CHAPTER FIVE

ADMINISTRATION OF THE PILOT TEST

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Administration of the Pilot Test

The next stage in the testing programme concerns the " trying out " of the test and the stage is further divided into two:

(a) Preliminary testing (in the pilot test form)

(b) Final administration of the test.

The present chapter deals with the details regarding the administration and analysis of the pilot form of the test.

Objectives (Preliminary testing)

The objectives of preliminary testing are as follows :

1. To know the difficulty value of each item.

Difficulty or degree of difficulty refers to the percentage of correct responses given to it.

In the construction of the test, care must be taken to place the test items in order of difficulty with the easiest items coming first and the others gradually increasing in the order of difficulty. When a test is to be applied to groups varying greatly in ability, naturally there must be some items so easy that the lowest can master them and some so difficult that even the ablest sometimes fail.

But in any group no matter how wide the scatter of ability, an item that can be passed by all has no discriminating value. It is evident then that the difficulty of an item is a very important factor in the reliability and validity of a test. Therefore it is important that we must have devices for establishing the relative difficulty of items so that they can be used for arranging test items in order of difficulty and for increasing the discriminating power of the test.

2. The second objective of the preliminary testing is to know the time required by the pupils to answer all test items of the battery.

3. To find out the ambiguity and difficulty of language and comprehension of the test item.

4. To find the discriminating power of each item so that the undesirables may be weeded out from the test.

The test is being prepared for student population of Class IX of Hyderabad, Secunderabad, Warangal, Khammam, Nalgonda, Karimnagar and Gantur districts. If we want to know the scientific aptitude of pupils of class IX in the areas covered by the above districts, we will have to test all the pupils of Class IX of all schools in those areas. Since this will be an unwieldy task to begin with, we have taken a sample for the preliminary testing from a representative group of student population. Students drawn from

various classes of society with varied family backgrounds and intellectual environments should go to form the random sampling.

Keeping these objectives in view a programme of the preliminary testing was chalked out.

Reasons for the Testing to be done by a Single Person

Testing conditions must be made the same for all pupils, even though tested at different times and by different examiners. The test maker cannot control testing conditions but much can be accomplished in this connection by taking proper precautions.

In testing programme detailed instructions are provided in the test booklet and they have to be followed strictly. Strict adherence to the test manual in the matter of answering pupils' questions, after a test has begun or assisting pupils in the understanding of test items, unfamiliar words, or misunderstood directions is absolutely necessary in the standardization of a test.

The teacher's job as a teacher is to see that pupils

1. understand the direction
2. do not cheat
3. work continually and faithfully.

For the reasons it has been urged by experts that the testing throughout should be done by one person. Such a

practice will tend to secure a higher degree of uniformity in the administration of the test.

Thus the advantages in concluding a test by a single person are fare more than those of being done by many. The testing in all the schools is done by the investigator himself.

Directions for the different types of test items together with the sample questions and sample answers were given at the beginning of each section of test items. Care was taken to see that these directions are complete in respect of explaining to the pupils as to what is to be done ? how he is to do it ? and where he is to place his response.

Administration of the Test

The test was administered on 220 pupils of Class IX, drawn from five Telugu medium schools on 6th, 14th, 16th, 21st and 23rd of June 1967. The test is given in the morning session during 10.30 a.m. to 1.00 p.m. when pupils will be quite fresh to answer the test. One mark is allotted for every item and two marks for neatness which brings the total to 155. The details of total number of pupils selected from 5 different schools and the dates on which the test is administered in these schools are given on the next page.

School	No. of Pupils administered	Date
A	44	20-6-1967
B	46	14-6-1967
C	50	15-6-1967
D	42	16-6-1967
E	38	21-6-1967
Total	220	

Randon Selection

Random sampling means that we rely upon certain method of selection called random to provide an unbiased cross section of the larger group of population. In the present work two hundred answer scripts are selected by lottery method by drawing well shaken slips containing the number of scripts.

Scoring is done by comparing the given responses with the correct responses in the key. Separately answer sheets are provided in the preliminary test and pupils are asked to record their responses on the answer sheet provided.

Validity of Test Items

As discussed in the previous chapter, many are of the opinion that "a test is valid in proportion as it measures what is proposed to be measured. A test is valid to the degree

that we know what it measures or predicts.

