

## Brief Report

### Extending the Classroom Vineland

Michael G King<sup>1</sup>  
Beaufort Primary School,  
Beaufort, Victoria

#### ABSTRACT

An improved method for the assessment of Social Development of secondary school students is described. For those with Social Development difficulties, the *Vineland Classroom* Edition can be used and interpreted to provide an Adaptive Behaviour Composite score. Prior to the present development, the *Classroom* Edition was only applicable to students below age 13. This extension to include students up to age 18 allows the more economical *Classroom Vineland* to be utilized in Secondary School assessments.

#### INTRODUCTION

The *Vineland Adaptive Behaviour Scales* were developed to "assess personal and social sufficiency of individuals" (Sparrow et al 1985). The *Vineland* is used extensively to measure the degree to which some children fail to achieve, socially, their full potential. In mainstream schools the *Vineland* has long been used in tandem with the IQ to determine those in greatest need of additional support. ***The Vineland Scales are seen as offering a systematic way to identify deficits in non-academic skills and to translate this information into educational objectives*** (Harrison, 1984)

Of the different forms of the test, the most convenient (and certainly most economical in terms of professional resources) is the *Classroom* edition: with this form no "semi-structured interview" is needed (as with the *Extended* or *Survey* forms), and the classroom teacher provides the responses. Unfortunately this form of the test only has age norms up to 12yr 11mths while the *Extended/Survey Vineland* has norms up to age 18 years.

It would clearly be convenient and resource-efficient and add coherence to the resultant scores to have *Classroom* norms which extend beyond age 12, so that secondary school students of (apparently) limited social development could be assessed by the same instrument as employed with primary school students. But there are difficulties (forsooth, impossibilities) in establishing these post-12-year-old norms: the task would involve rather more than administering the test to samples of older students. The entire test would have to be re-written for these more mature children because there are insufficient advanced ("difficult" in test parlance) items in the *Classroom* edition to correctly represent the spread of the target social skills. Even at the current upper limit of age, the *Classroom* norms are slightly askew: it is

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<sup>1</sup> Contact

Address: c/- Beaufort Primary School, Beaufort  
Victoria 3373.

Tel: 0418 577 053

Email: [mgking@netconnect.com.au](mailto:mgking@netconnect.com.au)

not possible to score beyond 118 on the Communication domain, nor above 124 on Socialization (where the age-based mean is adjusted to 100, and the standard deviation equals 15). Without these more “difficult” items, the mean and standard deviations for older student cohorts cannot be measured. Since there is no available estimate of the population parameters, then it is not possible to provide a correctly normed standardized score on a student with impoverished social development. Although a 15 year old student with poor social development would score well within the measuring range of the *Classroom* test (for example achieving an equivalent age of 8 years), there is no available conversion of Raw Score to standardized scores for students above the age of 12 years, and so no composite Score of Adaptive Behaviour to quote in applications for disability funding.

In summary, the *Classroom* Edition of the *Vineland* could be used to provide raw scores as well as equivalent age conversions for those older students who have substantially delayed social development. However there are no estimates of the population parameters to enable the conversion of these raw scores into Standard Score format, and no possibility of obtaining the missing statistics by direct measurement of cohorts of older students.

The present report describes a method of obtaining valid Standardized Scores of Adaptive Behaviour scores for socially deficient, older-age, students using the *Classroom Vineland*.

## METHOD

The task of providing, and then rendering useful, the extended age-range norms for the *Classroom Vineland* involved two steps:

- A. the estimation of virtual population parameters (means and standard deviations) for the *Classroom Vineland* up to age 19 years. Nominating the *Classroom* and *Survey* Form statistics (the Domain means) as the dependent variable (x) and independent variable (y) respectively, regression equations and correlation coefficients were computed. From these equations, estimates of the *Classroom* statistics could be generated from the matching *Survey* value for the mid-point of that age range.
- B. a method to calculate age-based Standard Scores (mean 100 and sd 15). This is achieved through a dedicated computer program (available from the author) or by manual calculations described below:

For any Domain, the age-based parameter P (mean or sd) is computed from:

$$P_{\text{age}} = P_{\text{yearslow}} + \text{age}_{\text{months}} * d P/d \text{ months}$$

Where  $P_{\text{yearslow}}$  = the parameter value below the student's age (eg is student is 8y 7 months, then  $P_{\text{Ylow}}$  is 8 (meaning 8y6m) and the same value would be used if student's age were 9y 3m).

