PART FIFTY-NINE

	++	+	−	=	?
59. A. How true do you think the following are?					
1. She/he gets me into a false position.					
2. I get her/him into a false position.					
3. She/he gets her/himself into a false position.					
4. I get myself into a false position.					
B. How would SHE/HE answer the following?					
1. "I get him/her into a false position."					
2. "He/she gets me into a false position."					
3. "I get myself into a false position."					
4. "He/she gets her/himself into a false position."					
C. How would SHE/HE think you have answered the following?					
1. She/he gets me into a false position.					
2. I get her/him into a false position.					
3. She/he gets her/himself into a false position.					
4. I get myself into a false position.					

PART SIXTY

60. A. How true do you think the following are?					
1. She/he is kind to me.					
2. I am kind to her/him.					
3. She is kind to herself/himself.					
4. I am kind to myself.					
B. How would SHE/HE answer the following?					
1. "I am kind to him/her."					
2. "He/she is kind to me."					
3. "I am kind to myself."					
4. "He/she is kind to herself/himself."					
C. How would SHE/HE think you have answered the following?					
1. She/he is kind to me.					
2. I am kind to her/him.					
3. She/he is kind to herself/himself.					
4. I am kind to myself.					

I.P.M. : SCORING SHEET

CODE: _____

IPM CHART: H X Ø

		H					(HW)				W				H					(WH)				W			
		P	RM	UD	A		HØ	HØ	H	Ø	A	DU	M	RF	P	R	M	UD	A	H	ØH	Ø	HØ	AD	U	M	RF
A.	1 Understands																									
	4 (Depends on)																									
	6 Takes seriously																									
	12 Respects																									
	15 Loves																									
	19 (Takes responsibility for)																									
	21 Lets be self																									
	28 Is honest with																									
	36 Can face conflicts																									
	40 Thinks a lot of																									
	45 Readily forgives																									
	53 Believes in																									
A-	11 Is afraid of																									
	35 Worries about																									
	44 Has a warped view of																									
B	4 Depends on																									
	9 Takes good care of																									
	19 Takes responsibility for																									
	34 Is good to																									
	37 Is at one with																									
	43 Likes																									
	60 Is kind to																									
B-	14 Is mean with																									
	22 Couldn't care less about																									
	30 Analyzes																									
	50 Is detached from																									
C1	18 Torments																									
	20 Finds fault with																									
	27 Mocks																									
	39 Blames																									
	49 Belittles																									
	51 Makes a clown of																									
	54 Humiliates																									
C2	"																									

CODE: ______________

IPM CHART: H X W

		H				(HM)				W				H					(WW)					W				
		P	RM	UD	A	H	W	HW	HW	A	DU	M	RF	P	R	M	UD	A	H	W	HW	H	W	AD	J	M	R	F
[illegible]	Understands																											
4	(Depends on)																											
[illegible]	Takes seriously																											
[illegible]	Respects																											
[illegible]	Loves																											
[illegible]	(Takes responsibility for)																											
21	Lets be self																											
[illegible]	Is honest with																											
[illegible]	Can face conflicts																											
40	Thinks a lot of																											
[illegible]	Readily forgives																											
52	Believes in																											
[illegible]	Is afraid of																											
[illegible]	Worries about																											
44	Has a warped view of																											
4	Depends on																											
[illegible]	Takes good care of																											
[illegible]	Takes responsibility for																											
[illegible]	Is good to																											
[illegible]	Is at one with																											
43	Likes																											
[illegible]	Is kind to																											
[illegible]	Is mean with																											
22	Couldn't care less about																											
[illegible]	Analyzes																											
[illegible]	Is detached from																											
[illegible]	Torments																											
[illegible]	Finds fault with																											
[illegible]	Mocks																											
[illegible]	Blames																											
49	Belittles																											
[illegible]	Makes a clown of																											
[illegible]	Humiliates																											

		H F RM U DA	(HW)	W AD UM R F	H F RM U DA	(WH)	W A D UM RF
C2	7 Is disappointed in						
	23 Pities						
	24 Doubts						
	32 Lets down						
	33 Expects too much of						
	42 Has lost hope for future						
	55 Is sorry for						
C-	46 Puts on pedestal						
D	5 Can't come to terms with						
	8 Can't stand						
	10 Would like to get away from						
	16 Tries to outdo						
	17 Fights with						
	26 Gets on nerves						
	29 Hates						
	47 Is bitter towards						
E	25 Makes contr.demands on						
	41 Deceives						
	48 Creates difficulties for						
	52 Bewilders						
	59 Gets into a false position						
F	2 Makes up mind for						
	3 Is wrapped up in						
	13 Makes centre of world						
	31 Treats like a machine						
	38 Won't let be						
	56 Makes into a puppet						
	57 Spoils						
	58 Owes everything to						

		H F	RM	U	DA	(HW)	W AD	UM	R	F	H F	RM	U	DA	(WH)	W A	D	UM	RF
C2	7 Is disappointed in																		
	23 Pities																		
	24 Doubts																		
	32 Lets down																		
	33 Expects too much of																		
	42 Has lost hope for future																		
	55 Is sorry for																		
C-	46 Puts on pedestal																		
D	5 Can't come to terms with																		
	8 Can't stand																		
	10 Would like to get away from																		
	16 Tries to outdo																		
	17 Fights with																		
	26 Gets on nerves																		
	29 Hates																		
	47 Is bitter towards																		
E	25 Makes contr.demands on																		
	41 Deceives																		
	48 Creates difficulties for																		
	52 Bewilders																		
	59 Gets into a false position																		
F	2 Makes up mind for																		
	3 Is wrapped up in																		
	13 Makes centre of world																		
	31 Treats like a machine																		
	38 Won't let be																		
	56 Makes into a puppet																		
	57 Spoils																		
	58 Owes everything to																		

242 CODE:_____

		H					(HH)				W				H					(WW)			W			
		F	RE	J	DA		H	ØH	Ø	HØ		AD	UM	R	F	RE	J	DA		H	ØH	Ø	HØ		A	D	UM
32	7 Is disappointed in																									
	21 Pities																									
	24 Doubts																									
	32 Lets down																									
	33 Expects too much of																									
	42 Has lost hope for future																									
	55 Is sorry for																									
2	16 Puts on pedestal																									
	5 Can't come to terms with																									
	9 Can't stand																									
	10 Would like to get away from																									
	16 Tries to outdo																									
	17 Fights with																									
	26 Gets on nerves																									
	29 Hates																									
	47 Is bitter towards																									
5	25 Makes contr.demands on																									
	41 Deceives																									
	45 Creates difficulties for																									
	52 Bewilders																									
	58 Gets into a false position																									
7	2 Makes up mind for																									
	3 Is wrapped up in																									
	13 Makes centre of world																									
	31 Treats like a machine																									
	35 Won't let be																									
	56 Makes into a puppet																									
	57 Spoils																									
	59 Owes everything to																									

I.P.M.: SUMMARY OF SCORES FOR EACH QUADRIPARTITE GROUP

243 CODE:	HØ		ØH		HH		ØØ		HW		WH		HH		WW		W+		+W		WW		++	
	H	Ø	H	Ø	H	Ø	H	Ø	H	W	H	W	H	W	H	W	W	+	W	+	W	+	W	+
AGREEMENT																								
DISAGREEMENT																								
UNDERSTANDING																								
MISUNDERSTANDING																								
A + U																								
A + M																								
D + U																								
D + M																								
REALIZES																								
FAILS TO REALIZE																								
R + U (of partner) Feels understood correctly																								
R + M (of partner) Feels misunderstood correctly																								
F + U (of partner) Feels misunderstood incorrectly																								
F + M (of partner) Feels understood incorrectly																								

TWENTY-FIVE ITEM FORM OF THE AWS

Source: SPENCE, J.T.; HELMREICH, R. and STAPP, J.A. 'A Short version of the Attitude Toward Women Scale (AWS)' Bulletin of Psychonomic Society. 32, 1975, 113-115.

