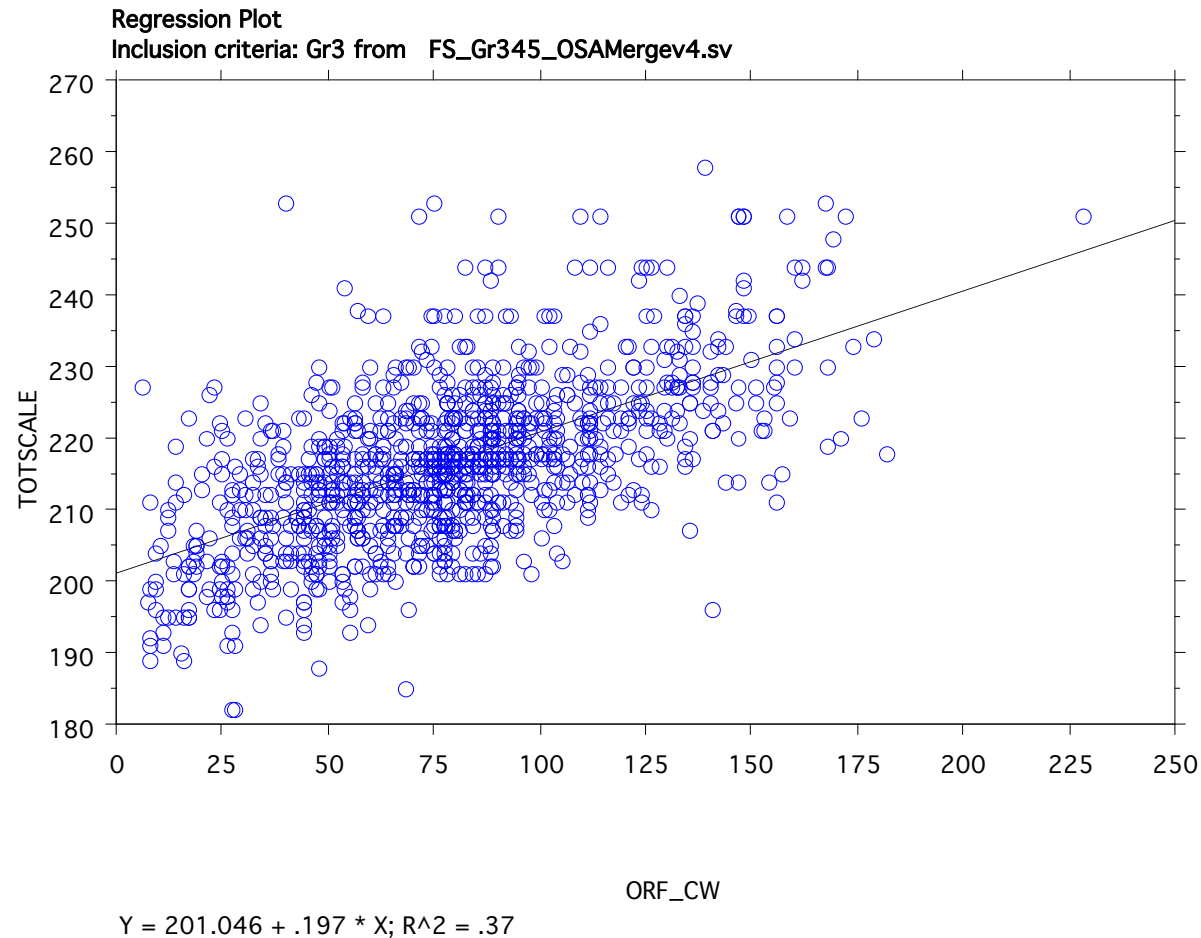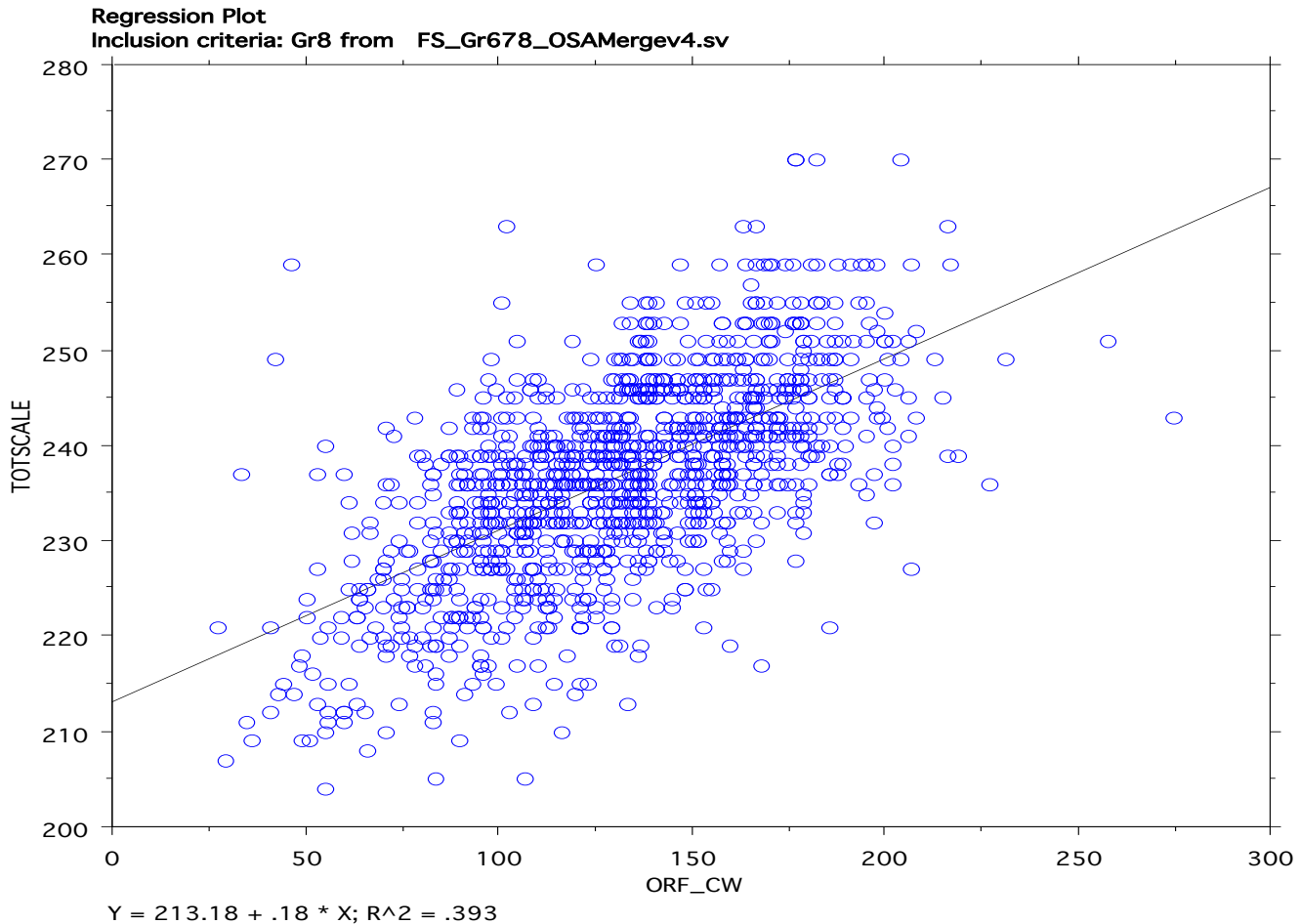
| Home | Students | Measures | Reports | | Account |

