



A Vertical Mathematics Curriculum for Gifted Primary Students

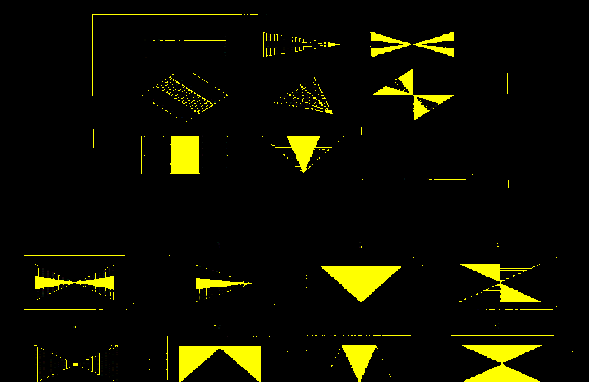
Maree Ryan
Faculty of Educational Psychology
The University of Melbourne



1. Introduction



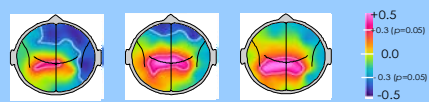

2. Study Method and Design

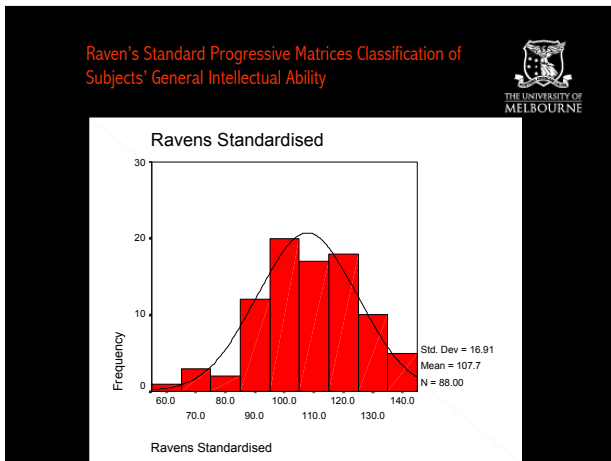
Raven's Matrices




CORRELATION BETWEEN SSVEP AMPLITUDE AND WAIS-R FULL-SCALE IQ
Raven Advanced Progressive Matrices
n=31

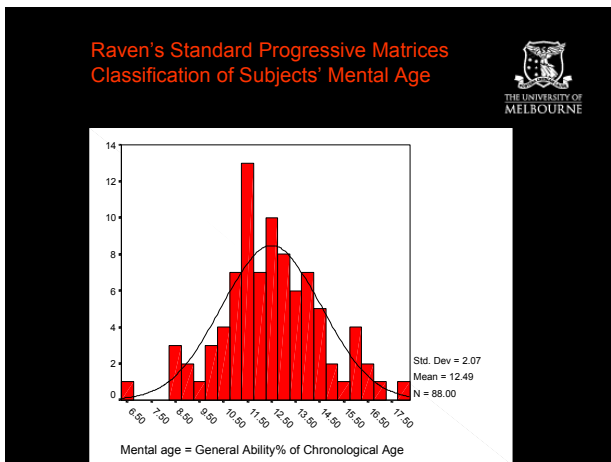
Easy Trials Medium Trials Difficult Trials





Raven's Standard Progressive Matrices Classification of Subjects' General Intellectual Ability

Classification of Raven's Groups	Raven's Standardised Scores	n	Mean	SD
Gifted	≥ 130	11	133.64	3.64
Bright	110-129	33	116	6.46
Average	90-109	30	100.70	5.32
Low Average	70-89	12	83.33	5.37
Low	69 or less	2	66	2.83




PATMath Criteria for Classification into Grade and CSF Levels

PATMath Scaled Scores Test 1	PATMath Scaled Scores Test 2	PATMath Scaled Scores Test 3	Classification CSF Level / National Profiles Level	Grade Classification
		70 - 78	CSF 5 consolidating	Yr. 8
		60 - 69	CSF 5 emerging	Yr. 7
	63 - 72	50 - 59	CSF 4 consolidating	Grade 6
60 - 69	53 - 62	40 - 49	CSF 4 emerging	Grade 5
50 - 59	43 - 52	0 - 39	CSF 3 consolidating	Grade 4
40 - 49	33 - 42		CSF 3 emerging	Grade 3
30 - 39	0 - 32		CSF 2 consolidating	Grade 2
0 - 29			CSF 2 emerging	Grade 1

Vertical Curriculum Mathematics Clinics


Mathematics Clinic	CSF Level	Equivalent Grade	Number	Ability Groups
5. R. Clinic	5 emerging	Year 7	20	10 Gifted, 9 Bright, 1 Average
4. O. Clinic	4 consolid.	Grade 6	17	1 Gifted, 10 Bright, 5 Average, 1 Low
3. M. Clinic	4 emerging	Grade 5	22	10 Bright, 9 Average, 2 Low Average, 1 Low
2. H. Clinic	3 consolid.	Grade 4	17	3 Bright, 10 Average, 4 Low Average
1. C. Clinic	2 consolid.	Grade 4 & below	12	1 Bright, 5 Average, 6 Low Average

- ### Progress was measured in three ways:
- Absolute Gain (AG):** Final (December) PATMath Scaled Score – Initial (February) PATMath Scaled Score
 - Initial Gain (IG):** Absolute Gain divided by Initial Score (expressed as a percentage)
 - Relative Gain (RG):** Absolute Gain divided by Maximum Possible Gain Score (100% - February score) (expressed as a percentage)

