CHAPTER 5

RESULTS OF STATISTICAL ANALYSES

This chapter discusses the results of the main statistical analyses employed in the empirical investigation of the postulated model of downward influence as depicted in Figure 3.1. The chapter is organised as follows: the first part provides descriptive information about the sample and a statistical assessment of the non-response bias. The second part presents the results of data reduction using the factor analysis on multidimensional constructs and assesses their measurement integrity using Cronbach's Alpha reliability. The basis upon which the items were selected and scales constructed is also discussed here. Predictive validity of the constructs was evaluated according to the converging correlational results. The third part describes the main computational procedures used in the quantification of causal and non-causal sources of statistical relationships using path analysis. This section elaborates the methods in computing the path coefficients and the basis for theory trimming.

5.1 Respondents' Sample Characteristics

From the total of 2,000 questionnaires mailed, a total of 374 responses were received, with data from 347 of those completed questionnaire being usable. The response rate was relatively low (17.4%) compared with those reported in Western countries (Hitt, Ireland, & Palia, 1982; Kotha, Dunbar, & Bird, 1995). This is expected however, since mailed questionnaire generally have a low response rate, presumably more so in the

Eastern setting. Of these responses, 27 were unusable because the informants' answers were incomplete. Most of the respondents' companies were located in the state of Selangor and the Federal Territory of Kuala Lumpur, and of these, the majority was located in the Klang Valley (covering the districts of Kuala Lumpur, Petaling Jaya, Shah Alam, Klang and Port Klang). Classifying the companies according to the type of industry showed that a greater proportion of the companies sample were involved in service industry (60.5%), followed by manufacturing industry (30.0%), and mining and construction industy (9.5%). Detailed sectoral breakdown of the sample is given in Table 5.1.

Table 5.1: Respondents' Analysis by Industries

Industry classification	No. of responses	% of responses	Questionnaires mailed	% of total mailed
Service	210	60.5	1100	55.0
Manufacturing	104	30.0	650	32.5
Mining and Construction	33	9.5	250	12.5
Total	347*	100%	2000	100%

* Non usable responses have been excluded

The detail of respondents' characteristics is shown in Table 5.2. By ethnic group, 44% of the respondents were Chinese, 33% were Malay, and 18% were Indian, while other races made up the rest. By gender, 46% were male and 54% were female. In terms of age, the highest proportion of respondents fell into the 30-39 years age group. They accounted for 45% of the total number of respondents. This was followed by the

20-29 years age group (38%), while those above 40 years old accounted for the remaining respondents.

On the whole, the education level of the respondents was high. Nearly 71% of the respondents had education up to tertiary level. Only 3% of the respondents had no tertiary education. The high educational level was reflected in the position or the type of occupation held by the majority of the respondents: 12 Presidents/Chief Executive Officers/Managing Directors/General Managers, 30 Senior Managers, 108 Departmental Managers/Assistant Managers and 194 Executives, and others made up of only three people. The survey data showed that 8% earned more than RM8,001 per month, 11% of the respondents earned more than RM6,001 per month, 32% earned between RM4,001 to RM6,000 per month, 41% earned between RM2,001 to RM4,000 per month and 8% earned less than RM2,000 per month. The average salary of the respondents was higher than the population's average. The population's average salary was RM2,215.50 per month (Source: Malaysia Economic Report, 2008/2009).

On average, the respondents had worked in the present company for three years with a standard deviation of 4.3 years. In detail, 54% of the total respondents had worked for 1 to 3 years in the present company, 11% had worked between 4 to 6 years, 7% had worked between 7 to 9 years and 5% had worked between 10 and 13 years, while only 1% of the respondents had worked longer than 20 years in the present company. The degree of job mobility among respondents was reflected in the average number of previous jobs held by respondents, that being two jobs. For the present sample, 17% respondents reported they had had no previous job, 24% had one, 26% had two, 20% had three and the rest reported that they had had more than four previous jobs.

In terms of the organisational size, the sample was of medium to large size Malaysian companies. It was found that 26% of the companies had less than 100 employees, 12% had 101 to 200 employees, 15% had 201 to 400 employees, 22% had 401 to 1,000 employees and 25% had more than 1,000 employees. Classifying the business according to the type of industry revealed that a greater portion of the companies are in services industries (65%), while 19% were in manufacturing industries and 16% were in mining and construction, and others.

The survey revealed the following information about the respondent's superior. It was reported in the survey that 64% of the superiors were males and 36% were female. The racial composition of the superiors was: 50% Chinese, 32% Malay, 11% Indian and 7% from other races. On average, the superiors had worked in the organisation for 8 years with a standard deviation of 7.2 years - longer than the subordinates' average. 38% had worked between 1 and 5 years, 23% had worked between 6 and 10 years, 16% had worked between 11 to 15 years, 8% had worked between 16 to 20 years and 6% had worked more than 20 years in the present company. The superiors held various positions in the company with 24% of them in the first hierarchical level, 34% in the second level, and 30% in the third level, while only a fraction of them were in the lower management positions. Their educational level was also predictably high, with 95% of them having had tertiary education. Only 5% had up to either primary or secondary education. By designation, 126 of the superiors were the Presidents/Chief Executive Officers/Managing Directors/General Managers of the companies, 102 were the Senior Managers, 115 were the Departmental Managers/Assistant Managers and the rest consisted of Executives and others.

Table 5.2: Respondents' Characteristics

Respondents' Characteristics	Classification	Percent (%)
Ethnic Group	Chinese	44
	Malay	33
	India	18
	Others	5
Gender	Male	46
	Female	54
Age	50 and above	3
	40 – 49	14
	30 – 39	45
	20 – 29	38
Education	Primary/Secondary	3
	Diploma/Bachelor Degree	71
	Master Degree	19
	Doctoral Degree	1
	Professional Qualification	5
	Others	1
Occupation	President/Chief Executive Officer/Managing Director/General Manager	3
	Senior Manager	9
	Departmental Manager/Assistant Manager	31
	Executive	56
	Others	1
Income per month	RM8,001 and above	8
	RM6,001 – RM8,000	11
	RM4,001 – RM6,000	32
	RM2,001 – RM4,000	41
	Less than RM2,000	8

Table 5.2 (Cont'd)

