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A STUDY OF THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN APPLIED TO GREEK SCHOOL CHILDREN

[ΛΕΥΚΗ ΣΕΛΙΔΑ]

I. WECHSLER' S THEORETICAL POSITION

WECHSLER has defined intelligence (1958) as «the aggregate or global capacity of the individual to act purposefully, to think rationally and to deal effectively with his environment». He adds that intelligence being global is composed of a number of abilities which are not entirely independent, but can be differentiated in a qualitative way. He stresses the point that factors other than intellectual, such as drive and incentive may be involved in intelligent behaviour, (one is reminded here of ALEXANDER'S 'X' factor of 'persistence').

Combining SPEARMAN'S 'g' factor theory and the 'Multiple Trait' theory he concludes: «The evidence is now quite clear that other factors besides 'g' are required to account for intercorrelations between tests of intelligence». He further suggests that an intelligence scale which is especially rich in 'g' would in the end measure 'g' exclusively and would not be a good measure of general intelligence. Here he seems to abandon altogether SPEARMAN'S theory, but he further says that primary mental abilities show a collective as well as an independent behaviour, implying the existence of 'g' as well as 's' factors. WECHSLER concludes that an intelligence test battery must not only include a great range of abilities, but it must also have tests which show greater coupling potential. He leans quite heavily on ALEXANDER'S findings (1935) to prove that there are also non - intellectual factors entering and playing quite an important role in effective behaviour.

Discussing the disadvantages of using M. A., as a measure of an individual's intelligence, he finds a better alternative in I. Q. measurements which define levels of intelligence in terms of standard deviation units. These measurements dispense with the necessity of assuming a linearity of the relation between mental and chronological ages; they also dispense with the idea of a fixed average mental age, and they are identically equivalent irrespective of age.

The WECHSLER intelligence scales have been widely criticised, although they have also been widely used:

a) Some investigators have shown that the scales do not discriminate at the higher levels of intelligence.
b) The I. Q.'s are determined by arbitrary computations.

c) Nowhere do the WECHSLER scales measure quantitatively the «ability to act purposefully and deal effectively» with the environment. That is, they do not measure incentive and drive. WECHSLER's main criterion for the presence of these factors seems to be subjective clinical observation. This is not surprising since such behaviour clearly contains non-intellectual factors which should be measured by tests of character and temperement.

d) MARSHAK (1950) working with the WECHSLER-BELLEVUE found the tests to be overweighted with items of general knowledge and suggests that the Information test might be dropped altogether. She also reports a lack of adequate representation of reasoning items mainly due to the fact that the Arithmetic test is essentially an educational attainment test and should be replaced by BURT's reasoning test.

e) Too much emphasis has been given to the clinical utility of the test. WECHSLER's attaching much significance to individual subtest 'scatter' has been widely criticised and many writers such as ANASTASI (1954) have pointed out that, at best, it can serve only as a possible indicator to be checked in the light of other clinical information about the individual. Furthermore, individual scatter in a test may be influenced by a number of factors, such as the order of administration of the subtests (KLUGMAN, 1948), socioeconomic status (COHEN, 1968), age and education (LYLE and GOYEN, 1969).

Nevertheless, and despite all criticism, the Wechsler Intelligence Scales for adults in particular, have and are being widey used. The fact that they give separate measures of verbal and performance I. Q.'s may account for their popularity. No doubt, they are unique in taking over intelligence testing where the STANFORD-BINET leaves off.

II. THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN (WISC)

The WISC seems to be a downward extension of the WAIS intelligence scale for adults. In fact, as Wechsler himself admits in the Manual (1949), «most of the items of the WISC are from Form II of the earlier scales, the main additions being new items at the easier end of each test, to permit examination of children as young as five years of age». Nevertheless, he calls it a distinct test from the earlier scales, without giving any reason, except perhaps that it was independently standadized.

In fact, the standardization was admirably carried out, but no justification is given by Wechsler for using with children a test originally designed for adults. He seems to be doing, in the opposite direction, the same mistake as BINET, whom WECHSLER had so vividly criticised.

