Concurrent validity of Jastak and Jastak's meanings and measures of mental tests.

Jennifer Dunn
University of Windsor

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CONCURRENT VALIDITY OF JASTAK AND JASTAK'S
MEANINGS AND MEASURES OF MENTAL TESTS

by

Jennifer Dunn
B.A., University of Windsor, 1979

A Thesis
Submitted to the Faculty of Graduate Studies
through the Department of Psychology
in Partial Fulfillment of the
Requirements for the Degree
of Master of Arts at the
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1981
ABSTRACT

Jastak and Jastak (1979) developed a scoring system to derive behavioral information which was relatively independent of intelligence from the Wechsler scales and the Wide Range Achievement Test. The principal purpose of the present study was to evaluate the validity of the Jastak system by comparing behavioral ratings of the 10 lobals derived from the Jastak system with ratings from individuals who knew the 31 learning disabled subjects well.

Results indicated that the raters were able to interpret Jastak and Jastak's lobal descriptions in a systematic and consistent fashion. However, in spite of high inter rater reliability, there was virtually no evidence to support the hypothesis that the Jastak system was concurrently valid. Explanations for these results are provided.

Interestingly, two of the 10 lobals were found to be more valid than the others. An examination of these lobals revealed that they constitute a verbal and a performance factor, leading one to question the uniqueness of the Jastak system.
ACKNOWLEDGEMENTS

First I would like to thank the Medical Research Council for financially supporting this study.

I wish to thank Dr. Byron P. Rourke for the time and energy that he invested in this project.

I also wish to thank Dr. Neal Holland for his greatly appreciated guidance and support, without which this project would undoubtedly never have been undertaken. Dr. Noel Williams deserves appreciation for his willingness to assist at the midway point in the study.

The people from Children's Achievement Centre were extremely cooperative. Helen Arbour, Chris Brannigan, Evelyn Corcos, Helen Martin, Sheila Minton and Marilyn Pinchard receive my appreciation for their willingness to participate in the study.

I would also like to express my gratitude to Charly Geier who was always willing to lend a helpful hand and who somehow found the strength to continually support me despite my unreasonable moods.

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CHAPTER I
INTRODUCTION

In an attempt to derive additional information from standardized intelligence tests, Jastak and Jastak (1979), transformed standard scores of the Wechsler scales and the Wide Range Achievement Test into non-intellective factors. Their system yields information related to behavioral characteristics which are relatively independent of intelligence. This study was an attempt to validate their theory.

Previous research concerning the structure of intelligence has provided much of the groundwork and has influenced the development of Jastak and Jastak's theory. To fully understand their theory, it will be beneficial to first examine alternate theories of intelligence.

The word intelligence is derived from the Latin word "intelligo" which means the actual exercise of intellect. With time, the meaning of intelligence became increasingly confused, to the point where there are so many different meanings of the word that one cannot provide a definite answer to the question "What is intelligence?" An examination of a few of the definitions ascribed to the word will clarify this point.

According to Pyle (1979), intelligence may refer to an individual's present ability or to what an individual is capable of doing in the future. Others have described intelligence as the rate of a child's mental development in relation to his peers, while others define it as the ability to profit from experience. A researcher's point of view
appears to affect how he defines intelligence. For example, Wechsler defines intelligence as an overall global capacity of an individual to understand and cope with the world around him (1974, p. 5); to Piaget intelligence is an individual's ability to adapt to the environment (Flavell, 1963); and still others refer to intelligence as what intelligence tests measure. Pyle (1979) provides a clear summary of this point:

> Basically, one finds that the biologist would stress the ability to adapt to the demands of the environment; the educationalist the ability to learn; some psychologists emphasize the measurement of the ability to reason and other cognitive functions, others the development of those functions; and probably the layman would rumble something about 'common sense'! (p. 3)

Apparently, psychologists have not been able to come to a general consensus about the definition of intelligence.

A number of researchers have attempted to clarify the meaning of intelligence by investigating the structure of this concept. Various theoretical models have been developed related to the number of structural components of intelligence.

Before examining the various models of the structure of intelligence, it is important to note that the theories are based on empirical investigations. Usually, the researcher administers a number of tests to a considerable number of people, and then correlates the scores to determine if a cluster of scores exists which involves the same ability. Through statistical techniques such as correlation coefficients and factor analysis, various test scores are compared and if they are found to correlate, they are regarded as measuring a factor. Thus,
"a factor is a construct which accounts for the objectively determined correlations between tests" (Vernon, 1950, p. 8). Therefore, the various factors discussed in the models are derived from empirical investigations of test results.

An English psychologist, Charles Spearman (1863-1945), was one of the first people to investigate the structure of intelligence by empirical methods. Spearman (1904) reports that when he administered a number of tests of mental ability to various children, he found that the tests were positively correlated. Thus, if a child scored well on one test, he would tend to score well on others. Based on these findings, Spearman concluded that:

This continued tendency to success of the same person throughout all variations of both form and subject matter - that is to say, throughout all conscious aspects of cognition whatever - appears only explicable by some factor lying deeper than the phenomena of consciousness. And thus there emerges the concept of a hypothetical general and purely quantitative factor underlying all cognitive performances of any kind. (1923, p. 5)

Spearman named this common factor 'general factor' and denoted it by 'g'. The general factor was thought to remain constant for any individual across all correlated abilities. Spearman emphasized that intelligence was not a definition of 'g', but instead felt that 'g' was influenced by the mental energy with which an individual was endowed.

However, since an individual did not obtain the same score on all of the tests, Spearman theorized that each operation had a smaller, more specific ability associated with it; the 'specific factor' denoted by the letter 's'. Specific factors were thought to vary interindividually, and intraindividually from one ability to another.
Spearman stated that these specific factors:

would thus function as alternative 'engines' into
which the common supply of 'energy' could be alternatively
distributed. (1923, p. 6)

Thus, the first model of intelligence was Spearman's two-factor
theory and essentially stated that an individual's performance on a task
was dependent on a general factor and on factors specific to the
particular task.