Respondents' Characteristics	Classification	Percent (%)
Length of service	More than 14 years	5
	10 - 13 years	9
	7 - 9 years	12
	4 - 6 years	20
Job Mobility	More than 4 previous jobs	13
	Three previous jobs	20
	Two previous jobs	26
	One previous job	24
	No previous job	17
Organisational Size	More than 1,000 employees	25
	401 – 1,000 employees	22
	201 - 400 employees	15
	101 - 200 employees	12
	35 - 100 employees	26
Types of Industry	Services	65
	Manufacturing	19
	Mining and construction	8
	Others	8
Respondents' Superior		
Ethnic Group	Chinese	51
	Malay	32
	India	11
	Others	6
Gender	Male	64
	Female	36
Age	50 and above	18
	40 – 49	35
	30 – 39	43
	20 – 29	4

Table 5.2 (Cont'd)

Respondents' Characteristics	Classification	Percent (%)
Education	Primary/Secondary	5
	Diploma/Bachelor Degree	51
	Master Degree	30
	Doctoral Degree	5
	Professional Qualification	8
	Others	1
Occupation	President/Chief Executive Officer/Managing Director/General Manager	46
	Senior Manager	16
	Departmental Manager/Assistant Manager	37
	Executive	1
Length of service	More than 21 years	6
	16 – 20 years	10
	11 – 15 years	19
	6 – 10 years	27
	1 – 5 years	38
Hierarchy level	First Level	24
	Second Level	34
	Third Level	29
	Fourth Level	8
	Fifth Level	5

5.2 Validating the Measures

Multi-item scales were used to measure the seven variables, these being: leadership styles, downward influence tactics, organisational structure, subordinates' competence, role ambiguity, OCB and satisfaction with supervision. Except for the single item measure the span of control, numerous methods were available to assess the measurement adequacy of the instruments used in this study. For the constructs exhibiting multiple

dimensionalities, the scales designed to measure the constructs were factor analysed. This process allowed some items from the scales to be screened out to improve the performance of individual measures. The measure of the reliability of scales whether of a multiple or unidimensional type, was gauged by their corresponding Cronbach's Alpha coefficients.

As suggested by Churchill (1979), coefficient alpha is one of the more significant ways to calculate the reliability of an instrument. Although Churchill (1979) strongly suggested that coefficient alpha be computed first and non-performing items removed before factor analysis is applied, other researchers (Cortina, 1993) argue that heavy emphasis on internal consistency early on will conceal a complex factor structure by suggesting the removal of the items that appear weak because they belong to another factor. This study follows the recommendation of Flynn and Pearcy (2001) in which exploratory factor analysis is to be conducted first and the item-to-total correlations recomputed each time an item is deleted.

Spector (1992) suggested that for the theory-building scale, the factors should be expected and built in *a-priori* and inter-item consistency be measured separately for each factor. This suggestion is followed in this study. As an indication of their measurement properties, the final corresponding Cronbach alphas (Cronbach, 1951) of the selected items forming the scale are presented in Table 5.3. The mean inter-item reliability across the set of constructs such as leadership styles, downward influence tactics, organisational context, subordinates' competence, role ambiguity, OCB and satisfaction with supervision are above 0.7 indicating the robustness of the scales used. Bagozzi (1994) indicated that Cronbach alpha coefficients of over 0.6 are acceptable for exploratory

studies, while Nunnally (1978) suggested that for basic research, alphas of 0.5 to 0.6 are probably adequate and that building alphas to levels of 0.80 or higher is unnecessary. Nonetheless, high internal consistency is important for model fit.

Another important indicator of measurement adequacy is the scale validity, which refers to whether or not the items measure the construct they purport to measure. The concept of validity is "multifaceted in that there are different kinds of validity" (Davis & Cosenza, 1988, p. 150). Concern for content validity, that is, the extent to which the scale items represent the domain of concept under study, can be alleviated by using the measurement scale from the literature that has survived many replications and validity assessment. Due to the difficulty inherent to the research design, no attempt was made to assess the convergent validity (tendency to correlate highly with other measures of the same construct) and discriminant validity (the scale's non-significant correlation with measures of non-related constructs) of the applied constructs. However, it is possible to assess the predictive validity of the measurement scales by looking at the significant correlations among variables. This provides an assessment of the extent to which some criterion variables can be predicted by the current measurement of the scale of interest. The correlational results are shown in Table 5.4.

The predictive validity of the two leadership styles is evidenced in the correlational results in Table 5.4. As expected, transformational style correlates highly with inspirational appeals ($r = 0.66$, $p < 0.01$), consultation tactics ($r = 0.69$, $p < 0.01$), and ingratiation tactics ($r = 0.54$, $p < 0.01$). Transactional style, on the other hand, relates to exchange tactics ($r = 0.31$, $p < 0.01$), pressure tactics ($r = 0.40$, $p < 0.01$) and legitimate tactics ($r = 0.22$, $p < 0.01$) as the present result stipulated. These discriminating

correlations are deemed adequate to demonstrate the predictive validity of the leadership measurement scales.

Data reduction, scale purification, and scalar quality of the measures are discussed in the following sections. The statistical procedures for finding factors and terminal factor loadings of the multi-dimensional scales are described in these sub-sections. The basic objective here is to obtain the best interpretation of the factors to match the prior theory. The approach and criteria for final scale item selection to achieve a satisfactory level of internal consistency are also discussed.

Table 5.3: Summary of Scale Items and Measure of Scale Reliabilities

Scales	Questionnaire Items & Operationalisation of the Scales	Inter-item Correlation	Cronbach Alpha
Leadership Styles			
Transformational	(D1+D2+D4*+D6+D8+D9+D10+ D13+D14+D15+D17+D18*+D19+ D21)/14	.52 to .75	.92
Transactional	(D3+D5+D7+D11+D12+D16*+ D20)/7	.67 to .79	.91
Organisational Contexts			
Structure	(F1+F2+F3+F4+F5+F6+F7)/7	.61 to .70	.87
Span of control	B7	n.a.	n.a.
Subordinates' Competence	(J2+J3*+J4+J5*+J6*+J7*+J8+J9+ J11*+J12+J13+J14*+J15*+J16*+ J17+J18*+J19+J20*+J21+J23)/20	.19 to .52	.79
Role Ambiguity	(I1*+I2*+I3*+I4*+I5*+I6*)/6	.71 to .83	.92
Downward Influence Tactics			
Inspirational Appeals	(E2+E8+E9+E15+E23+E30+E36)/7	.62 to .77	.90
Consultation Tactics	(E3+E12+E18+E27)/4	.51 to .78	.83
Ingratiation Tactics	(E10+E21+E26+ E34)/4	.61 to .65	.81
Exchange Tactics	(E5+E6+E13+E14+E22+E29)/6	.52 to .67	.84
Pressure Tactics	(E4+E24+E31+E35)/4	.50 to .65	.78
Legitimating Tactics	(E7+E17+E28)/3	.65 to .70	.82
Organisational Citizenship Behaviour	(G1+G2+G3+G4+G5+G6+G7)/7	.63 to .74	.89
Satisfaction with Supervision	(H1+H2+H3)/3	.82 to .89	.92