Mr / Mrs .....

The statements listed below describe attitudes toward the role of women in society that different people have. There are no right or wrong answers, only opinions. You are asked to express your feeling about each statement by indicating whether you (A) agree strongly, (B) agree mildly, (C) disagree mildly, or (D) disagree strongly. Please indicate your opinion by blackening either A, B, C, or D on the answer sheet for each item.

I. Swearing and obscenity are more repulsive in the speech of a woman than of a man.	A	B	C	D
2. Women should take increasing responsibility for leadership in solving the intellectual and social problems of the day.	A	B	C	D
3. Both husband and wife should be allowed the same grounds for divorce.	A	B	C	D
4. Telling dirty jokes should be mostly a masculine prerogative.	A	B	C	D
5. Intoxication among women is worse than intoxication among men.	A	B	C	D
6. Under modern economic conditions with women being active outside the home, men should share in household tasks such as washing dishes and doing the laundry.	A	B	C	D
7. It is insulting to women to have the "obey" clause remain in the marriage service.	A	B	C	D
8. There should be a strict merit system in job appointment and promotion without regard for sex.	A	B	C	D
9. A woman should be as free as a man to propose marriage.	A	B	C	D
IO. Women should worry less about their rights and more about becoming good wives and mothers.	A	B	C	D
II. Women earning as much as their dates should bear equally the expense when they go out together.	A	B	C	D
I2. Women should assume their rightful place in business and all the professions along with men.	A	B	C	D
I3. A woman should not expect to go to exactly the same places or have quite the same freedom of action as a man.	A	B	C	D

P.T.O.

Twenty-five item form of the AWS continued.....

A-agree strongly, B-agree mildly, C-disagree mildly, D-disagree strongly

I4. Sons in a family should be given more encouragement to go to university than daughters.	A	B	C	D
I5. It is ridiculous for a woman to run a locomotive and for a man to darn socks.	A	B	C	D
I6. In general, the father should have greater authority than the mother in the bringing up of children.	A	B	C	D
I7. Women should be encouraged not to become sexually intimate with anyone before marriage, even their fiances.	A	B	C	D
I8. The husband should not be favoured by law over the wife in the disposal of family property or income.	A	B	C	D
I9. Women should be concerned with their duties of child-bearing and house tending, rather than with desires for professional and business careers.	A	B	C	D
20. The intellectual leadership of a community should be largely in the hands of men.	A	B	C	D
2I. Economic and social freedom is worth far more to women than acceptance of the ideal of femininity which has been set up by men.	A	B	C	D
22. On the average, women should be regarded as less capable of contributing to economic production than are men.	A	B	C	D
23. There are many jobs in which men should be given preference over women in being hired or promoted.	A	B	C	D
24. Women should be given equal opportunity with men for apprenticeship in the various trades.	A	B	C	D
25. The modern girl is entitled to the same freedom from regulation and control that is given to the modern boy.	A	B	C	D

IMPORTANT: PLEASE DO NOT DISCUSS OR SHOW THIS FORM TO ANYONE BEFORE OR AFTER COMPLETION.

director in terms of perceived overall managerial activity. There was, however, no clear positioning of production managers at the E-level. Production managers emerged relatively low in comparison with other managers on empathy. Financial managers at the E-level, contrary to the hypothesis, did not emerge low on empathy.

Hypothesis 8 Finance and marketing will be perceived to be relatively higher on the potency dimension than production.

This research hypothesis may be accepted in terms of the results depicted in Table 7.6 and Figure 7.2.

8.2 Verification of fundamental postulate and certain corollaries

- Fundamental postulate

Kelly's fundamental postulate (Chapter 3, p.84) is substantially supported by the results of this thesis. A person's perceptual processes do not operate in a random manner but rather within a system of flexible but restrictive pathways that constitute a network.

Kelly (1955) used the term "to construe" to mean to interpret, to understand, to deduce or to explain. According to Kelly, personal constructs are an individual's conclusions or interpretations about life. Kelly developed the view that life is not so much a matter of objective events as it is of what one makes of those events. For Kelly, the person is only constituted in relation to others and constructs are available through interaction with others and obtain meaning in the context of that interaction.

According to Kelly, the formation of an impression of an individual's personality is not simply a matter of characterizing his or her behaviour on the basis of one's own personal constructs. It also involves making inferences about

Method and Procedure (Chapter 5)

1. Pearson product-moment correlation coefficients (rho).

The computational formula for the Pearson product-moment correlation is:

$$r_{XY} = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}}$$

Where X = Self-Disclosure score
Y = Perceptual Understanding score
Σ = The sum of X or X^2 or Y or Y^2
N = Number of pairs of measures

The calculation of probability values for the Pearson correlations is obtained by computing the t-statistic

$$tr = \frac{r\sqrt{N-2}}{\sqrt{1 - r^2}} \quad \text{with } df = N-2$$

where r = the appropriate Pearson correlation coefficient
N = the number of pairs of measures

A significant relationship exists if the calculated, or observed value (i.e., tr), equals or exceeds the tabled $t_{0,95}$ value with N-2 degrees of freedom .

2. Analysis of Variance Procedures: F-statistic.

In this study, the variability in Self-Disclosure (S-D) and Perceptual Understanding (P.U.) are analysed separately.

The purpose of the factorial analysis of variance procedures is to test whether the factors, kind of marriage (i.e., 'high' or 'low-caring') and dyad (i.e. Husband-husband's friend, husband-wife, and wife-wife's

friend), contribute to the variability of S-D and P.U. The effects of these factors on each of S-D and P.U. are considered simultaneously in the two-way analysis of variance procedures. (Stage Two and Five). The interaction between the effects (Kind*Dyad) is also computed since it is hypothesized that the effect of kind of marriage is not the same for the various levels of dyad (i.e., the different effects between 'high-' and 'low-caring' groups are different for the different levels of dyadic class).

In Stage Two and Five (Two-way Analysis of Variance) the factor whose scores are tabulated in columns (dyadic class) is referred to as the column factor, and the factor whose scores are tabulated in rows (kind of marriage)is referred to as the row factor. The levels of the column factor are referred to as J levels and those of the row factor are referred to as K levels. The scores have a subscript consisting of three digits:

X_{ijk}

where j = the jth level of the column factor
k = the kth level of the row factor
i = the ith person subjected simultaneously to the jth level of the column factor and the kth level of the row factor.