The main criticism of Spearman's model was that it did not
incorporate 'group factors' which are less general than 'g', but not
as specific as 's'. However, towards the end of Spearman's work, he
discussed the existence of group factors such as verbal, mechanical,
logical, psychological and arithmetical (1927, p. 241-242). Therefore,
although Spearman did state that these broad group factors were rare,
he did not state that they were non-existent. In fact, Spearman and
Wynn-Jones (1950) stated that the two-factor theory "only indicates the
initial degree of analysis; certainly not the ultimate" (p. 10).
Although, Spearman did acknowledge the existence of group factors,
American psychologists have provided more extensive research concerning
the identification of group factors.

L. Thurstone (1887-1955) also investigated the structure of human
abilities. In 1938, he reported the results of an analysis of fifty-six
psychological tests which had been administered to 240 college student
volunteers. Seven factors, which he called 'primary mental abilities',
were identified. These abilities are:

S - Space - the ability to visualize space

P - Perceptual Speed - facility in finding or in recognizing
particular items in a perceptual field

N - Number - facility in numerical calculation

V - Verbal comprehension - facility in understanding verbal material

W - Word Fluency - facility in finding words to represent restricted context (i.e.) rhyming

M - Memory - facility in recalling (word pairs/sentences)

I or R - Reasoning - facility in finding general rules and extracting commonalities (Thurstone, 1938).

The seven primary mental abilities were assumed to be of equal importance and an individual's performance on a given task was said to be dependent to varying degrees on one or more of these factors.

Spearmen (1939) indicated that Thurstone's primary factors were positively correlated and could be analyzed to yield a general factor and smaller group factors. Thurstone (1948) referred to these intercorrelations as 'second order factors' and stated:

These primary abilities may be regarded as media for the expression of intellect and people differ markedly in the effectiveness with which they can express themselves in these different media. The second order factors represent parameters that are more central in character and more universal in the sense that they are not determined by the efficiency of each modality or imagery type. The first order primary factors may be regarded as separate organs, in a general sense, while the second order or general factors represent parameters which influence the activities of several organs or primary factors. (p. 403)

Thus, Thurstone did not disprove the existence of 'g', but provided an alternate interpretation by dividing 'g' into seven group factors. However, Thurstone expressed the opinion that "a broad profile of an individual's mental abilities was more useful than a single, overall
measure" (Pyle, 1979, p. 11).

Gulford (1959), also an American researcher, feels that both Spearman's and Thurstone's models of intelligence are far too simple. He developed a model of the structure of intellect which involves at least 120 distinct intellectual abilities. Contrary to the previous models, which are hierarchical in nature, the 'structure of intelligence model' is morphological since it involves an interaction between three processes: operation, content and product.

Gulford begins by organizing the factors into these three categories. One way of classifying is based on the kind of operation performed. There are five groups of intellectual abilities within the operation category: factors of cognition (discovery or rediscovery or recognition); memory (retention of what is cognized); convergent thinking (the generation of new information from known information that leads to one right answer); divergent thinking (the generation of new information that leads to several possible answers or ideas); and evaluation (decisions as to goodness, correctness, suitability) (Gulford, 1959).

Factors are also classified according to content or the kind of material involved. The four types of content are: figural (concrete material perceived directly by the senses); symbolic (letters, digits, and other conventional signs); semantic (verbal meanings or ideas); and behavioral (psychological) (Gulford, 1959).

The third way of classification is according to the product or the forms that the information takes in processing. The six kinds of products are: units (things, segregated wholes, figures on ground, or
chunks; classes (set of objects with one or more common properties); relations (connections between two things; bridge or connecting link); systems (complexes, patterns or organizations of interdependent or interacting parts); transformations (changes, revisions, redefinitions or modifications from one state to another); and implications (expectations, anticipations, predictions from given information) (Guilford, 1967).

The 120 abilities which result from the cross-classifications of the factors are shown in Figure 1. Guilford assumes that each one of the 120 cubes represents a unique ability in that it is a combination of one kind of operation, one kind of product and one kind of content. He has subsequently attempted to develop tests to measure each of the 120 unique abilities.

On a practical level, the investigations of the structure of intelligence have influenced intellectual assessments. Many standardized intelligence tests provide an IQ score which summarizes all factors of intelligence into one score (e.g., Stanford-Binet). However, many researchers have attempted to deglobalize IQ scores (Rappaport, 1968; Tryon, 1970; Cronbach, 1960). Today, instead of providing a single IQ score, many testing instruments attempt to break down an individual's score to reveal an individual's intellectual abilities. Wechsler (1949, 1958, 1974) encouraged this type of analysis by dividing his scales into verbal and performance tests.

Jastak and Jastak (1979) support this contention that additional information can be extracted from intellectual assessments. They developed a scoring system for the Wechsler scales and the Wide Range Achievement Test in hopes of obtaining information related to behavioral
Figure 1: The structure of intellect model. (Adapted from J. Guilford "The Nature of Human Intelligence" New York: McGraw-Hill, 1967).
characteristics which are relatively independent of intelligence. Jastak and Jastak felt that the apparent conflicts between the various structure of intelligence theories could be resolved by a new interpretive approach.

The basic data in the development of their theory consisted of the correlation coefficients between the Wechsler scales and Wide Range Achievement Test subtests and means of the overall test scores. This analysis revealed that different subtests contributed different percentages to the total test variance.

Their system is based on the assumption of the existence of three factorial hierarchies in test results. These levels are referred to as global, lobal, and obal. The global level refers to a general underlying component in test results which is similar to Spearman's 'g'. Jastak and Jastak emphasize that although the global component underlies behavior, it does not determine the total behavior variance. By subtracting the lobal and obal variances from 100%, they estimated that the global level accounts for 22.7% of the total test variance.

The lobal level consists of non-global variances which are similar to what Thurstone called 'group factors'. Jastak and Jastak concluded that the mean variances were lobal since they tended to fluctuate in size from subtest to subtest. The lobals constitute an average of 60% of the unexplained variance in the Wechsler and Jastak Intelligence Scales.