The WISC and the WECHSLER - BELLEVUE scales overlap, since both can be used with adolescents, although the WISC is recommended by WECHSLER for the years up to 15. Comparisons between the WECHSLER - BELLEVUE and the WISC show high correlations between the tow tests among normal subjects reported by DELATTRE and COLE (1952) who question, however, WECHSLER's 'clinical sign' approach. With mental difectives the correlations are somewhat lower, as reported by VANDERHOST et al (1953) who also say from the start that the degree of correspondence between the two tests will be an artifact owing to the great overlapping of the items.

But KNOPF et al (1954) found significantly higher Verbal mean I. Q.'s in the WISC as compared to the WECHSLER - BELLEVUE. Results on subtest correlations led them to the conclusion that there seems to be dissimilarity between the two tests. PRICE and THORNE (1955) also report lack of equivalence on the two Verbal Scales, but fail to show the same for the Full Scales.

The treatment of scores on the WISC follows closely the prosedure used in the adult scales. The scaled scores are converted into a deviation I. Q. with equal means and SD's for all ages, in contrast with the Stanford - Binet, where they vary quite considerably from age to age.

The differences between Verbal and Performance I. Q.'s are theoretically designed to be on the average zero. But in point of fact, many discrepancies occur in individual cases, age apparently bearing no relation to them, although SEASHORE (1950) reports zero difference based on computations on the entire standardization data used for the WISC.

The reliability coefficients reported, are high between the Verbal, the Performance and the Full Scales, but some of the subtests do not appear to be very reliable, excepting the Vocabulary test. ANDERSON (1953) criticising the WISC test says that the reliability coefficient for Coding (two forms) and Digit Span (forward and backward) are based on two different tests, which should not be acceptable. He adds that the practice of including inferior material and prorating is bound to result in increased variability and decreased reliability.

No discussion of validity is included in the WISC Manual. Several studies comparing intelligence quotients between Stanford scores and WISC scores have been carried out since the publication of the Manual,

with the former reported consistently higher, particularly at younger age groups and at higher levels of intelligence (TRIGGS & CARTER 1953; HARLOW et al 1957; COHEN 1952; FRANDSEN 1951; KRUGMAN et al 1951; MAC ARTHUR and WAKEFIELD, 1968). GEHMAN and MATYAS (1956), on the other hand, report relatively constant I. Q's for both WISC and STANFORD BINET scales. But their sample of 60 children seems to be too small for the wide range of ages they used (4 to 11 years).

On the whole, the two tests correlate highly with each other, the Wechsler Verbal Scale correlating consistently higher with the Stanford--Binet than the Performance Scale, which is to be expected. JONES (1949) reports correlations of .74 for the Full, .84 for the Verbal, .59 for the Performance Scales. HOLLAND (1953) finds correlations of .87, .88, .73, for the three scales respectively. This suggests that the two tests offer little difference in their ability to predict academic attainment. Also, high correlations are reported between the WISC and the Progressive Matrices, the California Test of Mental Maturity, and the Columbia Mental Maturity Scale. (ALTUS, 1955).

Although the WISC seems to be measuring very much the same thing as the WECHSLER - BELLEVUE and the STANFORD - BINET, its discrimination at the lower (5 - 6 years) and at the higher end (14 - 15) of age range is inferior to the other two. KURETH et al (1952) report that all WISC I.Q.'s underrate the 5 year old by 8 to 13 points, as compared to the STANFORD - BINET. The WISC is not effective outside the range of 45 and 155 I. Q. points, as seen in the WISC Manual, whereas the Binet is capable of finer discriminations. The WISC is easy to administer and offers the possibility to compare Verbal and Performance I. Q.'s. Nevertheless, at least for very young children and for extreme ranges of intelligence, the Stanford - Binet is mostly recommended.