And  $(dP/d \text{ months})$  is the increment in the parameter per month, over that range

$$= (P_{\text{years.hi}} - P_{\text{years.low}}) / (\text{month band})$$

Where “month band” is either 12 months, or for older students 24 months.

Having computed the age-based parameters (to nearest month) the Standard Score is computed using the familiar relationship:

## RESULTS

Remembering that the intention of extending the *Classroom Vineland* is to measure *older* students of *delayed* social development, we needed a valid estimate of what may be termed *Virtual parameters*: means and standard deviations which exist in theory but (because of the ceiling effect of the test) cannot exist nor be measured in practice.

The regression equations in Table 1 were computed for the age range where both Classroom and Survey Form data co-exist (3 to 12 years). The same process was repeated for standard deviations.

From Table 1, it was possible to compute a value for the *Classroom* mean and standard deviation for any age where Survey values exist – that is from age 3 to age 18. Table 2 provides these computed values of *Classroom* descriptive statistics over the complete age range, giving the value for the mid-point of that age range. From the age-based data, an exact value (correct to the nearest month) can be obtained by interpolation, leading to calculation of the familiar Standard Scores – in this case based upon undistorted means and standard deviations. Examples of the scores for three (socially needy) secondary school students are provided in Table 3.

**Table 1:** Correlation coefficients  $r$  and regression equation  $y = ax+b$ , where  $y$  is class,  $x =$  survey

Correlation coefficient $r$	<b>A</b>	<b>b</b>
<u>Mean x: mean y</u>		
0.999	1.05899250127	-14.1921843312
0.9987	1.33728267627	-32.6093081436
0.9894	0.729657115988	3.83015331407
0.9941	1.33856502242	-38.8587443946
<u>Sd x : sd y</u>		
0.8541	1.22471504461	2.02958378462
0.5001	0.679194389498	11.2468351016
0.2565	0.227959638069	13.1841442039
0.9861	0.361407249467	4.69658848614

**Table 2:** Extended normative data for *Classroom Vineland*, computed from *Survey* data for the mid-point of that age band.

Age		Communication		Life skills		Socialization		Motor		
yr	Month from	Mnth to	Mean	Sd	Mean	Sd	Mean	Sd	Mean	sd
3	0	11	58.67	11.7	60.2	20.42	47.76	15.51	36.9	7.05
4	0	11	66.19	12.56	82.26	20.42	53.67	15.87	45.74	6.61
5	0	11	73.17	13.17	98.98	19.26	62.42	15.74	50.56	6.14
6	0	11	87.79	15.01	118.9	20.42	69.21	16.01		
7	0	11	97.64	14.15	130.4	20.69	73.29	15.74		
8	0	11	106.74	11.58	146.4	18.72	74.39	15.67		
9	0	11	112.25	12.56	153.5	19.47	76.94	15.87		
10	0	11	115.43	10.36	160.4	18.11	81.03	15.14		
11	0	11	117.23	10.11	164.5	18.04	82.63	15.3		
12	0	23	119.45	9.38	175.2	18.17	85.7	14.94		
14	0	23	122.74	7.3	181.8	17.29	90.51	14.8		
16	0	23	123.58	8.4	190.7	18.11	93.58	14.92		

**Table 3:** Examples of adolescent *vineland* (classroom) reports

	RAW	Std Score	Equiv Age (years)
<u>Name: THD. (male) age 14.0</u>			
Communication Domain Sum	81	< 20	5.99
Daily Life Skills Domain Sum	163	86.5	11.08
Socialization Domain Sum	63	74.5	5.54
Adaptive Composite	60		
<u>Name: THK. (male) age 13.3</u>			
Communication Domain Sum	71	< 20	5.15
Daily Life Skills Domain Sum	98	32.2	5.4
Socialization Domain Sum	59	72.3	5.07
Adaptive Composite	41		
<u>Name: NM. (female) age 13.6</u>			
Communication Domain Sum	73	<20	5.43
Daily Life Skills Domain Sum	119	49.7	6.47
Socialization Domain Sum	56	68.6	4.72
Adaptive Composite	46		

## DISCUSSION

The first result of the present study was the production of an extended set of virtual norms for the *Classroom* Edition. The magnitude of each of these *Classroom* values (Table 2) was shaped by the age-progression found in the published *Survey Vineland* data (Sparrow et al, 1984). Using these new extended norms, the test responses from the *Classroom Vineland* for a “socially needy” student are converted into estimated Standard Scores either by simple calculation (or by a dedicated computer program) interpolating between the these age-based midpoint data. From the raw *Classroom* scores either the older student is rated as “better than” the range of the *Classroom Vineland*, or a valid estimate of the student's level of delayed social development is given. The calculated Adaptive Behavior score can be used to guide decisions about additional resource allocation, or other aspects of Case Management.