Validity is of two kinds (1) Internal validity and (2) External validity.

Internal validity refers to the care with which the items of the test are selected and arranged. For this the items must be carefully written, judged by experts and then tried out on a small sample. Ambiguities and misunderstandings in certain items have to be eliminated after the test has been admihistered to a small group. If necessary, items are modified or omitted entirely.

In order to attain external validity the test may be compared with the actual achievement in a practical situation and with other measures of the same field. These outside measures are called criteria. In the case of tests of intelligence and aptitude type,teachers' judgments constituted the main criterion.

Methods of Determining Item Validity

The validity of a single test item may be determined by various methods. T.P.Guilford in his book 'Psychometric Methods' has discussed 19 methods of finding the validity of test items.

When the test items are scored as either right or wrong, or according to any other categories, the following two methods are generally used :

1. Difference between high and low groups

2. The Biserial 'r' method.

1. Difference between High and Low groups. When the total student population, that is tested is divided into two parts, a high group and a low group, the simple and most direct indicator of validity is to find a simple difference in the number of the correct responses in the upper and lower groups.

The two groups may be the highest and lowest thirds or fourths of the total population tested, or the extreme 27 per cent at either end of the range or the highest.

If V = Validity of the test items

U = Percentage of correct responses of upper group

L = Percentage of correct responses in the lower group

then V = U - L

2. The Biserial 'r' method. In the present test, test items are scored to give two responses either correct or wrong and if we assume that the two way split, we have made, in their performance would be continuous and normally distributed we may compute the correlations by the Biserial 'r' method. And this Biserial correlation coefficient is widely used in educational research as an 'index of validity' or 'Index of discrimination' of individual test items.

For finding the validity of single test items by this method the group of pupils attempting a particular test are

graded on the basis of the scores obtained in two groups, higher group and the lower group and then the Biserial 'r' coefficient of correlation between the two groups is found out for each and every other item in a test. The higher and lower thirds or fourths of the total population tested or the extreme 27% at either end of the range. The extreme 27% and lower 27% values are found out and the biserial 'r' coefficient of correlation between them is determined for all the test items. The biserial 'r' is obtained with the help of Flanagan's Tables to find the Index of validity.

Difficulty of Test Items

The difficulty of a test item is determined by the proportion of some standard group able to solve the item correctly. The scores obtained by a group of pupils depend not only upon the ability of the group but also upon the difficulty of test items. It is customary to select items for a test which vary in difficulty, from easy to hard and the poorest examinees will obtain marks very little near 0% while the best ones very near 100% and so the average will be as near as possible to 50%. It can be shown however that the sharpest discrimination as between good and poor subjects is provided by items which are passed by 50% members of the group. A test made up of items all of which are passed by approximately 50% (by different persons) would theoretically be the most

discriminating test. But it would be difficult to construct such a test and it is probable that a test made up of items covering a wider range of difficulty is psychologically a better measuring device. In a test the items are generally arranged according to the ascending order of difficulty.

Method of finding the Difficulty of Test Items

As Coombs has pointed out the difficulty of an item varies for different individuals.[1] We do not have accurate information concerning an item difficulty for an individual. All that we know is that if he passes the item, it is less difficult than his ability to cope with it and if he fails it is more difficult than his ability to cope with it.

The formula $D = \frac{U + L}{2}$ was used to calculate the difficulty value 'D' of each item.

D = Difficulty value of the item.

U = Percentage of testees scoring the item correctly in the upper 27% after being corrected for guess work.

L = Percentage of testees scoring the item correctly in the lower 27% after being corrected for guess work.

The difficulty values 'D' of all the items in the test are shown in the Table 1. The lower the value of 'D' the higher the difficulty level.

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[1]Coombs, C.H. The Concepts of Reliability and Homegeneity Educational Psychological Measurement, 1950, pp. 43-56.

Criterion

The validity of a test is the closeness of agreements between the scores and some other objective measure of that which the test is used to measure. This other measure is called Criterion. The coefficient of validity of a test is the coefficient of correlation between test scores and criterion scores. Aptitude tests are most generally validated against external criteria. It is therefore of primary importance to select some satisfactory external criterion to validate the present test against it.