The WISC offers the advantage of giving much information on the subject's intellectual abilities, since it is based on 12 subtests. This is consistent with Wechsler's view of measuring not only a 'g' factor but also a number of unspecified group factors. But investigation reveals (Gault 1953 - 54) that only a few factors have been found. MAXWELL (1959) finds a 'vg' factor which, he says, would be unwise to call just 'verbal' because it is found with high loadings in the Object Assembly, Block Design and Coding. A second factor 'sp' is reported by MAXWELL as having consistently high loadings for each age group on Block Design, Object Assembly (hence its name 'sp'), Picture Completion, Picture Arrangement, and Coding. Therefore, he doubts whether WECHSLER's Performance tests form a cluster, the same of course being true for the Verbal Scale.

These findings do much damage to WECHSLER's scales in general, since a clear discrimination between the scales is not possible, hence separate I. Q.'s become meaningless. DAVIS (1956) finds that generally speaking, factor saturations seem to be higher for the verbal than the performance subtests, but he also finds that Factor Analysis does not differentiate clearly between the two sets of ability scales.

The unsuitability of some of the material has been stressed by writers who argue that children get quickly tired of the Digit Span test, whereas adults don't seem to mind it; and also that the lack of variation in the serial presentation of the items within each subtest does not elicit the best effort for a child. Scoring also presents a problem with some of the subtests, such as Comprehension and Vocabulary, where scoring standards are rather flexible and are to a certain extent bound to be subjective (KASPER et al, 1968).

The two sets of directions given in the WISC for children under 8 and for "suspected" mental defectives may be a source of confusion. In fact completely different material is used in some subtests for these groups, which may mean the introduction of a different test (something almost similar to the Baby - Binet in a much smaller scale).

To conclude, the WISC does not seem to be as indispensable for childrens' testing as the WECHSLER - BELLEVUE or the WAIS have proved for adult testing. The STANFORD - BINET is recommended, at least for the younger ages, by most workers. No doubt, a refinement of the test at the lower ages is needed, and further research will help to solve quite a number of the problems now present.

III. THE STUDY

The purpose of this research was to modify wherever necessary the Wechsler Intelligence Scale for Children (WISC), for use with Greek school - children and then to assess the reliability and validity of the modified scale. In addition, the results have provided evidence on the relation between intelligence and (a) socioeconomic status, and (b) size of family.

The investigation necessitated the following steps:

(i) Translation of the WISC into Greek.

(ii) Modification of the subtests. The major modifications were done in the Verbal Scale and particularly in the Information, Comprehension and Arithmetic sub - tests.

(iii) Construction of an entirely new Vocabulary test (not a mere translation of the one given in the Manual), based on the principles used by Wechsler; this was considered necessary in order to improve the reliability of the sub - test.

(iv) An item analysis, and on the basis of this, further alterations in the order of items and the item content of a number of the subtests; in particular to items which seemed inapropriate to Greek socioeconomic and cultural conditions. Elimination of items which the present study showed to be unsuitable for use with Greek children and the introduction of new items which proved to be more suitable for them.

(v) Comparison of the results of the present research with Wechsler's findings and with results of similar investigations.

(vi) Assesment of the reliability and validity of the test.

Data and method

The sample of children was drawn from the school population of the town of Salonika which is situated in the North of Greece. It included quite a few children from rural districts, as well as a fair number of mentally retarded cases, owing to the lack of special schools for such children in Salonika. We therefore believe that we have drawn a representative sample. It was selected randomly according to sex and age for the years $9^{0}/_{12}$ - $9^{11}/_{12}$ and $10^{0}/_{12}$ - $10^{11}/_{12}$ from all the Primary Schools in Salonika; and according to sex and grade from the High Schools, taking only the 2nd grade which included children ranging from $13^{2}/_{12}$ to $15^{11}/_{12}$ years. The high school population was a selected one, for it comprised only children who had passed a fairly stiff examination at the age of 12. The total sample consisted of 80 nine year olds, 80 ten year olds (40 boys and 40 girls in each case) and 100 high school children (50 boys and 50 girls).

All testing and scoring was carried out by the same examiner who used, for the administration of the test, identical procedures to those given in the WISC Manual, with the following exceptions: The sub-tests were administered to the end regardless of failures; the Vocabulary was given in the middle of the performance tests, in order to avoid tiring the subject by the length of some of the verbal tests (e. g. the Information which included many alternatives, and the revised Vocabulary which consisted of 100 items).