* Incorporated after item was reverse-scored
n.a. Indicates alpha is not applicable

Table 5.4: Means, Standard Deviations and Pearson Correlations among Key Variables

	Variables	Means	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Transformational Leadership	4.56	1.14	1.00													
2	Transactional Leadership	3.71	1.47	-.63**	1.00												
3	Structure	3.92	1.16	.03	-.05	1.00											
4	Span of Control	13.60	20.20	-.03	-.02	-.27**	1.00										
5	Subordinates' Competence	3.35	.41	.31**	-.15**	.02	.12*	1.00									
6	Role Ambiguity	2.99	1.13	-.59**	.31	.09	-.05	-.43**	1.00								
7	Inspirational Appeals	3.33	.88	.66**	-.45**	.06	.01	.23**	-.47**	1.00							
8	Consultation Tactics	3.50	.82	.69**	-.41**	.01	-.05	.36**	-.56**	.58**	1.00						
9	Ingratiation Tactics	3.11	.82	.54**	-.33**	.08	.03	.23**	-.40**	.63**	.48**	1.00					
10	Exchange Tactics	2.83	.83	-.19**	.31**	.13*	-.16**	-.14*	.04	-.08	-.15**	.13*	1.00				
11	Pressure Tactics	2.90	.88	-.35**	.40**	.02	-.06	-.24**	.25**	-.24**	-.31*	-.16**	.43**	1.00			
12	Legitimating Tactics	3.15	.94	-.10	.22**	-.06	.02	.05	.07	-.04	-.08	-.08	.31**	.46**	1.00		
13	Organisational Citizenship Behaviour	4.63	1.33	.63**	-.40**	.02	.00	.31**	-.60**	.53**	.58**	.42**	-.10	-.33**	-.16**	1.00	
14	Satisfaction with Supervision	3.34	.98	.76**	-.49**	.05	-.03	.31**	-.68**	.63**	.66**	.50**	-.13*	-.39**	-.15**	.76**	1.00

* Correlation is significant at the 0.05 level (2 tailed)
** Correlation is significant at the 0.01 level (2 tailed)

5.2.1 Leadership Styles

Twenty one items were used to measure the extent to which leadership style is applied by a superior. The negatively worded items such as D4, D16 and D18 were reverse-scored prior to performing the analysis. Since the leadership styles were initially conceptualised as a multidimensional construct, factor analysis was performed on this variable to access how closely the present data replicate the construct dimensions. The principal component solution obtained after the varimax rotation for the 21 items of leadership styles is shown in Table 5.5. The 347 samples used in the analysis are considered sufficient in the sense that chance will not ordain the number of factors determined from the analysis of the large number of scale items. Five factors were extracted on the basis of eigenvalues greater than 1. Initial indications of reliability of the unpurified subscales based solely on the extracted factors were examined by calculating coefficient alpha across items that significantly loaded (loading greater or equal to 0.4) on a factor.

The five significant factors (i.e., eigenvalues greater or equal to 1) that emerged from the factor analysis explaining the greatest amount of total variance were retained for further analysis. Additionally, a Scree test (Cattell, 1965) indicated that they might be combined. Collectively, the five factors retained account for 47 percent of the total variance. The K-M-O statistic (0.92) indicated that the distribution of values is adequate for factor analysis. Also, as revealed by Bartlett's test of sphericity which is significant at < 0.005 level, the data met the requisite normality assumption. The mean correlations show that items in the scale were sufficiently coherent to justify combining them to form a scale. The item mean and standard deviation for the transformational leadership scale was 4.56 and 1.14 and for transactional leadership, 3.71 and 1.47 respectively.

The factors displayed in Table 5.5 are rank ordered from left to right according to the proportion of the total variance explained. The five factors retained encapsulate the leadership style dimensions established *a priori*, that is a combined core transformational and high performance, individualised support, intellectual stimulation, contingent reward and contingent punishment. Overall, the scale items of leadership styles exhibited loadings greater than or equal to $\pm$ 0.4 on at least one factor. Some of the scale items were not unambiguously loaded to their *a-priori* dimensions, for example, Item D8 (providing an appropriate model) and Item D13 (facilitating the acceptance of group goals) was highly loaded (loading of 0.58 and 0.62) on the first factor (core transformational) but also at the same time significantly loaded (loading of 0.46 and 0.45) on the second factor (individualised support).

There was an overlap between the core transformational and high performance dimensions of the transformational leadership as scale items of both dimensions were loaded jointly on the first factor. The individualised support and intellectual stimulation scale items were cleanly loaded on the second and third factors. Overall, except for the overlap of the core transformational and high performance dimension, the present data replicate the a-priori construct dimensions of transformational leadership of previous work (MacKenzie et al., 2001; Podsakoff et al., 1990; Wang et al., 2005). Likewise, the transactional leadership scale items were cleanly loaded on the fourth and fifth factor supporting the earlier research (MacKenzie et al., 2001).

The origins of the core transformational leadership dimension that combines the three dimensions of articulating a vision, providing an appropriate model and facilitating acceptance of group goals as well as the overlapping of the present core transformational

and high performance dimension, indicate that there were high intercorrelations between several dimensions. This justifies the researcher's decision to collapse all of these dimensions into a single scale appropriately named as Transformational Leadership Style. A similar approach is applied for the transactional leadership scale by combining contingent reward and contingent punishment into one scale. Several authors (e.g. Deluga, 1988b; Schlechter, 2006; Walumbwa et al., 2004) adopt a similar approach when the intent of the study is to secure a macro view of leadership styles rather than probing into minute distinction between different dimensions.