The source of the variance in "intimacy" (i.e., either Self-Disclosure or Perceptual Understanding) can be seen to occur between columns, between rows, due to the interaction of the J K levels and due to error (i.e., the fluctuation of measures due to chance). To analyze the contributions that the factors make toward the total variability of the individual participant's scores it is necessary to "partition" the total sum of squares (SST), that is, the sum of each subjects' squared deviation score from the sample mean, into the sum of squares between rows (SSR), for interaction (SSI), and the sum of squares for error (SSE). Thus

$$SST = SSC + SSR + SSI + SSE.$$

TABLE 5a

Two-Way Analysis of Variance: Source of Sum of Squares and Computational Procedure

Source of Sum of Squares	Notation	Computational Procedure
Between columns	SSC	$\sum_{j=1}^{c} \frac{T_{\cdot j}^2}{n_j} - \frac{T^2}{N}$
Between rows	SSR	$\sum_{i=1}^{r} \frac{T_{i\cdot}^2}{n_i} - \frac{T^2}{N}$
For Error	SSE	$\sum_{i=1}^{r}\sum_{j=1}^{c} \frac{T_{ij}^2}{n_{ij}} - \frac{T^2}{N}$
Total Sum of Squares	SST	$\sum_{i=1}^{r}\sum_{j=1}^{c}\sum_{k=1}^{n_{ij}} X_{ijk}^2 - \frac{T^2}{N}$
For Interaction	SSI	SSE − (SSC + SSR)

where $\frac{T^2}{N}$ _____ requires that each score in the entire collection be squared and divided by the total number of scores

$\sum_{j=1}^{c} \frac{T_{\cdot j}^2}{n_j}$ _____ requires that all scores for each column be summed, that each sum be squared, that each of the squares be divided by the number of subjects in the respective column and that one need to sum for all columns

$\sum_{i=1}^{r} \frac{T_{i\cdot}^2}{n_i}$ _____ requires that all scores for each row be summed, that each sum be squared, that each of the squares be divided by the number of subjects in the respective row, and that one need to sum for all rows

$\sum_{i=1}^{r}\sum_{j=1}^{c} \frac{T_{ij}^2}{n_{ij}}$ _____ requires that the scores for each JK cell be summed, that these sums be squared, that each of the squares be divided by the number of subjects in the respective cell and one sum for all cells

$\sum_{i=1}^{r}\sum_{j=1}^{c}\sum_{k=1}^{n_{ij}} X_{ijk}^2$ ___ requires that each score in the entire collection be squared and that the squares be summed

TABLE 5b

Two-Way Analysis of Variance: Sum of Squares and Degrees of Freedom

Sum of Squares	df
SSC	J-1
SSR	K-1
SSI	(J-1) (K-1)
SSE	N-JK
SST	N-1

where N = number of subjects in entire collection
J = the number of columns
K = the number of rows

TABLE 5c

Two-Way Analysis of Variance: Mean Squares and Computational Procedures

Source	Notation	Computational Procedure
Between Columns	MSC	$\frac{SSC}{J-1}$
Between Rows	MSR	$\frac{SSC}{K-1}$
for Interaction	MSI	$\frac{SSI}{(J-1)(K-1)}$
for Error	MSE	$\frac{SSE}{N-JK}$
Total Mean Square	MST	$\frac{SST}{N-1}$

As can be seen from TABLE 5c, a mean square is simply a sum of squares divided by the appropriate degrees of freedom.

Ratios of the mean squares, called F ratios, are used to test for the significance of column effects (FC), row effects (FR) and interaction effects (FI).

TABLE 5d

Source of F ratio	Notation	Computational Procedure
F-ratio for column effect	FC	$\frac{MSC}{MSE}$
F-ratio for row effects	FR	$\frac{MSR}{MSE}$
F-ratio for interaction effect	FI	$\frac{MSI}{MSE}$

When the calculated F-ratios exceed the critical F0,95 values with the appropriate degrees of freedom, a significant effect is said to exist. The significance of the interaction effect is tested first, should FI be significant, the effects of the row variable are not the same for each column and vice-versa. If the interaction is nonsignificant, the row and column variables may be considered independently.

In this study, no significant interactive effects between kind of marriage and dyad were found. The significance test for the column effects and that for the row effects were interpreted independently from each other and each of these results were treated simultaneously in a one-factor analysis of variance procedure, followed by the Duncan Multiple Range Test.

3. One-way Analysis of Variance Procedure.

The overall null hypothesis (i.e., HO: each of all possible comparisons is separately equal to zero) was tested by means of the overall F-test

procedure. The experimentwise error rate can be held to the alpha level by performing the overall ANOVA F-test at the alpha level and making further comparisons only if the F test is significant. Since such significance was established the Duncan's Multiple Range Test was used to pinpoint the significant comparisons.

The scores obtained for the dependent variable (S-D and P.U. were analyzed separately) were recorded in a table with J number of groups (e.g., H⟶HF high-caring, H⟶HF low-caring, H⟶W high-caring, H⟶W low-caring, etc.). Thus the number of groups or columns represents the levels of caring (2) multiplied by the levels of the dyadic class (4 or 6).

The various variance estimators are summarized in TABLE 5e below.

TABLE 5e

One-way Analysis of Variance: Variance estimators.

Source	Notation	df	Computational Procedure
Total Sum of Squares	SST	N-1	$\sum\sum X_{ij}^2 - \frac{T^2}{N}$
Sum of Squares between Groups	SSG	J-1	$\sum \frac{H^2}{n_j} - \frac{T^2}{N}$
Sum of Squares within Groups or Sum of Squares for error	SSE	N-J	$\sum\sum X_{ij}^2 - \sum \frac{T_j^2}{n_j}$
Mean Square Total	MST		$\frac{SST}{N-1}$
Mean Square between Groups	MSG		$\frac{SSG}{J-1}$
Mean Square for Error	MSE		$\frac{SSE}{N-J}$
F-statistic		J-1 and N-J	$\frac{MSG}{MSE}$

where J = The number of columns or groups

N = The total number of subjects in all of the J groups

nj = the no. of people in each group

$\frac{T^2}{N}$ = The square of the grand total divided by the total no. of subjects in all the J groups

Tj^2 = The sum of the squares of each J total

When the ratio $\frac{MSG}{MSE}$ exceeds F(0,95) with J-1 and N-J df the null hypothesis is rejected and this indicates that at least the difference between the largest and the smallest means is significant. To test whether one or more of the several other comparisons may be significant the Duncan's Multiple Range Test (alpha = 0,05) is used. (See Section 5).

4. Analysis of Covariance: Stage Three and Four.

In Stages Three and Four, the AWS scores of the men in each of the quadripartite groups (AWS1) and the AWS scores of the women in each quadripartite groups (AWS2) are entered into in analysis of covariance.

Analysis of covariance is a form of analysis of variance that tests the significance of the differences between means of final experimental data by taking into account the correlation between the dependent variable (S-D or P.U.) and one or more covariates (AWS1 and AWS2), and by adjusting initial differences in the experimental groups. Just as the analysis of variance works with sum of squares and variances, the analysis of covariance works with the sums of cross products and covariances (i.e., the variance of cross products) as well as the sums of squares.

