

Linstrom, A., Raven, R., & Raven, J. (2006, May 22). The Coloured Progressive Matrices in South Africa. *WebPsychEmpiricist*. Retrieved (date) from: http://wpe.info/papers_table.html.

WPE WebPsychEmpiricist

The Coloured Progressive Matrices in South Africa
5/22/06

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Abstract

With a view to establishing adequate South African norms for Raven's *Coloured Progressive Matrices*, 2,469 children, aged 5 to 12 years and judged to form a representative sample of pupils of that age in the Free State were tested. As was the case in earlier, less broadly based, studies, the overall norms which resulted were somewhat lower than their UK equivalents. However, when the data were broken down by language of the home, it emerged that the norms for the English and Afrikaans speaking group were very similar to the UK norms. Those for the "other languages" group were higher than norms which have been reported for an Xhosa-medium primary school near Grahamstown.

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South Africa has eleven official languages and a population of approximately 45 million divided into four main groups. Black people represent a diversity of indigenous groups. White people are mainly descendents of European immigrants. Colored people are descendents of cross-cultural relationships. And Asian people are mainly Indian. There are also minority groups of Chinese, Taiwanese, and Japanese. The population mix is unique in that Whites and Blacks have their roots in two totally different worlds. The first is primarily a European, capitalistic, industrialized society and the second mainly a pre-industrialized way of life.

Of the total population only an estimated 8% of adults have any post-school qualifications, 20% have school-leaving certificates, and 30% have some secondary school (statistics South Africa, 2003). It was with this apparent need to find strategies to accelerate the education and development of the youth of South Africa in mind that the Education Department of the Free State asked Jopie van Rooyen and Partners to assist in establishing norms for the *Coloured Progressive Matrices*.

Method

Participants, Materials, and Procedure. The Education department of the Free State province prepared the sample. This consisted of a random selection of schools from different regions, population groups, and school types chosen to yield as broad a database as possible. The research in the schools was carried out by Adien Linstrom in 2001. Data entry was organized by Jopie van Rooyen and Partners, but carried out by different institutions who did not always adhere to common instructions.

The Coloured Progressive Matrices (CPM) is designed to spread the scores of the bottom 20% of the population on the *Standard Progressive Matrices*. It consists of Set A and Set B of the Standard series, printed in color, with an additional set of items of intermediate difficulty (Raven, Raven and Court, 1998).

Completed CPM profiles were obtained from 2,469 South African children between the ages of 5 and 12 years. A breakdown of their socio-economic circumstances is given in Table 1.

One possible explanation of the apparent over-representation of children from rural areas might be that a greater proportion of children, in comparison with adults, live in rural areas - and this could well be the case, as rural families tend to be larger.

As far as the apparent over-representation of the Afrikaans and English speaking group is concerned, the vast majority of the population speak indigenous African languages as a first language, and then English or Afrikaans as a second (or even third) language. However, it is becoming more common for parents to send their children to English or Afrikaans-medium schools, and the children often then speak English or Afrikaans at home as their first language.

Results and Discussion

The overall South African norms derived from this sample are compared with the 1982 British Norms in Table 2.

When interpreting these data it should be borne in mind that there is much evidence to suggest that the British norms will have increased from 1982 to 2001.

Nevertheless the comparison is interesting. The figures for the 95th percentile for South Africa and the UK are similar while the scores for the lower percentiles drop increasingly behind.

In Table 3, the overall norms for the English and Afrikaans speaking group are compared with the overall norms for all other groups combined.

It will be seen that the norms for the English and Afrikaans speaking group are well above those for the combined “other languages” group and are, in fact, very similar to the 1982 British norms at all levels of ability. It may be worth commenting that similar results have been obtained when parallel analyses have been conducted within school districts in the USA.

Rather surprisingly, the norms for children living in rural areas do not differ much from those for children living in urban areas.

In common with the results obtained in many other societies, the norms for children coming from professional, administrative, and technical backgrounds are well above those for children whose fathers were laborers or who were unemployed.

Table 4 compares the Free State norms for both the (English plus Afrikaans) speaking group and the “All other languages” group with norms compiled from data collected by Natalie Bass from all children in a Xhosa-speaking primary school in Joza, Grahamstown, South Africa, others compiled by Vicki Costenbader in Kenya and the UK norms. It will be seen that the norms for the English-and-Afrikaans speaking group are similar to the UK norms, that the Joza-Xhosa norms are lower than the Free State All-other-languages group, and that Costenbader’s Keynan norms are similar to the South African All-other-languages group.

