APPLICATION OF THE WIDE RANGE ACHIEVEMENT TEST AMONG 6-20 AGE GROUPS IN TURKEY

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Summary

In this study, WRAT, The Wide Range Achievement Test, has been applied on various age groups and the data obtained has been compared to the American standards. This test has been applied among elementary, secondary and university students exceeding 1000. In addition to the analysis in groups and inter-groups, the successful and unsuccessful sample groups were also experimented and compared to each other. The findings of WRAT were also compared with the organicity test results in different age groups. This study has shown a pattern which is special to Turkish Society. WRAT test can be used to determine the reasons for the unsuecessfulnes of the students and it also helps to find out the ways to raise their level of success.

Introduction

As we all know, difficulty in studying, drives the child into various problems. This also worries the parents and forces them to go to different kinds of institutions, specially to the counselling departments. Among the children who come to the counselling departments, «failure in school» forms a major problem.

When we say failure, some may think of a kind of 'retardness! But researches have shown that the correlation between these two

factors (that is being retarded and failure in school) is lower than the expected estimations. The correlation doesn't go beyond .40, .50 (Sorensen, 1964) These findings make us think about other factors which effect'success in school' :

— Low socio-economic level, defects in perception and attention, and lack of motivation can be the major problems.

On the other hand if the I.Q. level is low, then the child is effected more by the low social level. Psychological factors are also very important in effecting success. Investigations are made about this problem also by Lecky, 1961, Combs and Snygg, 1959 Wattenberg and Clifford, 1964, Sheldon and Landsman 1950, and many others. It is a fact that we must not forget the importance of the neurological factors of course, as well as the relationship among all factors. Failure caused by neurological factors will defect the emotionel balance, leading the child towards a behaviour disorder. Therefore it is not sufficient to approach these children only through I.Q. tests or through other psychological methods. Next to the achievement tests, it is necessary to reach the child through organicity tests.

Benton (1963) points out the existance of the correlation between Wide Range Achievement Test (WRAT) reading score and Benton right score. Ormanlı (1977), found out that Benton Right Score among successful students is more than twice in failing ones.

It is noticed that, the achievement tests that have been proved valid and reliable, are not sufficient in our country. Therefore our aim is to take Wrat in hand seriously to make the population benefit from it.

Organicity tests, taken in parallel with achievement tests widens the outlook towards the problem. Such an approach leads us to help the child before the development and fixation of emotional factors caused by neurological factors.

Method

As for method, besides WRAT, three organicity tests are applied in this research: BENTON, BENDER and TRAIL MAKING tests.

Wrat

WRAT is consists of two levels. That is it is applied to two age groups.

1 — Level 1 is applied to 5-12 age groups.

2 — Level 2 is applied to 12-adult groups.

For both levels there are three sublevels such as reading, spelling and arithmetics.

The usage field of this test is wide, such as noticing sufficiency in arithmetics and difficulty in writing and spelling, helping the diagnosis of dislexy, determining the school success level of the adolescents. On the other hand it is used to examine the decrease in arithmetics, reading, writing performances caused by brain deficiency or other physical disorders.

The application of WRAT takes 20-30 minutes, and scoring takes 5 minutes at the most. Since Benton, Bender and Trail Making Tests are so well-known we won't discuss them here.

Subjects

As it is seen on Table I there are 393 females and 359 males making a sum of 752. At level II there are 367 females and 361 males making a sum of 738. The total number of subjects is 1490.

Age of the subjects varies between 5-21 years. The subjects are selected at random from different schools of Istanbul with different socio-economic levels. Students coming from different areas of Anatolia such as Trabzon, Konya and Antalya, have also been included in our research.

Procedure and statistical methods

In order to see the validity of the WRAT test, we have made a research on the correlations of different organicity tests which are used in our country.

We have compared WRAT findings with school success, as a criteria. We put our subjects into groups according to their ages and

followed the changes in the scores, as the ages differed. Doing this we determined the group norms. To see the consistency of the test, we looked at the correlation of the sub-tests. Also to see the reliability, we applied the test to the successfull an unsuccessfull students to determine the levels of significance.

