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BEHAVIOURAL STYLES AND TEACHERS' ESTIMATIONS OF INTELLIGENCE

Jean Whyte*
Queen's University, Belfast

Two hundred and forty four seven year-olds were rated by their teachers on attention span, activity level quality of participation in social and academic activities, and general mental ability An objective intelligence test was administered The results showed that girls tended to be rated more favourably on some behavioural traits and that the associations between those ratings and both measured and rated intelligence were stronger for girls than for boys It is suggested that a higher behavioural standard may be demanded of girls before they are rated equally with boys on mental ability and that the sex of a child may therefore be a factor in the complex of interacting forces determining his potential for success in school

Although temperamental qualities may directly influence a child's academic progress (3) it is probably true to say that their indirect influence, through the reactions they produce in people surrounding the child, is also important A child's behavioural style, based on stable qualities of temper ament might influence a teacher's estimation of his general mental ability, which in turn might influence the child's performance in school Despite these possible associations there has been relatively little research into relationships between temperament and scholastic variables, which may be due to a lack of refinement, until recently, in defining elements of temperament (10)

A number of recent studies have reported relationships between intelligence and aspects of temperament Gordon and Thomas (17) found that teachers tended to overestimate the intelligence of five year olds who reacted positively and quickly to new situations (and whom they rated high on 'quality of participation') and to underestimate the intelligence of those who reacted negatively at first and took some time to adapt to new situations (whom they rated low on 'quality of participation') The data suggested that the teachers' estimates were distorted by the behavioural styles of the children A replication of this study with thirteen year olds by Lerner and Miller (25) had the same result, their findings showed, however, a higher correlation between the behavioural variable and measured

* Requests for off prints should be sent to Jean Whyte Department of Psychology, Queen s University, Belfast

intelligence than that found by Gordon and Thomas, which they explain in terms of the more advanced age and the past reinforcing experiences of their subjects

The present study, like those above, also attempts to relate quality of participation to teachers' ratings of children's intelligence But it differs from previous studies in a number of ways Firstly, 'quality of participation' was defined more specifically for the present study, being related to participation as manifested in two types of situation, one intellectual (creative writing), the other social (physical education) Secondly, two more variables – attention span and activity level – were assessed at the same time as participation These ratings were made a month before the teachers were asked to rate the children's intelligence The extra variables were included in an attempt to reduce the halo effect which might have occurred had participation and intelligence been the only variables to be rated Attention Span and Activity Level were chosen because it was thought that they would be elements in a teacher's estimation of a child's mental ability They are normally observable in the classroom, even in a short period of time, and can be readily differentiated from 'quality of participation' in that Attention Span is defined in terms of the ease or difficulty in distracting a child from what he was doing or supposed to be doing, and Activity Level is defined in terms of restlessness, or on the other hand, physical apathy with no intellectual connotations The sample for the present study also differed in a number of ways from earlier ones It included a larger number of children, spread over four schools, and the subjects were, on average, seven years of age The intellectual and social range of the sample was broader and the subjects were not test sophisticated though they had acquired the basic skills necessary to tackle the formal testing required by the study Most important, the sample contained a sufficient number of boys and girls to allow examination of possible differences in teachers' ratings according to sex There already was evidence that teachers' assessments may vary with the sex of the subject being assessed (19, 22, 26, 34), that teachers tend to rate girls more favourably than boys in social and academic areas (8, 16, 23, 27, 30, 36), and that the temperamental qualities linked with optimum intellectual activity may differ in boys and girls (28, 40)

For the present study it was hypothesised firstly that teachers would tend to estimate on the high side the intelligence of children who react positively and quickly to new situations (i e , are high on quality of participation) Secondly, a long attention span in a child would predispose his teacher to estimate his intelligence on the high side, while a short attention span would have the opposite effect Thirdly, a high activity

level in a child would result in a teacher estimating his intelligence as low, while a low activity level would have the opposite effect Fourthly, teachers' assessments on all variables would vary with the sex of the subject being assessed And finally the correlations between teachers' ratings of mental ability and other traits would differ for boys and girls

METHOD

Sample

The sample consisted of 244 children (131 boys and 113 girls) from four primary schools Two classes were selected in each school The classes were mixed by sex and varied in size from 30 to 38 children The proportion of boys and girls differed as follows School A – 42 boys and 25 girls, School B – 37 boys and 24 girls, School C – 28 boys and 42 girls School D – 48 boys and 27 girls