Welcome tealy!

Select which area you would like to view or update.

Students
Enter new students or edit your current list,
grouping them by grade, class, period or subject.

Measures
Download and print measures, then enter scores
online.

Reports
View and analyze your students' tests, progress
and scoring.

Account
Change your password or edit any information
associated with your account.

Training
Learn how to administer and score the measures
used by easyCBM.

Oral Reading Fluency

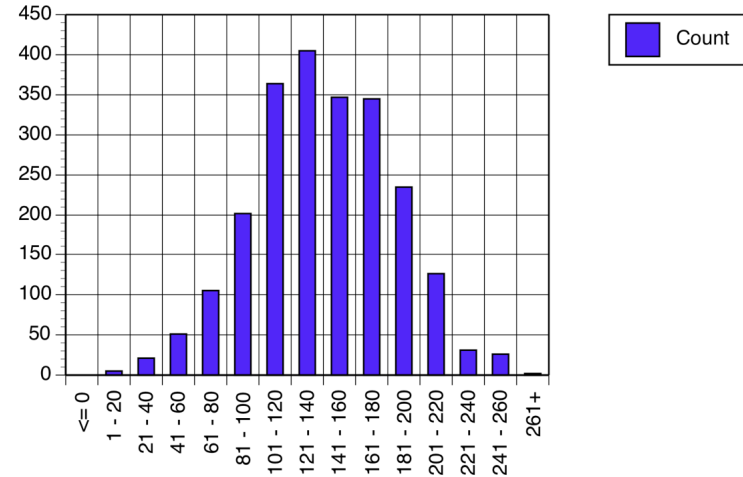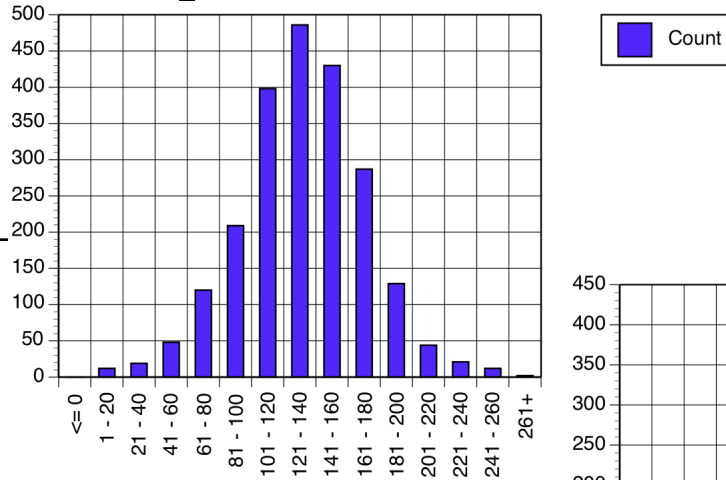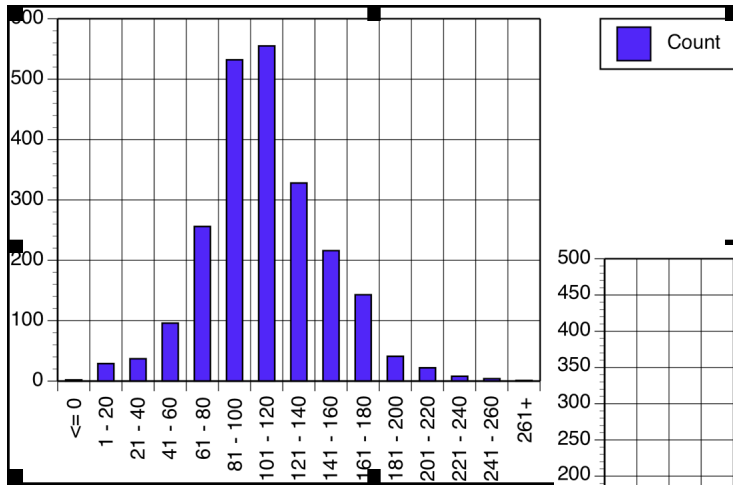| Last Name	Grade	Gender	Disab. Code	Ethnic	Fall PRF	Fall Vocab	Fall MCRC	Fall Factor	Fall Risk Category	Spring PRF	Spring Vocab	Spring MCRC	Spring Factor	Spring Risk Category
1	5	F		3	159	18	18	1	L	185	22	16	0	L
2	5	M		1	184	22	16	0	L	192	23	16	0	L
7	5	M		1	184	16	14	2	S	186	22	16	0	L
8	5	M	50	1	210	23	17	0	L	181	22	16	0	L
9	5	M		1	118	20	15	1	L	168	23	16	0	L
16	5	F		3	162	15	12	4	H	178	24	16	0	L
17	5	F		1	168	20	14	1	L	199	22	18	0	L
21	5	M		1						199	21	15	1	L
22	5	F		1	147	20	18	0	L	185	20	17	1	L
23	5	F		1	155	18	11	3	S	183	20	18	1	L
24	5	M		1	137	20	6	2	S	160	21	15	1	L
25	5	F		3	179	15	13	3	S	207	22	14	1	L
26	5	M		1	139	17	15	1	L	145	21	16	1	L
27	5	M		1						215	19	17	1	L
28	5	F		3	155	20	13	1	L	179	24	15	1	L
40	5	F		1	130	18	16	2	S	146	20	19	2	S
41	5	F		1	106	16	12	5	H	130	22	16	2	S
42	5	M	50	1	142	18	15	1	L	175	19	14	2	S
43	5	M		3	124	18	16	2	S	105	23	17	2	S
44	5	M		1	138	21	15	0	L	168	17	17	2	S
45	5	F		1	155	22	13	1	L	170	20	14	2	S
46	5	F		3						178	18	15	2	S
50	5	M	50	1	115	13	5	5	H	155	19	14	3	S
51	5	F	90	1	149	15	9	4	H	152	18	15	3	S
52	5	F		3	127	15	11	5	H	157	18	13	3	S
53	5	F	50	3						141	16	15	4	H
54	5	F		1	143	11	9	4	H	157	12	10	4	H
55	5	M		1	132	18	6	4	H	147	12	15	4	H
56	5	F	50	1	149	12	13	3	S	195	16	13	4	H
57	5	M	50	3	103	9	12	6	H	138	19	13	4	H
58	5	M	90	1	131	11	15	3	S	120	20	14	4	H
59	5	M		1	126	14	8	5	H	160	17	8	4	H
60	5	M		1						134	18	13	4	H