Raw scores were used for most calculations, but where necessary they were converted into scaled scores from the tables given in the WISC

Manual. Teachers' ratings on a five point scale were obtained to assess the validity of the test.

Results

1) The mean I. Q.'s in all three scales for the nine and ten year olds and for both sexes were lower than those of the Wechsler standardization sample. Mean differences for the Verbal Scale ranged from 3.97 to 6.42 points; for the Performance Scale from 11.15 to 14.67 points; and for the Full Scale from 8.12 to 14.67 points. Mean scores for the Performance Scale were lower than for the Verbal and Full Scales; they were between 80 and 90 I. Q. points with the exception of the older groups.

Significant differences in the mean scores between our sample and the standardisation sample were found for the Performance and Full Scales with the nine year old girls and for both sexes among the ten year olds (at the 1% level of confidence). A significant difference (at the 5% level) was found for the Verbal Scale with year 10 for both boys and girls, but with the high school girls a significant difference (5% level) was found for the Verbal Scale favouring our sample. This, however, may be due to bias in the population. Mean score differences between the two samples on the Performance Scale were significant at the 1% level with the older group favouring the standardization sample (Table 1).

The Standard Deviations obtained (ranging from 9.79 to 15.15) compared fairly well with those of WECHSLER.

2) No significant differences were found between the average performance of the Greek girls and boys in any of the three scales, although boys scored consistently higher than girls in all sub-tests, with the exception of Digit Span (year 9) and Coding (years 9 and 10). There was some indication, however, that a bias in item content favouring masculine interests may be responsible for this trend (Table 2).

Our results failed to give full support to the view that there are large differences in variability between the two sexes. Girls were more variable than boys in all three scales at year 9 and in the Verbal Scale at year 10, whereas boys gave higher variances in the Performance and Full Scales at year 10 and in all three scales at the high school level. The results suggest that boys' scores tend to show more variation than girls' as the children grow older, but this may be due to selection at high school level.

3) Most reliability coefficients found in this study (ranging from .285 for Object Assembly to .829 for Vocabulary in our sample) compared fairly well with those reported by WECHSLER. The exception was the

Table 1

Significance of differences between the Mean I. Q.'s for the American standardization Sample and the present study.

Age		Scale	Diff. Means	t	Diff. S. D. s.
This study 9 yrs. Wechsler's 7½ yrs.					
	Boys	WISC V.	3.97	1.359	2.60
	Girls		5.40*	2.101	-2.15[1]
	Boys	WISC P.	11.15	1.191	4.65
	Girls		12.62**	4.757	-1.66
	Boys	WISC F.	8.12	.859	4.57
	Girls		9.60**	3.744	-1.71
This study 10 yrs. Wechsler's 10½ yrs.					
	Boys	WISC V.	6.27*	2.245	1.37
	Girls		6.42*	2.136	2.84
	Boys	WISC P.	13.38**	4.881	2.82
	Girls		14.67**	6.002	3.21
	Boys	WISC F.	10.60**	3.816	2.85
	Girls		11.02**	4.063	3.47
This study 13½ - 14½ yrs. Wechsler's 13½ yrs.					
	Boys	WISC V.	1.43	.43	1.59
	Girls		-6.81*	-2.56	3.73
	Boys	WISC P.	9.42**	2.80	3.17
	Girls		7.91**	2.81	4.08
	Boys	WISC F.	3.86**	1.12	2.96
	Girls		.52	.19	6.61

[1] A minus sign (-) indicates that the figures obtained in the present study are higher than those given by Wechsler.