Other useful measures are also available, such as the equivalent social age of the student. These equivalent age estimates are based upon the student's score on each of the domains and sub-domains, and were always available from raw scores for any student of any age, using the *Classroom* manual. Samples of resulting profiles of the social development are summarized in Table 3 which gives results for several adolescents who were referred by the school system for diagnosis because of their manifest social difficulties.

Of concern to the reader may be the fact that the Vineland II Survey Form has now been published (Sparrow et al, 2005), and the question might be raised if this data set should be used as the basis for the current study. In fact, the *Survey* statistics only serve to give the *shape* to the age-based change in social skills. The very high correlations in Table 1 for the means of the two tests (each one around  $r = 0.99$ ) indicate that – at least over the common age band – the values used (*Survey*, 1984) could not be bettered as an estimate of the age-band means of the *Classroom* edition.

A second point which may require clarification is the potential confusion between the highly correlated means, as opposed to the rather weaker correlation of individual scores from the two tests. The high correlations (Table 2) serve to show that the average overall age-based increment in Social Behaviour is consistently and coherently measured by both tests. The published fact of a more modest relationship (with around 60% of shared variance) between the two forms of the test is a separate issue. It is a comforting fact that for one student (age 13y7m) the Adaptive Behaviour Composite (Vineland –II Survey Form) was 66,

while that estimated from the “Extended Classroom form” was 67. This level of coincidence is not predicted in every case: it is not demanded by the present study, and is not anticipated from the Classroom manual even for the actual shared age range.

An additional point of interest is that with sd correlations, some have little consistent variation across the age range, as indicated by the low *r* values. The outcome of this is that the computed age-band sd's will only vary modestly from the value of the constant (effectively the computed “average” value of this parameter) for the extended age ranges. This outcome is neither a surprise nor a flaw in the method: it is, of course, not a requirement that sd should vary with age.

Finally, it should be noted that using the *Extended Classroom* method, the computed Standard Scores are not distorted (to remove the expected and empirical fact that social disadvantage is not a Gaussian curve) but are precisely based upon mean and standard deviation. Distorting the data (as is done in some computations of so-called Standard Scores) makes little sense in the case of a measure such as the Vineland where the underlying assumption is that a non-Gaussian distribution exists. Such arbitrary distortion of standard Score distribution produces a score which is not in line with a measure of Adaptive Behaviour based upon “mean and standard deviation”: *the transformation of each raw-score distribution into a normal distribution . . . transforms into score values that are potentially quite discrepant . . .* (Butcher, Williams et al, 1992, p 21). This deliberate changing of the shape of the measured normative data, and its ramifications in educational decisions, is addressed elsewhere (King, 2002). The computed value from the present method (over both the standard Classroom age range as well as the extended age range) meets the statutory requirement of certain education departments: a measure of Adaptive Behaviour with a cut-off score of *two standard deviations below the mean*.

Although there is a dedicated interpretative program at the centre of the presently described method (available from the author), the relatively simple arithmetic computations necessary to convert raw scores into estimated Standard Scores (once mean and sd are known) are within the gamut of skills of the graduate psychologist.

In summary, and from practical usage, it is concluded of this method:

- a. it is efficient in terms of using the responses on the answer sheet and obtaining Standard Scores;
- b. the scores are based upon mean and sd for the student's age, corrected to *the nearest month*. By comparison, tables of Standard Scores vs Raw Scores commonly use bands of three months, and the tables of the *Vineland* do not precisely match the Standard Score of 70 to equal the legally prescribed limit of “two standard deviations below the mean”.
- c. the method described here could be adapted to base its standardized scores upon different norms (for example, specific cultural or other up-dated scores (eg de Lemos, 1989).
- d. as appropriate, the “extended *Classroom*” results can be a resource-efficient screening test prior to subsequent professional interview (*Survey/Extended*) which will be unaffected by the initial measurement of Adaptive Behaviour.

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### **Biographical Note:**

With degrees in the physical sciences, in Psychology and in Education, King practises as an Educational Psychologist with the Department of Education, Victoria, Australia serving rural primary and Secondary schools. He has a continuing interest in the technical and applied aspects of psychological assessment which has spawned a series of measurement-related papers over the last two decades.