As early as 1940, Wechsler discussed similar findings that 50 to 70% of the intertest correlational variance remained unaccounted for after all recognizable intellectual factors were eliminated. He suggested
that "this residual variance is largely contributed by such factors as
 drive, energy, impulsiveness, etc." (p. 444). Wechsler referred to
these factors as 'nonintellective factors in general intelligence' which
could be regarded as temperamental traits. However, he feels that it is
a mistake that these factors are generally treated as sources of error
and eliminated from test measures. He states:

What is necessary, instead, is the devising of test
situations in which the non-intellective factors can
be identified, measured, and weighted. (1940, p. 445)

In an attempt to identify these non-intellective factors, Jastak
and Jastak, through inspection of correlation matrices and clinical
intuition, concluded that the mean lobal variances are associated with
personality traits outside the realm of intelligence. The number of
these traits is limited by "the number and type of subtests which
belong together beyond the global effect" (1979, p. 3). In total they
identified ten lobal clusters: 1) Lexigraphic Cluster; 2) Linguistic
Cluster; 3) Semantic Cluster; 4) Reality Cluster; 5) Motivational
Cluster; 6) Psychomotor Cluster; 7) Elative Cluster; 8) Depressive
Cluster; 9) Judgement Cluster; and 10) Reasoning Cluster. These lobals
are described in Appendix A.

Individual lobal scores are standard scores with a mean of 100 and
standard deviation of 15. It is important to note that interpretations
of lobal cluster scores are intra-individual assessments. Such an
assessment indicates an individual's strong and weak areas of adjustment
or behavior in comparison to himself.

The third level, referred to as the obal level is a residual measure
of error not measured in the global and lobal levels, which is unique
to each subtest. The obal level may also include an unexplored lobal. Thus, "the size of obals is inversely proportionate to the size of lobals" (Jastak and Jastak, 1979, p. 31). The obal level can be calculated directly from the correlations between subtests and means by the formula $(1 - r^2)^2$.

This study deals with lobals and the behavioral correlates associated with them. Jastak and Jastak describe in detail behavioral manifestations of extreme lobal scores. Apparently, there has been no attempt to formally validate this system. The purpose of this study, therefore was to attempt to validate Jastak and Jastak's system using concurrent validity procedures.

Specifically, learning disabled children's WISC and WRAT profiles were scored and interpreted according to Jastak and Jastak's system. The lobal scores for each individual child were then ranked from highest to lowest. Individuals who knew the children well were asked to rate a number of the lobals within each child, according to definitions of each lobal. A comparison was then made between these two types of ratings.

Jastak and Jastak assume that the variation within each child, which is identified by lobal levels, is manifested behaviorally. Therefore, it was hypothesized that descriptions of the child provided by people who knew the child well would correlate with descriptions based on Jastak and Jastak's interpretation system. Thus, it was expected that a positive correlation would result between raters' rankings and test data ranks.
CHAPTER 2

METHOD

Subjects

The subjects consisted of 31 children who were currently enrolled in the program at Children's Achievement Centre, Windsor, Ontario. Two of the subjects from the original sample of 33 were eliminated from the sample as a result of missing test data. The sample was 84% male and 16% female. Subjects ranged in age from 7 years, 1 month to 14 years, 9 months, with an overall mean age of 10 years, 5 months.

Procedure

The subjects' WISC and WRAT profiles were drawn from results which were currently available from the Neuropsychology Department, Regional Children's Centre, Windsor Western Hospital, Windsor, Ontario. Individual profiles were scored and interpreted according to Jastak and Jastak's system of analysis.

The various calculations which are part of the system of analysis are summarized on analysis forms (Figure 2). Separate analysis forms were developed for each sex. As illustrated, the first column to the right of the subtest names contains the mean correlations: that is, the correlations between each subtest and the mean of all the WISC and WRAT subtests. The next two columns contain the raw and scaled scores for each of the 14 subtests.

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<tr>
<td>13. WRAT Spelling</td>
<td>77</td>
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<td>14. WRAT Arithmetic</td>
<td>74</td>
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</tr>
<tr>
<td>Standard Deviation</td>
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</tr>
</tbody>
</table>

the 14 subtests for sex. Sex-adjusted standard scores have a mean of 100 and a standard deviation of 20, and are included in the manual from Table 27 to 32. This step is necessary because the WISC and WRAT were originally standardized on sexually mixed populations. The analysis of Jastak and Jastak requires separate norms for males and females since correlation coefficients between WISC and WRAT subtests and the means of the overall test scores revealed sex differences. The mean and standard deviation of the sex-adjusted standard scores are then calculated.

Column 5 contains regression constants for each of the 14 subtests. These are multipliers that are used in regressing the standard score to the mean. The regressed scores which are reported in Column 6 are calculated as follows. The mean of the sex-adjusted scores is subtracted from 100, the group mean. The resulting difference is multiplied by each regression constant and added to or subtracted from each of the 14 sex-adjusted scores. The mean of the 14 regressed scores, which is expected to be very close to 100, is then calculated. The purpose of regressing the scores to the mean is to convert the sex-adjusted standard scores to an ipsative format.

The next 10 columns are reserved for the calculations of the 10 lobal clusters. The subtests which enter into each cluster are marked by the loading which the test is assumed to contribute to the factor. For example, in Column 7 entitled Lexigraphics, the tests of reading and spelling are involved. The loadings of the marked cells are added to or subtracted from the corresponding regressed score in Column 6. To determine whether the loadings are added or subtracted, it is necessary to calculate the mean of the regressed scores that correspond
to the marked cells. If the mean of the regressed test scores that are included in a cluster are 100 or above, the loadings are added to the appropriate regressed scores. If the mean is below 100, the loadings are subtracted. There is one exception, however. If a column contains an underlined loading (e.g., 5), the value of the appropriate regressed score determines whether loadings are added or subtracted. When the appropriate regressed score is 100 or above, loadings are added; if below 100, loadings are subtracted.

