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A COMPARISON OF WISC AND OSA IN ASSESSING THE INTELLIGENCE OF IMMIGRANT CHILDREN OF NON-ENGLISH SPEAKING BACKGROUND. A PILOT PROJECT.

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Descriptors-*COMPARATIVE ANALYSIS, ENGLISH (SECOND LANGUAGE), INTELLIGENCE LEVEL, *INTELLIGENCE TESTS, *NON ENGLISH SPEAKING, PERFORMANCE TESTS, TESTS

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Twenty-five English speaking and twenty-five non-English speaking Canadian children equated on sex and chronological age were given the Ontario School Ability (OSA) test and the performance section of the Wechsler Intelligence Scale for Children (WISC). The pilot study was conducted to compare the ability of the two tests to assess the intelligence level of English speaking and non-English speaking children. The Ontario test had been developed originally to decide the eligibility of candidates for admission to the Ontario School for Deaf. Both groups scored higher on the OSA than on WISC. Results showed that the two tests do not tap the same areas of intelligence; therefore, scores on these tests should not be used interchangeably. The age and background of each child should be taken into consideration along with test results. Because results of this pilot study were inconclusive, additional research with a larger group of children is recommended. (MS)

A PILOT PROJECT

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I - INTRODUCTION

According to 1961 Census of Canada twenty-two per cent of the Canadian population is foreign born, of this group 208,987 are children under the age of twenty years. About sixty-one per cent of these children come from countries whose mother tongue is other than English (Bulletin 1.3-Dominion Bureau of Statistics - Table 90, p.11).

The task of educating such large numbers of non-English speaking children has become of paramount importance in many Toronto schools located in districts where various ethnic groups tend to gravitate. Frequently a principal in one of these schools wishes to know the general intelligence of an immigrant child before assigning him or her to a particular grade. Or a teacher may feel that a child placed in her classroom is too slow or too superior mentally to benefit from the programme offered in her class. In such instances the school psychologist is called upon to assess the child's ability. Because of the latter's limited experience with English, his intelligence can only be assessed by means of non-verbal tests.

In Toronto, the two tests most widely used to tap performance level of intelligence of immigrant children are the Ontario School Ability (OSA) examination and the performance part of the Wechsler Intelligence Scale for Children (WISC). Some investigation (Altus 1953) of the WISC Performance Items as a mental measurement with bilingual children has been carried out. A review of literature does not reveal any published investigations where the OSA examination was used with non-English speaking immigrant children.

The main purpose of this pilot study was to compare the OSA and the WISC performance items on their functions to assess the inteliigence level of English speaking and non-English speaking children. How comparable are the results of the two tests when used for different age groups? To what entent do these tests tap the same aspects of intelligence?

II - METHOD

In order to compare the performance items with the OSA for assessing the general intelligence of non-English speaking immigrant children, it was desirable to have a parallel group of Canadian born children of English speaking background. This provided some basis for evaluating the discrepency between mean scores on the two tests which could be a function of the tests and/or 'testees'.

Sample

Two groups of children were used for the present investigation. One group consisted of non-English speaking immigrant children who had come to Canada since 1959 from any of the following countries: Italy, Germany, Greece, Poland, Finland, Yugoslavia, Portugal, the Azores, China and Spain. This group (hereafter referred to as N.E.S.) was composed of sixteen boys and nine girls ranging in age from five to thirteen years with a mean age of 10.0 years. The English speaking group (hereafter referred to as E.S.) was comprised of fifteen boys and ten girls ranging in age from six to thirteen years with a mean age of 9.8. In both groups, where a child's chronological age had changed during the lapse of time between test administrations, his or her age at the time of taking the second test was selected for statistical purposes.

The N.E.S. group ranged in grades from one to six with three children in opportunity classes. The mean grade level was 3.2 when the opportunity class children were excluded. When the latter were assigned

to the grade level they were in before placement in opportunity class, the mean grade level still remained 3.2. The E.S. group ranged from grades one to seven with a mean of 4.3. The difference between N.E.S. and E.S. with respect to mean grade level is consistent with the general practice in the schools of placing N.E.S. immigrant children at approximately one grade below their age level. Thus the two groups were similar, as to chronological age and sex though not at the same grade level.