** Significant at 1% level of confidence

* Significant at 5% level of confidence

Table 2

Mean Scores for each Subtest and for Boys and Girls separately

	Verbal Scale								
	Information			Comprehension			Arithmetic		
	Yr.9	Yr.10	Yr.14	Yr.9	Yr.10	Yr.14	Yr.9	Yr.10	Yr.14
Boys	10.67	10.1	13.78	8.5	8.5	9.14	10.05	10.85	9.28
Girls	9.57	8.25	12.54	7.15	7.9	9.46	10.07	9.5	8.72

	Verbal Scale								
	Similarities			Digit Span			Vocabulary		
	Yr.9	Yr.10	Yr.14	Yr.9	Yr.10	Yr.14	Yr.9	Yr.10	Yr.14
Boys	10.32	14.5	10.88	7.85	8.3	8.5	8.55	8.7	11.4
Girls	10.61	9.8	11.98	8.62	7.99	8.4	8.42	8.37	11.8

	Performance Scale								
	Pict. Arrangement			Pict. Completion			Block Design		
Boys	6.50	6.92	7.84	9.3	9.82	10.72	9.22	8.67	9.54
Girls	6.57	6.15	7.14	8.92	8.2	9.6	8.95	8.7	9.2

	Performance Scale								
	Obj. Assembly			Mazes			Coding		
Boys	7.87	7.07	8.48	8.27	7.7	7.82	8.37	8.45	11.05
Girls	7.15	6.4	8.8	7.25	6.85	7.48	10.72	9.47	10.78

Object Assembly test which gave very low values for all three ages, (.285, .340, .285 for ages 9, 10 and the high school group respectively). The most reliable sub-test in the Performance Scale proved to be the Block Design test. This result is in accordance with many previous studies. The Performance Scale as a whole, however, proved to be a less reliable measure of intelligence than the Verbal or the Full Scales, particularly with the older children (mean reliability coefficients: Verbal Scale .762; Performance Scale .679; Full Scale .774, in Table 3).

Table 3

Reliability Coefficients for the present study and for Wechsler's Standardization Sample

Test	The present Study (Kuder - Richardson formula)			Wechsler's findings (Split half - reliability)	
	9 yrs.	10 yrs.	14 yrs	10 1/2 yrs	13 1/2 yrs.
Information	.825	.780	.605	.80	.82
Comprehension	.673	.635	.630	.73	.71
Arithmetic	.659	.657	.585	.84	.77
Similarities	.732	.542	.607	.81	.79
Digit Span	.415	.528	.710	.59	.50
Vocabulary	.829	.819	.770	.91	.90
Pict. Completion	.653	.575	.567	.66	.68
Block Design	.754	.707	.693	.87	.88
Object Assembly	.285	.340	.285	.63	.71
Mazes	.768	.560	.787	.81	.75
Verbal Scale	.755	.854	.679	.96	.96
Performance Scale	.716	.754	.566	.89	.90
Full Scale	.817	.805	.709	.95	.94
N =	80	80	100	100	100

4) Correlations between scores in WISC and teachers' ratings were reasonably high for the Verbal (.500 to .705) and Full (.405 to .677) Scales with the younger age groups, but for the Performance Scale they were low (.293 to .508), especially among the 10 year olds (.303). Correlations for all three scales were low in the high school sample (.542, .226, .324 for the Verbal, Performance and Full Scales respectively, in Table 4).

Table 4

Correlations between the WISC Verbal, Performance and Full Scales with Teachers' Ratings

Age		Teachers' Ratings and WISC V.	WISC P.	WISC F.
9 yrs. Boys & Girls	80	.640	.508	.677
10 yrs. Boys & Girls	80	.705	.303	.569
Boys	50	.500	.293	.405
14 yrs. Girls	50	.619	.140	.200
Combined	100	.542	.226	.324

5) The order of diffifulty of the items for most subtests corresponded very little to that given by Wechsler. Greater differences were found in the verbal than in the performance items. This suggests that the different orders of difficulty observed were mainly due to cultural and language differences. Little uniformity was observed in the scaling of items within each sub-test. In the original Wechsler version large gaps were observed, particularly in the median - to - difficult ranges. These findings were particularly true for the Information, Comprehension and Block Design tests and did not occur in the revised Vocabulary test. One of the aims of the modification of the WISC was to remedy this.

6) Fairly high correlations were found between fathers' occupation and the intelligence of their children for both Verbal and Full Scales (.552 to .578 in Table 5), whereas for the Performance Scale they were somewhat lower (.338 to .473). Our figures were in general higher than those usually reported by investigators in Great Britain for instance.