The means and standard deviations of each of these 10 columns is then calculated. The mean of each of the columns is a lobal value, which has a mean of 100 and a standard deviation of 15. The standard deviations of the columns are thought to indicate the stability of the cluster score. Thus, the smaller the standard deviation of the cluster score, the less likely the cluster is expected to change with subsequent testing.

The sex-adjusted standard scores of Column 4 are then ranked from highest to lowest and entered in Column 17. Jastak and Jastak used the means and standard deviations of each rank to develop standard scores for each rank. These standard scores, which are found in Table 34 of the manual, are reported in Column 18. The highest and lowest of these scores represents the error range of the IQ.

This study focused on lobal values, which are the means of Column 7 through 16. These values were calculated for each of the 31 subjects. The 10 lobal values for each individual child were then ranked from highest to lowest.

Six individuals who had worked at Children's Achievement Centre,
Windsor, Ontario for an average of 4 years served as raters. Their specific roles were that of a resource liaison, a behavior management supervisor, a motor unit supervisor, a speech and language pathologist, a visual teacher and an intake officer. The raters, who had daily contact with the children and knew all of the subjects well, were each given 10 cards containing the high behavioral descriptions of the 10 lobals. The behavioral descriptions were taken directly from Jastak and Jastak's manual (Appendix B). In addition, they were given a list of the names of the 31 subjects. The raters were asked to read the behavioral descriptions on the cards carefully and were then given time to discuss their interpretation of the descriptions, so as to reduce any ambiguity which was inherent in the definitions.

These six individuals were then asked to think about each child whose name appeared on the list and rank the 10 lobals from most characteristic to least characteristic for each individual child according to the behavioral descriptions (see Instructions, Appendix C). During this meeting, it was emphasized that it was important that they rated individually and did not discuss their ratings with each other.

Coefficients of concordance of rater agreement across the six raters were calculated to assess inter-rater reliability and indicated whether Jastak and Jastak's lobal descriptions were interpreted systematically across raters. The coefficients of concordance indicated whether the lobal constructs are consistent enough to be systematically identified.

The mean ranking of the six raters for each individual child was then calculated. Using the Kendall tau statistic, the raters' mean
rankings were correlated with the ranks derived from the Jastak and Jastak system, for each individual child.

In addition, Jastak and Jastak suggest that lobals are relatively independent of each other, but neglect to include any supporting data in the manual. In order to clarify this issue, pearson-product moment correlations between all possible pairs of lobals were calculated.
CHAPTER 3

RESULTS

The results of the analyses described earlier will be presented in this chapter. The results will be presented in two general sections based upon a presentation of the descriptive statistics and the statistics directly related to the validation of the Jastak system.

Descriptive Statistics

The statistics in this section are computed on the basis of data from the Jastak & Jastak analysis system.

The mean, standard deviation, minimum and maximum values, and the range are presented in Table 1 for each of the 10 lobals, based on the full sample of 31 children. The profile of mean lobal scores for the sample subjects is shown in Figure 3.

Pearson Product Moment correlations were computed using the 10 lobals for the sample of 31 children. The correlation matrix is contained in Table 2. An examination of Table 2 shows that 15 of the 45 correlations were statistically significant.

Validation Statistics

To assess inter-rater reliability, coefficients of concordance of rater agreement were calculated across the six raters for each of the 31 subjects, using Kendall's W. Twenty-three of the 31 obtained coefficients were found to be significant (p < .05). Table 3 contains the coefficients
TABLE 1
DESCRIPTIVE STATISTICS FOR SAMPLE OF CHILDREN (n=31)

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum Value</th>
<th>Maximum Value</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>90.06</td>
<td>11.14</td>
<td>63.00</td>
<td>114.00</td>
<td>51.00</td>
</tr>
<tr>
<td>Lexigraphic</td>
<td>94.35</td>
<td>20.84</td>
<td>62.00</td>
<td>151.00</td>
<td>89.00</td>
</tr>
<tr>
<td>Semantic</td>
<td>108.10</td>
<td>12.45</td>
<td>74.00</td>
<td>130.00</td>
<td>56.00</td>
</tr>
<tr>
<td>Reality</td>
<td>111.97</td>
<td>12.79</td>
<td>79.00</td>
<td>131.00</td>
<td>52.00</td>
</tr>
<tr>
<td>Motivation</td>
<td>90.77</td>
<td>12.26</td>
<td>73.00</td>
<td>115.00</td>
<td>42.00</td>
</tr>
<tr>
<td>Psychomotor</td>
<td>100.65</td>
<td>10.54</td>
<td>81.00</td>
<td>120.00</td>
<td>39.00</td>
</tr>
<tr>
<td>Elation</td>
<td>103.68</td>
<td>10.82</td>
<td>80.00</td>
<td>127.00</td>
<td>47.00</td>
</tr>
<tr>
<td>Depression</td>
<td>97.03</td>
<td>9.94</td>
<td>75.00</td>
<td>112.00</td>
<td>37.00</td>
</tr>
<tr>
<td>Judgement</td>
<td>113.06</td>
<td>10.76</td>
<td>83.00</td>
<td>133.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Reasoning</td>
<td>89.55</td>
<td>7.93</td>
<td>80.00</td>
<td>120.00</td>
<td>30.00</td>
</tr>
</tbody>
</table>
Figure 3. Profile of Mean Lobal Scores
TABLE 2
CORRELATION MATRIX OF LOCAL SCORES OF ALL SUBJECTS (n=31)

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lin.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lex.</td>
<td>.09</td>
<td>1.0</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sem.</td>
<td>.03</td>
<td>-.13</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rea.</td>
<td>-.33</td>
<td>-.83***</td>
<td>-.11</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mot.</td>
<td>.04</td>
<td>.83***</td>
<td>-.16</td>
<td>-.79***</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psy.</td>
<td>-.50**</td>
<td>.36*</td>
<td>-.47**</td>
<td>-.06</td>
<td>.18</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ela.</td>
<td>-.44*</td>
<td>-.42*</td>
<td>-.28</td>
<td>.45*</td>
<td>-.26</td>
<td>.10</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dep.</td>
<td>-.04</td>
<td>-.32</td>
<td>.10</td>
<td>.19</td>
<td>-.09</td>
<td>-.07</td>
<td>-.13</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jud.</td>
<td>.19</td>
<td>-.45*</td>
<td>.55**</td>
<td>.34</td>
<td>-.60***</td>
<td>-.37*</td>
<td>-.06</td>
<td>-.21</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Res.</td>
<td>-.00</td>
<td>.06</td>
<td>-.40*</td>
<td>.08</td>
<td>.13</td>
<td>.29</td>
<td>-.24</td>
<td>.27</td>
<td>-.49**</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*  \( p < .05 \)
** \( p < .01 \)
*** \( p < .001 \)
for each individual subject. These results suggest that Jastak's lobal
descriptions were interpreted systematically across the raters.

