

CHAPTER 7

RESEARCH DESIGN AND RESULTS

7.1 INTRODUCTION

This chapter summarises and reports on the data collected, the statistical treatment of the data, and deals with the results of the empirical study. This will be done by following guidelines and working within a framework suggested by noteworthy researchers, *inter alia* McKeown & Thomas (1988), Stephenson (1953), Brown (1980) and Kerlinger (1986). The computer software utilised to analyse the data consisted of the SPSS (Statistical Packages for the Social Sciences) software programme.

In terms of the Mitroff model, which was used in Chapter 1 to describe the scope of the research, this chapter deals with activity 5, namely feedback in the narrow sense, between the solution (circle IV) and the conceptual model (circle II).

7.2 THE FIELD RESEARCH

The field research took place during August and September 1999. Important practical considerations had to be taken into account in the planning of the field research. Firstly, tertiary institutions presenting an MBA programme had to be consulted and permission had to be obtained, after the terms and conditions under which the Q-sorting would take place, were agreed upon. These institutions were chosen for their sound academic reputation and had to have a student profile closely representing the broader South African population.

It is important to note that the students had to be formally registered MBA-students, who have enrolled more than six months prior to August 1999, thereby ensuring their '*seriousness*' and '*dedication*'. The assumption is made here that those students who were not serious or dedicated enough, would not continue with their studies after six months.

7.2.1 PROCEDURE

Once permission for the research had been granted by the respective institutions of higher learning, dates and objectives could be set with the relevant lecturers.

An informative instruction page (refer Appendix A) was handed to the participants. The importance and role of the instruction page is emphasised by Schreuder (1999) and should explain to participants what will be expected from them. The instruction page was tested on three post-graduate students, who understood the brief without additional verbal explanation from the researcher, a prerequisite for the instruction page. This 'pilot' exercise also served to monitor the time it took to complete the Q-sort, and the result was a mean average of 18 minutes. As part of the conditions agreed upon between the researcher and the respective institutions of higher learning, a ten-minute discussion on Q-method was followed by a short introduction to the background of the study. Seven biographic questions were included on the instruction page, as part of the study. These questions included questions regarding age, gender, culture group, industry sector, and number of years in current position.

In completing the Q-sorts, respondents followed an unforced distribution scheme on an agreement scale (using a five point Likert-type scale), where 1 represented "strongly *disagree* with" and 5 "strongly *agree* with", and 3 "neutral". The 60 statements, each printed on a separate sorting card, were sorted into the five piles. Each participant received separate numbers, facilitating the sorting process and minimising confusion. The raw response data on the sort were prepared for analysis by a process of coding and tabulation. After coding, the data were captured on computer and various procedures in the SPSS system were applied to the data. The 60 x 60

correlation matrix was factor analysed, using the principal components method with an oblimin (with Kaiser normalisation) rotation. Several solutions were considered, but a four-factor solution was deemed most adequate. Criteria for “adequacy” can vary from study to study, but in this case it was strongly indicated by the fact that 17 items had loadings exceeding statistical significance on one or more of the four factors. (See discussion on factor analysis in 7.2.2).

All significant and relevant results are reported in the text. Summaries of significant and non-significant results are reported in the addendums.

7.2.2 FACTOR ANALYSIS

One of the strong points of Q-methodology is its analytical possibilities. Kerlinger (1986) feels so strongly about this strength that he states the impossibility of discussing Q-methodology without discussing factor analysis.

Preliminary to a consideration of factor analysis, it is essential to clarify what is being factored. In R-method, correlation summarises the relationships among, and factor analysis denotes the clusters of, the N traits. What is important in this connection is that the units of measurements for the N traits are singly centered by column. Trait A, for example, will be regarded as a measure of intelligence; hence all values in column A are expressed in terms of IQ scores. Depending on its nature, trait B may be measured in terms of some other unit (for example, daily caloric intake). As a practical matter, there is nothing to prevent correlating persons (columns) in this fashion, but what possible meaning could be attributed to the deviation of mean scores (effected by the normalisation subsumed in correlation) when they are composed of such diverse measuring units? McKeown and

Thomas (1998) answer this question by stating that Stephenson (1953) addressed this problem thus: *All observations in Q-technique are premised on a common unit of measurement, namely, "self-significance"*.