The present combined scale exhibited high internal consistency with coefficient Cronbach's Alphas of 0.92 for transformational leadership and 0.91 for transactional leadership. The minimum cut-off point of item-to-scale correlation for all scales closely met the criteria set by Payne and Pheysey (1971). The average of the total score of each set of items that formed the scale was used as a measure of the leadership styles i.e. transformational (mean = 4.56, S.D. = 1.14) and transactional (mean = 3.71, S.D. = 1.47).

Table 5.5: Factor Structure Matrix for Varimax Rotated Factor Solution – Leadership Styles

Item No	Leadership Styles/Items	CTR & HP I	ISU II	IS III	CR IV	CP V
	Transformational Leadership					
	Core Transformational (CTR)					
1.	My superior always articulating a vision.	.67	.36	.27	-.18	-.12
8.	My superior providing an appropriate model.	.58	.46	.29	-.21	-.12
13.	My superior facilitating the acceptance of group goals.	.62	.45	.25	-.13	-.12
	High Performance (HP)					
2.	My superior makes it clear to me that he or she expects me to give 110 percent all of the time.	.79	.13	.22	-.19	-.09
10.	My superior insists on only the best performance.	.81	.06	.24	-.13	-.09
17.	My superior will not settle for second best.	.71	-.08	.23	-.22	-.24
	Individualised Support (ISU)					
4.	My superior acts without considering my feelings.	.02	.74	.11	-.23	-.32
6.	My superior considers my personal feelings before acting.	.16	.77	.30	-.12	-.08
15.	My superior shows respect for my personal feelings.	.26	.82	.29	-.11	-.06
18.	My superior treats me without considering my personal feelings.	.09	.69	.14	-.19	-.23
	Intellectual Stimulation (IS)					
9.	My superior challenges me to think about old problems in new ways.	.29	.26	.78	-.10	-.12
14.	My superior asks questions that prompt me to think about the way I do things.	.27	.24	.79	-.16	-.14
19.	My superior has stimulated me to rethink the way I do some things.	.30	.28	.77	-.17	-.09
21.	My superior has ideas that have challenged me to reexamine some of my basic assumptions about my work.	.28	.17	.81	-.16	-.11

Table 5.5 (Cont'd)

Item No	Leadership Styles/Items	CTR & HP I	ISU II	IS III	CR IV	CP V
	Transactional Leadership					
	Contingent Reward (CR)					
3.	My superior only gives me positive feedback when I perform well.	-.18	-.17	-.11	.78	.31
7.	My superior assures special recognition when I produce at a high level.	-.13	-.09	-.16	.81	.36
12.	My superior usually commends me only if I exceed my productivity goals.	-.18	-.25	-.16	.79	.21
16.	My superior usually does not care to acknowledge me unless it is related to my good performance.	-.32	-.20	-.15	.78	.09
	Contingent Punishment (CP)					
5.	My superior will clearly show his or her disapproval if I perform at a low level.	-.16	-.31	-.19	.27	.73
11.	My superior tells me there is a close agreement between what I am expected to put into the group effort and what I can get out of it.	-.20	-.15	-.13	.31	.83
20.	My superior states in a matter-of-factly about what I can get from what I accomplish.	-.15	-.18	-.09	.26	.86
	Eigenvalues	9.9	2.3	1.7	1.1	1.0
	% of variance explained	46.9	11.1	8.1	5.0	4.8

N = 347
Principal Component with Varimax Rotation and Kaiser Normalisation

5.2.2 Downward Influence Tactics

An exploratory factor analysis was performed on the aggregate score of each of the six factors representing every downward influence tactics dimension (Hurley, Scandura, Schriesheim, Brannick, Seers, Vandenberg, & Williams, 1997). Principal component extraction and varimax rotation methods were performed on the measures of the six dimensions: inspirational appeals, consultation tactics, ingratiation tactics, exchange tactics, pressure tactics and legitimating tactics. Sampling adequacy for factor analysis was checked using the Kaizer-Meyer-Olkin (K-M-O) statistics and found to be 0.89 for all of the downward influence tactics dimensions indicating that the distribution of values was adequate for the factor analysis. George and Mallery (1995) suggested that a measure of > 0.9 is generally thought of as excellent, > 0.8 as good, > 0.7 as acceptable, > 0.6 as marginal, > 0.5 as poor and < 0.5 as unacceptable. Additionally, the Bartlett test of sphericity showed a statistical significance value of less than 0.005 for all dimensions, indicating that the data did not differ significantly from the normality assumption.

Factors with eigenvalues greater or equal to 1 were extracted for each of the downward influence dimensions. Ford, MacCallum, and Tait (1986) suggested that in exploratory research using factor analysis, an item loading equal to or above 0.4 is an appropriate cut-off point for making interpretations. In general, this rule will be used in discussing the meanings of factors in the construct dimension. Based on these criteria, the first six factors were selected. The results are presented in Table 5.6. The order of items was altered to show the clustering of items more clearly. Factor loading of > 0.40 are underlined to indicate the items finally selected to represent the six subscales. Considering that the result as a whole supported the *a priori* grouping of items, it can be

concluded that the downward influence tactics scale developed by Yukl and Falbe (1990) was suitable for application to the present data although some purification was necessary to improve its accuracy. The indices of the six downward influence tactics were computed by averaging the samples' responses to the items in each factor.

This resulted in the creation of six continuous subscales which represented inspirational appeals, consultation tactics, ingratiation tactics, exchange tactics, pressure tactics and legitimating tactics, which between them contained all items earlier included in the scale. The factor which represented exchange tactics contained six items as against eight items included in the earlier scale. Item E16 "My superior offers to help with a task if I agree to do it" and item E27 "My superior offers to do some of my work if I will do a task for him or her" were found to be poorly correlated with the rest of the exchange tactics items and not to be suitable for inclusion here; hence, they were dropped from the analysis. All the four factors explained nearly 63 percent of the variance in the data.