All teachers were female and had between 5 and 20 years of teaching experience It was expected that they would therefore be able to take note of the individual qualities of the children and to form an opinion about their temperaments and level of intelligence All the teachers were unmarried except one, who was childless Thus their first hand experience with children probably came from teaching Teaching was by traditional methods in all the schools, the children spent most of the day sitting at tables All the teachers had informal grouping within their classroom for all subjects Children rarely changed from one group to another during the year Teachers seemed to form their groups independently of the teachers' placements in the previous year There was some movement in the classroom – for reading, physical education, television programmes and free activity

Measures

(a) *Teachers' rating of quality of participation* This is a combination of two of the nine variables which Thomas *et al* (42, 43, 44) found they could distinguish as relatively stable characteristics up to age 12 It refers to a child's characteristic style of reaction to new activities and situations in the classroom and is a combination of his initial response (approach withdrawal) and of the ease with which an initial negative response will change to a positive one with repeated contact with the situation (adaptability) For this measure a four point scale was used as in the Gordon and Thomas study, the terminology was changed somewhat for the present study (titles, not descriptions of categories) so as to conform to usage on this side of the Atlantic (1) unwilling (originally 'non participator') – the

child who remains negative and non participant, (ii) slow but willing (originally 'side liner') – the child who becomes involved after an initial negative response, (iii) willing (originally 'go alonger') – a positive approach, but some hesitation, (iv) quick and enthusiastic (originally 'plunger') – the child who plunges into new situations and activities quickly and un hesitatingly Measures were obtained for social type and intellectual type situations These are more easily definable in our primary schools than in the American kindergarten where there is greater emphasis on socialization it was felt that the social behaviour of the children might have had undue influence in the Gordon and Thomas study and that a comparison of ratings obtained in two situations might be interesting It was also felt that since the ratings would be done early in the school year and teachers' familiarity with the children was still slight, it would be better to standard ize the situations and take a stated instance of behaviour which would be common to all the teachers rather than have teachers make a global assessment For the ratings of attention span and activity level it was not felt necessary to link the rating with a specific situation as it has been found that these variables tend to manifest themselves over all the activities of the individual (7, 31, 32, 37)

(b) *Teachers' rating of attention span* This variable was also among those isolated by Thomas *et al* (44) as one of the attributes of the human organism which interacts with and affects its environment and in turn feeds back to shape its development A three point scale was used (i) long attention span – concentration for as long as was required or longer without obvious strain, (ii) medium attention apan – concentration for required period with effort (iii) short attention span – unable to concentrate for a required period

(c) *Teachers' rating of activity level* This was another of the variables picked out by Thomas *et al* (44), it can be regarded as a non intellectual variable and therefore different from the other variables in the study Three levels of activity were outlined (i) high activity – the child who moves frequently and quickly, is liable to break things, to get bruised often, apt to collide with others, to interfere unintentionally with the activities and comfort of others, and to present problems of restless ness in situations were sitting quietly for long periods is necessary, (ii) average activity – a child who shows a certain amount of restlessness but in whom control is also evident, (iii) low activity – a child who is slow moving, content to remain in one place for long periods of time and apt to be slowed still further by attempts to hasten him

(d) *Teachers' rating of general mental ability* The term general mental ability was intended to include level and use of language, problem solving ability and attitudes, ease of learning basic skills, academic potential and ability to learn from experience Teachers rated the children on a seven point scale very superior, superior, above average, average, below average, inferior and very inferior

(e) *The Young Non Readers' Intelligence Test* is intended as a predictor of educability and as an aid in the assessment, grading and streaming of children aged 6 7 to 8 11 (48) Its norms are based on the scores of 4,960 children, its correlation with the Terman Merrill Form L is 83 and with 11+ results, 82 Measures of internal consistency are given as 95 and of stability as 95 (over four weeks) and 88 (over six months) It has four sections general information, differences, analogies and opposites

Procedure

A month was allowed at the beginning of the school year for teachers and pupils to become accustomed to one another The temperamental traits of interest (attention span, quality of participation, activity level) were then outlined to the teachers by the investigator with the request that their manifestation in the children be observed for the following three days At the end of that time, for each scale, the teacher was presented with a sheet of paper containing the names of all the children in her class in alphabetical order Opposite the children's names there was a number of columns corresponding to the number of points on each particular scale The sheet also bore a reminder of the description of the trait and its categories Teachers were invited to place a tick opposite each child's name in the column which best described him or her in relation to that trait The rating scales were filled in one at a time during the same session in the following order activity level, quality of participation, attention span Four weeks later, the children were given the Young Intelligence Test while the teacher filled in a rating sheet for general mental ability drawn up like the previous sheets Finally she was presented with another rating sheet for quality of participation 'in case she had changed her mind about any of the children' Second ratings were not obtained on the other traits