Our plan is to make further researches to examine the eorrelation between the two forms of the tests, to apply the test to different groups of professions, and to make item analyses. Besides,

TABLE I

Numbers of the *Subjects* by Age and Sex, in both Levels of WRAT

AGE IN YEARS	FEMALES	MALES	TOTAL
5	8	10	18
6	36	42	78
7	71	53	124
8	101	76	177
9	54	53	107
10	74	72	146
11	49	53	102
LEVEL I.			N = 752
12	72	71	143
13	84	72	156
14	58	64	122
15	60	63	123
16	64	69	133
17	24	19	43
18	5	8	13
19	—	2	2
20	—	2	2
21	—	1	1
LEVEL II.			N = 738
T =	760	730	1490

our aim is to investigate the correlation between WRAT findings and I.Q. tests and other achievement tests in the Turkish population. Also the number of the subjects to be tested has to be increased for the reliability of the test.

Findings

As we come to the findings,

— On Table II we see the average and standard deviation of the female subjects in WRAT's 3 sub-tests. (reading, spelling arithmetics)

TABLE II

Means and Standart Deviations of the *Female Group* for 3 Subjects (Reading, Spelling and Arithmetic) in both Levels (N = 760)

		READING		SPELLING		ARITHMETIC	
AGES	N	M	SD	M	SD	M	SD
5	8	84,67	6,73	36,75	6,13	21,12	2,29
6	36	85,8	20,2	35,1	11,2	21,2	2,4
7	71	88,29	11,55	46,26	10,58	25,25	12,11
8	101	96,43	17,61	51,85	7,08	28,61	3,28
9	54	98,23	5,16	51,86	11,32	32,2	4,11
10	74	95,48	12,63	55,29	8,33	33,83	12,27
11	49	95,59	9,11	55,38	8,25	34,86	8,98
12	72	87,81	3,38	40,26	6,23	22,04	3,98
13	84	83,5	7,49	49,94	4,78	19,29	5,68
14	58	85,0	10,53	49,57	7,28	19,92	7,32
15	60	85,9	5,38	48,4	2,92	25,4	5,85
16	64	87,2	1,48	50,28	1,43	25,71	4,41
17	24	87,1	1,15	47,7	8,06	23,9	5,81
18	5	87,2	2,25	49,8	2,04	21,8	2,64

— Table III is for the male subjects.

— On table IV, average and standard deviation of 1490 subjects are given according to see the ages. This group is assumed to represent the Turkish population. Sex difference is not taken into cosideration.

— On table V to give a possibility of comparison, the score of the American group subjects are given (N=9087)

TABLE III

Means and Standart Deviations of *Male Group* for 3 Subjects in both Levels (N = 730)

		READING		SPELLING		ARITHMETIC	
AGES	N	M	SD	M	SD	M	SD
5	10	71.80	4.14	31.10	5.22	19.10	3.94
6	42	78.72	2.69	36.95	4.4	20.98	4.3
7	53	90.13	11.12	45.83	10.98	26.70	3.91
8	76	92.85	8.85	49.88	7.48	28.95	2.63
9	53	95.49	11.26	51.47	8.31	31.79	5.43
10	72	97.04	3.12	53.98	8.09	34.43	5.98
11	53	97.50	6.99	53.99	9.18	34.79	6.81
12	71	83.42	8.99	41.29	5.88	19.72	7.99
13	72	85.86	8.91	44.86	8.88	21.13	5.15
14	64	85.0	7.32	49.57	4.99	19.92	6.38
15	63	81.15	9.68	48.23	5.79	21.0	8.15
16	69	87.7	1.0	50.26	0.99	32.79	5.05
17	19	87.57	4.88	49.26	2.40	26.0	4.73
18	8	87.0	2.42	49.25	1.03	24.4	5.31
19	2	88.0	0	48.5	0.71	22.5	2.12
20	2	82.0		44.5		17.0	
21	1	89.0	0	51.0	0	24.0	0

TABLE IV

Means and Standart Deviations of the Total *Turkish Group* for 3 Subjects of WRAT in both Levels (N = 1490)