The standardised Cronbach's Alpha and the inter-item correlation for each subscale were computed and are provided in Table 5.3. All the scales had Coefficient Cronbach's Alpha greater than 0.78. The internal consistency reliability coefficients for all the scales were satisfactory (Nunnally, 1978; Nunnally & Bernstein, 1994). An inter-item correlation is a correlation between an item's score and subscale score computed from the remaining items in the set. The inter-item correlations for the five scales ranged between 0.50 and 0.78. Thus, the downward influence tactics dimensions measures can be taken as simple unweighted averages of their component items. The computed scale means and standard deviations are as follows: inspirational appeals (mean = 3.33, SD = 0.88), consultation tactics (mean = 3.50, SD = 0.82), ingratiation tactics (mean = 3.11,

SD = .82), exchange tactics (mean = 2.83, SD = 0.83), pressure tactics (mean = 2.90, SD = 0.88) and legitimating tactics (mean = 3.15, SD = 0.94).

The reliability of the scale was further tested using the method suggested by Payne and Pheysey (1971) that is the mean coefficient of the scale with items should be greater than the inverse of the square root of the number of items forming that scale. All downward influence items were included since all item-to-scale correlation were at least equal or above $1/\sqrt{30} = 0.18$. The alpha coefficient for each of the factors indicated adequate reliability or internal consistency with Cronbach's Alphas for inspirational appeals at 0.90, consultation tactics at 0.83, ingratiation tactics at 0.81, exchange tactics at 0.84, pressure tactics at .78 and legitimating tactics at 0.82. Hence, they all met or exceeded the recommended alpha level of 0.5 to 0.6 set by Nunnally (1978) for basic research. Given that these alphas are high and therefore, satisfactory, it can be concluded that the scale adequately captures the attributes of the downward influence tactics. Further analyses were carried out on the intercorrelations between the downward influence tactics dimensions to check for any sign of conceptual redundancy.

The predictive validity of the six downward influence tactics is evidenced in the correlational results in Table 5.4. As expected, consultation tactics correlated highly with transformational leadership ($r = 0.69$, $p < 0.01$) and subordinates' competence ($r = 0.36$, $p < 0.01$). And as speculated, the positive relationship between transformational leadership and inspirational tactics was confirmed by the present correlational result ($r = 0.66$, $p < 0.01$). Pressure tactics, as predicted, correlated negatively with satisfaction with supervision ($r = -0.39$, $p < 0.01$) and OCB ($r = -0.33$, $p < 0.01$). Intuitively, pressure tactics should also have a negative correlation with inspirational appeals, consultation

tactics and ingratiation tactics as the present results stipulated. These discriminating correlations are deemed adequate to demonstrate the predictive validity of the downward influence tactics measurement scales.

Table 5.6: Factor Structure Matrix for Varimax Rotated Factor Solution – Downward Influence Tactics

Item No	Influence Styles/Items	IA I	CON II	ING III	EX IV	PRE V	LE VI
	I. Inspirational Appeals (IA)						
1.	My superior uses stirring, emotional language to build enthusiasm for a proposed activity or change.	.71	.21	.06	-.08	.02	-.14
7.	My superior explains how a proposed activity or change would help my career.	.76	.17	.15	-.01	-.17	.12
8.	My superior talks about values and ideals when proposing a new activity or change.	.78	.23	.13	-.02	-.16	.13
13	My superior describes a proposed new activity or project as an exciting adventure or challenge.	.73	.26	.17	.01	-.11	-.06
19.	My superior makes an inspiring speech or presentation to gain support for a proposed activity or change.	.71	.14	.23	-.08	-.04	-.02
25.	My superior tells me a proposed activity or change is an opportunity to do something really exciting and worthwhile.	.78	.20	.24	-.05	-.03	.01
30.	My superior explains how a proposed change would benefit me (e.g., Help me get something I want, make my job easier to do).	.76	.04	.28	.02	.03	-.04
	II. Consultation (CON)						
2.	My superior asks me to help plan an activity or project that he or she wants me to support or carry out.	.26	.67	.01	-.02	.01	.02
10.	My superior asks me to suggest things I could do to help him or her attain a task objective.	.32	.75	.20	-.04	-.16	-.05
15	My superior encourages me to express my concerns I have about a proposed change that he or she wants me to support or implement.	.32	.73	.27	-.00	-.16	-.02
22.	My superior asks me to help plan a change that he or she want me to support or implement.	.28	.64	.23	-.16	-.06	-.07

Table 5.6 (Cont'd)

Item No	Influence Styles/Items	IA I	CON II	ING III	EX IV	PRE V	LE VI
	III. Ingratiation (ING)						
9.	My superior praises my skill or knowledge when asking me to do something.	.37	.17	.62	.10	-.13	.02
17.	My superior compliments me about something before making a request.	.34	.02	.65	.18	-.19	-.08
21.	My superior says that I have the unique skills and knowledge needed to carry out a difficult request.	.29	.27	.74	.00	.01	-.07
28.	My superior says I am the most qualified person for a task that he or she wants me to do.	.36	.16	.70	.06	.10	-.02
	IV. Exchange (EX)						
4.	My superior offers to do a specific task for me in exchange for carrying out a request for him or her.	.01	-.24	-.06	.74	.16	-.08
5.	My superior offers to help me implement a change if I agree to make it.	.07	.02	-.11	.81	.12	.07
11.	My superior offers to give me something I want in return for my help on a task or project.	-.05	-.25	.19	.72	.04	.08
12.	My superior offers to provide any assistance I need to carry out a request.	-.13	.16	.07	.75	.10	.22
16	My superior offers to help with a task if I agree to do it.	.22	.24	.10	.28	-.08	.15
18.	My superior offers to do something for me in the future in return for my help now.	-.01	-.31	.26	.67	.20	.09
24.	My superior offers to provide the resources or assistance I would need to do a task for him or her.	-.11	.23	.10	.63	.21	.23
27.	My superior offers to do some of my work if I will do a task for him or her.	.25	-.02	.13	.03	.07	-.04

Table 5.6 (Cont'd)

Item No	Influence Styles/Items	IN I	CO II	ING III	EX IV	PRE V	LE VI
	V. Pressure (PRE)						
3.	My superior demands that I carry out a request promptly.	-.16	.14	-.22	.22	.66	.29
20.	My superior strongly insists that I must carry out a request.	-.08	-.07	-.02	.20	.74	.26
26.	My superior uses threats or warnings in an attempt to get me to do something.	-.08	-.41	.12	.17	.63	.04
29.	My superior repeatedly checks to see if I have carried out a request.	-.06	-.12	-.04	.16	.78	.17
	VI. Legitimate (LE)						
6.	My superior says that his or her request is consistent with company rules and policies.	-.02	-.06	-.17	.16	.13	.80
14.	My superior verifies that his or her request or proposal is consistent with policies and standard procedures.	.05	-.01	-.03	.13	.22	.82
23.	My superior says that his or her request or proposal is consistent with tradition and precedent in the company.	-.01	-.03	.09	.09	.22	.83
	Eigenvalues	7.9	4.9	2.3	1.7	1.3	1.1
	% of variance explained	26.2	16.5	7.6	5.7	4.2	3.6