Description of the Instruments

The Wechsler Intelligence Scale for Children (WISC) was developed from the Wechsler-Bellevue Intelligence Scales used with adolescents and adults. The theory underlying the WISC is that intelligence cannot be separated from rest of the personality and a deliberate effort has been made to take into account other factors which contribute to the total intelligence of the individual. It consists of twelve tests, six verbal and six performance.

The WISC has many attractive features. It is easy to give, the material is compact and very accessible, snd the testing time varies much less than for the Stanford-Binet. It has the advantage of providing two scores, Verbal and Performance, and discrepencies between these scores may be of great value to the clinician and to the school. WISC correlations with the time honoured Stanford-Binet are quite high. However, sizeable discrepencies (five to thirteen points) between test results have been noted when used with five and six year olds (Buros, 1959). With children at the lower age level, the sub-tests 'Coding' and 'Picture Arrangement' and of questionable validity.

To sum up, "For testing children who are not outstandingly bright or markedly dull, the WISC is a convenient, reliable instrument which uses up-to-date material intrinsically interesting to the child." (Buros 1959, p.559).

The Ontario School Ability Examination (OSA) was developed in an attempt to provide some means of deciding the eligibility of candidates for admission to the Ontario School for Deaf. In its present form, this examination consists of six parts, namely, 'Manipulation', 'Colour Patterns', 'Knox Blocks', 'Dominoes', 'Drawing' and 'Tapping'. According to the manual of OSA examination it is a valid measure in the province of Ontario for the purpose of determining the school ability up to and including mental age twelve years of deaf children, retarded children and children coming from non-English speaking home background. The 'Coloured Pattern' and 'Tapping' sequences are reported to be most satisfactory; the 'Knox Cube' and the 'Domino' series heap too much at various mental ages. The 'Block' Building and the 'Drawing' progressions seem to need further extension and investigation.

Each child in both groups was given the OSA test and the performance section of the WISC. In cases where the child was given both tests within a month, the order of presentation of items was reversed to minimize practice effect on the Knox Blocks, an adaptation of which appears on both tests.

III - PRESENTATION OF DATA AND STATISTICAL ANALYSES

For purposes of comparisons mean scores and standard deviations were computed on WISC and OSA for the two groups of children, N.E.S. and E.S. The groups were further sub-divided on the basis of chronological age to form two sub-groups in each, i.e., 'older (above median) and 'younger' (below median) in order to examine the relationship between age and test performance.

Intra Group Comparisons on WISC and OSA

As shown in Table 1 the mean I.Q. score of the N.E.S. group was found to be 91 and 96 on WISC and OSA respectively. The corresponding standard deviations for both tests were almost the same.

TABLE 1

INTRA GROUP COMPARISONS FOR N.E.S. AND E.S. CHILDREN OF VARIOUS AGE GROUPS WITH RESPECT TO THEIR MEAN PERFORMANCE AND STANDARD DEVIATIONS ON WISC AND OSA

Group	Mean			t	Standard Deviation	
	WISC	OSA	Difference		WISC	OSA
All N.E.S.	91	96	5	2.27*	20	20
N = 25 E.S.	100	103	3	1.26	16	14
Younger N.E.S.	104	110	6	1.98	15.8	19.4
N = 12 E.S.	101	110	9	2.37*	14.0	10.0
Older N.E.S.	77	81	4	1.46	14.08	8.1
N = 12 E.S.	98	96	2	.56	17.58	14.6

* significant at .05 level

The difference between means on both tests was tested by a t test (for matched groups) and was significant at .05 level. The English speaking group also showed a higher mean I.Q. score (103) on the OSA than on the WISC (100). This difference, however, was not found to be statistically significant.

In order to ascertain whether the tendency to achieve higher mean score on OSA than WISC existed for both the 'older' and 'younger' groups, the mean scores for these sub-groups were compared.