In order to determine if the age of the subject or the length of
time the subject had attended Children's Achievement Centre covaried
with the level of rater agreement, Kendall tau correlations were
calculated. The correlation between age and rater agreement was .087,
while the correlation between the length of attendance and the level of
rater agreement was -.097. These non-significant correlations indicate
that neither the age of the subject nor the length of time he/she
attended Children's Achievement Centre affected the degree of inter-rater
agreement.

The mean rankings of the six raters for each individual child were
then calculated. Using the Kendall tau statistic, the raters' mean
rankings were correlated with the ranks derived from the Jastak system
for each individual child. The analysis revealed that four of the 31
obtained correlations were statistically significant ($p < .05$). The 31
individual correlations are presented in Table 4.

To determine if the level of rater agreement was related to the
correlation between the raters' rankings and ranks derived from the Jastak
system, a Kendall tau correlation was calculated. Only those subjects
for whom the coefficient of concordance was .500 or above were included
in this calculation. On the basis of the 13 subjects, the correlation
was -.167, indicating that the level of rater agreement did not affect
the degree of relation between the raters' rankings and Jastak and
Jastak's rankings.

Previous test results from within the past two years were used as
the basis for the Jastak analysis. Therefore the time interval between
TABLE 3

SUMMARY OF COEFFICIENTS OF CONCORDANCE (W)

<table>
<thead>
<tr>
<th>Subject</th>
<th>W</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>.829***</td>
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<tr>
<td>2.</td>
<td>.805***</td>
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<tr>
<td>3.</td>
<td>.785***</td>
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<tr>
<td>4.</td>
<td>.783***</td>
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<tr>
<td>5.</td>
<td>.719***</td>
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<tr>
<td>6.</td>
<td>.652***</td>
</tr>
<tr>
<td>7.</td>
<td>.632***</td>
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<tr>
<td>8.</td>
<td>.613***</td>
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<tr>
<td>9.</td>
<td>.560***</td>
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<tr>
<td>10.</td>
<td>.559***</td>
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<tr>
<td>11.</td>
<td>.554***</td>
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<tr>
<td>12.</td>
<td>.551***</td>
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<td>13.</td>
<td>.530***</td>
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<td>14.</td>
<td>.465**</td>
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<tr>
<td>15.</td>
<td>.460**</td>
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<tr>
<td>16.</td>
<td>.430**</td>
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<tr>
<td>17.</td>
<td>.430**</td>
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<td>.426**</td>
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<td>.417**</td>
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<td>20.</td>
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<td>21.</td>
<td>.384*</td>
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<td>22.</td>
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<td>.176</td>
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* p < .05
** p < .01
*** p < .001
<table>
<thead>
<tr>
<th>Subject</th>
<th>Kendall tau</th>
</tr>
</thead>
<tbody>
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<td>1</td>
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</tr>
<tr>
<td>2</td>
<td>.289</td>
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<tr>
<td>3</td>
<td>.556*</td>
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<tr>
<td>4</td>
<td>.311</td>
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<td>5</td>
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<td>.267</td>
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<td>30</td>
<td>.289</td>
</tr>
<tr>
<td>31</td>
<td>.378</td>
</tr>
</tbody>
</table>

* p < .05
** p < .01
the administration of the intelligence tests and when the raters were asked to rate the subjects may have affected the results. To determine if this time interval affected the degree of correlation between the raters' rankings and ranks derived from the Jastak system, a Kendall tau correlation was calculated. The correlation of -.177 indicates that the length of time since the assessment did not significantly affect the results.

Finally, Kendall tau correlations were calculated to determine if specific lobals were more valid than other lobals. That is, the raters' mean rankings were correlated with ranks derived from the Jastak system for each of the 10 lobals across the sample of 31 subjects. These correlations are presented in Table 5. As indicated in the table, significant positive correlations were obtained for the lobals referred to as Lexigraphic and Reality. In addition, a significant negative correlation was found for the Depression lobal. The obtained correlations for the remaining seven lobals were non-significant. These results will be discussed in detail in the next chapter.
TABLE 5

SUMMARY OF KENDALL TAU CORRELATIONS FOR EACH OF THE 10 LOBALS

<table>
<thead>
<tr>
<th>Lobal</th>
<th>Kendall tau</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lexigraphic</td>
<td>.486***</td>
</tr>
<tr>
<td>Linguistic</td>
<td>.029</td>
</tr>
<tr>
<td>Semantic</td>
<td>.128</td>
</tr>
<tr>
<td>Reality</td>
<td>.453***</td>
</tr>
<tr>
<td>Motivation</td>
<td>.083</td>
</tr>
<tr>
<td>Psychomotor</td>
<td>.091</td>
</tr>
<tr>
<td>Elation</td>
<td>.130</td>
</tr>
<tr>
<td>Depression</td>
<td>-.217*</td>
</tr>
<tr>
<td>Judgement</td>
<td>.177</td>
</tr>
<tr>
<td>Reasoning</td>
<td>.102</td>
</tr>
</tbody>
</table>

* p < .05
*** p < .001
CHAPTER 4
DISCUSSION

The purpose of the present study was to evaluate the validity of the Jastak system. Specifically, it was an attempt to determine if individuals who have daily contact with the subjects would rate the behavioral correlates associated with Jastak's lobals in a manner similar to ratings derived from the Jastak system.