Note. Red represents the strategic group, students below the 10th percentile rank (PR). Yellow represents the intensive group, students between the 11th and 30th PR. Green represents the on track group, students above the 30th PR.

Broad Causal Inference

Teacher Report

Student Name	Fall Risk	Winter Risk	Change	Winter Risk	Spring Risk	Change	Fall Risk	Spring Risk	Change
Horton, Billy	2	1	1↓	1	1	-	2	1	1↓
Scott, Annabell	5	3	2↓	3	2	1↓	5	2	3↓
Sofasa, Jimmy	3	4	1↑	4	3	1↓	3	3	-
...	...	...	...	...	...	...	...	...	...

Building/District Report

Grade 3 Risk Ratings	Fall Count	Winter Count	Change	Winter Count	Spring Count	Change	Fall Count	Spring Count	Change
Risk 0 (Low)	34%	36%	2%↑	36%	40%	4%↑	34%	40%	6%↑
Risk 1 (Low)	18%	21%	3%↑	21%	17%	4%↓	18%	17%	1%↓
Risk 2 (Some)	10%	12%	2%↑	12%	14%	2%↑	10%	14%	4%↑
Risk 3 (Some)	13%	10%	3%↓	10%	9%	1%↓	13%	9%	4%↓
Risk 4 (High)	11%	9%	2%↓	9%	10%	1%↑	11%	10%	1%↓
Risk 5 (High)	8%	7%	1%↓	7%	5%	2%↓	8%	5%	3%↓
Risk 6 (High)	6%	5%	1%↓	5%	5%	-	6%	5%	1%↓

Toggle options for: (Total | Percentage) and (Intact | Cohort)