Tabel 1 shows that the mean performance of the 'younger' children tended to be higher on OSA than WISC for N.E S. and E.S. groups. However, the mean difference was found to be significant (.05 level) only for E.S. group.

For the 'older' group of children, the tendency to achieve higher on OSA than WISC was non-existent for E.S. group. The N.E.S. group showed a higher mean I.Q. score on OSA (81) than WISC (77) though this difference was not significant.

Comparisons Between Immigrant (N.E.S.) and Canadian-born (E.S.) Children on Performance Part of WISC and OSA

As indicated in Tabel 2, the mean performance of the immigrant, N.E.S. group was lower than the mean performance of E.S. group on WISC and OSA. However, the differences between the two groups were not statistically significant.

TABLE 2

COMPARATIVE MEAN PERFORMANCE OF CHILDREN COMING FROM NON-ENGLISH AND ENGLISH SPEAKING BACKGROUNDS ON WISC AND OSA

Group	Test	Mean			t
		N.E.S.	E.S.	Difference	
All	WISC	91	100	9	1.8
N = 25	OSA	96	103	7	1.6
Younger	WISC	104	101	3	.5
N = 12	OSA	110	110	0	0
Older	WISC	77	98	21	3.3**
N = 12	OSA	81.0	96	15	3.2**

** Significant at .01 level

The 'younger' sub-groups show no significant differences between N.E.S. and E.S. for either test. For the 'older' sub-group the mean performance of Canadian born E.S. children was found to be significantly higher than N.E.S. immigrant children on the WISC as well as OSA. The mean difference was somewhat more pronounced on WISC (21 points) than OSA (15 points). This would reflect either a difference due to selection of sample or a possible combination of factors related to the tests, age and language.

Relationship Between Total Scores on OSA and Performance Part of WISC for Children of Non-English Speaking and English Speaking Backgrounds

In order to ascertain the relationship between OSA and WISC Pearson Product-Moment Correlation co-efficients were computed for the two groups. These correlations are presented in Table 3.

TABLE 3

CORRELATION CO-EFFICIENTS BETWEEN SCORES ON WISC AND OSA FOR N.E.S. AND E.S. CHILDREN OF VARIOUS AGE GROUPS

All N = 25		Younger N = 12		Older N = 12	
N.E.S.	E.S.	N.E.S.	E.S.	N.E.S.	E.S.
.87**	.61**	.82**	.43	.71**	.76**

** Significant at .01 level

As shown in Table 3 there exists a significant correlation between OSA and performance part of WISC for children of non-English speaking and English speaking backgrounds. This, however, does not hold true for the 'younger' group of Canadian-born children of English speaking background. All other correlations were found to be significant at .01 level.

Relationships Between Scores on OSA Sub-tests and WISC Sub-tests for N.E.S. and E.S.

The relationships between OSA sub-tests (Colour Pattern, Knox Blocks, Dominoes, Drawings and Tapping) and WISC sub-tests-Performance Part (Picture Completion, Picture Arrangement, Block Design, Object Assembly and Coding were determined by computing correlation co-efficients for all possible combinations.

TABLE 4

CORRELATION CO-EFFICIENTS BETWEEN SCORES ON OSA SUB-TESTS AND WISC SUB-TESTS FOR N.E.S. AND E.S. GROUPS

O.S.A. Sub-tests	Group	WISC Sub-Tests				
		Picture Completion	Picture Arrangement	Block Design	Object Assembly	Coding
Colour Patterns	N.E.S.	.68**	.44**	.59**	.72**	.20
	E.S.	.48*	.62**	.81**	.55**	.48*
Knox Blocks	N.E.S.	.25	.41*	.47*	.29	.35
	E.S.	.19	.38	.38	.13	.34
Dominoes	N.E.S.	.54**	.64**	.62**	.55**	.32
	E.S.	.48*	.59**	.56**	.36	.64**
Drawings	N.E.S.	.54**	.28	.23	.10	.40*
	E.S.	.14	.45*	.67**	.49*	.50*
Tapping	N.E.S.	.20	.30	.34	.34	.40*
	E.S.	.64**	.57**	.71**	.30	.57**