Factor analysis: principles and purposes in Q

Factor analysis is fundamental to Q-methodology, since it comprises the statistical means by which subjects group themselves, through the process of Q-sorting. Once Q-sorts have been correlated, the mathematics of the factoring process are *virtually* identical to those followed in R-method application. It is in statistical respects that that Q and R are most alike, despite the persistent (and thus mistaken) notion that they represent rival factor analytic systems (refer Chapter 6 for more detail on this argument).

The factoring process commences once a matrix of Q-sort correlations is provided. According to McKeown and Thomas (1998) it makes no difference whether the coefficients in the correlation matrix are Pearson's r , Spearman's ρ , or any other commonly employed non-parametric measure of association. Likewise, they argue, it makes no difference whether the specific factoring routine is the principal components, centroid, or any other available method. The concern here is with the *principles* and *products* of factor analysis as applied in Q-studies, not with the statistical *means* by which these principles are effected or these products realised. These latter issues subsume mathematical complexities extending well beyond the scope of this study.

In short, factorisation substantially simplifies the interpretive task, bringing to attention the typological nature of audience segments on any 'subjective' issue.

PROFILE OF PARTICIPANTS

As mentioned earlier in this chapter, the participants in this study had to be MBA students who have enrolled more than six months prior to August 1999. A description of the participants will now be made.

Table 7.1: Frequency Tables: Age, Gender, Title, Industry Sector, Number of years in position and Cultural Group

Table 7.1.1: Age

Age Group	<i>f</i>	%	Cumulative <i>f</i>	Cumulative %
20-24	3	1.2	3	1.2
25-29	53	21.4	56	22.6
30-34	58	23.4	114	46.0
35-39	67	27	181	73.0
40-44	38	15.3	219	88.3
45-49	8	3.2	227	91.5
50-54	1	0.4	228	91.9
55+	2	0.8	230	92.7
Not marked	18	7.3	248	100.0

Of the 248 participants, the majority (71,8%) were in the age group 25-39. A large percentage, (7,3) did not indicate their age. Few were younger than 25 years or older than 49.

Table 7.1.2: Gender

Gender	<i>f</i>	%	Cumulative <i>f</i>	Cumulative %
Female	56	22.6	56	22.6
Male	182	73.4	238	96.0
Not marked	10	4.0	248	100.0

Not surprisingly, by far the majority of participants were male, representative of the national distribution of the MBA enrolment profile. However, to have nearly a quarter of the participants be female may suggest an improvement on the representation of females in the management cadres of the future.

Table 7.1.3: Title

Title	<i>f</i>	%	Cumulative <i>f</i>	Cumulative %
Manager	80	32.3	80	32.3
Head of Dept	15	6.0	95	38.3
Consultant	40	16.1	135	54.4
Director	18	7.3	153	61.7
Senior Man.	31	12.5	184	74.2
Entrepreneur/own	21	8.5	205	82.7
Other	38	15.3	243	98.0
Not Marked	5	2.0	248	100.0

Close to a third (32.3%) of the participants were managers, with a further 12,5% on senior management level. Interestingly, 16,1% of the participants were consultants and 8,5% were entrepreneurs, indicating the need for management training, even in your “own time” (as opposed to an individual who are sent/nominated by his/her institution for further studies).

Table 7.1.4: Industry Sector

Sector	<i>f</i>	%	Cumulative <i>f</i>	Cumulative %
Financial Service	39	15.8	39	15.8
Healthcare	21	8.5	60	24.3
Transport	18	7.3	78	31.6
Construction	8	3.2	86	34.8
Telecommunication	20	8.1	106	42.9
Academia	8	3.2	114	46.1
Government body	28	11.3	142	57.4
Pharmaceutical	7	2.8	149	60.2
Military	7	2.8	156	63.0
Mining	8	3.2	164	66.2
Leisure	5	2.0	169	68.2
Marketing	10	4.0	179	72.2
Public Utility	10	4.0	189	76.2
Retail	9	3.6	198	79.8
Food	7	2.8	205	82.6
Media	8	3.2	213	85.8
Consultancy	27	10.9	240	96.7
Other	7	2.8	247*	99.5*

* *Frequency missing = 1 (0.5%)*

The industry sector most represented here was the financial services (15,8%), followed by government body (11,3%) and consultants (10,9%).

