Appendix No. 3.

Statastial Processing.

Mean $\frac{\Sigma x}{N}$

Standard Deviation.

$$St = \sqrt{\frac{1}{n}\Sigma x^2 - \bar{x}^2}$$

$$St = \frac{1}{109}\ 316411 - 48.34^2$$

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t Test.

$$t = \frac{\bar{x} - \bar{y}}{\sqrt{\frac{Stx^2_1}{n_2} + \frac{Sty^2_1}{n_1}}} \qquad Stx^2 = \frac{1}{n}\Sigma x^2 - \bar{X}^2$$

$$t = \frac{48.34 - 29.38}{\sqrt{\frac{566.09}{60} + \frac{310.74}{109}}}$$

Critical Ratio:

$$CR = \frac{MD - MD}{\sigma_{MD}}$$

$$\sigma_{MD} = \sqrt{\sigma_M^2 + \sigma_m^2}$$

$$\sigma_M^2 = \frac{S_x^2}{n}$$

$$CR = \frac{48.34 - 29.38}{\sqrt{\frac{868.09}{100} + \frac{310.71}{60}}}$$

X^2 : Chisquare.

	a	b	a+b		83	35	118
	c	d	c+d		26	25	51
	a+c	b+d	Total.		109	60	169

$$X^2 = \frac{(ad - bc)^2 \; N}{(a+c)(b+d)(a+b)(c+d)} = \frac{(83 \times 25 - 35 \times 26)^2 \; 169}{109 \times 60 \times 118 \times 51}$$

$$= 5.82$$

X^2 : Chisquare:-

	a / a^1	b / b^1	c / c^1	$a+b+c=N_1$
	d / d^1	e / e^1	f / f^1	$d+e+f=N_2$
	a+d	b+e	c+f	N

7 / 8.44	31 / 28.97	13 / 13.57	51
21 / 19.55	65 / 67.02	32 / 31.42	118
28	96	45	169

$$X^2 = \frac{a^2}{a^1} + \frac{b^2}{b^1} \quad \frac{f^2}{f^1} - N$$

$$= \frac{49}{8.44} + \frac{961}{28.97} + \frac{169}{13.57} + \frac{441}{19.55} + \frac{4225}{67.02} + \frac{1024}{31.42} - 169$$

$$= .6.$$

Point biserial Correlation

$$r = \frac{\bar{x}_p - \bar{x}_q}{St} \sqrt{p_q} .$$

$$St = \frac{1}{n} \; Ex^2 - \bar{x}^2$$

$$r = \frac{4.56 - 3.75}{\sqrt{2.35}} \sqrt{0.645 \times 0.355}$$

: Correlation Coefficient :

$$r = \frac{\Sigma xy - N \bar{x} \bar{y}}{\sqrt{(\Sigma x^2 - N\bar{x}^2)\ (\Sigma y^2 - N\bar{y}^2)}}$$

$$= \frac{280588 - 109 \times 43.5 \times 48.34}{\sqrt{(208777 - 109 \times 1892.25)\ (316411 - 109 \times 2336.76)}}$$

Analysis of variance:

	UM	M	LM	
Male	x_{11} / x_{11}			M
Female			x_{12} / x_{2n_6}	F
Total	U	M	1	

$$G = M + F = U + M + 1.$$

T. Total S.S. Sum of squares. - C.F.

$$C.F. = \frac{G^2}{N}$$

S.S. due to S.L.S. (B)

$$= \frac{U^2}{N_1} + \frac{m^2}{N_2} + \frac{1^2}{N_3} - C.F.$$

S.S. due to sex (A)

$$= \frac{m^2}{N_1} + \frac{f^2}{N_2}$$

Table T_1

	U M	M	L M	
Male	x_{11}	x_{12}	x_{13}	M
Female	x_{21}	x_{22}	x_{23}	F
Total	U	M	1	G

Total S.S. for table T_1

$$= \frac{x_{11}^2}{n_1} + \frac{x_{12}^2}{n_2} + \frac{X\ 23}{n_6} - C.F.$$

Interaction between Sex and C.E.S.

T_1 - S.S. due to S.E.S. -S.S due to Sex (c)

Analysis of variance Table.

Source	d.f	S.S.	M.SS.	F
1. due to Sex	1	A	A/1	A/E/N
2. due to S.E.S.	2	B	B/2	$B/2_{/E/N}$
3. Interaction C.X.S.E.S.	2	C	$C_{/2}$	$C_{/2/E/N}$
4. Error Residual		T-A-B-C E	$E_{/N}$	~~T/2T E/N~~
5. Total.				

	U M	M	L M	
Male	936 / 21	2436 / 57	1969 / 31	4741
Female	302 / 7	1621 / 39	616 / 14	2539
	1238	4057	1985	7280

$$C.F. = \frac{7280^2}{169} = 313600.00$$

T Sum of squares of 169 scores - C.F.

$$= 317736 - 313600 = 4136$$

S.S. due to S.E.S. (B)

$$= \frac{1238^2}{28} + \frac{4057^2}{96} + \frac{1985}{45} - C.F.$$

$$= 313748.36 - 313600 = 148.36$$

S.S. due to Sex (A)

$$= \frac{4741}{109} + \frac{2539}{60} - C.F.$$

$$= 313613.77 - 313600 = 13.77$$

$$T_1 = \frac{936^2}{21} + \frac{2436^2}{57} + \frac{1969^2}{31} + \frac{302^2}{7} + \frac{1621^2}{39} + \frac{616^2}{14} - C.F.$$

$$= 313791.17 - 313600 = 191.17$$

Interaction due to sex and S.E.S.

$$= 191.17 - 13.77 - 148.34$$

$$= 29.06$$

Analysis of variance Table:

Source	df.	S.S.	M.SS.	F
Sex	1	13.77	13.77	$\frac{13.77}{24.05} = 0.572$
S.E.S.	2	148.34	74.17	$\frac{74.17}{24.05} = 3.083$
Interaction	2	29.06	14.53	$\frac{14.53}{24.05} = 0.604$
Error Residual	164	3944.33	24.05	—
Total.	169	—	—	—