N = 347
Principal Component with Varimax Rotation and Kaiser Normalisation

5.2.3 Organisational Structure

The seven-item scale, which measures organicity, has a high inter-item reliability with a Cronbach's Alpha of 0.87. The item-to-scale correlation was above the cut-off point set by Payne and Pheysey (1971), i.e. $1/\sqrt{7} = 0.37$. This shows that the scale incorporated a consistent set of organising philosophy commonly adopted by organisations. The high reliability score is consistent with the works of Covin and Slevin (1989) which reported that this scale has an inter-item reliability coefficient of 0.80. The average of the algebraic sum of the scores for the seven items produced the overall score for this organicity scale (mean = 3.92, SD = 1.16). The organicity measure of structure was significantly associated with only two variables in the study i.e. span of control ($r = -0.27$, $p < 0.01$) and exchange tactics ($r = 0.13$, $p < 0.05$). These associations shown in Table 5.4 (Correlational Table), although limited in number, are still conceptually relevant and in the expected direction, lending support to the predictive validity of the construct.

5.2.4 Subordinates' Competence

The original subordinates' competence scale was made up of twenty-three items. The items were scaled so that high scores indicated high competence and low scores indicated low competence. The negatively worded items such as items J3, J5, J6, J7, J11, J14, J15, J16, J18 and J20 were reverse-scored prior to performing the analysis. Since the subordinates' competence was initially conceptualised as a unidimensional construct (Morse, 1976; Tharenou & Harker, 1984; Snyder & Bruning, 1985; Wagner & Morse, 1975), factor analysis was not performed on this variable. The mean correlations show that items in the scale are coherent enough to justify combining them to form a scale.

However, the scale demonstrated a less favourable (although adequate) measure of internal reliability with an Alpha value of 0.77. The integrity of the scale was further tested using the method suggested by Payne and Pheysey (1971), according to which, three items: J1 "No one knows this job better than I do", J10 "If anyone here can find the answer, I'm the one" and J22 "I can get so wrapped up in my work that I forget what time it is and even where I am" that seemed comparatively weak (correlation with the scale lower than $1/\sqrt{23} = 0.21$) were dropped from the scale as their item-to-scale correlation fell below of the recommended value of Payne and Pheysey (1971).

It seemed probable that these three items had been misunderstood by the respondents. This exclusion improved the internal consistency of the scale with a resultant Cronbach's Alpha of 0.79. The average of the score of the twenty remaining items were used in the measurement of the subordinates' competence (mean = 3.35, SD = 0.41). As mentioned earlier, and also supported by the result of this analysis, the one dimension of subordinates' competence has undergone satisfactory conceptual and empirical evaluation by previous researchers (Morse, 1976; Snyder & Bruning, 1985; Tharenou & Harker, 1984; Wagner & Morse, 1975). A strong positive correlation between the subordinates' competence and consultation tactics ($r = 0.36$, $p < 0.01$) provides preliminary evidence of the scale's predictive validity, since intuitively, the self-reported subordinates' competence would encourage the superior to exercise consultation tactics.

5.2.5 Role Ambiguity

The six-item scale measuring the role ambiguity appeared to be internally consistent with an Alpha value of 0.92. All scale items were reverse-scored prior to performing the analysis. The scale demonstrated item-to-scale correlations above the cut-off point set by Payne and Pheysey (1971), in this case: $1/\sqrt{6} = 0.41$. The entire scale items were thus retained for the measurement of the variable. The measurement of the variable role ambiguity was then obtained by averaging the total of these items (mean = 2.99, SD = 1.13).

5.2.6 Organisational Citizenship Behaviour

Seven items were used to measure the altruism and compliance aspect of subordinates' OCB. The items were scaled so that high scores indicated a high level of helping and or compliance behaviour. This study adopted a similar approach used by George (1990) and George and Bettenhausen (1990) in treating OCB as a unidimensional construct. Hence, factor analysis was not performed on this variable. The mean correlations showed that items in the scale are sufficiently coherent to justify combining them to form a scale. The coefficient Alpha of the reduced scale was relatively high at 0.89 indicating its robustness. The item mean and standard deviation for the scale were 4.63 and 1.33 respectively. The predictive validity of the OCB measure was indicated in its positive and significant correlation with consultation tactics ($r = 0.58$, $p < 0.01$) and inspirational appeals ($r = 0.53$, $p < 0.01$), and also ingratiation tactics and OCB ($r = 0.42$, $p < 0.01$) since the increased use of consultation tactics and inspirational appeals is expected to improve subordinates' OCB (Dulebohn et al., 2005; Sparrowe et al., 2006).

5.2.7 Satisfaction with Supervision

The three-item scale measuring the satisfaction with supervision appeared to be internally consistent with an Alpha value of 0.92. All scale items demonstrate item-to-scale correlations above the cut-off point set by Payne and Pheysey (1971), in this case: $1/\sqrt{3} = 0.58$. All scale items were thus retained for the measurement of the variable. The measurement of the variable satisfaction with supervision was then obtained by averaging the total of these items (mean = 3.34, SD = 0.98)

5.3 Path Analysis Procedure and Results

Path analysis was used as the main analytical technique to test the hypothesised relationships among variables in this study. A series of multiple regressions was performed and results were represented by the equations 1 to 10 in Chapter 4. This was followed by the computation of regression, path coefficients and their *t* values and statistical significance for a full model. Next, by following the theory-trimming approach to path analysis, a more parsimonious trimmed model with new path coefficients was computed and presented.

5.3.1 Distribution Properties of the Variables

It is necessary to examine the general distributional properties of the variables to be used in subsequent explanatory modelling. This is one of the conditions in the application of the structural equations represented in equation 1 to 10. For this purpose, two indicators were computed, these being skewness and kurtosis statistics. Skewness measures the departure from symmetry about the mean and Kurtosis measures the peakedness or

flatness of the unimodal frequency curve. George and Mallery (1995) suggested that variables with a skewness and kurtosis measured value in the range of -2 to 2 can be treated as closely resembling normal distribution. The measure of skewness and kurtosis in Table 5.7 shows that all of the variables included do not differ significantly from the assumption of normality. Overall, the sample showed the satisfactory bell-shaped properties of a normal distribution.