Table 5

Correlations between Intelligence Quotients obtained in the WISC test and Fatbers' occupations and Family size

Age		Occupation of fathers and WISC V	Occupation of fathers and WISC P	Size of family and WISC F	Size of family and WISC F
9 yrs.	80	.531	.473	.552	-.103
10 yrs.	80	.478	.339	.455	-.137
14 yrs.	100	.524	.345	.516	-.050

7) Small negative correlations were found between family size and intelligence scores for the Full Scale (-.36 to -.05). The correlation obtained for the high school sample was lower than for the other tow groups.

Conclusions

The WISC test as adapted in this research for use in Greek schools appears to be a reasonably good measure of general intelligence for younger rather than for older children. The Verbal Scale was a rather better measure than the Perfomance Scale. The test proved to be more difficult for the Greek children than for the American standardization sample

used by WECHSLER; the differences being too large to be due only to a lack of test sophistication among the Greeks.

The much lower means in the Performance Scale cast some doubt on the view (emphasized by Wechsler) that the non-verbal sub-tests are less influenced by cultural differences. In general, the results indicate that the Performance Scale, with the exception of Block Design, is not a very good measure of the intelligence of Greek school children, particularly of the older ones. Not only has it proved less reliable, but also less valid when scores were correlated with teachers' ratings; more so in the high school group, even allowing for a bias in favour of verbal abilities in the teachers' ratings. The correlations are so low for the Performance Scale that one is forced to conclude that this Scale, as it stands, is probably unsuitable for use with older Greek school children.

The alterations made to the WISC, especially in the Information test, and the construction of the new Vocabulary test proved quite successful, but are by no means final. Further changes, particularly in the performance part should be considered.

The positive relation between socioeconomic status and intelligence, and the negative relation between intelligence and family size are of some value, since they confirm that such results are widespread even among relatively different cultures (COHEN, 1968). Furthermore, since the size of the family correlates less highly with intelligence among the high school sample, we venture to suggest that family size exerts less influence among the higher socioeconomic classes, (considering that the latter were more highly represented among the high school group), provided of course that there is no significant difference in size of family between the high school group and the younger age groups.

Our results in general confirm those reported by most investigations. The intelligence of the children tested seems to be related to the occupation of their parents, but it is not possible to state the extent to which this is due to genetic or to environmental factors.

ΜΕΛΕΤΗ ΤΟΥ ΤΕΣΤ ΝΟΗΜΟΣΥΝΗΣ WISC ΚΑΙ ΕΦΑΡΜΟΓΗ ΤΟΥ ΣΕ ΕΛΛΗΝΕΣ ΜΑΘΗΤΕΣ

ΠΕΡΙΛΗΨΗ

'Η μελέτη ἀρχίζει μὲ μία ἀναφορὰ στὶς θεωρητικὲς ἀπόψεις τοῦ WECHSLER, καὶ ἰδιαίτερα στὴν πεποίθησή του ὅτι ἕνα τέστ γενικῆς νοημοσύνης πρέπει νὰ ἐξετάζῃ ἕναν εὐρὺ ἀριθμὸ ἱκανοτήτων καὶ ὅτι τὰ τέστ ποὺ κατασκεύασε προχωροῦν καὶ πέρα ἀπὸ τὰ στενὰ αὐτὰ πλαίσια, ἀγγίζοντας ἀκόμη καὶ μὴ νοητικοὺς παράγοντες.

'Επίσης γίνεται κριτικὴ θεώρηση τοῦ τέστ γενικῆς νοημοσύνης γιὰ παιδιὰ ποὺ κατασκεύασε ὁ WECHSLER (WISC). 'Αναφέρονται γνῶμες καὶ εὑρήματα διαφόρων μελετητῶν καὶ τέλος διατυπώνεται ἡ ἄποψη ὅτι τὸ WISC δὲν εἶναι τόσο ἀναντικατάστατο ὄργανο γιὰ τὴ μέτρηση τῆς γενικῆς νοημοσύνης στὰ παιδιά, ὅσο εἶναι τὰ ἀντίστοιχα τέστ τοῦ WECHSLER γιὰ ἐνήλικες. Τὸ τέστ STANFORD - BINET εἶναι ἴσως καλύτερο, ἰδίως ὅταν πρόκειται νὰ ἐξετάσουμε πολὺ μικρὰ παιδιά.

