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AGO-PBS Report 225

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Report # 225

6 Summary of Maxwell and Ellington Testing Means, Standard Deviations, and Intercorrelations.

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1. Description of Samples considered

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a. Maxwell

The Maxwell testees were divided, for the sake of testing convenience, into two groups, referred to as Group I and Group II. As far as is known, there are no significant differences, with one exception between Group I and Group II.

Test	N	Mean	t ¹ (Fisher)
G.C.T. 1-b			
Group I	97	115.39	1.01
Group II	96	117.44	
Test M (Mechanical Information)			
Group I	97	63.49	.359
Group II	96	62.80	
Physics (T.P.-4 Re)			
Group I	97	25.48	.601
Group II	96	24.47	
Mechanical Movements			
Group I	90	46.40	1.85
Group II	96	43.68	
Algebra + 20 (twenty was added to each score to eliminate negative scores)			
Group I	91	56.25	1.16
Group II	96	58.24	
Grammar + 20			
Group I	95	75.23	2.40
Group II	95	80.55	

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1. When there are 200 degrees of freedom, a "t" of 1.97 is required to be significant at the 5% level. If the true difference of the means is zero, the chances of obtaining a "t" of 1.97 are 5 in a 100.

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<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>t (Fisher)</u>
Geometry + 20			
Group I	90	34.86	
Group II	96	84.57	.354
Trigonometry + 20			
Group I	91	33.40	
Group II	96	31.61	1.64
U. S. History + 20			
Group I	91	76.88	
Group II	96	78.52	.569

B. Ellington

Two groups were tested at Ellington; a group of bombardiers and a group of navigators.

1. The mean scores of the bombardiers tested at Ellington do not appear to differ significantly, with two exceptions, from the mean scores of the navigators tested at Ellington.

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>(2) (Fisher)</u>
G.C.T. 1-b			
Navigators	100	123.43	
Bombardiers	105	124.41	.671
Test M			
Navigators	100	68.80	
Bombardiers	116	68.75	.029
Physics (T.P.-4-Re)			
Navigators	100	35.65	
Bombardiers	105	33.78	1.02

2. Where there are 300 degrees of freedom a "t" of 1.97 is required to be significant at the 5% level.

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>t (Fisher)</u>
Grammar + 20			
Navigators	100	83.50	
Bombardiers	116	82.69	.384
Trigonometry + 20			
Navigators	100	41.70	
Bombardiers	115	38.10	3.50
Geometry + 20			
Navigators	100	36.49	
Bombardiers	101	36.15	.415
U. S. History + 20			
Navigators	74	92.32	
Bombardiers	73	81.16	3.05
Mechanical Information*			
Navigators	100	38.02	
Bombardiers	103	37.46	.659
Surface Development*			
Navigators	100	30.84	
Bombardiers	103	30.01	.847
Mechanical Problems*			
Navigators	100	37.37	
Bombardiers	102	37.77	.702
Total M-A-2			
Navigators	100	105.96	
Bombardiers	103	105.1	.783

*These tests are sub-tests of M-A-2

C. Maxwell and Ellington

1. The groups tested at Maxwell (Bombardiers Groups I and II combined) appear to differ systematically from the groups tested at Ellington (Bombardiers and Navigators combined)

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>t (Fisher)</u>
G.C.T. 1-b			
Maxwell	193	116.41	
Ellington	216	123.97	6.25
Test M			
Maxwell	193	63.34	
Ellington	216	68.77	4.45
Physics (T.P.-4-Re)			
Maxwell	193	24.98	
Ellington	205	34.69	7.83
Grammar + 20			
Maxwell	190	77.89	
Ellington	216	83.06	3.38
Geometry + 20			
Maxwell	186	34.71	
Ellington	201	36.32	2.78
Trigonometry + 20			
Maxwell	187	32.48	
Ellington	215	39.78	9.73
U. S. History + 20			
Maxwell	187	77.72	
Ellington	147	86.78	3.89

2. The Bombardiers tested at Ellington appear to differ systematically from those tested at Maxwell (Groups I and II combined).

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>t (Fisher)</u>
G.C.T. 1-b			
Ellington	105	124.41	
Maxwell	193	116.41	5.03
Test M			
Ellington	116	68.75	
Maxwell	193	63.34	3.73
Physics (T.P.-4-Re)			
Ellington	105	33.78	
Maxwell	193	24.98	6.11
Grammar + 20			
Ellington	116	82.69	
Maxwell	190	77.89	2.61
Geometry + 20			
Ellington	101	36.15	
Maxwell	186	34.71	2.09
Trigonometry + 20			
Ellington	115	38.10	
Maxwell	187	32.48	6.24
U. S. History + 20			
Ellington	73	81.16	
Maxwell	187	77.72	1.16

II Means and Standard Deviations

With the limitations suggested in the previous section in mind it was deemed advisable to compute the means and standard deviations for each group separately, and then to recompute the means and standard deviations for the groups combined.