The net outcome of the procedure is an analysis of covariance table that tests the significance of the differences of the Y means (the S-D or P.U. means) of the experimental groups (i.e., 'low-' and 'high-caring') after adjustment of the Y sums of squares. This adjustment

in effect removes from the Y sums of squares that part due to the relation between X (i.e., AWS1 or AWS2) and Y. The higher the correlation between X and Y, the more effective the analysis of covariance. What emerges for a final analysis of covariance table are the adjusted total, between-groups (SSG) and within-groups (SSE) sums of squares. Variances (mean squares) and the F ratio are calculated from these adjusted measures. The analysis of covariance F test, which uses Y sums of squares and mean squares, is thus "purged" of the influence of X (Kerlinger, 1973. p. 372).

5. Duncan's Multiple Range Test (DMRT).

The Duncan's Multiple Range Test controls the comparisonwise error rate at the 0,05 alpha level and is used in this study to pinpoint the significant main effects. Multiple comparison measures, such as the Duncan's Test, give more details about the differences among the means and allows for the control of error rates for a multitude of comparisons. Usually, when many comparisons are made using some alpha level to judge significance, the likelihood of making a Type I error increases, since there are more chances to make such an error.

For more comprehensive explanation of D.M.R.T. see McGuigan, 1968. pp. 204-218.

occupied by a manager performing primarily an administrative function and that the source and application of funds were primarily determined at corporate level. In effect, the manager was performing a senior accounting function, although designated by title and job grading level to be at the E-level. The incumbent had been with the company for many years and is close to retiring age.

The position marked 4 (manufacturing manager, company F) was that of an incumbent who left the company whilst the study was in progress in that company and was judged by other managers in the company to be most ineffective in all respects.

The relatively high degree of scatter of position No.2 (marketing director) may be explained by the varying power of marketing in the companies in the sample. Although all the companies were in the manufacturing industry, four were in engineering and four in home products and consumer goods. The marketing managers at E-level (marked 2) were not, however, distributed according to the importance of marketing from a consumer point of view. The two marketing managers rated highest on component 1 were in companies producing goods for the mining industry, whereas the marketing manager rated third was in a company producing automotive batteries primarily for the original component automotive industry. The industrial marketing managers appear to have had slightly higher loadings on component 1. Two marketing managers whose positions are marked 2 in quadrant 2 are judged to be low on constructs associated with empathy. The majority of marketing managers in these companies (8 out of 10) had been technical product managers before (five with engineering degrees) accounting for the relatively lower position on dimension 2.

Production and marketing are two functions which at the more senior (E) level could be major sources of heterogeneity in this study. Although the sample was chosen to be as

homogeneous as possible, differing technologies and market environment effects did, nevertheless, have an influence on the design of the companies.

Schepers and Grant (1969) found in their earlier studies done on the structure of African intellect that heterogeneity of samples had an important bearing on factor structure and could, in fact, cause factor structure to collapse.

In this study the effects of the "collapsing" of factor structure may be found in the percentage of variance accounted for by the first component for individual managers (λ = 48%) to the percentage of variance accounted for by the first component in the consensus grid for 90 managers - 60,64%.

Interpretation of the perceptual space in more than three dimensions on to the surface of a globe becomes increasingly complex. Theoretically the space has as many dimensions as there are constructs. The human mind is normally capable of interpreting only in three dimensions. In this and other multi-dimensional scaling techniques there are theoretically an infinite number of possible dimensions. As one proceeds beyond three dimensions, however, the task becomes increasingly complex, if not impossible. The fact that so much structure has emerged is in itself significant.

CHAPTER 9

SUMMARY AND CONCLUSIONS

> It is probably no mere historical accident that the word person, in its first meaning, is a mask. ...It is rather a recognition of the fact that everyone is always and everywhere, more or less consciously, playing a role... It is in these roles that we know each other; it is in these roles that we know ourselves (Park, 1950, p.249).

9.1 Introduction

Analysis of the empirical results in Chapter 7 revealed that managers impose a certain order or structure on the social world within which they exist.

The institutions in which one functions in society are the products of human action and in their objectified form they become part of the real world in which we live. Berger and Luckman (1971) view this as a dialectical process in which individuals are engaged collectively in construing this objectivity. This in turn shapes what individuals become.

People are continually construing their social worlds. Through their interactions with each other social patterns are gradually built and eventually a set of institutional arrangements is established. Through continual interactions the arrangements previously constructed are gradually modified or replaced.

The production of social structure is itself guided and constrained by the context. The existing social structure is an important constraint in the process and it often produces a

social world which influences managers, constraining their actions.

In this study it has been demonstrated that the above phenomena are manifested in at least two ways. First, managers, as do all human beings, simplify their social worlds by construing their roles in a simplistic way, through a selected number of "filters" or "channels".

> The manager's mind works with verbal codes which summarize complex events and task-relevant information (Daft & Wiginton, 1979, p.184).

Secondly, representations in three-dimensional space by means of multidimensional scaling techniques indicate the effect of organizational factors such as structure and role (function) which transcend personality differences.

9.2 Individual construct systems

In Table 7.2 it can be seen that although each manager in the study had the opportunity to utilize 40 different constructs, there was such a high degree of association between groups of these constructs, that 76,83% of the variance was accounted for by the sum of the first three orthogonal components. The first component or major cluster of constructs accounted for 46,67% of the variance. In an analysis of the expected distribution of quasi-grids, a theoretically derived model in which managers would not "psychologically channelize events" (Kelly, 1955), the expected proportion of variance accounted for by the first channel or filter would have been only 19,64%. Separate t tests and an overall multivariate Hotelling's T^2 and Mahalanobis' D^2 were computed to determine whether the observed results could have been obtained by chance. The research hypotheses set up were confirmed. The structuring or perceptual filtering which did take place could not have been attributed to chance.

Examination of Table 7.2 will reveal that that there were individual differences among the 90 managers in the sample with the lowest percentage of variance contributed by the first components being 19,73% and the highest 70,21%.

A comparison of the distribution of the correlation coefficients for the measured quasi-grids and the resultant X^2-test reveal that the number of construct inter-correlations above the 0,65 level is well in excess of that which may have been obtained by chance. Tables 7.6 to 7.8 are reflections of the three main components or "channels" which managers typically used in construing their social worlds in this study.

In addition to confirming the results of studies on implicit personality theory conducted outside the managerial domain (Chapter 3), the results of this study may serve to cast further light on the way in which managers actually function in organization as opposed to the way in which they ideally ought to. The classical view held is that the manager organizes, co-ordinates, plans and controls in a systematic manner. Mintzberg (1975), however, suggests otherwise. On the basis of his own research and that of others on the nature of managerial work he concludes that in fact:-

- managers are not reflective systematic planners. Study after study has shown that "... their activities are characterized by brevity, variety, and discontinuity and that they are strongly oriented to action and dislike reflective activities" (p.52).

- managers do not utilize information from well sourced comprehensive management information systems. He found in fact that "managers strongly favour the verbal media - namely telephone calls and meetings ... Managers seem to cherish "soft" information especially gossip, hearsay and speculation" (p.52).