Table 7.1.5: Years in current position

Years	<i>f</i>	%	Cumulative <i>f</i>	Cumulative %
Less than 1 yr	44	17.7	44	17.7
1 - 3 yrs	110	44.4	154	62.7
4 - 7 yrs	62	25.0	216	87.1
8 yrs +	31	12.5	247	99.6
Not marked	1	0.4	248	100.0

Close to half of the respondents (44,4%) had been in their current positions between one and three years. A surprising 17,7% had been in their current positions for less than one year and considering that all the respondents had been enrolled in the MBA-programme for longer than six months, it will be interesting to know whether they were appointed in those positions because of the enrolment or as a proviso for the appointment. This issue will be taken up in Chapter 8.

Table 7.1.6: Area of Job/Interest

Job/Interest	<i>f</i>	%	Cumulative <i>f</i>	Cumulative %
Gen/Bus Man.	82	33.1	82	33.1
Operations*	35	14.1	117	47.2
Human Res.	17	6.9	134	54.1
Technology	36	14.5	170	68.6
Finance	34	13.7	204	82.3
Marketing	16	6.5	220	88.8
Training	9	3.6	229	92.4
Other	18	7.2	247	99.6
Not Marked	1	0.4	248	100.0

**Including Production/distribution*

Most respondents were either involved in general management or had a keen interest in general management (33,1%). The second largest domain trails far behind, with technology (14,5%) second and operations (14,1%) third.

Table 7.1.7: Culture Group

Culture Group	<i>f</i>	%	Cumulative <i>f</i>	Cumulative %
White SA	117	47.2	117	47.2
Black SA	77	31.0	194	78.2
Coloured SA	6	2.4	200	80.6
Indian SA	30	12.0	230	92.6
White non-SA	10	4.0	240	96.6
Black non-SA	6	2.4	246	99.2
Other	1	0.4	247	99.6
Not marked	1	0.4	248	100.0

As could be expected at this point in time, the majority of the respondents belonged to the white South African culture group (47,2%). With 31% of the respondents from the black South African culture group, this provided a satisfactory representation of the group, although not representative of the broader population. No distinction was made between language as it was assumed that the white (predominantly Afrikaans and English first language) cultural groups shared the basic cultural values and norms. The same goes for the various black South African groupings. This point will be further discussed in Chapter 8.

7.3 RESULTS

The four principle component factors extracted from the correlation matrix will be reported first, followed by an overview of the factors.

7.3.1 THE PRINCIPLE COMPONENT FACTORS

Accordingly, the four orientations are identified as:

Factor 1: Individualism

Factor 2: Collectivism

Factor 3: External locus of control

Factor 4: Group think- decision making

Factor 1: Individualism

The first factor extracted consists of six variables, and an appropriate description for this factor would be 'individualism' (see table 7.2).

This view represents a strong bias toward individual growth, diversity as a strength in organisations, taking ownership for one's own life; individual contributions for the benefit of the group; and internal locus of control.

Table 7.2: Factor 1: Individualism

Factor loading	Mean score*	Item number	Item description
.830	4.72	S28	Continuous learning is important
.787	4.57	S10	Different types of people contribute to the success of an employer
.761	4.41	S16	One should be in control of one's own future
.729	4.34	S12	One feels good when one can contribute to the wellbeing of one's group
.617	4.20	S11	It is important to keep one's dignity at all times
.554	4.27	S38	Doing something 'extra' (not mentioned in one's job description), can give great job satisfaction

*5 = strongly agree; 1 = strongly disagree; rounded off to the nearest two decimals

N of cases = 246; Alpha = .8086

The view from Factor 1 is not simplistic. Although it has an individualistic overtone, the statement scores above suggest a marked “emphatic” undertone. Statements 28, 10, 12 and 11 suggest a concern with the “other” in the organisation. Statement 28 suggests a continuous learning curve and thus interaction with other learners. Considering that the study was undertaken amongst MBA students, all working adults, this statement should have a high agreement score. The high agreement score on S10 indicates a tolerance or even an acceptance for differences in the workplace.

Factor 2: Collectivism

The second factor identified can best be described as ‘collectivism’.