On the basis of Jastak's interpretation system, a description of the sample of 31 learning disabled subjects can be derived from the profile of mean lobal scores. Past research has indicated that learning disabled children do not constitute a homogeneous population (Fisk & Rourke, 1979; Sweeney & Rourke, 1978). To the extent that this sample is composed of children from a number of different subtypes of learning disabilities, a general profile may not prove to be meaningful.

With this limitation in mind, the sample of subjects is best described as being able to make quick, workable decisions. They tend to be loners, highly independent, and sure of themselves. In addition, the sample is perceptive, objective, relevant, and flexible and tend to learn most effectively in settings in which they are able to interact, manipulate and experiment with the environment.

One major weakness is their ability to think in a logical, step-by-step manner. These children approach problem situations in a random, trial-and-error fashion and are inclined to be distracted by irrelevant
issues.

Another area of weakness is their tendency to become easily frustrated. Consequently, these children give up or take the path of least resistance when faced with a problem. Moreover, they lack self-control and self-discipline.

In the language area, these children are weak in their ability to learn basic language codes, and have difficulty with reading and spelling. Expressing themselves verbally, following oral instructions, and learning through the auditory medium are other problem areas. However, these children exhibit a relative strength in the area of verbal comprehension. They catch on quickly and get the intended meaning from language with a minimum of verbal or pictorial clues.

There are a number of contradictions within the description of the sample. For example, the children have difficulty reading but catch on quickly with a minimum of verbal or pictorial clues. One explanation for the contradictions is that the sample is composed of children from different subtypes of learning disabilities. The Jastak system may be more beneficial if the subtypes of learning disabled children were examined separately.

Jastak and Jastak do not make a definite statement about the relative independence of the lobals. They state:

We do not assume that the projected measures of traits are necessarily always independent of each other, though they have considerable clinical validity and may be considered important indices in practical diagnostic work. (1979, p. 11)

This statement implies that Jastak would contend that the lobals are relatively independent of each other. The correlations between all
possible pairs of lobals was an attempt to clarify this issue.

The results revealed a large number of significant correlations. The possibility of 15 significant correlations occurring by chance is extremely remote. Thus, contrary to Jastak's contention, the lobals are definitely not independent of each other.

It was apparent from the results that the raters were indeed able to interpret Jastak's lobal descriptions in a systematic and consistent fashion. This indicates that the lobal constructs are reliable and are consistent enough to be systematically identified across a number of individuals.

The results directly related to the validation of the Jastak analysis system did not support the main hypothesis. Although the raters interpreted the lobal constructs in a consistent manner, their ratings were found to correlate with ratings derived from the Jastak system at a level which was only slightly greater than would be expected by chance.

The results of the individual correlations indicate that there is, at best, marginal evidence of concurrent validity within the Jastak system. In spite of the high inter rater reliability there was virtually no evidence that the Jastak and Jastak system is concurrently valid.

Another consideration in this study was whether or not specific lobals were more valid than others. Correlations between raters' rankings and the ranks derived from the Jastak system for each of the 10 lobals revealed that some lobals are indeed more valid than others. Specifically, the raters' rankings for the Lexigraphic and Reality
lobals were found to be significantly correlated in a positive direction with Jastak's ranks.

The Lexigraphic lobal is related to a child's reading and spelling skills and his/her ability to learn language codes. In the Jastak system, this score is derived from the WRAT reading and spelling scales. Individuals who work in an educational setting for learning disabled children may be preoccupied with these skills, since many of these children have difficulties in this specific field. Thus, children's abilities in these 'lexigraphic' areas may be more apparent to the individuals who work with them. One explanation for the validity of the Lexigraphic lobal is that these specific skills are more readily apparent to the individual raters.

The significant correlation for the Reality lobal is not as easily explained. A child who obtains a high score on this lobal is described as being alert, objective, and appropriate and relevant in behavior. This score is derived from four WISC performance subtests: Picture Completion, Picture Arrangement, Block Design, and Object Assembly. The reason for the validity of this lobal is not clear, but perhaps the characteristics related to the Lexigraphic and Reality lobals are more salient than other characteristics when they are found or not found in a child's behavioral repertoire.

Interestingly, an examination of these 2 lobals reveals that the Lexigraphic lobal is derived from 2 WRAT verbal scales and the Reality lobal is derived from 4 WISC performance scales. The finding that the 2 valid lobals are apparently a verbal and a performance factor leads one to question the uniqueness of the Jastak system, since factor
analytic investigations of the WISC have resulted in a similar Verbal Comprehension factor and a Perceptual Organization factor (Cohen, 1959; Maxwell, 1959; Silverstein, 1969). The Jastak system is an attempt to derive additional information from intelligence tests, but there is evidence to suggest that the system results in factors which are similar to the verbal and performance factors of the Wechsler Intelligence Scales.

Although the results of this study indicate that Jastak and Jastak were unsuccessful in their attempt to derive personality factors from relationships between patterns on standardized intelligence and achievement tests and other modes of functioning. Specifically, the results of two recent studies have revealed a relationship between learning disabled children's patterns on the WISC and WRAT and their abilities on a number of neuropsychological skills: tactile-perceptual skills, visual-perceptual and visual-spatial skills, auditory-perceptual and verbal skills, and psychomotor skills (Rourke & Finlayson, 1978; Rourke & Strang, 1978). Moreover, additional research has indicated that learning disabled children who exhibit different patterns of linguistic and visual-spatial abilities, as evidenced by their WISC and WRAT scores, were predictably different in their patterns of personality and socio-emotional behavior (Strang, 1981; Ozols & Rourke, Note 1; Porter & Rourke, Note 2). Therefore, it is apparent that there are identifiable relationships between patterns on the WISC and WRAT on the one hand, and academic performance, personality functioning, and socio-emotional behavior on the other.