		READING		SPELLING		ARITHMETIC	
AGES	N	M	SD	M	SD	M	SD
5	18	78.37	5.4	33.9	5.45	20.1	3.2
6	78	81.99	2.52	36.1	3.5	21.08	3.8
7	124	89.08	11.40	46.07	10.75	25.86	9.54
8	177	94.89	14.69	51.57	7.34	28.76	3.02
9	107	96.87	8.84	51.66	9.95	32.0	4.81
10	146	96.50	9.29	54.64	8.24	34.12	9.70
11	102	96.60	8.31	54.30	8.75	34.90	8.23
12	143	84.47	3.95	40.77	4.81	16.47	4.80
13	156	86.17	6.48	48.48	5.38	18.82	3.91
14	122	86.25	4.46	49.23	3.20	19.01	4.37
15	123	87.1	7.71	49.34	4.8	20.66	7.4
16	133	88.13	1.18	49.89	1.25	24.58	4.31
17	43	87.33	2.89	48.39	6.12	24.83	5.01
18	13	87.08	2.32	49.46	1.48	23.4	3.91

When two tables are compared the difference between the scores of the Turkish and the American groups draws attention.

For example; (a) In the Turkish group, reading and spelling scores in all age groups are higher than the American norms. On the other hand the arithmetic scores in the Turkish group are lower than the American norms. (e.g. At level I, age II and at level II, the whole age grops) We assume that the difference between the education systems of these two groups has effected the results. (b) The expected performance, that is the proportional accelaration between age and scores can be seen in both groups. But in the Turkish group a kind of disorderliness is noticed in the performances of age 17 and 18. This result can be attributed to the insufficiency of the number of subjects. (N=8)

TABLE V

Means and Standart Deviations of *American Group* for 3 Subjects of WRAT in both Levels (N = 9087)

		READING		SPELLING		ARITHMETIC	
AGES	N	M	SD	M	SD	M	SD
5	533	18.36	7.82	14.78	5.49	13.21	4.47
6	667	28.10	11.33	20.99	6.26	18.18	4.84
7	747	43.48	12.83	30.01	6.61	23.60	4.86
8	724	52.81	12.93	34.42	6.62	27.79	4.53
9	669	59.24	13.55	38.76	7.26	30.90	4.72
10	655	64.88	13.52	43.09	8.03	35.36	6.25
11	585	69.39	13.45	46.29	8.01	40.57	6.63
12	650	44.81	11.83	25.01	8.76	24.49	5.64
13	646	47.57	11.89	28.07	8.94	26.97	6.13
14	691	51.72	11.98	30.69	8.78	28.90	6.30
15	589	54.59	12.17	32.20	9.18	29.57	6.49
16	558	55.76	12.72	33.86	9.34	29.85	6.91
17	485	57.29	12.76	35.24	9.25	30.60	7.25
18/19	287	58.74	13.79	36.06	10.09	29.12	7.70
20/24	232	59.84	14.00	36.94	10.15	28.54	8.00
25-34	148	59.20	13.95	35.63	10.60	23.57	7.95
35-44	112	59.19	14.04	34.86	10.89	23.06	7.74
45	109	58.98	14.13	33.51	10.26	20.90	7.82

Tables VI, VII, VIII and IX, give the findings of organicity tests which are applied to the subjects besides WRAT.

It is seen that Bender error score, Trail Making time scores and Benton error score, are inversely proportional with the ages of the subject whereas Benton right score is directly proportional. These findings are normal in reflecting the validity of the above 3 organicity tests.

TABLE VI

Means and Standart Deviations of *Bender Gestalt Test* by Age and Sex (N = 339)

	FEMALES		MALES		TOTAL	
AGES	M	SD	M	SD	M	SD
6	9.0	0	6.5	6.36	7.33	7.1
7	6.0	3.26	4.34	2.32	5.21	3.4
8	4.78	2.9	3.30	2.16	4.13	2.8
9	4.57	2.82	3.41	3.87	3.81	2.9
10	2.23	1.86	2.33	1.45	2.28	1.67
11	2.70	2.00	2.48	2.83	2.51	2.6

TABLE VII

Means and Standart Deviations of *Trail Making Test* by Age and Sex (N = 898)

	FEMALES		MALES		TOTAL	
AGES	M	SD	M	SD	M	SD
5	94.37	51.93	85.7	43.7	89.2	45.8
6	96.97	79.21	85.37	79.0	91.2	79.1
7	75.21	54.15	63.7	41.56	70.5	46.5
8	50.69	22.26	56.07	38.98	52.7	31.6
9	38.14	12.98	34.64	12.96	37.6	12.97
10	45.00	34.82	37.63	13.88	42.8	28.9
11	41.54	17.33	35.28	16.69	37.4	16.8
12	43.0	9.5	26.5	19.09	36.4	13.6
13	33.0	22.16	25.0	12.9	30.0	18.5