A. Maxwell

1. Group I

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>
a. G.C.T. 1-b	97	115.39	13.96
b. Test M	97	63.49	13.09
c. Physics (T.P.-4-Re)	97	25.48	11.41
d. Mechanical Movement	90	46.40	8.68
e. Algebra ³ + 20	91	56.25	10.60
f. Grammar + 20	95	75.23	14.97
g. Geometry + 20	90	34.86	5.66
h. Trigonometry + 20	91	33.40	6.71
i. U. S. History + 20	91	76.88	19.56

II. Group II.

a. G.C.T. 1-b	96	117.44	13.82
b. Test M	96	62.80	13.27
c. Physics (T.P.-4-Re)	96	24.47	11.60
d. Mechanical Move. + 20-102		43.30	11.91
e. Algebra + 20	102	57.73	12.55

3. Twenty was added to each of the Educational Achievement Test scores to eliminate negative scores. The corresponding correct mean is the reported mean minus 20. The standard deviation is not altered by the addition of a constant to each raw score.

II. Group II (Cont'd)	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>
f. Grammar + 20	96	80.75	15.41
g. Geometry + 20	102	34.53	5.45
h. Trigonometry + 20	102	31.56	7.83
i. U.S. History + 20	102	78.97	19.70

III. Groups I and II combined

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>
a. G.C.T. 1-b	193	116.41	13.93
b. Test M	193	63.15	13.17
c. Physics (T.P.-4-Re)	190	25.07	11.58
d. Mechanical Move. + 20	192	44.76	10.60
e. Algebra + 20	193	57.03	11.71
f. Grammar + 20	185	77.96	15.08
g. Geometry + 20	192	31.68	5.58
h. Trigonometry	193	32.42	7.41
i. U. S. History	193	77.98	19.68

B. Ellington

1. Bombardier

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>
a. G.C.T. 1-b	116	124.43	10.79
b. Test M	129	67.60	12.56
c. Physics (T.P.-4-Re)	116	31.84	13.53
d. Grammar + 20	128	81.65	17.32
e. Geometry + 20	113	35.91	5.74
f. Trigonometry + 20	129	36.88	8.32
g. U. S. History + 20	88	80.06	24.14

1. Bombardier (Cont'd)

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>
h. Mechanical Information*	106	37.27	6.40
i. Surface Development*	106	29.71	7.01
j. Mechanical Problems*	106	37.66	4.07
k. Total M-A-2	106	104.62	14.57

2. Navigators

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>Std.Dev.</u>
a. G.C.T. 1-b	100	123.43	10.00
b. Test M	100	68.80	12.64
c. Physics (T.P.-4-Re)	100	35.65	13.65
d. Grammar - 20	100	83.50	14.80
e. Geometry - 20	100	36.49	6.12
f. Trigonometry - 20	100	41.70	7.22
g. U. S. History - 20	74	92.32	18.45
h. Mechanical Information*	100	38.02	5.97
i. Surface Development*	100	30.84	6.99
j. Mechanical Problems*	100	37.37	4.01
k. Total M-A-2	100	105.96	14.63

3. Bombardiers * Navigators Combined

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>Std.Dev.</u>
a. G.C.T. 1-b	203	123.88	10.48

*These tests are sub-tests of M-A-2

3. Bombardiers & Navigators Combined (Cont'd)

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>StdDev.</u>
b. Test M	205	68.54	12.49
c. Physics (T.P.-4-Re)	203	34.87	12.94
d. Grammar / 20	202	83.50	14.97
e. Trigonometry / 20	205	40.39	7.23
f. Geometry / 20	201	36.32	5.75
g. U. S. History / 20	138	90.79	17.80
h. Mechanical Information*	206	37.64	6.17
i. Surface Development*	206	30.26	7.01
j. Mechanical Problems*	206	37.52	4.04
k. Total M-A-2	206	105.27	14.62

C. All Bombardiers Combined (Maxwell I and II and Ellington Bombardiers)

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>Std.Dev.</u>
G.C.T. 1-b	309	119.42	13.42
Test M	318	65.08	13.06
Physics (T.P.-4-Re)	306	27.64	12.78
Grammar / 20	311	79.53	16.15
Geometry / 20	305	35.14	5.64
Trigonometry / 20	305	34.41	8.06
U.S. History / 20	280	78.61	21.24

*These tests are sub-tests of M-A-2

D. All Groups Combined (Maxwell I and II and Ellington Bombardiers and Navigators)

<u>Test</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>
G.C.T. 1-b	409	120.40	12.79
Test M	418	65.97	13.06
Physics (T.P.-4-Re)	406	29.61	13.46
Grammar / 20	411	80.49	15.95
Geometry / 20	338	35.58	5.85
Trigonometry / 20	405	36.21	8.47
U. S. History / 20	334	81.71	21.42
Mechanical Information*	206	37.64	6.17
Surface Development*	206	30.26	7.01
Mechanical Problems*	206	37.52	4.04
Total M-A-2	206	105.27	14.62

III Intercorrelations

A. Maxwell

1. Group I - refer to Table #1
2. Group II - refer to Table #2
3. Group I and II combined - refer to Table #3

B. Ellington

1. Bombardiers - refer to Table #4
2. Navigators - refer to Table #5
3. Bombardiers and Navigators combined - refer to Table #6

- C. All Bombardiers combined (Maxwell, Groups I and II; and Ellington Bombardiers and Navigators) - refer to Table #7

*These tests are sub-tests of M-A-2

D. All groups combined (Maxwell, Groups I and II; and Ellington Bombardiers and Navigators) - Refer to Table #8.

(The M-A-2 scores are not available on the Maxwell groups. Hence the intercorrelations between the M-A-2 sub-tests and total reported in Table #8 refer to Ellington Bombardiers and Navigators only).