Commonly used Criteria

Among the criteria frequently used in validating measuring instruments are the following :

1. The outcome of an activity - such as failure or success in school or the vocational situations,
2. Another measurement possessing known or assumed validity.
3. Associate's Ratings.
4. Self Ratings.
5. Factors isolated by factor analysis techniques and
6. Responses of selected groups such as inmates in an institution or members of vocational groups.

A sample of 100 scores of the pupils is selected for the purpose of validating the test with the help of external criteria. The criteria selected to establish validity in this test are (1) Annual science examination marks of testees (2) Teacher's estimation of the pupils. Both of these two criteria are applied

for the test. The correlation coefficients between (1) standard test scores and standard criterion scores (Annual examination marks in Science of the previous class) (2) Standard test scores and the teacher's estimation of the pupils are determined.

The concerned science teachers of the pupils are requested to rate the pupils as per their performance in the class on a seven point scale, A, $\overset{+}{B}$, B, $\bar{B}$, $\overset{+}{C}$, C, $\bar{C}$ and the grades given by the teachers have been recorded as teacher's estimation.

The raw criterion scores and the pilot test scores are converted into standard scores taking mean M = 50 and standard deviation σ = 10 before finding the correlation coefficient between the two sets of scores. This is quite necessary for the purpose of comparison. The standard test scores and the standard criterion scores are given in Tables 4 and 6 respectively.

The following formula[1] is used for the conversion of the raw scores into standard scores.

$$\frac{X' - M'}{\sigma'} = \frac{X - M}{\sigma} \qquad \text{Eq.(1)}$$

where

X = a score in the original distribution

X'= a standard score on the new distribution

M and M' = Means of the raw scores and the standard scores distributions respectively.

σ and σ'= Standard deviation of raw and standard scores respectively.

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[1]Garrett,H.E. Statistics in Psychology & Education(New York: Longmans,Green & Co),1958,pp.312-313.

In the formula the values of M' and σ' are taken to be equal to 50 and 10 respectively.

Results

The highest validity of an item is seen to be .48 (item 23). The lowest positive value of the index is found to be .03 (Item 129). On the negative side it has gone to as low as -.15 (Item 26).

The highest difficulty value of an item is found to be 87 (Item 116) and the lowest difficulty of the item 8.5(Item 25). The difficulty of the items selected, range between 8.5 and 87, While the validity indices range between -.15 to .48.

Selection of the Items for the Final Test

The test items included in the final test must have high validity index. Validity of items ranging from .17 to .48 have been included. The items having validity index .20 and above are considered to be valid but in the final draft, items having values less than .20 (ranging from .17 to .20) are also included to give pupils the benefit of practice needed to acquaint them with the technique of answering the items. They serve as shock absorbers. The test items having negative and low positive values like -.15, -.12, -.095 and .03 and .025 etc. have been omitted. The final draft of the test items with high validity index and graded difficulty was prepared and arranged in seriatem.

The order of the sub-tests has been re-arranged according to the difficulty levels. According to the general principles of

test construction the items in each sub-test should have to be arranged according to their difficulty values, the easiest being at the top and the hardest at the bottom. The difficulty level of each of the items in the sub-test is taken into account and the items arranged from easy to difficulty and more difficult.

The final test is thus an assembly of seven sub-tests containing 148 test items.

Selection of Items in the Final Test

Section	Items		Items	Time
	Of the Pilot Test	Rejected	Of the Final Test	required
Section I	29	2	27	20 Minutes
Section 2	25	-	25	20 "
Section 3	18	-	18	15 "
Section 4	19	-	19	15 "
Section 5	24	1	23	20 "
Section 6	24	2	22	20 "
Section 7	14	-	14	10 "
Total	153	5	148	120 Minutes

Table :1: Showing Internal Consistency data, Internal Consistency indices and Difficulty Values of the Items.

Item No.	U%	L%	D	r	Item No. New order
1	90	66	78	.34	4
2	92	72	82	.32	1
3	90	70	80	.30	2
4	28	12	20	.24	9
5	80	42	56	.29	7
6	88	70	79	.26	3
7	50	30	40	.21	8
8	80	42	61	.40	5
9	70	47	58.5	.24	6
10	26	12	19	.21	10
11	13	6	9.5	.17	27
12	30	15	22.5	.205	25
13	30	14	22	.22	26
14	53	20	36.5	.36	24
15	60	28	44	.33	17
16	46	26	36	.22	18
17	60	40	50	.21	15
18	73	30	51.5	.43	14
19	70	36	53	.35	13
20	90	64	77	.36	12
21	92	64	78	.40	11
22	58	40	49	.18	20

Table :1: Contd.