Whilst these findings, taken from the context of Mintzberg's book, sound somewhat harsh, they are nevertheless

generally not disputed by practising managers. The findings do not necessarily reflect adversely upon managers from the point of view of value judgements but strongly emphasize man's limited capacity to process large quantities of information. Whilst managers may have many evaluative constructs or dimensions with different names, they do, either in terms of implicit personality theory (Bruner & Tagiuri, 1954), trait inference (Hays, 1958), or correlational bias (Berman & Kenny, 1976), have underlying theories of organizational behaviour (Davis, 1968).

9.3 Group construct systems

In this study evidence was found for the existence of a relatively well-defined set of group constructs and the patterning of group constructs giving the first empirical evidence known to the researcher in favour of Thomas' (1979) commonality corollary.

The individual company role construct maps (figures 7.12 to 7.21) as well as the consensus map for each of the ten companies (figures 7.2 to 7.4) depict clearly the existence of social structure. A synthesis of the positions of individual role incumbents leads to a well-defined clustering of particular role occupants defined in terms of the axes of differentiation defined.

9.4 The personnel function

The relative position of the personnel managers has already been highlighted in discussing hypothesis 4. The personnel function and its institutionalised presence in the personnel department often lack clear direction and purpose. A research study done by Ritzer and Trice (1969) found for example:

> The role of the personnel department was not clearly defined. There was a lack of clear definition in management's expectations of the personnel management function... The author of the report felt that the unclear definition of personnel responsibilities was the root of many of the problems found in the personnel department. This lack of definition applied to the purpose of the personnel function, the relationship of the personnel function to line management, and the relationship to other departments on personnel matters (p.65).

In this dissertation it has been shown by comparing the perception of the E-Band personnel director with the perception of what he ought to be like, that the two domains are distinctly different. (Figures 7.22 and 7.23).

A plausible explanation of the relatively low positioning of the personnel function along the first component reflecting overall managerial ability is also related to the personnel director's relative incapability of exercising influence over the attitudes and behaviour of other individuals or groups. In order to exert influence a group or individual must possess or control something, for example status, money, information, knowledge, that is valued by and salient to those they wish to influence. Power is a contingent, not an absolute, power base.

Interview data collected in this study revealed that E-level line managers perceived their personnel departments to be primarily concerned with the technological aspects of the function. Eight out of nine managing directors and 29 out of 36 E-level managers saw the main role of the personnel function as the "appointment of the right people" (selection), "training and handling liaison committees and other industrial relations structures". Only one managing director saw the role of personnel in broader managerial terms:

> A major measure of the company's success is reflected in the bottom line (financial statement). In order to achieve financial objectives we have to optimize resources, and people are one. The major role of the personnel manager is to advise, set goals and devise means of achieving goals that will maximize the human resources of the company. (Managing Director Company B, 1980)

Whenever managers interviewed in this study discussed aspects of the personnel function in their own companies they highlighted the inability of personnel managers to relate to line management's needs and perspectives. They were quoted as being "technically too specialized", "too involved in psychological theory", "having insufficient strength of conviction", "low impact", "having no or relatively low concern for profit".

Ritzer and Trice (1969), in a study based purely on interview data, found, in general, that personnel departments were:

- primarily passive - not initiators;
- defending the status quo rather than being creative and attempting to exercise leadership;
- reacting to, rather than anticipating problems;
- not standing up to be counted;
- carrying out management decisions, but not helping to shape management thinking;
- not business (profit) orientated;
- not prepared to take risks;
- lacking influence with management.

Also reporting from the U.S.A., Foulkes (1975, 1977) reports on virtually identical perceptions of personnel managers conducted in a wide range of business organizations.

Legge (1978) reports that line management in Great Britain:

- tends to have a confused, hazy and/or stereotyped perception of the potential nature and scope of a personnel department's activities;
- at the middle and junior level in particular, tends to consider that personnel departments are out of touch with the kinds of problems and constraints which face them.

If one examines the constructs used by managers in evaluating the personnel function in South African companies, many similarities may be found with the basic interview data above. However, from interview data of this dissertation both managing directors and E level managers saw, unlike the British researchers, that the greatest challenge facing personnel management was that of industrial relations and that this was one of the main areas in which they expected to find their personnel departments functioning in the future. Blau (1964) aptly summarizes expert power as a potential power base which could well lead to an increase in the power and status as well as general business involvement of personnel managers.

> By supplying services in demand to others, a person establishes power over them. If he regularly renders services they cannot readily obtain elsewhere, others become dependent on and obligated to him for these services unless they in turn can supply services to the former person that he needs. The power of one individual over another thus depends on the social alternatives or lack of them available to the subjected individual (p.118).

Recent events in the field of labour relations in South Africa reinforce the need for expertise in industrial/labour relations.

Salancik and Pfeffer (1974) found that sub-units in an organization acquire power to the extent that they provide resources critical to the organization and that power affects resource allocations within organizations in so far as the resource is critical to the sub-units and scarce within the organization. In this study it has been shown that there are distinct differences in sub-unit power and that differentiation occurs even within sub-units depending on the decision-making level.

Salancik and Pfeffer (1974) point out that power in social systems may be vertical or horizontal and that it may also be interpersonal or involve relations between organizational units. Unfortunately social science research has in the past been dominated with a concern for vertical interpersonal power - the influence of one person over another.

Perrow (1970) is, however, one writer who has criticized this preoccupation with vertical power differentials and has noted that it has created a lack of attention to the important issue of power differences among sub-units in organizations. He suggests that horizontal power is the means by which interacting people obtain benefits for themselves.

In this dissertation it has been demonstrated clearly that perceptual mediation does occur when managers perceive their superiors, peers and subordinates. The two major sources of influence in the perceptual processes of managers are, first, cognitive structuring leading to a high degree of correlation among the constructs or evaluative dimensions being employed and, secondly, the context of their functioning as reflected by the role that the manager plays.

9.5 CONCLUSIONS

The major thesis has been that managers have certain "cognitive maps" or structures which they use in interpreting

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9.5 CONCLUSIONS

The major thesis has been that managers have certain "cognitive maps" or structures which they use in interpreting

their functional worlds and which therefore affect their behaviour.

Many theorists, ranging from Tolman (1948) to Simon (1952), to Daft and Wiginton (1979) have referred to these theories or models which managers hold about organization.

Empirical verification for the existence of these models, in particular role sets, has been provided by way of a visual representation of perceptual structuring derived from multidimensional scaling.

In this thesis the concept of role has been regarded as central in the process of organizing and the concept has been utilized as one of the major frameworks of analysis.

It is contended that the perspective and level of analysis adopted are appropriate to models of organization which alert one to the importance of the organization member in determining the content of organization.

University of the Witwatersrand, Johannesburg

Graduate School of Business Administration

2 St David's Place, Parktown, Johannesburg
Postal address P O Box 31170, Braamfontein 2017
Telephone (011) 642-4771 Telegrams 'Embark'

Interfunctional Perception in Organization - Ph.D. Research Study

I am presently conducting research on interfunctional and interpersonal perception in organization (finance/marketing/personnel/production). The results of this research programme should have considerable benefit not only for the discipline of organizational behaviour, but also for the different professions involved in these functions as well as for individual companies who may use the results.