Specific Causal Inferences

Group Passage Reading Fluency Performance (Only shown for groups of 10 students or less)
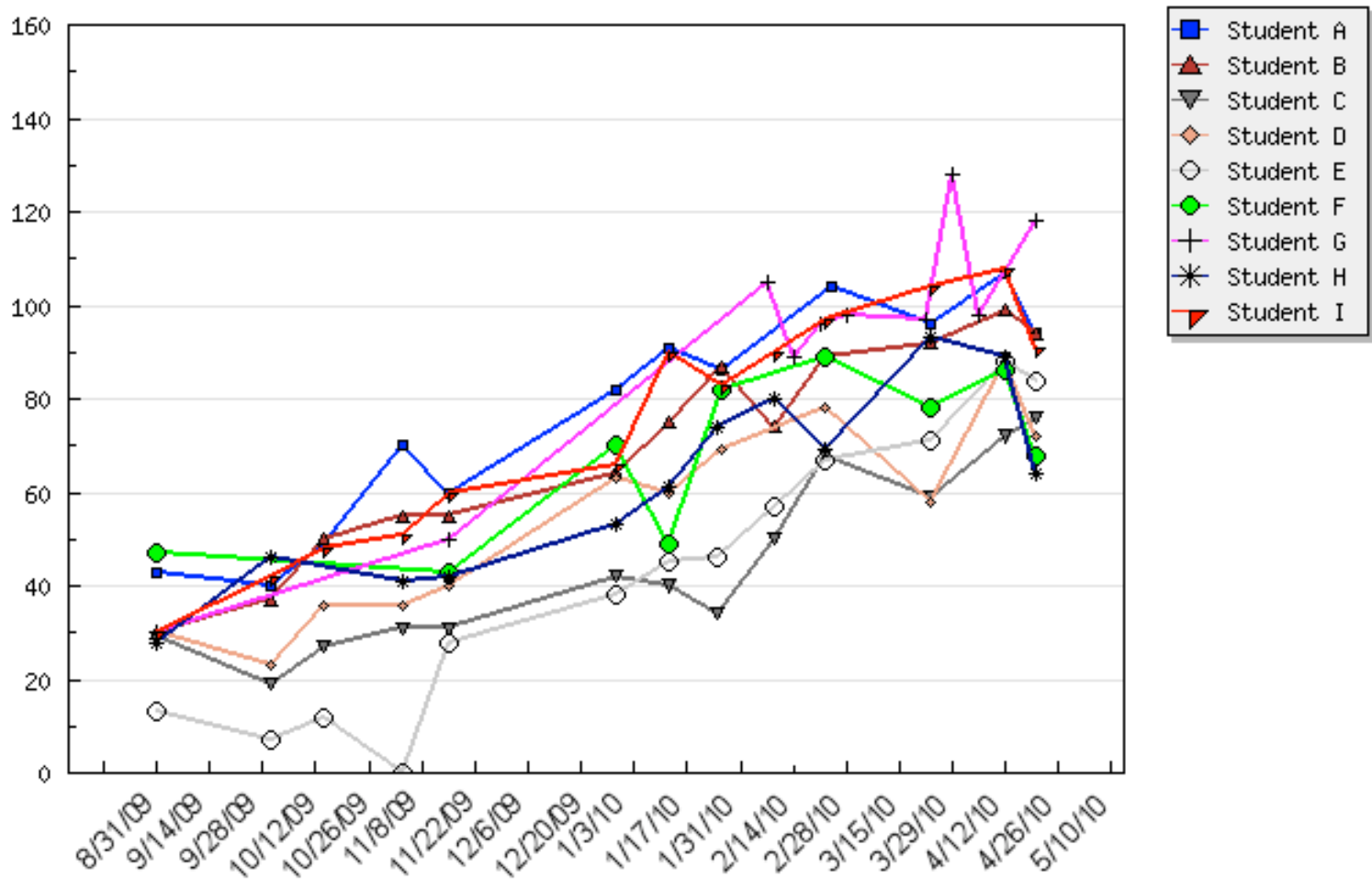
Connecting Individual Differences with Making an Individual Difference

