Chapter 14

The *Coloured Progressive Matrices* in South Africa

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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. Coloured 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*. (As explained in the General Introduction to this book, 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. [See Raven, Raven and Court, 1998])

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 organised by Jopie van Rooyen and Partners, but carried out by different institutions who did not always adhere to common instructions.

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 14.1.

One possible explanation of the apparent over-representation of children from rural areas might be that a greater proportion of children,

Table 14.1. Socio-Economic Composition of South African Sample of Young People Compared with State and National Statistics (Adults)

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

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

The overall South African norms derived from this sample are compared with the 1982 British Norms in Table 14.2.

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 14.3, the overall norms for the English and Afrikaan 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 labourers or who were unemployed.

Table 14.4 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

Table 14.2. *Coloured Progressive Matrices*
Smoothed 2001 Norms for South Africa In the Context of 1982 British Data

	Age in Years (Months)													
	5½	6		6½		7		7½		8		8½		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)
Percentile	UK	UK	SA	UK	SA	UK	SA	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
n	35	23	56	42	108	54	232	55	220	44	186	48	226	52	211

(continued)

	Age in Years (Months)											
	9½		10		10½		11		1½		12	12½
	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)
Percentile	UK	SA	UK	SA	UK	SA	UK	SA	UK	SA	SA	SA
95	35	33	35	33	35	34	35	34	35	35	35	35
90	33	32	33	32	34	33	35	33	35	34	34	34
75	31	28	32	29	33	30	33	31	34	32	33	33
50	28	21	30	23	31	25	31	26	32	27	29	30
25	24	14	25	15	26	16	28	17	30	20	22	25
10	19	11	21	11	22	12	23	13	25	14	15	17
5	16	8	17	9	18	10	20	11	22	12	13	16
n	37	212	53	191	49	218	51	190	55	216	105	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 14.3. *Coloured Progressive Matrices*
Smoothed 2001 Norms for South Africa By Language Spoken

Age in Years (Months)

Percentile	6		6½		7		7½		8		8½		9		9½
	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	E+A	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
n	36	61	60	96	122	94	121	75	116	100	119	90	109	83	120

(continued)

Age in Years (Months)

Percentile	10		10½		11		11½		12		12½	
	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)	
	E+A	O	E+A	O	E+A	O	E+A	O	E+A	O	E+A	O
95	34	31	35	32	35	32	35	33		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
n	71	111	87	123	75	113	90	119	51	52	36	59

E+A: English and Afrikaans speaking.

O: Other languages.

a Xhosa-speaking primary school in Joza, Grahamstown, South Africa, others compiled by Viki 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 Vicki 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 Westernised 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 IRT-based 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.

Table 14.4. *Coloured Progressive Matrices*
2001 Norms for the Orange Free State
Afrikaans + English Speaking and All-Other-Languages Groups' norms in the Context of 2001 Joza (Grahamstown) Xhosa-Speaking Group, Kenyan Norms and 1982 British Data

| | Age in Years (Months) | | | | | | | | | | | | | | | | | |
| Percentile | 5½ 5(3) to 5(8) | 6 5(9) to 6(2) | 5(4) to 6(3) | 6½ 6(3) to 6(8) | | | 7 6(9) to 7(2) | | | | 6(4) to 7(3) | 7½ 7(3) to 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**
n	35	23	**36**	**237**	42	**61**	60	54	**96**	**122**	**4**	**213**	55	**94**	**121**	**6**

Table 14.4. *Coloured Progressive Matrices*
2001 Norms for the Orange Free State
Afrikaans + English Speaking and All-Other-Languages Groups' norms in the Context of 2001 Joza (Grahamstown) Xhosa-Speaking Group, Kenyan Norms and 1982 British Data *(continued)*

	Age in Years (Months)													
	8					8½				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)	
Percentile	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
n	44	75	116	14	255	48	100	119	19	52	90	109	27	289

(continued)

	Age in Years (Months)												
	9½				10					10½			
	9(3)				9(9)			9(4)		10(3)			
	to				to			to		To			
	9(8)				10(2)			10(3)		10(8)			
Percentile	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
n	37	83	120	16	53	71	111	27	234	49	87	123	31

E+A: English and Afrikaan speakers in South Africa. See Table 14.2 for a description of the sample.

O: Other languages in South Africa. See Table 14.2 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).

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