It has often been suggested that the difference between the norms for the Westernized groups and indigenous Africans (which are similar to those for indigenous Americans) might be, at least in part, due to the latter groups' relative unfamiliarity with the way of thought required to solve the problems presented in the test. To test this hypothesis, Nicola Taylor ran a 1-parameter item analysis separately within these groups. The correlation between the item difficulties established separately in the English-speaking and indigenous African group was .97. This is similar to the correlations obtained in other studies (see Jensen, 1998; Owen, 1992; Raven, 2000; and Raven et al., 2000, updated 2004) and seriously calls into question the hypothesis that the difference in mean score between the groups is due to one group's unfamiliarity with the way of thought required by the test. The test is working, and working in the same way, for both groups.

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Table 1

Socio-Economic Composition of South African Sample of Young People Compared with State and National Statistics (Adults)

	Sample	Free State	South Africa
<i>Gender</i>			
Male	48%	48%	48%
Female	52%	52%	52%
<i>Area</i>			
Urban	62%	76%	58%
Rural	38%	24%	42%
<i>Home Language</i>			
Afrikaans/English	46%	13%	22%
Other	54%	87%	79%
<i>Father's Status</i>			
Professional	16%		
Technical	18%		
Administrative	14%		

Table 2
Coloured Progressive Matrices
 Smoothed 2001 Norms for South Africa
 In the Context of 1982 British Data

Percentile	Age in Years (Months)															
	5_		6		6_		7		7_		8		8_		9	
	5(3)		5(9)		6(3)		6(9)		7(3)		7(9)		8(3)		8(9)	
	to		to		to		to		to		to		to		to	
	5(8)	6(2)	6(8)	7(2)	7(8)	8(2)	8(8)	9(2)	UK	SA	UK	SA	UK	SA	UK	SA
95	22	24	23	26	25	28	27	31	29	32	30	33	31	34	32	
90	20	21	19	23	21	25	24	28	26	30	28	32	30	33	31	
75	18	19	16	20	17	21	19	23	21	25	23	27	25	29	27	
50	15	16	12	17	13	18	14	20	15	22	16	24	17	26	19	
25	12	13	9	14	10	16	11	17	11	18	12	20	13	22	14	
10	10	11	7	12	8	13	8	14	9	15	9	16	9	17	10	
5	8	9	6	11	6	12	7	13	7	14	7	14	7	15	7	
<i>n</i>	35	23	56	42	108	54	232	55	220	44	186	48	226	52	211	

Percentile	Age in Years (Months)													
	9_		10		10_		11		11_		12		12_	
	9(3)		9(9)		10(3)		10(9)		11(3)		11(9)		12(3)	
	to		to		to		to		to		to		to	
	9(8)	10(2)	10(8)	11(2)	11(8)	12(2)	12(8)	UK	SA	UK	SA	UK	SA	
95	35	33	35	33	35	34	35	34	35	35	35	35	35	
90	33	32	33	32	34	33	35	33	35	34	34	34	34	
75	31	28	32	29	33	30	33	31	34	32	33	33	33	
50	28	21	30	23	31	25	31	26	32	27	29	30	30	
25	24	14	25	15	26	16	28	17	30	20	22	25	25	
10	19	11	21	11	22	12	23	13	25	14	15	17	17	
5	16	8	17	9	18	10	20	11	22	12	13	16	16	
<i>n</i>	37	212	53	191	49	218	51	190	55	216	105	94	94	

SA: South African data comprised of a sample of primary school children in the Orange Free State Province.

The education department of the Free State randomly selected schools

from different regions, population groups, and school types in an attempt to obtain a broad as possible data base.

UK: Based on a sample of 598 schoolchildren, including those attending special schools.

Table 3
Coloured Progressive Matrices
 Smoothed 2001 Norms for South Africa
 By Language Spoken

Percentile	Age in Years (Months)															
	6		6 ₋		7		7 ₋		8		8 ₋		9		9 ₋	
	5(9)		6(3)		6(9)		7(3)		7(9)		8(3)		8(9)		9(3)	
	to		to		to		to		to		to		to		to	
	6(2)	6(8)	7(2)	7(8)	8(2)	8(8)	9(2)	9(8)	O	E+A	O	E+A	O	E+A	O	
95	16	26	18	28	21	30	24	32	26	33	27	34	29	34	30	
90	15	24	16	26	17	27	19	29	21	30	23	32	25	33	27	
75	13	21	14	23	15	25	16	27	17	28	18	30	19	31	21	
50	11	17	12	18	12	19	13	22	13	24	14	26	15	27	17	
25	8	13	9	14	10	15	10	17	10	19	11	21	12	23	12	
10	7	10	7	11	8	12	8	13	8	14	9	15	9	16	10	
5	6	9	6	9	6	10	6	11	6	12	6	13	6	14	7	
<i>n</i>	36	61	60	96	122	94	121	75	116	100	119	90	109	83	120	

Percentile	Age in Years (Months)											
	10		10 ₋		11		11 ₋		12		12 ₋	
	9(9)		10(3)		10(9)		11(3)		11(9)		12(3)	
	to		to		to		to		to		to	
	10(2)	10(8)	11(2)	11(8)	12(2)	12(8)	O	E+A	O	E+A	O	E+A
95	34	31	35	32	35	32	35	33	34	34	34	34
90	33	28	34	30	34	31	34	32	35	33	35	34
75	32	23	32	25	33	27	33	28	34	30	34	32
50	28	19	29	20	30	21	30	23	31	24	31	25
25	24	13	25	13	26	16	27	17	28	18	29	20
10	18	10	20	11	21	11	22	12	23	14	24	15
5	15	7	16	8	17	9	18	10	19	12	19	13
<i>n</i>	71	111	87	123	75	113	90	119	51	52	36	59

E+A: English and Afrikaans speaking.