Treatment of data

Teachers' subjective ratings were transformed into standard scores by the method outlined by Garrett (14) which assumes a normal distribution of the traits under examination in the population as a whole Each sex

was scored separately The procedure was as follows in, for example, a class of 15 boys where on activity level (three point scale) the distribution was High – 8, Medium – 5, and Low – 2 The percentage of the total assigned to each point was calculated giving in the example cited High – 53 per cent, Medium – 34 per cent, and Low – 13 per cent The standard score was obtained by referring to the table in Garrett showing mean distances from the mean of various per cents of a normal distribution, in this case 75, 55, 1 63 These scores were then added to +3 00 and the results multiplied by 10 to give a score to the nearest whole number Thus the final scores applied in this example would be for High, 23, for Medium, 36 and for Low, 46 Pearson product moment correlations were calculated for all pairs of variables for the total number of subjects, for boys only and for girls only Chi squared tests were applied to test whether there were significant differences between the distributions of the ratings on attention span, participation (intellectual, both ratings, and social) and activity level by sex and for those whose mental ability had been estimated on the high side, on the low side, and within the same category when teachers' ratings and test results were compared Following Gordon and Thomas, in order to compare teachers' ratings with the scores on the intelligence test, the intelligence test scores were grouped into seven categories as follows very superior, 130+, superior, 120 129, above average, 110 119, average, 91 109, below average, 81 90, inferior, 71 80, very inferior, 61 70 As in the above study, a teacher rating which fell outside the appropriate category, was designated a high or low estimate While the precautions as detailed by Digman (9) were taken in obtaining the ratings, it must be acknowledged that there were still many sources of possible error in this type of measure ment (2, 19, 22, 35, 45) A comparison of ratings with objective scores also causes problems, apart from the question of error of measurement in the scores themselves, as the structural equivalence and predictability between data sources cannot be taken for granted Nevertheless, it has been found in previous studies (1, 15, 17, 18, 25, 33) that teachers' ratings and objective measures of intelligence have a high and significant correlation This was supported by the results in the present study and it was felt to justify the division of the ratings into high, low and accurate estimates so as to facilitate the isolation of any links with the other rated traits

RESULTS

The correlations between the ratings of quality of participation (intellect ual, both ratings) and rated mental ability were high and significant beyond the 001 level It is notable that the re rating of this trait had a higher

correlation with mental ability than the first rating, suggesting that there was a halo effect The correlation between quality of participation (social) and general mental ability was also significant beyond the 001 level, but it was not so high as that of intellectual participation

TABLE 1

INTERCORRELATIONS ON ALL VARIABLES FOR ALL SUBJECTS (N 244)

1	2	3	4	5	6	7
Activity Level	Participation (intellectual)	Participation (social)	Attention Span	Mental Ability	IQ (test)	Participation (intell re rated)
1	− 17	− 51	13	− 08	− 03	− 13
2		45	63	68	50	68
3			15	28	20	35
4				67	47	65
5					58	81
6						56

All correlations over 14 are significant beyond the 001 level

TABLE 2

TEACHERS RATINGS OF TEMPERAMENT TRAITS AND ESTIMATES OF MENTAL ABILITY

		Mental Ability Ratings					
TRAIT	LEVEL	HIGH	ACCURATE	LOW	χ^2	*df*	*p*
Quality of Participation (intell 1st rating)	Low (I & II)	11	19	47	38 68	4	< 001
	Medium (III)	26	40	26			
	High (IV)	36	23	16			
Quality of Participation (intell 2nd rating)	Low (I & II)	9	24	39	37 24	4	< 001
	Medium (III)	24	37	37			
	High (IV)	40	21	13			
Attention Span	Long (I)	36	23	15	30 8	4	< 001
	Medium (II)	28	47	41			
	Short (III)	9	12	33			
Activity Level	High (I)	7	19	14	6 0	4	NS
	Average (II)	47	53	47			
	Low (III)	19	15	23			
Quality of Participation (social)	Low (I & II)	5	11	23	11 47	4	< 05
	Medium (III)	29	36	31			
	High (IV)	35	39	35			