TABLE VIII

Means and Standart Deviations of *Benton Retention Test* «Number Correct» Score by Age and Sex (N = 898)

	FEMALES		MALES		TOTAL	
AGES	M	SD	M	SD	M	SD
5	3.12	2.97	2.2	1.62	2.4	2.1
6	3.34	1.8	3.65	2.21	3.5	4.2
7	5.21	1.87	4.7	2.47	5.0	2.1
8	6.62	1.8	5.73	2.20	6.20	2.0
9	7.21	2.06	4.47	1.6	5.6	1.9
10	7.15	2.34	6.79	1.47	6.9	2.4
11	8.0	1.32	6.94	0.72	7.4	0.9
12	5.67	2.35	8.0	1.41	6.2	1.7
13	8.25	0.9	5.33	3.92	6.8	1.9
14	7.1	3.2	6.7	0.9	7.0	2.1
15	7.7	2.9	6.8	1.2	7.6	2.3
16	8.0	3.1	7.1	2.1	7.6	2.9

TABLE IX

Means and Standart Deviations of *Benton Retention Test* «*Error*» *Score* by Age and Sex (N = 898)

	FEMALES		MALES		TOTAL	
AGES	M	SD	M	SD	M	SD
5	6.75	4.98	8.0	6.5	7.4	5.5
6	7.77	3.5	8.75	7.9	5.14	4.2
7	6.0	2.89	6.8	4.05	6.3	3.2
8	4.2	2.8	5.1	3.44	4.5	3.1
9	3.44	2.93	3.5	1.98	3.48	2.6
10	4.0	4.3	3.89	2.46	3.95	3.1
11	2.69	1.43	3.72	0.8	3.15	1.15
12	5.33	2.35	2.0	1.41	5.8	1.7
13	3.0	0.81	6.33	2.02	4.4	1.4
14	2.8	1.0	3.5	1.9	3.1	1.5
15	2.3	0.1	2.9	1.2	2.5	0.8
16	2.1	0.9	2.7	0.8	2.5	0.94

On table X, we see the school achievement levels.

At level I, scores are graded on a 5 point scale.

At level II, scores are graded on a 10 point scale.

On table XI «Rho» correlative relation among reading, spelling and arithmetic sub-tests are given. The high level of the correlation points out that, although the average values of the Turkish population are different from the American norms, consequency among sab-tests is also high for the Turkish population. So we can assume that WRAT can be valid for our population too.

TABLE X

Means and Standart Deviations for *School Achievement* of the Subjects by Age and Sex

	FEMALES		MALES		TOTAL	
AGES	M	SD	M	SD	M	SD
5	3.84	0.66	3.80	0.98	3.80	0.8
6	4.16	0.6	4.02	1.2	4.08	0.8
7	4.03	0.79	4.38	0.58	4.17	0.73
8	4.29	0.82	3.54	1.42	3.97	1.20
9	4.12	0.80	4.12	0 87	4.12	0.84
10	3.96	0.87	3.90	1.01	3.93	0.94
11	4.90	1.58	3.72	1.02	4.33	1.43
12	6.26	1.41	5.46	1.35	6.59	1.41
13	6.08	1.11	4.79	1.48	5.99	1.22
14	6.02	1.41	6.02	0.36	6.33	0.72
15	7.08	1.09	7.16	1.63	6.47	1.55
16	6.01	0.91	5.94	1.10	5.83	1.05
17	6.13	1.39	6.35	1.12	6.23	1.28
18	6.27	1.44	6.46	1.53	6.38	1.49
19			6.68	0.53		
20			3.71			
21			5.86	0		

TABLE XI

Intercorrelations between *WRAT Subjects*, by «Rho» in both Levels

AGES	READING SPELLING	READING ARITHMETIC	SPELLING ARITHMETIC
5	.69	.64	.65
6	.74	.76	.78
7	.77	.64	.65
8	.73	.59	.61
9	.79	.62	.65
10	.82	.64	.66
11	.82	.65	.66
12	.71	.61	.61
13	.66	.42	.43
14	.71	.52	.57
15	.69	.53	.56
16	.58	.52	.51
17	.72	.51	.52
18	.69	.45	.66

As our research will continue and as we don't have sufficient number of subjects, to see the correlative relation, we used «Rho». When the research is completed, the correlative investigations will be examined by «r» correlation coefficient.

