

# Use of the Griffiths Mental Scales in Normal 2 Year Old Malaysian Children

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## Summary

The Griffiths Scales for Mental Development were used to assess a group of 60 normal 2-year old Malaysian children (25 Indian, 23 Malay and 12 Chinese).

The mean GQ was 104.2 (SD 9.3). This was significantly higher than the test mean of 100,  $p < 0.001$ . The mean score for Malaysian children was significantly higher on the locomotor, personal social, performance and practical reasoning subscales while they were significantly lower on the hand eye subscale and did not differ from the test mean on the hearing and speech subscale. There was a significant correlation between GQ and social class,  $r = -0.39$ ,  $p < 0.05$ . Scores were lower than those currently obtained on British children,  $p < 0.001$ .

Minor difficulties due to language and cultural factors arose over the interpretation of several items but with standardisation of these items the test is useful in Malaysian children.

**Key Words:** Malaysia, Child development, Social class, Griffiths scales

## Introduction

The Griffiths Scales for Mental Development, a quantitative means of assessing development, although originally intended for use in assessing British children have been used on children from a variety of cultural groups. We used this test to assess the 2-year outcome of a cohort of Malaysian very low birth weight infants. As a control for this study we assessed a group of normal children of similar age. The test is made up of 6 subscales and after adjustment for age these are used to derive an overall score, the general quotient (GQ). In 1950 when the test was originally developed the test mean for the GQ was set at 100 and SD 12. Hanson *et al* reported

the use of the test on 447 children between 1978 and 1982 and reported a mean GQ of 110<sup>1</sup>. The investigators felt that this increase in GQ was due to environmental factors and that children were achieving the test items at a younger age than they did in 1950.

As there are no reports of these scales being used in Malaysian children we report our experience with a group of normal Malaysian children.

## Materials and Methods

Sixty children were selected from the waiting room of a walk-in primary care clinic attached to the hospital, the main health facility for this urban community. Children attended this clinic for a

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variety of conditions which would normally be dealt with by general practitioners. They were either a patient attending the clinic or the sibling of a patient. Criteria for inclusion were: born at term, aged between 24 and 30 months, no obvious physical or mental defect, never been referred to a Paediatric Specialist, and no chronic illness. If they were ill at the time of recruitment then an appointment was given for the assessment to be done after the child was well. Verbal consent from the accompanying parent was obtained after the test was explained to them. Parents were informed of the result of the test and how it should be interpreted. Any children with abnormalities discovered in the course of the study were subsequently referred to a Paediatric Specialist for further assessment.

These children served as controls for a cohort of very low birth weight infants treated in the hospital during the year 1993. Controls were recruited and examined during the year 1995 on days when no cohort patient was being examined.

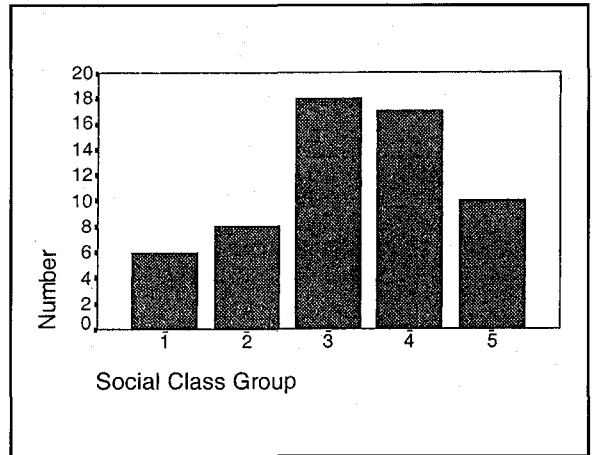
The Griffiths assessment and a neurological examination was carried out on each child. The test was conducted in Malay, Tamil or English. Where the child spoke only Chinese a parent was asked to interpret for the child. Hearing was screened using a hand held free field audiometer (Interacoustics, Denmark) in a quiet room and vision was tested using preferential looking cards (Cardif Acuity Test, Keeler, UK).

Social class was classified according to the Registrar General's classification using fathers occupation<sup>2</sup>.

Statistical analysis was done using the epi-info statistical package. Means were compared using the Anova statistic for normally distributed data and Kruskal-Wallis test for data not normally distributed.

**Results**

There were 36 females and 24 males. Of these, 25 (42%) were Indian, 23 (38%) were Malay and 12 (20%) were Chinese. The mean age at the time of



**Fig. 1: Social class distribution of study population consisting of 60 normal Malaysian 2-year old children using Registrar-General's social classes for fathers occupation<sup>1</sup>.**

examination was 27 months (SD 1.6). Forty-seven (78%) were from an urban area. There were 23 (38%) first born, 17 (28%) second born and 20 (33%) were the third or higher born. The social class distribution is shown in Figure 1. All had normal hearing and vision. None had an abnormal neurological exam.