In terms of the sampling strategy your company has been selected for inclusion in the study. Should you decline to participate (which I hope you will not) another company will have to be selected.

The study involves a 60-minute interview and questionnaire (combined time) with each of:

1. The senior co-ordinating executive of the major functions. (General Manager or Managing Director)

2. The senior manager of the functions : finance/marketing/personnel/ production.

3. An immediate subordinate of each of the managers in 2.

In return for the time given to me in gathering the above data, I shall provide each participating company with a short report for management on the results of the entire study.

Should you decide to participate in the study I would welcome an opportunity to meet with you briefly to allow me to give you more details or answer any questions which may arise.

C. J. COGILL

SENIOR LECTURER IN ORGANIZATIONAL BEHAVIOUR.

CJC/m

The purpose of this research is to find out how people see others, how observant they are in noting differences between people and how they describe other people.

When interacting with superiors, subordinates and peers in the same function or in different functions, one forms judgements with regard to how they behave in the work situation along different behavioural dimensions, e.g. cautious or impulsive, energetic or lethargic.

The list of dimensions below has been obtained from a representative sample of South African managers. This list contains the dimensions, which people in organisation typically use in describing each others' behaviour. For each of the persons in the positions specified on each page of the questionnaire, attempt to get a mental picture of that person in your mind. Think of the behavioural characteristics which that person typically displays and then rate that person.

Please complete the rating for the nine role occupants on each dimension before proceeding to the next dimension.

1. There are no right or wrong answers. We are only interested in relative performance of the role incumbents along the behavioural dimension.

2. Feel free to use the entire range of the scale

   (a) If the description is strongly characteristic of the person being rated then place your tick at one end:

   CAUTIOUS 3 2 1 0 1 2 3 IMPULSIVE
   :✓: : : : : : :

   or CAUTIOUS : : : : : : :✓: IMPULSIVE

   (b) If the description is quite closely related to the person, but not strongly so:

   CAUTIOUS : :✓: : : : : : IMPULSIVE

   or CAUTIOUS : : : : : :✓: : IMPULSIVE

   (c) If you feel the person is slightly more one than the other:

   CAUTIOUS : : :✓: : : : IMPULSIVE

   or CAUTIOUS : : : : :✓: : : IMPULSIVE

   (d) If the dimension is neither characteristic nor uncharacteristic of the role occupant, place your tick in the centre block.

   CAUTIOUS : : : :✓: : : : IMPULSIVE

3. Work at a fairly high speed: do not worry or puzzle over individual items - it is your first reaction that is the most useful to us.

4. Be sure that you tick every scale : do not omit any.

5. Never put more than one check mark on a single scale.

personal constructs" (p.26). This general approach to the understanding of "social perception" has not precluded the formulation of so-called "nomothetic" generalizations concerning the way in which psychological construing develops. There is now considerable evidence that, as children mature, (as mentioned on p.91), they employ progressively more "psychological" constructs in describing persons, that is, constructs which refer to personality traits and other psychological characteristics.

Researchers (Barrat, 1976, 1977; Brierley, 1967; Duck, 1975; Little, 1968; and Scarlett, Press and Brockett, 1971), have shown consistently that there is a decrease with age in the relative frequency of usage of constructs which refer to people's appearance (for example, "she is tall"), social roles (for example, "Bill fights a lot"), while there is a corresponding increase in the use of personality constructs (for example, "Mary is quite shy").

An analysis of political construing is proposed by Du Preez (1972) in his examination of the constructs used in South African parliamentary debate. He shows how, in debate in the South African parliament, parties have used superordinate constructs which are not directly relatable. The Nationalist Party has centred its reaction to particular concerns and events around the construct: "survival-non-survival" for the White race (in both cultural and physical sense). The United Party was, during its existence, largely trying to make sense of policies and proposals in terms of a "cost-effectiveness, economics" construct while others have been talking in "moral-humanitarian" terms. Du Preez shows how "the facts" for each group were determined by their modes of construction. In addition to analyzing change over a period of twenty years (for example, the Nationalist change from a "racial" to a "national" mode of construction) Du Preez has shown that there was a clash between these political groupings that cannot be resolved in a logical debating

Perhaps if personal construct psychology is properly to serve the needs of social investigation a "complementality corollary" should also be added to Kelly's original system. According to Thomas (1979) it might be framed as follows:

> Complementality Corollary : When people share in a common pool of events including each other, but by virtue of their position sample these events differently, their constructions of experience will develop to complement each other. This complementation will produce a social system which exhibits greater complexity of stable organization than exists in the construction of any individual contributing to it (p.66).

Thomas (1979) maintains that the complementality corollary serves to link commonality to the other social corollaries. This corollary allows the concepts of "organization and institution to be introduced into the personal construct psychology approach to social systems" (p.66).

> Repertory grid techniques must be expanded to include complementality. The form of the grid must not only contain the possibility of identifying commonality between the constructions of experience, one person to another, but the sum of the grids from the members of a group should reveal system properties not contained in the grids of any one (Thomas, 1979, p.66).

The research which has been considered so far has a distinctively idiographic character in the sense that it involves eliciting personal constructs from each subject individually. This emphasis is dictated by the basic logic of the Individuality Corollary. Bonarius (1965) notes, "the research has shown convincingly that the individual prefers to express himself and to describe others by using his own

Kelly's theory has been the work of sociality, that is, the ability of people to play roles with respect to each other. There is in Sechrest's (1963) view, a good chance that more intensive investigation of the relationships between people and the way those relationships relate to personality construct systems would have been highly beneficial. Here is an area in which Kelly's ideas might be elaborated into spheres of group relationships and perhaps even international understanding. The Americans, for example, tend to apply the construct: "freedom - slavery" to a great many governmental actions, while Russia may view the same actions in terms of "order - chaos" (Smith 1976). Perhaps it should not be surprising that the two countries disagree so strongly on so many issues.

There has been a tendency to view personal construct psychology, if dealing with relations at all, as relevant only to dyadic interaction. According to Stringer and Bannister (1979) the attention given to the therapist-client relation is partly responsible. In addition, it is maintained that the repertory grid has often been taken as providing information about a set of dyadic relations. Although group processes have rarely been examined through personal constructs there is, in principle, no reason why they should not be. A group could be considered as a semi-connected lattice of relations, constituted through the procedure outlined above.

> A collective or group construct system could be construed by an individual or a group in a manner analogous to the construing of one person by another. Equally, the process of construing would constitute the individual-group, or inter-group relation (Stringer and Bannister, 1979, p.xv).

The only valid test of whether two individuals have similar constructions of experience is for them to explore each other's constructs in detail and in depth and to agree what is shared (Thomas, 1979, p.58).

more likely that one construction system can subsume part of another" (Kelly, 1955, p.99)

It has been demonstrated by researchers in a series of recent studies (Duck, 1973, 1975, 1977; Duck and Spencer, 1972) that this is indeed the case. These researchers have found repeatedly that friends typically exhibit more similarity in terms of elicited constructs than do pairs of individuals who are not friends. Stringer and Bannister (1979, p.202), and Crockett and Meisel (1974, p.290) point out that interpersonal construct systems develop out of the perceivers' experience with other people and with socially shared interpretations of people's behaviour.