Item No.	U%	L%	D	r	Item No. New order
23	80	33	56.5	.48	19
24	62	28	45	.35	16
25	9	8	8.5	.025	Rejected
26	6	12	9.0	-.15	Rejected
27	60	34	47	.27	21
28	52	30	41	.23	22
29	50	26	38	.26	23
30	60	31	45.5	.30	37
31	32	12	22	.28	42
32	30	14	22	.22	43
33	32	10	21	.32	44
34	32	14	23	.25	39
35	62	32	47	.31	40
36	32	12	22	.28	41
37	30	16	23	.19	38
38	60	30	45	.31	45
39	62	28	45	.35	46
40	64	30	47	.35	47
41	66	30	48	.37	48
42	58	30	44	.29	49
43	52	32	42	.21	50
44	54	30	42	.25	51
45	60	24	42	.37	52

Table :1: Contd.

Item No.	U%	L%	D	r	Item No. New order
46	66	30	48	.37	34
47	94	76	85	.33	28
48	60	40	50	.21	33
49	90	74	82	.26	29
50	80	42	61	.29	30
51	80	37	58.5	.34	31
52	70	40	55	.31	32
53	62	32	47	.31	35
54	58	34	46	.25	36
55	90	68	79	.32	53
56	86	44	65	.47	54
57	46	22	34	.27	63
58	52	32	42	.21	59
59	50	31	40.5	.20	62
60	50	33	30	.18	60
61	30	12	21	.26	65
62	42	24	33	.20	64
63	86	44	65	.47	55
64	71	30	50.5	.41	56
65	52	31	41.5	.22	61
66	60	31	45.5	.30	58
67	66	32	49	.35	57
68	80	50	65	.33	67

Table :1ł Contd.

Item No.	U%	L%	D	r	Item No. New order
69	54	30	42	.25	68
70	50	22	36	.31	66
71	32	16	24	.21	69
72	34	14	19	.27	70
73	32	16	24	.21	86
74	94	74	84	.36	71
75	52	30	41	.23	84
76	82	42	62	.43	72
77	60	32	46	.29	74
78	52	32	42	.21	82
79	26	10	18	.26	89
80	58	32	45	.27	76
81	62	23	42.5	.36	79
82	60	25	42.5	.36	80
83	60	28	44	.33	77
84	30	12	21	.26	88
85	50	32	41	.19	85
86	32	13	22.5	.265	87
87	52	30	41	.23	83
88	52	32	42	.21	81
89	60	31	45.5	.30	75
90	62	24	43	.39	78
91	70	40	55	.31	73

Table :1: Contd.

Item No.	U%	L%	D	r	Item No. New order
92	56	32	44	.25	98
93	51	30	40.5	.22	107
94	52	31	41.5	.22	104
95	16	6	11	.23	112
96	34	17	24.5	.255	109
97	90	68	79	.32	91
98	54	34	44	.21	97
99	60	18	39	.33	108
100	50	33	41.5	.18	103
101	26	36	31.0	-.12	Rejected
102	30	18	24	.175	110
103	24	12	18	.19	111
104	50	32	41	.19	106
105	94	70	82	.40	90
106	55	32	43.5	.24	99
107	92	62	77	.42	92
108	60	30	45	.31	96
109	52	30	41	.23	105
110	72	40	56	.33	95
111	54	30	42	.23	102
112	92	60	76	.44	93
113	80	42	61	.40	94
114	52	32	42	.21	101

Table :1: Contd.

Item No.	U%	L%	D	r	Item No. New order
115	52	34	43	.19	100
116	94	80	87	.29	113
117	18	25	21.5	-.095	Rejected
118	62	39	50.5	.235	122
119	32	16	24	.21	130
120	70	40	55	.31	119
121	60	30	45	.31	124
122	78	40	59	.40	118
123	50	26	38	.26	129
124	90	62	76	.38	115
125	64	24	44	.41	125
126	68	34	51	.35	121
127	82	40	61	.45	117
128	32	14	23	.25	132
129	22	20	21	.03	Rejected
130	92	60	76	.44	114
131	52	30	41	.23	128
132	82	42	62	.43	116
133	62	30	46	.33	123
134	60	27	43.5	.34	126
136	28	10	19	.28	134
137	34	14	24	.27	131
138	28	12	20	.24	133

Table :1: Contd.