- **Level-1 (Measurement Occasion):**

  - $Y_{tij} = \pi_{0ij} + \pi_{1ij}(time) + e_{tij}$

- Level 1 is the Outcome (Achievement) for each student in each measurement occasion in each school = <u>Intercept</u> for a given student within a given school (starting point) at Time 0 + <u>Slope</u> for a given student within a given school + <u>Leftover</u> that is not explained (for the one students and from other variables not considered and error)
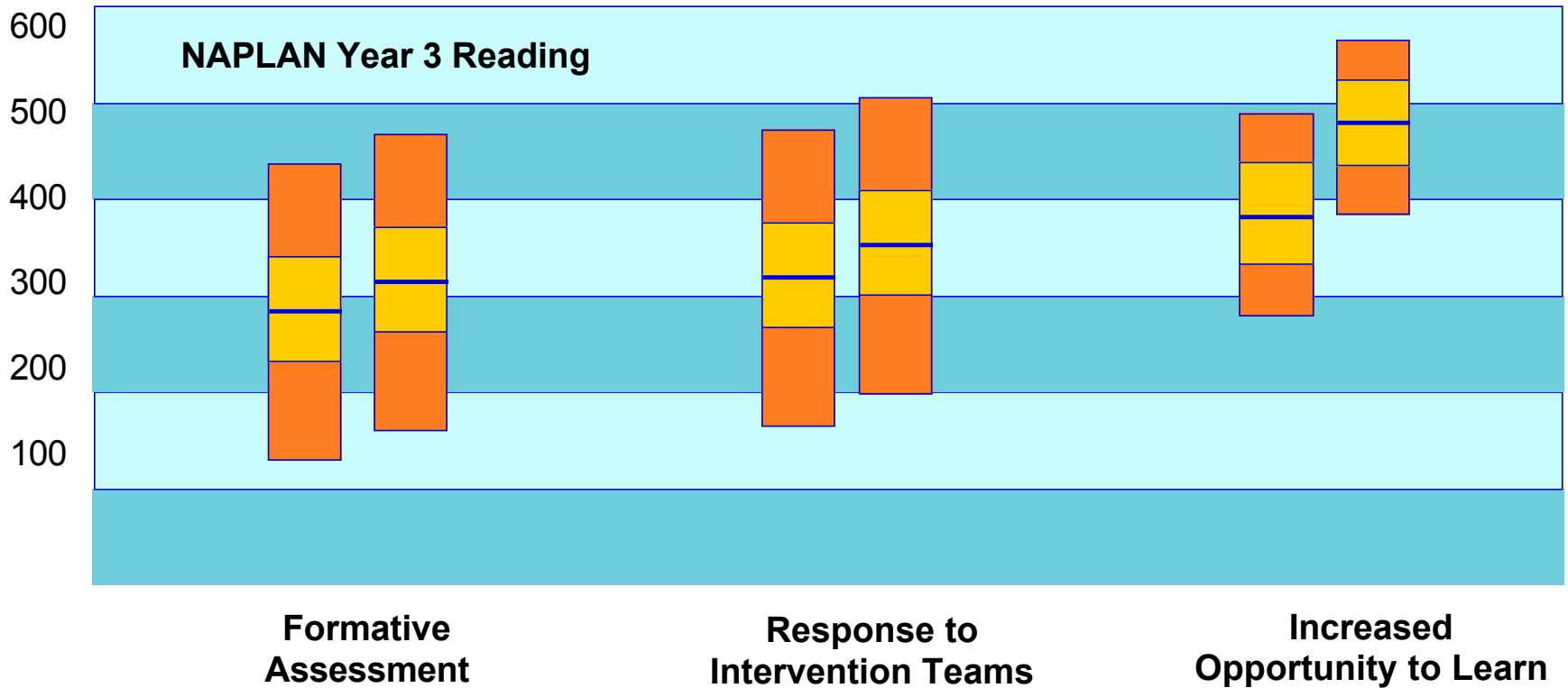
Connecting Individual Differences with Making an Individual Difference

- *Level-2 (Students):*
  - $\pi_{0ij} = \beta_{p0j} + \beta_{pij}(a_{Pij}) + r_{0ij}$
  - $\pi_{1ij} = \beta_{p1j} + \beta_{pij}(a_{Pij}) + r_{1ij}$

- Level 2 Intercept (across students) = <u>Average **Intercept**</u> at Time 0 across all students + <u>Other predictors of all students' Intercept</u> (race-ethnicity, gender, etc.) + <u>Leftover</u> that is not explained (from other variables not considered and error)

- Level 2 Slope (across students) = <u>Average **Slope**</u> across all students + <u>Other predictors of all students' Slope</u> (race-ethnicity, gender, etc.) + <u>Leftover</u> that is not explained (from other variables not considered and error)

Connecting Individual Differences with Making an Individual Difference

- *Level-3 (Schools):*

  - $\beta_{p0j} = \gamma_{000} + \gamma_{pqs}(W_{sj}) + u_{00j}$

  - $\beta_{p1j} = \gamma_{pq1} + \gamma_{pqs}(W_{sj}) + u_{10j}$

- Level 3 Intercept (across schools) = <u>Average **Intercept** </u> at Time 0 across all schools + <u>Other predictors of all schools' Intercept </u>(RTI, PD OTL, etc.) + <u>Leftover </u>that is not explained (from other variables not considered and error)

- Level 3 Slope (across all schools) = <u>Average **Slope** </u>across all schools + <u>Other predictors of all schools' Slope </u>(RTI, PD OTL, etc.) + <u>Leftover </u>that is not explained (from other variables not considered and error)

Latest Results - Revised

NAPLAN Year 3 Reading

Formative Assessment

Response to Intervention Teams

Increased Opportunity to Learn

http://www.brtprojects.org

http://easycbm.com