Duck (1973) puts forward his own "filter hypothesis", which implies that, as the basis of a role-relationship expands, there will be a progressive shift of interest away from factual information to a greater concern with understanding one another's psychological processes, that is, "sociality".

3.8 "From individuality to sociality"

Within the framework of personal construct theory, an explicit model of interpersonal relations has been derived from the Individuality, Commonality and Sociality Corollaries. Researchers, concentrating on these three principles, have shown that people tend to rely on particular constructs to interpret their social environment ("individuality") and that they can then form more definite and complex constructs. Thus, it is hardly surprising that persons choose as friends other people who employ the same constructs as themselves.

There is now considerable evidence that this form of commonality facilitates the development of role-relationship in general, that is, "sociality".

Probably the most interesting research stemming fr...

upon one being able to hold similar and elaborate sets of related constructs simultaneously in one's mind, compare them, and locating common areas of reference. It is possible that the more constructs an individual is able to bring to bear on social interaction ("cognitive complexity"), the better position he is in to construe it from several different perspectives at once and to make inferences about the points of view of the other persons involved (Adams-Webber, 1969, p.706). In support of this hypothesis, Olson and Partington (1977) found evidence that:

> An individual's ability to reconcile simultaneous perspectives in an interaction is directly related to the complexity of organization of the constructs by which he structured his world (p.14).

The index of "cognitive complexity" employed by Olson and Partington also correlates with accuracy in making inferences about the personal constructs of other people.

Kelly's model of interpersonal relations implies that the probability that one person will be able to understand the constructions of another, should increase with the degree of similarity between their personal construct systems. As Eiser and Stroebe (1972) note, "the commonality and sociality corollaries, taken together, predict, among other things, that individuals who are cognitively similar will be able to communicate more effectively with each other" (p.206). On the other hand, Kelly himself (1955, p.99) claims that "commonality can exist between two people who are in contact with each other without either of them being able to understand the other well enough to engage in a social process with him". Thus, according to Kelly, commonality is not a sufficient condition for sociality. He does allow, however, that "commonality between construction systems may make it

terms of the number of different constructs that are used to describe people, that is, complexity, is accompanied by a gradual shift of emphasis from a primary concern with appearance, social roles and behaviour to a predominant interest in personality. As Duck (1973) suggests, this process may reflect a general change from viewing others mainly in terms of "stereotypes" to a greater "individuation" and "differentiation" of them as persons.

3.6 Role

The concept of role has been discussed in Chapter 2. Salmon (1970) notes that there is a close parallel between Kelly's elaboration of the implications of the sociality corollary and Cameron's (1947) role-theory in that both of these approaches to the study of interpersonal relations emphasize understanding the outlooks of other persons. For instance, Cameron (1947) contends that "the less practised a person is in sharing the perspectives of others the less opportunity he will have of finding out how different from himself other persons can be" (p.167).

Skill in inferring differences between people in terms of the structure and content of these personal construct systems allows one to make a variety of distinctions between their personalities, and it may play a major role in the formation and development of role-relationships.

Landfield (1971) notes that according to Kelly:

> The critical factor in the development of productive role interaction or sociality lies in the ability of one or both participants in a dyadic relationship to subsume the points of view of the other person (p.7)

3.7 Recent research

Thomas (1977) argues that this form of sociality depends

training, students had narrowed down their view to a simple and tight view using only a few dimensions in terms of which they viewed children. Towards the end of their training students had again loosened their sub-systems. Success as a teacher was related to the distance moved from loose-to-tight-to-loose rather than being solely one or t other.

Grids applied to subjects aged 6, 9, 13 and 17, indicate that with increasing age, more constructs are used; there is somewhat more equal elaboration of both poles of each construct and there is recognition of more shades of grey (Applebee, 1976).

The effect of training has shown that a student group, as opposed to its instructors, used more concrete description constructs such as age, sex and profession (Lifschitz, 1974).

In the youngest age groups studied so far - eight and younger - appearance and role constructs are used more often than either behaviour or personality constructs. At intermediate ages - from eight to ten - behaviour constructs are used most frequently. During puberty and early adolescence, from twelve to fifteen, the use of personality constructs increases dramatically, and by mid-adolescence, they are the most prevalent of all. Girls tend to employ more personality constructs than boys at every age surveyed in these studies. Barratt (1977, p.351) also indicates that, as children mature, their social construing becomes "more adequately descriptive, less likely to involve a personal frame of reference of greater "depth", and of increasing discriminatory potential ... (and) girls are generally precocious with respect to these transformations". Thus from this standpoint of personal construct theory, social development involves systematic transformations in both the structure and content (Bannister & Mair, 1968) of interpersonal construct systems. A progressive increase in

> sense which can be given to forms of construing (and these may equally well be non-verbal as verbal) rests partly on general pre-suppositions which are understood by the communicating parties and partly on the meaning which is created within the particular relational context of the communication.

3.5 Development of construct systems

Salmon (1970) considers the increasing degree of organization, in terms of superordinancy of a system, to be one of the major developmental aspects of construct systems.

> Educational growth is not the accumulation of more and more pieces of information, but the development of an increasingly complex structure for organizing and inter-relating ideas (Bannister & Fransella, 1974, p.88).

Bannister and Fransella (1974) point out that there is regrettably little evidence as to the specific processes that take place during the hierarchical development of construct systems. Little (1968) has shown that children move from using physicalistic constructs to using psychological ones. Brierley (1967) has shown that one's psychological constructs increase in complexity with age. There is, however, a great deal to be learned about the ways in which constructs change with time, in organization, in permeability, in form and in content.

Bannister (1965) has shown that people tend to tighten the relationship between constructs when they experience validation and loosen when invalidated.

Runkel and Damrin (1961) showed that teachers' college students who were at the beginning of their training were using a multiplicity of loosely related dimensions in terms of which they viewed children. Half-way through this

The seven point bipolar scale used in the grid has been assumed to be of equal intervals, hence the data base is assumed to be metric. The required technique will therefore be a procedure that analyses multivariate, interdependent metric data. Examination of Figure 6.2 shows that the procedures available are: factor analysis, cluster analysis, and/or metric multidimensional scaling.

In factor analysis and cluster analysis no attempt is made to separate variables in advance into criterion and predictor sub-sets. In factor analysis one is concerned with the whole dependence structure and the possibility of summarizing the columns of the data matrix by a smaller set of linear combinations of the original variables. In cluster analysis, focus is on the objects rather than the variables. "In this class of techniques one attempts to partition the rows of the data matrix into subsets consisting of objects that closely resemble one another over the whole set of variables" (Green & Tull, 1970, p.328).

6.2.3.1 Factor analysis

> Since the substitution of a reduced number of concepts and laws (relations) for a vaster set of particulars ("chaos") is the aim of all science, factor analysis is one of the most direct, universally applicable, and representative of scientific methods (Cattel, 1966, p.175).

Factor analysis is a method for determining the number and nature of the underlying variables among large numbers of measures. More succinctly, factor analysis is a method for determining k underlying variables (factors) from n sets of measures, k being less than n.