Item No.	U%	L%	D	r	Item No. New order
139	56	27	41.5	.305	127
140	30	16	23	.19	146
141	94	72	83	.38	135
142	54	30	42	.25	140
143	60	23	41.5	.385	142
144	90	62	76	.38	137
145	52	30	41	.23	141
146	28	12	20	.24	147
147	40	21	30.5	.225	144
148	52	25	38.5	.29	143
149	80	50	65	.33	138
150	28	10	10	.28	148
151	60	40	50	.21	139
152	32	16	24	.21	145
153	92	60	76	.44	136

Table :2: Distribution of Items according to 'D' Values

Difficulty Indices	f Frequency	Garrett's Distribution	W Summer's Distribution
		1.below 25 'D' -25%	1.0-40 - 20%
		2.between 26D and 75D - 50%	2. 41-60 - 60%
		3.above 75D - 25%	3. 61-100- 20%
1 - 5	0		
6 - 10	1	1 - 25	1 - 40
11 - 15	1	expected frequency =37	expected frequency =30
16 - 20	9	Obtained " =32	obtained " =43
21 - 25	20		
26 - 30	1		
31 - 35	3		
36 - 40	8		
41 - 45	43	26 - 75	41 - 60
46 - 50	17	expected frequency =74	expected frequency=88
51 - 55	9	obtained " =96	obtained " = 76
56 - 60	6		
61 - 65	10		
66 - 70	0		
71 - 75	0		61 - 100
76 - 80	13		expected frequencies=30
81 - 85	6	76 - 100	obtained " = 29
86 - 90	1	expected frequencies =37	
91 - 95	0	obtained " =20	
96 - 100	0		
	N = 148		

Table :3: Data grouped for the Calculation of Mean, Median and Standard deviation of the Pilot Test scores of 200 pupils

Class interval scores	Frequency	Cumulative frequency	Deviation d	fd	fd^2
60 - 64	1	200	+6	+6	36
55 - 59	3	199	+5	+15	75
50 - 54	4	196	+4	+16	64
45 - 49	15	192	+3	+45	135
40 - 44	34	177	+2	+68	136
35 - 39	37	143	+1	+37	37
				+187	
30 - 34	64	106	0	0	0
25 - 29	29	42	-1	-29	29
20 - 24	12	13	-2	-24	48
15 - 19	1	1	-3	-3	9
				-56	
	N=200			+131	569

Mean M = Assumed mean + correction factor

$$= 32 + \frac{i\Sigma fd}{N}$$

$$= 32 + \frac{5 \times 131}{200}$$

$$= 32 + 3.29$$

$$= 35.29$$

$$\text{Median} = l + \left(\frac{N/2 - F}{f_m}\right) i$$

$$= 29.5 + \left(\frac{100 - 42}{64}\right) 5$$

$$= 29.5 + \left(\frac{58}{64}\right) \times 5$$

$$= 29.5 + (.9062 \times 5)$$

$$= 34.031$$

$$\text{S.D.} = i \sqrt{\frac{\Sigma fd^2}{N} - \left(\frac{\Sigma fd}{N}\right)^2}$$

$$= 5 \times \sqrt{\frac{569}{200} - \left(\frac{131}{200}\right)^2}$$

$$= 5 \times \sqrt{2.416}$$

$$= 7.77$$

Similarly the parameters Mean, Median and Standard Deviation have been calculated for the grouped data of the criterion scores (Annual examination marks in Science of the previous class).

Table :4: Raw Test Scores and their Corresponding Standard Scores.