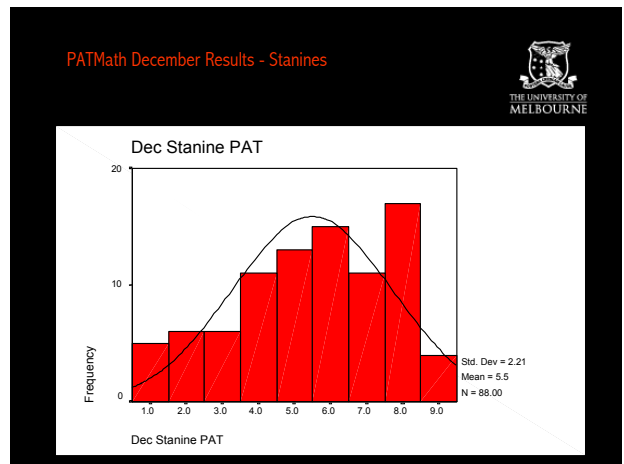
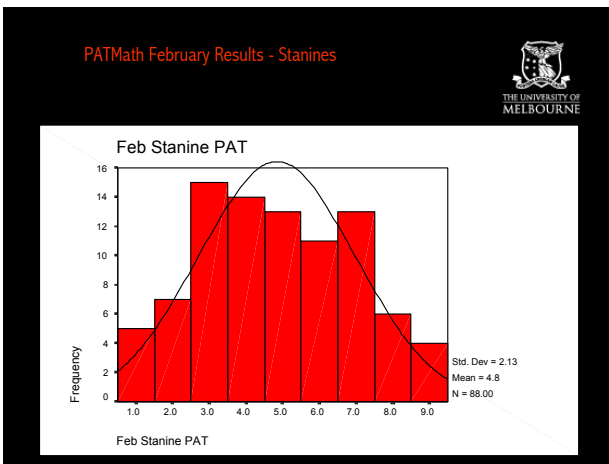


Three main research questions of interest:

- Did the vertical curriculum cohort make significant progress in mathematics during the year?
- Did any of the vertical curriculum Clinics make relatively greater progress compared with the other Clinics?
- Did the Gifted students across the Clinics make relative greater progress compared with the students in the other Ability Groups?



3. Results



PATMath Absolute Gains for Clinics




Clinic	n	SD
R (Year 7)	20	4.22
O (Grade 6)	17	6.43
M (Grade 5)	22	6.96
H (Grade 4)	17	7.84
C (Std 4 & below)	12	5.86
Cohort	88	6.91

ANOVA of PATMath Absolute Gain for Clinics

Source of Variation	SS	df	MS	F	p
Between groups	776.24	4	194.06	4.76	.002**
Within groups	3383.37	83	40.76		
Total	4159.62	87			

PATMath Initial Gain Scores for Mathematics Clinics



Clinic	n	SD
R (Year 7)	20	6.855
O (Grade 6)	17	11.64
M (Grade 5)	22	13.42
H (Grade 4)	17	16.53
C (G 4 & below)	12	15.65
Cohort	88	14.60

ANOVA of PATMath IG Scores for Mathematics Clinics

Source of Variation	SS	df	MS	F	p
Between groups	4649.00	4	1162.25	6.933	.000***
Within groups	13913.36	83	167.63		
Total	18562.36	87			

PATMath RG Scores for Mathematics Clinics

Clinic	n	SD
R (Year 7)	20	32.06
O (Grade 6)	17	34.51
M (Grade 5)	22	38.37
H (Grade 4)	17	36.52
C (G 4 & below)	12	21.07
Cohort	88	35.64

ANOVA of RG Scores for Mathematics Clinics

Source of Variation	SS	df	MS	F	p
Between groups	14793.46	4	3698.36	3.206	.017
Within groups	9575609	83	1153.68		
Total	110549.56	87			

PATMath AG Scores for Ability Groups

Ability Groups	n	SD
Gifted	11	5.28
Bright	33	6.16
Average	30	8.60
Low Average	12	6.097
Low	2	3.54
Cohort	88	6.915

ANOVA of PATMath AG Scores for Ability Groups

Source of Variation	SS	df	MS	F	p
Between groups	100.27	4	1162.25	.513	.727
Within groups	4059.35	83	167.63		
Total	4159.62	87			

PATMath IG Scores for Ability Groups

Ability Groups	n	SD
Gifted	11	8.46
Bright	33	13.40
Average	30	17.28
Low Average	12	15.14
Low	2	7.09
Cohort	88	14.61

ANOVA of PATMath IG Scores for Ability Groups

Source of Variation	SS	df	MS	F	p
Between groups	860.719	4	215.18	1.009	.408
Within groups	17701.65	83	213.27		
Total	18562.36	87			

PATMath RG Scores for Ability Groups

Ability Groups	n	SD
Gifted	11	41.26
Bright	33	29.41
Average	30	44.88
Low Average	12	23.65
Low	2	16.26
Cohort	88	35.65

ANOVA of PATMath RG Scores for Ability Groups

Source of Variation	SS	df	MS	F	p
Between groups	1029.96	4	257.49	.195	.940
Within groups	109519.59	83	1319.51		
Total	110549.56	87			

The Gifted Student's Progress

Of the eleven students in the gifted student group:

- One Grade 6 student progressed to CSF Level 5 *Established*, or what is considered to be Year 8 level.
- Eight Grade 6 students moved on to CSF Level 5 *Consolidating*, or what is normally considered to be at a Year 7 level.
- One Grade 5 student progressed to achieve CSF Level 5 *Consolidating*, or what is considered to be Year 7 level.
- One Grade 6 student progressed to CSF Level 4 *Consolidating*, or what is considered to be equivalent to Grade 6 level, which was chronologically age appropriate.

3. Discussion & Conclusion