Table 5.7: Univariate Test of Normality[a]

	Variables	Skewness	Kurtosis
1.	Transformational Leadership Style	-0.86	-0.80
2.	Transactional Leadership Style	0.18	-1.53
3.	Organisational Structure	-0.19	-0.37
4.	Subordinates' Competence	0.56	0.96
5.	Role Ambiguity	0.69	-0.12
6.	Inspirational Appeals	-0.37	-0.49
7.	Consultation Tactics	-0.56	-0.22
8.	Ingratiation Tactics	-0.38	-0.09
9.	Exchange Tactics	0.05	-0.38
10.	Pressure Tactics	-0.03	-0.60
11.	Legitimating Tactics	-0.21	-0.37
12.	Organisational Citizenship Behaviour	-0.54	-0.68
13.	Satisfaction with Supervision	-0.60	-0.61

[a]N = 347

5.3.2 Common Method Variance

The problem of common method variance needs to be addressed prior to proceeding with further statistical analyses. This is due to the data obtained in this study being subjective and provided by a single person (Cote & Buckley, 1987; Podsakoff & Organ, 1986). The use of self-report data is rampant in the management and behavioural research, but there is a concern that under certain situations, self-report data can either inflate (Cote & Buckley, 1987; Williams, Cole, & Buckley, 1989) or suppress (Ganster, Hennessey, & Luthans, 1983) the strength of relationships being studied, causing common method variance problems. Despite initial preventive efforts such as in the elimination of social desirability bias and the reduction of the effects of respondents' strain toward consistency in the scale construction, post hoc analysis is still needed to verify the obstrusiveness of common method variance.

In an attempt to check for common method bias on the observed relationships, the researcher used one of the common statistical procedures called Harman's (1967) single factor test (Podsakoff & Organ, 1986). In this procedure, all the variables of interest are entered into a factor analysis. The results of the unrotated factor solution are then examined to determine the number of factors that are necessary to account for the variance in the variables. The basic assumption of this technique is that if a substantial amount of common method variance exists, either (a) a single factor will emerge from the factor analysis, or (b) one 'general' factor will account for the majority of the covariance in the exogenous and endogenous variables.

In the present study, all multi-items scales of the respondents' self-report were entered into a single factor analysis. The principal component method (following Tippin

& Sohi, 2003) was used to obtain the unrotated factor solution for the test. Twenty-two (22) factors with eigenvalues greater or equal to 1 were entered from this collection of selected items. The 22 factors explained 73.61% of the variance with no single factor explaining more than 25.24% of the variance. The total variance explained with respect to the components extracted is shown in Table 5.8. The Scree plot is shown in Figure 5.1. Several previous studies have employed this procedure of controlling for common method variance (Andersson & Bateman, 1997; Aulakh & Gencturk, 2000; Greene & Organ, 1973; MacKenzie et al., 1991; MacKenzie, Podsakoff, & Fetter, 1993; MacKenzie, Podsakoff, & Paine, 1999; Podsakoff et al., 1990; Organ & Greene, 1981; Schriesheim, 1979).

Table 5.8: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	27.768	25.244	25.244	27.768	25.244	25.244
2	7.489	6.808	32.052	7.489	6.808	32.052
3	6.086	5.533	37.585	6.086	5.533	37.585
4	5.099	4.636	42.221	5.099	4.636	42.221
5	4.303	3.911	46.132	4.303	3.911	46.132
6	3.742	3.401	49.534	3.742	3.401	49.534
7	2.859	2.599	52.132	2.859	2.599	52.132
8	2.697	2.452	54.585	2.697	2.452	54.585
9	2.187	1.988	56.573	2.187	1.988	56.573
10	2.018	1.834	58.407	2.018	1.834	58.407
11	1.976	1.796	60.203	1.976	1.796	60.203
12	1.706	1.551	61.754	1.706	1.551	61.754
13	1.670	1.518	63.272	1.670	1.518	63.272
14	1.564	1.422	64.694	1.564	1.422	64.694
15	1.445	1.314	66.007	1.445	1.314	66.007
16	1.376	1.251	67.258	1.376	1.251	67.258
17	1.329	1.208	68.466	1.329	1.208	68.466
18	1.202	1.092	69.559	1.202	1.092	69.559
19	1.190	1.082	70.641	1.190	1.082	70.641
20	1.168	1.062	71.703	1.168	1.062	71.703
21	1.084	.986	72.688	1.084	.986	72.688
22	1.020	.927	73.616	1.020	.927	73.616

Extraction Method: Principal Component Analysis.