Sr. No.	Raw Test Scores 'x'	Standard Scores 'x'	Sr. No.	Raw Test Scores x	Standard Scores x'
1	19	28.8	22	40	56.1
2	20	30.1	23	41	57.4
3	21	31.4	24	42	58.7
4	22	32.7	25	43	60
5	23	34.0	26	44	62.3
6	24	35.3	27	45	62.6
7	25	36.6	28	46	63.9
8	26	37.9	29	47	65.2
9	27	39.2	30	48	66.5
10	28	40.5	31	49	67.8
11	29	41.8	32	50	69.1
12	30	43.1	33	51	70.41
13	31	44.4	34	52	71.7
14	32	45.7	35	53	73.0
15	33	47.0	36	54	74.3
16	34	48.3	37	55	75.6
17	35	49.6	38	56	76.9
18	36	50.9	39	57	78.2
19	37	52.2	40	58	79.5
20	38	53.5	41	59	80.8
21	39	54.8	42	60	82.1

In arriving at the above standard scores, the eq.(1) given on Page 79 is used where

$\sigma = 7.77 \quad \sigma' = 10$

$M = 35.29 \quad M' = 50$

Table :5: Data grouped for the Calculation of Mean, Median and Standard Deviation of the Criterion Scores. (Annual Examination Marks in Science)

Class Intervals	Frequency f	Cumulative frequency	Deviation d	fd	fd^2
75 - 79	2	200	+6	+12	72
70 - 74	2	198	+5	+10	50
65 - 69	3	196	+4	+12	48
60 - 64	5	193	+3	+15	45
55 - 59	12	188	+2	+24	48
50 - 54	28	176	+1	+28	28
				+101	
45 - 49	44	148	0	0	0
40 - 44	36	104	-1	-36	36
35 - 39	34	68	-2	-68	136
30 - 34	24	34	-3	-72	216
25 - 29	7	10	-4	-28	112
20 - 24	3	0	-5	-15	75
				-219	
	N=200			-118	866

Mean = 44.05 Median = 43.95 S.D. = 9.98

Table :6: Raw Criterion Scores and their Corresponding Standard Scores

Sr. No.	Raw Crite-rion Scores	Standard Scores	Sr. No.	Raw Crite-rion Scores	Standard Scores
1.	20	25.5	31	50	56.1
2.	21	26.5	32	51	57.1
3.	22	27.6	33	52	58.2
4.	23	28.6	34	53	59.2
5.	24	29.6	35	54	60.2
6.	25	30.6	36	55	61.2
7.	26	31.6	37	56	62.2
8.	27	32.7	38	57	63.3
9.	28	33.7	39	58	64.3
10.	29	34.7	40	59	65.3
11.	30	35.7	41	60	66.3
12.	31	36.7	42	61	67.3
13.	32	37.8	43	62	68.4
14	33	38.9	44	63	69.4
15	34	39.8	45	64	70.4
16	35	40.8	46	65	71.4
17	36	41.8	47	66	72.4
18	37	42.9	48	67	73.5
19	38	43.9	49	68	74.5
20	39	44.9	50	69	75.5
21	40	45.9	51	70	76.5
22	41	46.9	52	71	77.5
23	42	48.0	53	72	78.6
24	43	49.0	54	73	79.58
25	44	50.0	55	74	80.6
26	45	51.0	56	75	81.6
27	46	52.0	57	76	82.6
28	47	53.1	58	77	83.7
29	48	54.1	59	78	84.7
30	49	55.1	-	-	-

In arriving at the Standard Scores, the eq.(1) given on Page 75 is used where

$\sigma = 9.98 \quad \sigma' = 10 \; ; \quad M = 44.05 \quad M' = 50$

Table :7: Scatter Diagram between Criterion Scores and Test Scores

Standard Test Scores: Class Intervals	Standard Criterion Scores 35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	f_y
70-74									1		1
65-69						1	1		-		2
60-64					3	3		1		1	8
55-59					3	3	1		2		9
50-54				4	4	2	1				11
45-49			2	9	5	1	1				18
40-44		8	6	6	7	5					32
35-39	2	3	3	2	1						11
30-34	1	2	1								4
25-29	3	1									4
f_x	6	14	12	21	23	15	4	1	3	1	100

Product Moment r = 0.75 ; P.E r = $\pm$ 0.0295

Table :8: Showing Scatter-Diagram between the Teacher's Estimation and Standard Test Scores

Class Intervals	$\bar{C}$	C	$\dot{C}$	$\bar{B}$	B	$\dot{B}$	A	f_y
70-74							1	1
65-69						1	1	2
60-64					5	1	2	8
55-59			1		5	2	1	9
50-54				1	9	1		11
45-49			1	4	10	2		17
40-44			3	13	12	4		32
35-39			5	4	3			12
30-34			2	2				4
25-29			3	1				4
f_x			15	25	44	11	5	100

Product moment r = 0.62

P.E.r = $\pm$ 0.04155