Table 7.3: Factor 2: Collectivism

Factor loading	Mean score*	Item number	Item description
.662	3.62	S7	Everyone has to be part of a group at work
.651	3.18	S6	To be rejected by one’s colleagues has to be avoided at all times
.510	4.05	S3	One should have opportunities for helping other people
.479	3.97	S9	One has to deliberately include a new employee in discussions at work

*5 = strongly agree; 1 = strongly disagree; rounded off to the nearest two decimals

N = 242

Alpha = .5108

In contrast to Factor 1, a specific collective attitude permeates the perspective of Factor 2.

The defining features of Factor 2 are its fundamental concern with colleagues, their well-being *per se*, and support to the group. With reference to Ubuntu, its core elements of respect, dignity, care and acceptance are strongly represented here.

Table 7.4: Factor 3: External locus of control

Factor loading	Mean score*	Item number	Item description
.673	3.33	S22	One should reflect more on the past for guidance in the future
.663	3.18	S50	The organisation is responsible for career planning and training
.545	4.07	S52	An organisation/employer should not only see to economic needs, but also to employees' social, spiritual and psychological needs
.479	3.00	S20	An organisation should be an extension of one's social life

*5 = *strongly agree*;

1 = *strongly disagree*; rounded off to the nearest two decimals

N of cases = 245

Alpha = .5330

As indicated by the scores of the statements speaking to the primacy of the organisation over the individual, it is clear that this is an external locus of control viewpoint. The individual in this instance expects the organisation to play a paternalistic role, taking responsibility for the individual. This can be seen in direct contrast to the 'empowerment' drive advocated by business and political leaders in South Africa (refer 'Future research' in Chapter 8 for more on empowerment).

Table 7.5: Factor 4: ‘Group think’ – decision making

Factor loading	Mean score*	Item number	Item description
.759	3.22	S44	Compromise result in nobody losing face
.638	3.61	S30	To have consensus on a matter is more important than having one’s ideas implemented
.526	4.06	S25	Disagreement must be debated and an agreement reached through consensus

5 = strongly agree;

1 = strongly disagree; rounded off to the nearest two decimals

N = 245

Alpha = .5334

Factor 4 and Factor 2 share a high regard for group values that serve to call for the wellbeing of the group members, as opposed to the wellbeing of the individual, who may or may not be part of a group. This factor needs to be read together with S13, “A successful individual need not share the limelight/success with colleagues”, which has a mean score of 2.22 and S21: “The individual in the group and not the group should be accountable for results” with a mean score of 2.57. The participants clearly disagreed with the latter two statements.

The data obtained from the Q-sort ($n = 248$) were statistically manipulated by means of a principal component factor analysis with oblimin rotation to identify various factors. A principal factor analysis assisted in identifying new or obscured factors regarding the field of study, determining the interrelationship of the 60 statements contained in the sort.

No significance level can be attached to the solution. Significance levels can be used to assess the robustness of the correlation matrix before it is imputed into the factor analysis. Bartlett's Test of Sphericity was done for this. The use of multivariate analysis was done, since the dependent variables were not correlated. This figure was significant at the .001 level, so, the analysis could proceed. Following this, the Kaiser-Meyer-Olkin measure of sampling adequacy was performed (the sum of the squared correlations *to* the sum of the squared correlations *plus* the sum of the squared correlations). This tests whether the partial correlations among variables are small. The higher the figure the better. Anything above 0.6 suggests that the data are appropriate for factor analysis. This measure was found to be acceptable as well.

The sample size was appropriate for factor analysis, which at 248 amounted to 4.13 participants per statement.

A scree plot of the eigenvalues indicated a levelling out of values after the fourth identified factor, suggesting that four factors could be extracted. (A copy of the original scree plot is attached as Appendix B). All four of these proved to have eigenvalues greater than 1.0, thus satisfying Kaiser's criterion of factor significance. However, because on its own this criterion does not always produce a good solution, the oblimin rotation was repeated. As a result, four factors were identified which together explained 52.5% of the common variance in the matrix. Values of as low as 50% are satisfactory for short tests, though tests with many items (80 and more) should yield values of 80% or even higher (Kehoê 1995).