The mean GQ was 104.2 (SD 8.3). This is significantly higher than the test mean of 100,  $p < 0.001$ . Using the test mean of 100 and SD of 12, 52 children were within 1 standard deviation of the test mean of 100, one child was just below (GQ = 85), 6 were in the range of 1 - 2 SD above, and 1 was more than 2 SD's above the mean.

If it is assumed that the test mean for each of the 6 subscales was also 100 then the study group scored significantly better than the test mean on 4 of the 6 subscales. The mean score for the speech and language subscale was not significantly different from 100 while the mean score for the hand eye subscale was significantly lower, Table I.

**Table I**  
**Mean Scores for GQ and each of the Griffiths Subscales by ethnic group compared with test mean of 100 and mean scores obtained by Hanson *et al* in 1980.**  
 (ns=not significant at 0.05 level)

	Indian	Malay	Chinese	Whole Group	Significance Compared with test mean (p value)	Scores of 1980 cohort reported by Hanson <i>et al</i> *	Significance compared with 1980 cohort (p value)
GQ	104.6	103.9	104.0	104.2	<0.001	110	<0.001
Locomotor	108.8	113.9	108.5	110.7	<0.001	112	ns
Personal Social	103.3	104.6	104.3	104.0	<0.001	105	ns
Hearing and Speech	103.5	95.5	101.8	100.1	ns	103	ns
Hand Eye	96.6	96.2	95.1	96.2	0.007	106	<0.001
Performance	106.8	114.4	112.3	110.9	<0.001	108	ns
Practical Reasoning	104.2	103.3	101.9	103.3	0.01		

\* Practical Reasoning Scale not used by Hanson *et al*.

The means scores for GQ and the subscales were compared with the scores achieved by children reported by Hanson *et al* who were tested in their second year tested in 1980<sup>1</sup>. The study group had a significantly lower mean GQ, 104 compared with 110,  $p < 0.001$ , and significantly lower scores on the hand eye subscale, 96 compared with 106,  $p < 0.001$ . The performance scale was not assessed by Hansen *et al*, Table I.

There were no significant differences between ethnic group and sex for any of the scales. However the numbers were small.

The GQ was highest in social class 1 and lowest in Social Class 5 as shown in Table II. The relationship between GQ and social class was measured using correlation. The correlation coefficient was  $-0.39$ ,  $p < 0.05$ .

**Table II**  
**Mean GQ by Social Class for 60 normal Malaysian children,  $r = -0.39$ ,  $p < 0.05$**

Social Class	No. of Children	GQ
1	6	110.8
2	8	108.1
3	18	103.1
4	17	103.3
5	10	99.2

## Discussion

The mean GQ of 104 achieved by our group of Malaysian children was significantly higher than the test mean of 100 derived from British children in 1950 but significantly below the test mean of 110 achieved by the British children tested in 1978 - 1982.

There are 3 possible explanations for this difference.

Firstly there are cultural differences which may alter the interpretation of the test. Malaysian children represent 3 main ethnic groups (ethnic Malay, Chinese and Indian). Due to cultural differences, psychomotor development may vary resulting in a difference in the rate of development in certain areas. This has been found for Black Americans and Japanese<sup>3,4</sup>. Cultural factors account for why some skills are acquired at different times in Malaysian children compared with British children. For example, Malay children are taught to eat with their hands before they are taught to use a spoon. Although at 2 years they could skillfully scoop up and eat grains of rice with one hand, for a number of the study group they first used a spoon only during the Griffiths assessment. Due to a lack of exposure some of the objects on the picture cards were not very familiar to them. Where-ever these difficulties arose they were treated in a consistent manner.

Secondly, the level of socioeconomic development of a society may have an influence on the GQ. The temporal improvement in the test result seen in Britain over a 30 year period could be due to socioeconomic development over that period of time. Multiple factors including health, diet and level of maternal education might contribute to this. Malaysia is a developing country with a population of widely varying socioeconomic status.

Thirdly this difference could merely reflect a difference in the distribution of social class in the populations. We had smaller numbers in social class I and II than Hanson *et al*. Because their study population had a high proportion of Social

Class I and II they randomly excluded children from their sample so that it matched the British census distribution and compared the GQ of this group. This adjustment made no significant difference in the GQ score up to 18 months of age. We were unable to obtain population based raw data on occupation in Malaysia that could be classified according to the Registrar Generals social classes. This meant we were unable to make any comparison of social class distribution in our study group with the Malaysian population. We found a significant relationship between the test score and social class. The distribution of social class in our population therefore may have an important bearing on our result. We are unable to explain why our GQ scores correlated with social class when this has not been reported by others at 2 years of age<sup>5,6,7</sup>. However it is possible that social class differences are wider in a developing society thus allowing them to have a greater influence at an earlier age.

In conclusion the Griffiths Scales for Mental Development are useful in a Malaysian population although due to cultural differences difficulties arise with the interpretation of some of the test items. These differences need to be standardised if the test is to be used to compare different subgroups of the population. However as a new version of the Griffiths test is now available and slowly being introduced it is recommended that any further investigation in Malaysian children be done with this.

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