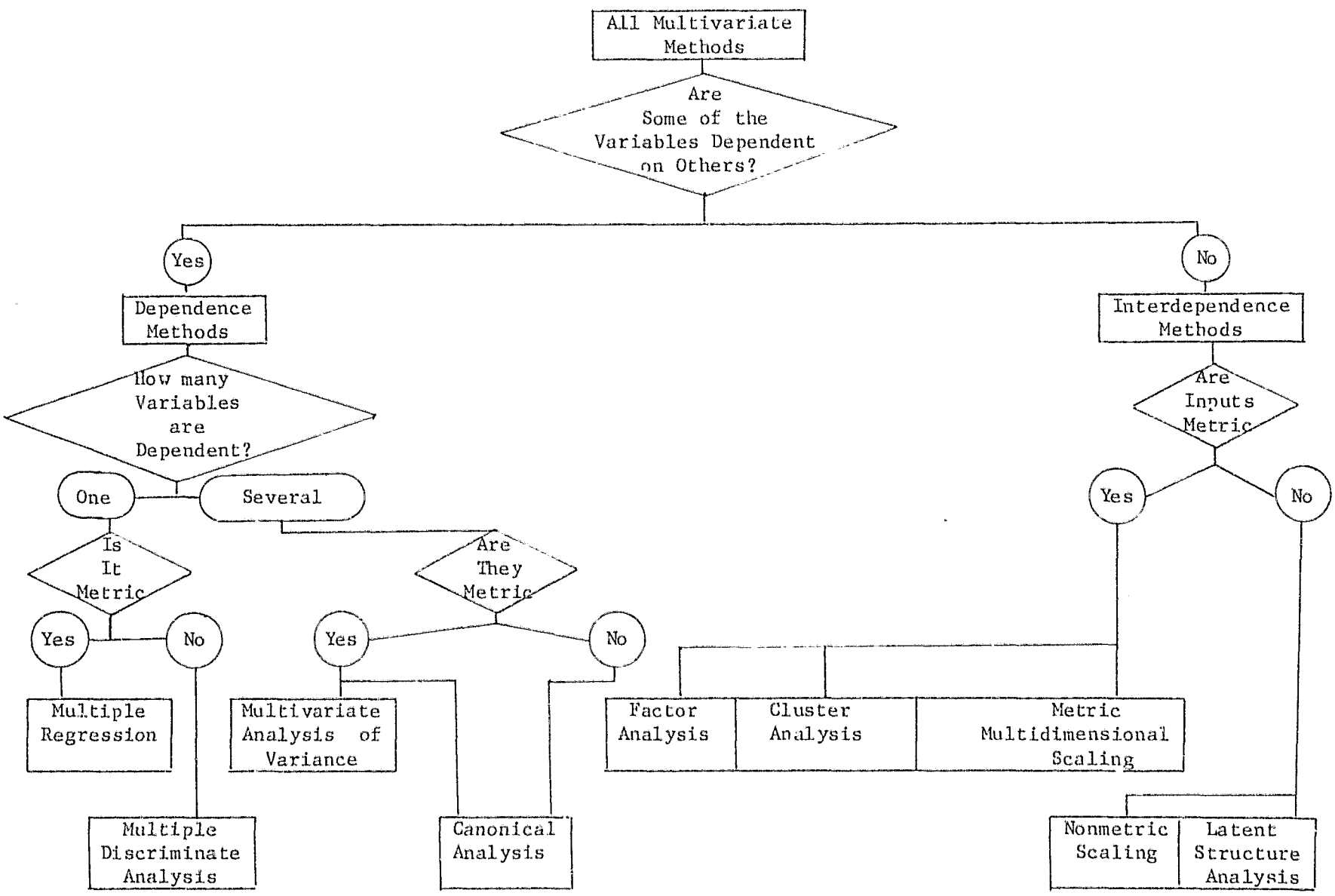

Figure 6.2
A Classification of Multivariate Methods
(Sheth, 1971, p.15)

In interdependence we are concerned with the relationship of a set of variates among themselves, no one being selected as special in the sense of a dependent variate. The analysis of functional relationships, correlation and component analysis fall into this group. (Kendall, 1957, p.6).

Populations	
One population	Two or more populations
Principal components Factor analysis	Multivariate analysis of variance Discriminant functions
Q1	Q2
Q3	Q4
Polynomial fit Multiple correlation Canonical correlation Multiple partial correlation	Multivariate covariance

Figure 6.1
Classification of Multivariate Procedures
(Cooley & Lohnes, 1971, p.7)

An excellent and far more descriptive summary of multivariate classification has been designed as a paradigm by Sheth (1971) adapted from Kendall (1968) and is shown in Figure 6.2. The particular procedure to be selected requires an examination of Figure 6.2. and a comparison with the data-type generated - in this study by the grid. The grid by itself has no dependent variable(s), hence one of the inter-dependence methods will be required for analysis of the data.

An important distinction which supports the use of multivariate techniques is that the multiple variates are considered in combination, as a system of measurement. The basic assumption on which the mathematical model of multivariate statistical procedures is based, is the multivariate normal distribution.

There is a number of multivariate techniques available to the researcher, the particular choice usually being dictated by the nature of the data ba . For instance:

> Regression analysis is to be differentiated from correlation analysis in that the former assumes fixed values for the predictor (independent) variables, whereas correlation analysis assumes that both criterion (dependent) and predictor variables are random variables. With respect to objectives, in regression the approach emphasizes prediction, whereas in correlation it focuses on measuring the "strength" of the (linear) relationship (Green & Tull, 1970, p.343).

A commonly accepted basis of classification is to separate dependence models from interdependence models.

Kendall (1957) has utilised a classification that places each procedure in a quadrant of a lattice depending on how many sets of variables and how many populations are included in the design. See Figure 6.1.

> In dependence, one (or more) of the variates is selected for us by the conditions of the problem and we require to investigate the way in which it depends on the other variates - the so-called but badly-named "independent" variates. The regression of one variate on others or the variance analysis of a set of yields in a factorial experiment are of this type.

In the theory of multidimensional scaling, social structure may be described by way of a summarized description of a large number of attributes or variables. In the mathematical context, and consistent with Osgood, Suci and Tannenbaum's (1957) postulated semantic space, each variable is represented by an axis in multidimensional space, each such axis being orthogonal to all other axes. Each respondent by way of his evaluations of variables, is allocated a unique position in the multdimensional space. More formally:

> If p measurements have been made on N - individuals, the test space model represents each individual as a point in a p-dimensional Cartesian space. The p variates become the p orthogonal axes spanning the space (each axis at right angles to all the others). Each point representing an individual has a location determined by taking the p scores for the individual as Cartesian co-ordinates (Cooley & Lohnes, 1971, p.8).

Raw data are presented in the form of a matrix of dimensions: n columns (elements) by m rows (variables). Since respondents are required to evaluate a large number of variables and since these variables require simultaneous analysis if they are to be of use for valid inference, an analytical algorithm is required that is capable of handling a large number of variables simultaneously. Since bivariate techniques are inadequate because only two variables can be studied at a time, and thus possible important relationships with other variables might be disregarded, a method of multivariate data analysis is required.

In general, multivariate analysis is a branch of statistics concerned with analysing multiple measurements that have been made on one or several samples of individuals.