When the ratings of mental ability were broken down into 'high', 'low' and 'accurate' estimates and their distribution compared by Chi square tests with the distribution of quality of participation (intellectual) ratings (Table 2), it was found that teachers tended to give a higher rating than the objective test gave for mental ability to those children whom they rated as actively participant, and lower rating to those whom they saw as poor participants The trend was not apparent however when the distribution of quality of participation (social) was tested (Table 2)

Attention Span was also correlated highly with rated mental ability and it was found that a high rating on the variable was likely to be linked with a high estimate of intelligence, and a low rating with a low estimate of intelligence Activity Level was not significantly correlated with rated mental ability, in fact its correlation was negative, and the differences between the distributions were not significant at the 05 level

Teachers seemed to give girls more favourable ratings on quality of participation (intellectual, both ratings) and attention span The correlation between both ratings of participation (intellectual) was significantly higher for girls than for boys, suggesting that either teachers change their minds more often about boys, or that boys are less stable in their behaviour patterns There were no significant differences between the sexes on the distribution of ratings for quality of participation (social) and activity level

TABLE 3

SEX DIFFERENCES IN TEACHERS' RATINGS OF TEMPERAMENT TRAITS

TRAIT	LEVEL	BOYS	GIRLS	χ^2	*df*	*p*
Quality of Participation (intell 1st rating)	Low (I & II)	40	37			
	Medium (III)	63	29	16 9	2	< 001
	High (IV)	28	47			
Quality of Participation (intell 2nd rating)	Low (I & II)	51	21			
	Medium (III)	53	45	17 71	2	< 001
	High (IV)	27	47			
Quality of Participation (social)	Low (I & II)	19	23			
	Medium (III)	51	45	1 7	2	NS
	High (IV)	61	45			
Attention Span	Long (I)	29	45			
	Medium (II)	68	48	10 7	2	< 01
	Short (III)	29	45			
Activity Level	High (I)	21	19			
	Average (II)	72	75	5 1	2	NS
	Low (III)	38	19			

The distribution of mental ability ratings was not significantly different by sex either and this coincided with the results of the intelligence test An analysis of variance of the scores found no significant differences for sex, though it found differences for schools and classes (both beyond the 01 level of significance)

When we consider the correlations between the variables separately for each sex, some differences emerge The correlation between quality of participation (intellectual, first rating) and mental ability was significantly higher for girls than for boys, as was correlation between participation (social) and mental ability

TABLE 4

INTERCORRELATIONS FOR ALL VARIABLES SEPARATELY BY SEX

Boys (N 131)						
1	2	3	4	5	6	7
Activity Level	Participation (intellectual)	Participation (social)	Attention Span	Mental Ability (rated)	IQ (tested)	Participation (re rated)
1	− 15	− 65	23	− 04	04	− 05
2		34	58	61*	45	59**
3			03	16	07	23
4				63	42	62
5					57	82
6						54
Girls (N 113)						
1	2	3	4	5	6	7
Activity Level	Participation (intellectual)	Participation (social)	Attention Span	Mental Ability (rated)	IQ (tested)	Participation (re rated)
1	− 2	− 31	01	− 12	− 13	− 24
2		57	68	76*	55	79**
3			28	42	35	50
4				70	53	70
5					60	79
6						61

*Significant at 05 level **Significant at 01 level

The distribution of the ratings on participation (intellectual, both ratings) and attention span among those whose mental ability had been estimated on the high side (compared to their IQ scores) showed that the girls in this category were more likely to be favourably rated on those variables, whereas boys whose mental ability was estimated on the high side were not favoured to the same extent There were no differences between the distributions of the ratings on participation (intellectual) for those whose mental ability was estimated on the low side

TABLE 5

RATINGS ON QUALITY OF PARTICIPATION ATTENTION SPAN FOR SUBJECTS GIVEN A HIGH ESTIMATE OF INTELLIGENCE

TRAIT	LEVEL	BOYS	GIRLS	χ^2	*df*	*p*
Quality of Participation (intell 1st rating)	Low (I & II)	9	2			
	Medium (III)	22	4	25 60	2	< 001
	High (IV)	9	27			
Quality of Participation (intell 2nd rating)	Low (I & II)	8	1			
	Medium (III)	18	6	14 4	2	< 001
	High (IV)	14	26			
Attention Span	Long (I)	11	25			
	Medium (II)	22	6	16 7	2	< 001
	Short (III)	7	2			