As it is seen on table XII, when WRAT sub-tests are compared with Bender scores, the correlation is higher as the ages of the subjects go up. But in the spelling sub-test, correlation is a little bit higher. According to us, this shows the dependency of the spelling and writing processes on visual motor perception. In short, if the visual motor perception of the subject has developed enough, he or she can be successful in writing. Unsuccessfulness of the age group 6 in spelling is considered as a result of this.

When we look at the correlation between WRAT sub-tests, it is seen that the correlation between WRAT arithmetic sub-test and

TABLE XII

Correlations (Rho) between *WRAT Subjects* and *Bender Test Scores* by Age (N = 339)

AGES	READING	SPELLING	ARITHMETIC
6	.39	.42	.49
7	.41	.52	.50
8	.41	.50	.48
9	.52	.50	.48
10	.60	.65	.60
11	.61	.64	.61

TABLE XIII

Correlations (Rho) between *WRAT Subjects* and *Trail Making Scores* by Age (N = 898)

AGES	READING	SPELLING	ARITHMETIC
5	.21	.20	.51
6	.30	.18	.52
7	.18	.16	.52
8	.20	.17	.48
9	.29	.14	.52
10	.10	.20	.50
11	.15	.12	.49
12	.17	.18	.48
13	.19	.23	.49

Trail Making score is higher than the other sub-tests, this leads us to think of the existance of number joining process in the latter one. When we look at the correlation between Benton right score and WRAT sub-tests, we see that spelling and arithmetic sub-tests are higher than reading scores. This result shows us that Benton

TABLE XIV

Correlations (Rho) between *WRAT Subjects* in both Levels and *Benton «Number Correct» Scores* by Age (N = 898)

AGES	READING	SPELLING	ARITHMETIC
5	.34	.41	.42
6	.62	.78	.77
7	.58	.62	.63
8	.61	.71	.68
9	.51	.62	.60
10	.52	.79	.80
11	.51	.58	.52
12	.41	.52	.52
13	.35	.55	.54
14	.35	.41	.61
15	.25	.42	.51
16	.26	.71	.68
17	.41	.62	.60
18	.39	.51	.52

measures logical thinking as well as visual motor perception. It is obvious that this correlative relationship needs detailed research.

On table XV WRAT total score and the school-achievement of the subjects are compared as an external criteria. Correlation is high in all age levels. This shows us WRAT can determine the success of a student in a very short period of time (like in 15 minutes), whereas it takes a whole academic year for a class teacher to determine the student's success. The level of discrimination of a successful students are measured by Fisher's «t» test.

As it is seen on table XVI, both levels of WRAT test (level I and level II) (p .001) can discriminate successful and unsuccessful students. As a result of the studies we have performed, we can assume WRAT test can be used as a tool to assess success.

TABLE XV

Correlations (Rho) between *WRAT Total Score* in both Levels and the *School Achievement* of the Subjects by age (N = 1490)

AGES	Rho
5	.49
6	.60
7	.55
8	.68
9	.62
10	.58
11	.59
12	.48
13	.57
14	.62
15	.47
16	.51
17	.62
18	.50

TABLE XVI

The significance Level by Fisher's «t» Test of the *2 Groups of Students (succesfull and failure) WRAT Total Score*

	Succesfull		Failure		
	M	SD	M	SD	«t»
Level I M = 70	158.6	8.3	150.1	7.4	4.45+++
Level II M = 70	168.5	5.4	163.2	5.8	3.90+++

+++ $p < .001$ significant

Under the guidance of the findings, special education programmes can be applied to the subjects to heighten their performances. When applied with an organicity tests it can be determined whether unsuccessfulness has an organic source or not. When it is applied with an I.Q. test it can determine the intelligence problem. When we eliminate the above two problems, we can approach a psychological problem using personality tests. Doing these, an organic or a psychological factor can be abolished or lessened before the symptoms get intensified. As we have seen, the validity and reliability of WRAT is supported by the correlative relations between organicity tests scores and WRAT sub-test scores.

As a last word we don't want to make further assumptions at this point in time, and we suggest that more detailed researches should be made on this subject.