Στὴ συνέχεια ἀναπτύσσεται ἡ ἐρευνητικὴ μελέτη. Σκοπὸς τῆς ἔρευνας αὐτῆς ἦταν πρῶτον νὰ γίνουν οἱ ἀπαραίτητες τροποποιήσεις στὸ WISC, ὥστε νὰ χρησιμοποιηθῇ σὲ ἑλληνικὸ πληθυσμό, καὶ δεύτερον νὰ γίνῃ ὁ ἔλεγχος τῆς ἀξιοπιστίας καὶ τῆς ἐγκυρότητας τοῦ τροποποιημένου τέστ.

Τὰ ἀποτελέσματα ἔδειξαν ὅτι τὸ τέστ WISC, ὅπως διορθώθηκε στὴ μελέτη γιὰ νὰ χρησιμοποιηθῇ σὲ 'Ελληνόπουλα, φαίνεται ὅτι εἶναι ἀρκετὰ καλὸ μέτρο τῆς γενικῆς εὐφυΐας γιὰ τὰ μικρότερα παιδιά, καὶ μάλιστα τὸ προφορικὸ μέρος τοῦ τέστ. Παρατηρήσαμε ὅτι τὸ τέστ εἶναι πιὸ δύσκολο γιὰ τὰ 'Ελληνόπουλα, ὅταν συγκριθοῦν οἱ ἐπιδόσεις τους μὲ τὶς ἐπιδόσεις τοῦ 'Αμερικανικοῦ δείγματος ποὺ μεταχειρίστηκε ὁ WECHSLER γιὰ τὴ στάθμιση τοῦ τέστ αὐτοῦ. Οἱ διαφορὲς ἦταν πολὺ μεγάλες γιὰ ν' ἀποδοθοῦν μόνο στὸ γεγονὸς ὅτι τὰ 'Ελληνόπουλα γνωρίζουν ἴσως λιγότερο ἀπὸ τὰ 'Αμερικανόπουλα τὶς μεθόδους ποὺ χρησιμοποιοῦνται συνήθως στὰ τέστ τοῦ εἴδους αὐτοῦ (TEST SOPHISTICATION).

Οἱ ἰδιαίτερα χαμηλὲς τιμὲς ἐπιδόσεως στὴν Κλίμακα 'Εκτελέσεως ἀσφαλῶς δὲν στηρίζουν τὴν ἄποψη ὅτι τὰ τέστ ἐκτελέσεως εἶναι περισσότερο ἐλεύθερα ἀπὸ πολιτιστικὲς ἐπιρροὲς ἀπὸ ὅ,τι τὰ προφορικά, ἄποψη ποὺ ἰδιαίτερα τονίζει ἀνάμεσα σ' ἄλλους καὶ ὁ WECHSLER. Γενικὰ τὰ ἀποτελέσματα δείχνουν ὅτι ἡ Κλίμακα 'Εκτελέσεως, μὲ μόνη ἐξαίρεση τοὺς Κύβους, δὲν εἶναι κα-