* Significant at .05 level
** Significant at .01 level

As expected there is a great range (.10 to .81) among the correlations. Most of the correlations are significant. "Knox Blocks" (OSA) seems to have a lower relationship with WISC sub-test than "Colour Patterns" and "Dominoes" for both groups. There is a marked discrepency between the two groups with respect to their correlations between "Drawings" and "Tapping" (OSA) on one hand and the WISC sub-tests on the other. The two groups, however, show a somewhat consistent pattern as far as correlations between "Knox Blocks" and WISC sub-tests are concerned. It is interesting to note that correlations for E.S. group tend to be higher than those for the N.E.S. group.

IV - SUMMARY

The present study was an attempt to do a preliminary investigation of the relative merits of OSA and the performance part of the WISC in assessing the intelligence of immigrant children of non-English speaking (N.E.S.) background. For purposes of comparison, a parallel group of Canadian-born children of English speaking (E.S.) background was selected. The two groups were equated on sex and chronological age.

Both groups were administered the OSA test and the performance section of the WISC. Means and standard deviations were computed on each of the tests for both groups. In order to determine relationship between age and mean performance on the two tests, the groups were further sub-divided on the basis of chronological age to form two sub-groups, i.e., 'older' (above median) and 'younger' (below median).

A comparison of the mean performance on WISC and OSA showed that both groups tended to score higher on OSA than WISC. However, this was not true of the older N.E.S. group whose mean score was slightly higher on WISC than OSA. The mean difference between performance on WISC and OSA was found to be significant for non-English speaking group consisting of all age groups, and English speaking group comprised of twelve younger subjects only. All other mean differences were not significant.

The immigrant children of non-English speaking background tended to score lower than children with English speaking background on both tests; the difference between the two groups was not significant.

This tendency was especially marked for the 'older' group for which the mean difference was found to be statistically significant at the .01 level in favour of children with an English speaking background. One possible explanation of this significant difference could be a real difference between the mental ability of two groups since three children of the N.E.S. group were attending opportunity classes. It is interesting to note that 'younger' immigrant children (N.E.S.) scored higher on WISC than their counterparts of English speaking background; the mean difference was not significant. The mean performance of both groups was identical on OSA. It seems that WISC and OSA approximately give the same measure when dealing with younger children of both groups.

In order to ascertain the relationship between OSA and WISC correlation, co-efficients were worked out for both groups and for 'older' and 'younger' age groups within each group. All correlations were found to be significant at .01 level except the one for 'younger' group comprised of children with English speaking background.

The relationship between OSA sub-tests and the performance part of WISC sub-tests was ascertained by computing correlation co-efficients for all possible combinations. Most of these correlations are significant. The E.S. group shows a higher relationship between OSA and WISC sub-tests than N.E.S. group. This is especially true for "Drawings" and "Tapping" (OSA) on one hand and WISC sub-tests on the other. The striking dissimilarity of the two groups on correlations between "Tapping" and WISC sub-tests is noteworthy

since according to OSA manual "Tapping" was given a slightly higher weighting because it maintained a more consistant correlation with school progress. The two groups, however, are not too far apart with respect to their correlations between "Knox Blocks" (OSA) and WISC sub-tests.

This study should not be interpreted as conclusive on the relative merits of WISC and OSA in assessing the mental ability of new immigrant children of non-English speaking background. In fact, it was not meant to be so; the initial probing, however, has revealed certain disparities between the two tests with respect to chronological age and background of the testee. A comparative study of the WISC and OSA in predicting school achievement (conducted on a larger sample) might reveal relative advantages of each test. It may be pointed out here that the two tests do not tap the same areas of intelligence, therefore scores on these tests should not be used interchangeably. For interpretation of tests scores, it is necessary that age and background of each child should be taken into consideration. The weight to be given to this information needs to be ascertained.

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