O: Other languages.

Table 4

Coloured Progressive Matrices

2001 Norms for the Orange Free State Afrikaans + English Speaking and All-Other-Languages Groups
In the Context of 2001 Joza (Grahamstown) Xhosa-Speaking Group, Kenyan Norms and 1982 British Data

Percentile	Age in Years (Months)																	
	5_		6				6_			7					7_			
	5(3)		5(9)	5(4)		6(3)			6(9)		6(4)			7(3)				
	to		to	to		to			to		to			to				
	5(8)		6(2)	6(3)		6(8)			7(2)		7(3)			7(8)				
	UK	UK	O	KN	UK	E+A	O	UK	E+A	O	XH	KN	UK	E+A	O	XH		
95	22	24	16	17	26	26	18	28	28	21	16	20	31	30	24	17		
90	20	21	15	16	23	24	16	25	26	17	15	18	28	27	19	16		
75	18	19	13	14	20	21	14	21	23	15	14	15	23	25	16	15		
50	15	16	11	12	17	17	12	18	18	12	12	13	20	19	13	13		
25	12	13	8	10	14	13	9	16	14	10	11	11	17	15	10	12		
10	10	11	7	7	12	10	7	13	11	8	10	9	14	12	8	11		
5	8	9	6	6	11	9	6	12	9	6	9	8	13	10	6	10		
<i>n</i>	35	23	36	237	42	61	60	54	96	122	4	213	55	94	121	6		

Percentile	Age in Years (Months)															
	8					8_					9					
	7(9)				7(4)	8(3)					8(9)		8(4)			
	to				to	To				To		to				
	8(2)			8(3)		8(8)				9(2)		9(3)				
	UK	E+A	O	XH	KN	UK	E+A	O	XH	UK	E+A	O	XH	KN		
95	32	32	26	19	25	33	33	27	20	34	34	29	21	30		
90	30	29	21	18	23	32	30	23	19	33	32	25	20	28		
75	25	27	17	16	18	27	28	18	16	29	30	19	17	22		
50	22	22	13	14	14	24	24	14	14	26	26	15	15	15		
25	18	17	10	12	11	20	19	11	13	22	21	12	13	12		
10	15	13	8	11	9	16	14	9	12	17	15	9	12	10		
5	14	11	6	10	8	14	12	6	11	15	13	6	11	9		
<i>n</i>	44	75	116	14	255	48	100	119	19	52	90	109	27	289		

Percentile	Age in Years (Months)															
	9_				10						10_					
	9(3)				9(9)				9(4)	10(3)						
	to				To				to	To						
	9(8)				10(2)			10(3)		10(8)						
	UK	E+A	O	XH	UK	E+A	O	XH	KN	UK	E+A	O	XH			
95	35	34	30	22	35	34	31	24	33	35	35	32	26			
90	33	33	27	21	33	33	28	23	31	34	34	30	25			
75	31	31	21	18	32	32	23	19	26	33	32	25	21			
50	28	27	17	15	30	28	19	16	18	31	29	20	18			
25	24	23	12	13	25	24	13	14	13	26	25	13	14			
10	19	16	10	12	21	18	10	13	10	22	20	11	13			
5	16	14	7	11	17	15	7	12	9	18	16	8	12			
<i>n</i>	37	83	120	16	53	71	111	27	234	49	87	123	31			

E+A: English and Afrikaans speakers in South Africa. See Table 2 for a description of the sample.

O: Other languages in South Africa. See Table 2 for a description of the sample.

KN: Kenyan data collected by Virginia Costenbader and Stephen Mbugua Ngari from 1,370 children in the primary schools of the Municipality of Nakuru, a region which is fairly typical of the overall population of Kenya. 50% of the children were from the Kikuyu tribe and 21% Luo. The data have been re-worked by the authors. See Raven et al 1998.

UK: Based on a sample of 598 schoolchildren, including those attending special schools. See Raven et al 1998

XH: The study was conducted by Natalie Bass. The sample was drawn from a representative Xhosa-medium Public Primary School in Joza, a township on the outskirts of Grahamstown, South Africa. See Bass (2000) and Knoetze et al (2005).