λὸ μέτρο τῆς γενικῆς νοημοσύνης γιὰ τὰ Ἑλληνόπουλα καὶ ἰδίως γιὰ τὰ παιδιὰ τῶν Γυμνασίων. Ὄχι μόνον εἶναι λιγότερο ἀξιόπιστη ἀπὸ τὴν Προφορικὴ Κλίμακα, ἀλλὰ εἶναι καὶ λιγότερο ἔγκυρη ὅταν συσχετισθοῦν οἱ ἐπιδόσεις τῶν παιδιῶν μὲ τὴν κρίση τῶν καθηγητῶν τους, ἰδίως στὰ μεγαλύτερα παιδιά. Κατὰ ἕνα ποσοστὸ αὐτὸ εἶναι δυνατὸ νὰ ὀφείλεται στὶς δύσκολες συνθῆκες διδασκαλίας ποὺ παρατηροῦμε μέσα στὰ Γυμνάσια, ὅπως π.χ. τὸν μεγάλο ἀριθμὸ μαθητῶν σὲ κάθε τάξη. Ἀλλὰ οἱ τιμὲς συσχετίσεως εἶναι τόσο χαμηλὲς στὴν Κλίμακα Ἐκτελέσεως, ὥστε νὰ ἀναγκασθῇ κανεὶς νὰ φτάσῃ στὸ συμπέρασμα ὅτι ἡ Κλίμακα αὐτή, ὅπως εἶναι σήμερα, εἶναι ἴσως ἀκατάλληλη γιὰ τὰ παιδιὰ τῶν Γυμνασίων. Οἱ τροποποιήσεις ποὺ κάναμε, ἰδιαίτερα στὸ ἐπὶ μέρους τέστ τῶν Πληροφοριῶν, καθὼς καὶ τὸ νέο Λεξιλόγιο, ἀποδείχθηκαν ἀρκετὰ ἐπιτυχεῖς, ἀλλὰ ἀσφαλῶς δὲν ἔχουν πάρει ἀκόμη τὴν τελική τους μορφή.

Οἱ θετικὲς συσχετίσεις ἀνάμεσα στὸ κοινωνικοοικονομικὸ ἐπίπεδο καὶ στὴ νοημοσύνη, καὶ οἱ ἀρνητικὲς συσχετίσεις ἀνάμεσα στὴ νοημοσύνη καὶ στὸν ἀριθμὸ τῶν παιδιῶν μέσα σὲ μιὰ οἰκογένεια (δηλ. τὸ μέγεθός της) ἦταν ἐπίσης ἀξιόλογα εὑρήματα. Δείχνουν ὅτι πρόκειται γιὰ φαινόμενα ποὺ εἶναι κοινὰ ἀκόμη καὶ σὲ διαφορετικὰ πολιτιστικὰ πλαίσια, ἀφοῦ τὰ βρίσκουμε ἐκτὸς ἀπὸ τὴν Ἑλλάδα καὶ σὲ ἄλλες χῶρες, ὅπως στὴ Μ. Βρεττανία καὶ τὴν Ἀμερική. Ἐπιπλέον, τὸ εὕρημά μας, ὅτι τὸ μέγεθος τῆς οἰκογένειας συσχετίζεται λιγότερο μὲ τὴ νοημοσύνη στὶς ὁμάδες τῶν Γυμνασίων, νομίζουμε ὅτι ὑποδηλώνει πὼς ἡ μεταβλητὴ αὐτὴ ἔχει λιγότερη ἐπιρροὴ στὶς ἀνώτερες κοινωνικοοικονομικὲς τάξεις, δεδομένου ὅτι στὰ Γυμνάσια ὑπῆρχε μεγαλύτερο ποσοστὸ παιδιῶν ἀπὸ τὶς κοινωνικὲς αὐτὲς τάξεις παρὰ στὰ Δημοτικὰ Σχολεῖα. Τὸ συμπέρασμα αὐτὸ ἰσχύει βέβαια μόνο ἂν ἀποδειχθῇ ὅτι δὲν ὑπάρχει στατιστικὰ σημαντικὴ διαφορὰ στὸ μέγεθος τῆς οἰκογένειας ἀνάμεσα στὶς ὁμάδες τῶν μεγαλύτερων καὶ τῶν μικρότερων παιδιῶν.

Τὰ ἀποτελέσματα σὲ γενικὲς γραμμὲς συμφωνοῦν μὲ ὅσα ἀναφέρουν παρόμοιες μελέτες. Ἡ νοημοσύνη τῶν παιδιῶν ποὺ ἐξετάσθηκαν φαίνεται ὅτι ἔχει σχέση μὲ τὸ ἐπάγγελμα τοῦ πατέρα τους, ἀλλὰ δὲν ἦταν δυνατὸ νὰ ἐξακριβωθῇ, στὸ στάδιο αὐτὸ τῆς μελέτης, πόσο αὐτὸ ὀφείλεται σὲ γενετικοὺς παράγοντες ἢ σὲ στοιχεῖα τοῦ περιβάλλοντος.

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