Additional results indicated a significant negative correlation between the raters' rankings and Jastak and Jastak's ranks for the
Depression lobal. The negative correlation may have been a result of rater misinterpretation, since the behavioral descriptions for this lobal are the opposite of those that would be expected. That is, a high score on the other nine lobals, with the exception of Elation, indicates a high level of that trait. However, a child who obtains a high score on the Depression lobal is described as showing "a relative absence of emotional response at times of failure to achieve or failure to establish satisfying relationships with the environment" (Jastak & Jastak, 1979, p. 13). Therefore, it seems probable that the negative correlation is a result of rater misinterpretation of the lobal description.

Summary and Conclusions

Jastak and Jastak attempted to identify clinically meaningful sub-clusters of the WRAT and the WISC so that clinicians would be able to derive behavioural descriptions of children on the basis of their intelligence test scores. There were a number of contradictions within the description derived from the Jastak system for the sample of learning disabled subjects in this study. Since past research indicates that there are a number of different subtypes of learning disabilities, the lack of homogeneity within the sample is one explanation for the contradictions within the behavioral description.

Another area of concern in this study was related to the relative independence of the lobals. Contrary to Jastak's suggestion, the lobals were not found to be independent of each other.

The purpose of this study was to evaluate the validity of the Jastak
system. Results indicated that the lobal constructs are reliable and consistent enough to be identified systematically across a number of individuals. However, only a relatively small number of significant correlations were found between the raters' rankings and ranks derived from the Jastak system. Thus, in spite of the high inter-rater reliability, there was virtually no evidence of concurrent validity.

The lack of concurrent validity may be a function of a limitation within the Jastak and Jastak system. That is, there is evidence to suggest that at least one of the lobal descriptions, the Depression lobal, was misinterpreted by the raters. However, all other potential confounding variables were not found to affect the results of the study. Moreover, the raters were blind to the purpose of the study and to each other's ratings. Therefore, the results of the study indicate that there is virtually no evidence of concurrent validity within the Jastak and Jastak system.

Finally, Jastak and Jastak attempted to drive behavioural information which was relatively independent of intelligence from the WISC and the WRAT. However, the 2 apparently valid lobals, Lexigraphic and Reality, seem similar to the verbal comprehensive and perceptual organization factors of the Wechsler Intelligence Scales. This indicates that information derived from the Jastak and Jastak system may not be as unique as Jastak and Jastak had originally intended. In addition, this finding suggests that the extent to which the Jastak and Jastak system does not coincide with the factor structure of the WISC is the extent to which it lacks validity.
APPENDIX A

LOCAL DESCRIPTIONS

1. The Lexigraphic Cluster is a coding skill involving the integrations of the senses of kinesthesia (muscles, joints, tendons) sight, and hearing in that order. The kinesthetic element inheres in the optic, facial, and other bodily muscles. It is best derived from oral, printed and written verbal tests such as reading, spelling, and other tests broken up into small verbal units.

2. The Linguistic Cluster is a coding skill involving the integration of the senses of hearing, sight, and kinesthesia in that order. Its measures are best derived from oral, printed and written verbal tests such as vocabulary, information, and other tests broken up into small verbal units.

3. The Semantic Cluster deals with the meanings attached to multisensory codes in more or less complex events. Identical codes may have many different meanings depending on the context (e.g. "slip"). Also, identical meanings may be expressed in different codes. (e.g. They drove...traveled...toured...went...flew...walked...crawled...hopped...ran. All denote movement from one place to another. The mode of moving is not identical, but the underlying semantic meaning is basically the same.) As a transoding process, the semantic cluster integrates and elaborates the meaningful messages from all senses: Tests of verbal comprehension, analogies, similarities in prose and poetry yield fair measures of this cluster.

4. The Reality Cluster refers to the way in which meanings are projected by people on environmental events, social situations, and objects used by them. Such events and objects may be viewed as propitious or harmful to humans regardless of their objective merits. Misinterpretations of reality may be illusory or delusional.

It is a key factor in diagnosing schizoid tendencies, ego strength, breaks with reality. Performance-type tests involving the arrangement and interpretation of pictures, designs, and puzzles are strong measures of this cluster.

5. The Motivational Cluster comprises such well-known aspects of behavior as attention, memory, recall, and persistent striving. It is goal-setting and goal-reaching behavior, implying freedom from distraction and overactivity.

It is a key factor in diagnosing anxiety, malingering, hysterical reactions, stress. Tests requiring both short and long term memory and recall as well as skill-type tests on which ratings can be higher, as a result of frequent practice and drill are good measures of this cluster.

6. The Psychomotor Cluster consists of the integrations and coordinations of the small and large skeletal muscles. The muscles operate with varying degrees of bodily inertia. Their output thus becomes measurable
by tests of finger dexterity and gross body movements in the 
solution of all types of performance tests.

It is a key cluster in diagnosing psychosomatic tendencies, 
neurasthenia. Coding tests are especially good measures of this 
factor.

7. The Elative Cluster reveals the personal attitudes and feelings one 
has toward successful achievements and favorable events. The 
effect may vary from relative absence of emotional response (high 
scores) to an exaggerated state of exuberance over minor gains or 
promises of gain (low scores). Tests involving attention and 
concentration, especially the picture completion test, are sensitive 
to elation.

8. The Depressive Cluster indicates the person's attitudes and feelings 
times of failure to achieve or failure to establish satisfying 
relationships with the environment. Its effect may vary from 
relative absence of emotional response (high scores) to an exaggerated 
state of despondence over minor shortcomings or disappointments in 
life (low scores). Tests of comprehension, especially picture 
arrangement, are used to reflect the effects of these feeling tones.

Elative and depressive states seem to vary at random to each other. 
Because of this randomness, it is possible to encounter predominantly 
manic, predominantly depressive, and predominantly mixed or 
fluctuating affects in individuals.

Comparing the elative and depressive clusters can provide much insight 
in the diagnosing of severe emotional depression as opposed to situ-
ational depression, the degree and direction of mood variation, the 
affective disorders, manic tendencies, and emotional stability.