DISCUSSION

The results of this study showed an association between teachers' estimates of intelligence and teachers' rating of quality of participation (intellectual) Thus, the findings of previous studies (17, 25) would seem to be supported even with a longer period of time between the ratings, a refinement of the concept, and using a non American sample of a different age and of a broader social and intellectual range The addition of attention span showed it to be a possible behavioural rating alternative to quality of participation, as it would seem an easier concept and its relationship with the other variables was not significantly different from that of quality of participation The inclusion of activity level showed that the teachers in this study were able to separate physical characteristics from intellectual functioning in their rating of the children, and they did not see any sex differences in the distribution of ratings on this variable

The larger sample in this study, however, permitted a breakdown of the findings accorded to sex and this showed that although neither intelligence

ratings nor objective IQ scores differed significantly by sex in their distribution, there were significant differences favouring the girls in the distribution of ratings on participation (intellectual) and attention span, further, the association between ratings on these variables and estimates of intelligence was not the same throughout the sample It was found that while low ratings on these variables were associated with estimates on the low side for intelligence without significant differences between the sexes, the association between high ratings on these variables and estimates of intelligence which were on the high side (compared to the objective scores) was much stronger for girls than for boys This suggests that the overall finding for the subjects in the present study and in previous studies (17, 25) may have been due to the more positive behavioural ratings for the girls and that the association may not be true to the same extent for boys In this context several questions arise Why should girls be rated higher on these traits? Why should the association between high ratings on those traits and high estimates of intelligence be stronger for girls than for boys? And what are the implications for teachers and researchers?

The question of higher ratings for girls has been investigated by researchers concerned about the lower ratings for boys linked with inferior academic performance (12, 23, 34) They offer explanations firstly in terms of the sex of the child – girls may be more sensitive to expectations and more conformist at that age, perhaps by nature, perhaps by culture, girls show more stability in temperamental traits, shown by the two ratings on quality of participation (intellectual) in this study, boys are expected to be, and perhaps are, more rowdy and lively and this is looked on as something to be controlled and repressed rather than as something on which to build so that ratings for equivalent behaviour may be less favourable for boys (13, 31) Secondly, explanations are offered in terms of the sex of the teacher, bearing in mind the fact that the majority of teachers at the lower end of the primary school are female (4, 24, 38, 41, 47) – female teachers may find it easier to deal with and classify girls than boys, they may have a better entente with girls and clearer ideas of the kind of behaviour they want to reinforce in girls, children may imitate models of their own sex – and gain approbation from them for this – but not those of the opposite sex at that age (11, 34, 39) Finally, explanations have been offered in terms of the school as an institution, which presents female values and models, and its curriculum at the primary stage which may be more suited to the inclinations and abilities of girls (23, 46) While this last explanation was supported by Martin's findings of lower ratings for boys on social and academic variables by both male and female teachers (29), it is brought into question by the findings of the present study which showed that

while low ratings on behavioural traits and low ratings on mental ability were associated, there was not a significant difference between the sexes when rated by female teachers

Although the association was stronger for girls than for boys, between high ratings on quality of participation (intellectual) and attention span on the one hand and estimates of mental ability which were on the high side (compared to the objective scores) on the other, it is possible that the teachers rated all three variables completely independently of each other, and that girls may differ from boys on these traits One might see support for this possibility in the slightly higher correlations for girls between these behavioural variables and measured intelligence On the other hand other suggestions can be offered in attempting to explain why teachers might have associated the variables in the way shown by the results Given the realities of cultural bias against women, it may be that girls need to show more active participation and more concentration than boys if they are to succeed in life Teachers, especially female teachers, being aware of this, will take temperamental traits such as those in this study into consideration when assessmg mental ability and will demand a high level of partic ipation and attention in girls before they will rate them equally with boys on mental ability Although both boys and girls, who were rated low on these behavioural variables and who were given low estimates of intelligence, may suffer equally the consequences of low expectations in ability and general behaviour (20, 21), once boys have shown themselves average on participation and attention span they seem to enjoy favourable estimates of intelligence and the expectations it brings to the same extent as girls who have to work harder on a behavioural level for the same result

An association between behavioural variables and both rated and measured intelligence has been indicated by this study, but it is also clear that the relationship is by no means a simple one The fact that studies, based on the premise that this association varies simply with sex, which have developed educational programmes mainly to boost the academic performance of boys, have had inconclusive results (5, 39) tends to support the conclusions of the present study that a complex of interacting forces including temperamental qualities, intelligence and sex of the child as well as pressures of culture and personalities outside the child must be taken into consideration when assessing a child's potential for success

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