All four factors had a sufficient number of variables with loadings greater than 3.0 to justify interpretation. These factors were named according to each factor's central theme and common denominator. All factors loaded positively.

Table 7.7: Eigenvalues, percent of total variance and cumulative percentage of identified factors

Factor	Eigenvalue*	% of variance	Cumulative %
1	4.358	25.636	25.636
2	2.246	13.213	38.849
3	1.280	7.530	46.379
4	1.050	6.174	52.554

**An eigenvalue of 1 was used as cut-off point for the purpose of this analysis*

Component 1 accounts for 25.6 % of the total variance. The four components together account for 52.5 % of the total variance.

Communalities are presented in the table below. The communality of a variable is the proportion of the variance of that variable that can be explained by the components.

Table 7. 8: Communalities

Item	Communality	Item	Communality
S3	.486	S20	.517
S6	.491	S22	.490
S7	.442	S25	.420
S9	.401	S28	.694
S10	.640	S30	.462
S11	.605	S38	.529
S12	.591	S44	.603
S16	.629	S50	.445
S52	.491		

No items were removed as all communalities were greater than .40

7.3.2 ITEM ANALYSIS

Before a principal component factor analysis was done on the items, the mean values of the individual items were calculated to determine to what extent respondents agreed or disagreed with the various items. The item analysis provides a general overview of participants' experiences regarding the 60 statements which constitutes the sort.

The results are tabled according to the level of agreement (see Appendix C).

The lowest mean value indicate the lowest level of agreement and the highest mean value indicate the highest level of agreement or the lowest level of disagreement.

This was based on the assumption that a mean value of 1 would indicate *total disagreement* and a mean value of 5 *total agreement*. A mean value of 2 could be regarded as *disagreement* and a mean value of 4 *agreement*.

It can be noted that of the 60 statements taken from the comparative analysis in Chapter 5, 13 were taken from Japanese, 20 from Western, 14 from African and 13 from Ubuntu.

It has to be emphasised that no distinctive clusters emerged from these statements and that no clustering of statements from any one cultural group emerged.

In general, no statement was identified with which the participants totally agreed or disagreed, although there appeared a tendency to agree with statements rather than to disagree. Statement 28 ("Continuous learning is important"), with the highest mean value of 4.75, has to be seen in the

context of the profile of the participants, who are all actively involved in 'continuous learning', otherwise they would not be studying toward an MBA.

Certain inferences can be made from these results. All the statements with high mean values can be described as 'softer managerial issues', discussed in Chapter 3. (As opposed to 'harder' issues such as systems and structure). The participants clearly viewed these 'softer' issues as important, emphasising the human relations component of management.

Although the role of the individual in the group was not negated, the participants nevertheless wanted to downplay any possibility of being put 'on the spot'. Face saving and coping mechanisms played an important role. Time was of the essence, process was seen as not being that important, although new ideas should not *only* have short term results to the organisation. A little competition between colleagues was healthy and might do some good, as long as it was not overemphasised.

Negotiation and dialogue were of primary importance. It should be done regularly, in such a way that it is not perceived as 'top-down' decision making, as the participants wanted to be involved in decision making processes, not seeing themselves as functional specialists who carry out top management's orders. Power and money were perceived to go together, while job titles were not important. The law should not be used in resolving conflicts, and should only be used as a last resort.

The participants felt strongly that employees could neither expect to be promoted on seniority alone, nor stay in a current job for a long time. They also felt strongly that knowledge should be shared with colleagues and

not kept to oneself.

7.4 SUMMARY

In this chapter the results of a survey done at institutions of higher learning were discussed, and certain inferences were made. The results were compiled in three separate sections: The profile of the participants, the four principle component factors extracted from the correlation matrix, followed by an overview of the factors.

The profile of the participants indicated that the majority were from the age group 25-39, and predominantly male. Close to half of the participants were either managers or on senior management level, and between one and three years in their current positions. Most of them were either involved in general management or had a keen interest in general management. Nearly half the participants were white South Africans and a third black South Africans.

The four principle component factors extracted from the correlation matrix were discussed. The process and role of factor analysis in Q-methodology were described in a detailed manner.

The results were presented in such a way that the conclusions could be used as recommendations and guidelines in the development of a model to be formulated in the final chapter, Chapter 8.