9. The Judgment Cluster determines how well and how fast a person makes 
choices from a number of possible alternatives. It further indicates 
the person's dependency needs, their need for external structure and 
direction, their confidence in making decisions. Tests of similarities, 
vocabulary, and object assembly involve choices among alternatives.

requires the accurate perception of the start, the number of steps 
to be consecutively followed and solved, and the end of the task.

It further indicates how orderly the person is in being able to plan 
and organize, to keep consequences in mind, to consider "what will 
happen if...", how readily he/she may be sidetracked, important tests 
of reasoning are tests of arithmetic, information, and block design. 
(Jastak & Jastak, 1979, p. 12-13).
APPENDIX B

BEHAVIORAL DESCRIPTIONS OF LOBALS

Lexigraphic Cluster
High: Proficiency in learning language codes. Strong in the areas of rote, reproductive verbal learning. Reading and spelling skills strong in comparison to intellectual level.

Linguistic Cluster
High: Strong in verbal communication skills. Efficient in using language codes for verbal thought, for following oral instructions, for learning through the auditory medium.

Semantic Cluster
High: Strong in verbal comprehension and in getting objective and intended meaning from language. Needs a minimum of contextual or pictorial or verbal clues. Catches on quickly.

Reality Cluster
High: Is alert to environment stimuli. Proficient in dealing with social and physical environment. Interprets events accurately and objectively. Is appropriate and relevant in behavior. Is more objective than subjective in dealing with events. Is highly flexible and adaptable. Can accept change and adapt to new situations. Has few extreme or unrealistic fears. Practical comprehension is high. Is quick to catch on. Is able to apply knowledge to the solution of everyday problems. Has good common sense and practical know-how. Is willing and able to compromise when necessary. Can engage in 50-50, give-and-take relationship with peers. Is more aggressive than passive in dealing with environment. Faces things directly and head-on. Does not fantasize or escape from reality. Is self-confident; lacks feelings of inferiority. Strong ego structure; lesser need for ego defenses. Learns most effectively in laboratory-type, applied situations and through actual manipulation of concrete objects.

Motivation Cluster
High: Strong will to persist and persevere. Highly conscientious, dependable, thorough, accurate. Much attention to small detail - possibly to the point that the overall idea is lost. Meticulous; tends to be a perfectionist. High frustration tolerance - hates to give up. Willing to try alternatives. Inclined to worry; to be tense, anxious, uptight. Anxiety may remain unresolved. Is prone to develop guilt feelings. Is intra-punitive rather than extra-punitive. Has high standards of achievement. Tendency to be
inhibited or repressed. Strong sense of responsibility toward obligations. High degree of self-discipline, self-control, impulse control. Favorable response to habit training. Likes schedules and routines. High arithmetic and high reading skills indicate good perseverance toward longer range goals. High coding, and digit span indicates good concentration and attention toward immediate goals. Emphasizes quality more than quantity of work. Is more inhibited, restrained, repressed - can wait for rewards and satisfaction of needs.

Psychomotor Cluster
High: Harmony and balance between mind and muscles. Muscular system is quickly responsive to the commands of the mind. Physical energy is mobilized quickly. Time and energy is used efficiently. Work output for given time periods is high. Self-image is strong - doesn't mind being compared with others. Indifferent to physical fatigue or bodily ailments. Has high threshold for pain, for physical stamina and physical endurance. Reaction time is fast. Tends to bring into play only those muscles necessary to do a job.

Elation
High: Relative absence of emotional response to successful achievements and favorable events.

Depression
High: Relative absence of emotional response at times of failure to achieve or failure to establish satisfying relationships with the environment.

Judgment Cluster
High: Highly independent behavior. Makes decisions quickly and confidently. Seldom has an after-thought or regret. Can quickly go on to something else. Tends to make workable decisions and to use good judgment. May tend to be somewhat of a loner. Prefers to structure own environment and determine own course of action. Dislikes receiving instructions, directions, and guidance from others and requires minimal support from them.

Reasoning Cluster
High: Strong in logical, systematic, and step-by-step thinking. Strong in problem solving ability. Not easily side-tracked or distracted while thinking. Does not veer off on tangents or into irrelevant areas. Is able to plan and organize effectively. Is able to see consequences of behavior and cause and effect relationships. Is not easily influenced by the thinking or ideas of others.
APPENDIX C

INSTRUCTIONS

Each of you has before you a list of student’s names with whom you are familiar. Beside each name you will see the numbers from 1 to 10. In addition, you each have a set of 10 cards. On each card there is a description of a behavioral characteristic. I would like you to read the descriptions of the behavioral characteristics carefully. When you have finished reading all of the cards and feel that you understand the descriptions, I would like you to think about the child whose name appears first on the list and then rank the characteristics from 1 (most characteristic) to 10 (least characteristic) in terms of whether the behaviors are commonly seen in the child. To do this, simply sort the cards in a line from 1 to 10, and then record the heading of each card next to the corresponding rank on the name sheet. Do this for all of the children on the list.

When you are ranking these characteristics, it is important to rate each individual child in terms of his/her relative strengths and weaknesses. That is, do not make comparisons between the students. For example, a student may not read well, but reads better than he spells, so you would rank reading at a higher level than spelling, regardless of whether you feel his/her ability in reading is at a higher or lower level relative to his/her peers.

If you feel that 2 or more of the characteristics are equivalent in rank, then simply place them in the same pile and assign them both the same rank number. For example, if you feel that a child’s ability is equally
strong in math and spelling, and both descriptions are most characteristic of the child, the ranks would appear:

1. Math
2. Spelling
3. 
4. 
5. etc.

Although tied ranks are allowed, please try to avoid them unless you see no other conceivable alternative.

In addition, for each child I would like you to think about how confident you feel about your ratings for that child and then circle a number from 1 (extremely unconfident) to 6 (extremely confident).

Please, remember to read the descriptions of the characteristics carefully, and rank each child in comparison to him or herself. Also, I cannot overemphasize how important it is that you rate individually and do not discuss your ratings with each other, as this will bias the results of the study.
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