Results shown for Eigenvalue greater than 1

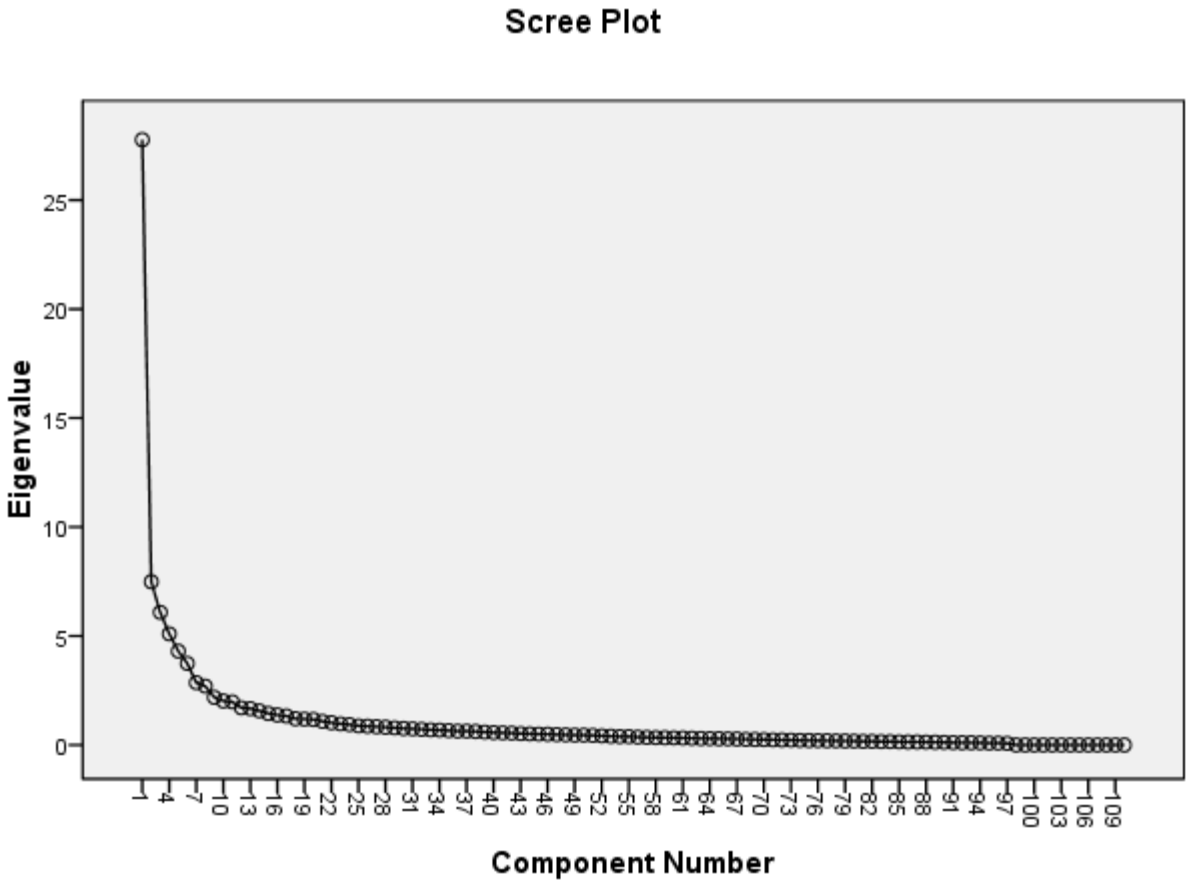

Figure 5.1: Scree Plot

As shown in the results, common method variance has less effect on the strength of the hypothesised relationships. Therefore, the relationships between leadership styles, organisational contexts, mediators and criterion variables were not substantially affected by the common method variance. Although these results indicate the unobtrusiveness of common method variance, the single factor test itself exhibits a certain ambiguity since the likelihood of finding more than one factor naturally increases as the number of variables increase. Even with this caveat in mind, one simply cannot ignore the obvious deduction from this analysis of the credibility of the data used. This procedure was followed to counter the effect of social desirability that is often found when people are asked to report on their own behaviour.

Common method variance has long been a concern to researchers in behavioural research. Even now, researchers who used a single factor test to check method biases have further analysed the data by using confirmatory factor analysis (CFA) which is a more advanced technique to test the hypothesis that a single factor can account for all variance in their data (Iverson & Maguire, 2000; Korsgaard & Roberson, 1995; Mossholder, Bennett, Kemery, & Wesolowski, 1998). Indeed, there are other statistical procedures to control the common method biases, such as the partial correlation technique (Brief, Burke, George, Robinson, & Webster, 1988; Burke, Brief, & George, 1998; Chen & Spector, 1991; Jex & Sepctor, 1996), but this particular technique also has its limitations (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). So far, there is no complete solution for a common method problem although Podsakoff et al. (2003) have proposed some important guidelines for researchers to identify the potential biasing effects of method variance.

5.3.3 Path Regression Coefficients and Path Coefficients

Within the present sample, path ordinary least square (OLS) equations were fitted to the data in order to estimate the path regression coefficients and path coefficients. At each stage, represented by equations, an endogenous variable is regressed in a single analysis on all the independent variables that are hypothesised to affect it. The model shown in Figure 3.1 in Chapter 3 requires eighteen regression analyses (equation 1 to 10 in Chapter 4) for the calculation of the path coefficients. For example, the path coefficient from X1 to X5 ($P_{5,1}$) and similarly from X2 to X5 ($P_{5,2}$), X3 to X5 ($P_{5,3}$), X4 to X5 ($P_{5,4}$) are calculated by regressing X5 on X1, X2, X3 and X4 and accordingly, $P_{6,1}$, $P_{6,2}$, $P_{6,3}$ and $P_{6,4}$ are obtained by regressing variable X6 on variable X1, X2, X3 and X4. A path coefficient indicates the direct effect of a variable hypothesised as a cause of a variable taken as an effect (Pedhazur, 1997).

It is necessary to remind that the causal flow of the model is unidirectional. In the type of model often called recursive models, no allowance is made for reciprocal causation between variables either directly or through a causal loop. An endogenous variable treated as dependent on one set of variables may also be conceived as an independent variable with respect to another endogenous variable(s). For instance, variable X5 and X6 are taken as dependent on variables X1, X2, X3 and X4 and as two of the independent variables with respect to variable X7. On the other hand, variable X8 is hypothesised to be dependent on variables X1, X2, X3, X4, X5 and X6 and not on variable X7. The exclusion of variable X7 from the causal relation is deliberate, since alternative interpretation of directional dependency is not hypothesised even though correlation may be possible because of reasons outside of the model. Since it is almost

never possible to account for the total variance of a variable, residuals are introduced to represent the effects of variables not included in the model. For example in this model, D5 is the residual for variable X5. This is analogous to the residual *e* in regression analysis. The path coefficient from D5 to variable X5 is equal to $\sqrt{(1-R^2_{5,1234})}$, where $R^2_{5,1234}$ is the squared multiple correlation of the endogenous variable X5 with variables X1, X2, X3 and X4 that affect it. A similar approach is carried out for the remaining variables until all the path coefficients are determined for the model.

The results of successive regression analyses using the REGRESSION procedure in SPSS for the just-identified model are given in Table 5.9. The results included are the path regression coefficients and the standard errors, beta coefficients, *t* values and the significance of the linear relationships between the dependent variables and independent variables. The R^2 with the *F-test* measures the overall efficacy of the regression equation by the measure of the proportion of variance explained by the independent variables in the predictor variable and their significance. It is important to recall that when variables in a causal model are expressed in standard scores (*z*), and the underlying assumptions of the regression equations are reasonably met, path coefficients turn out to be equal to the standardised regression coefficients (*beta*) obtained in the multiple OLS regression analysis.

Table 5.9: Results of Multiple Regression Analysis

Dependent and independent variables	Regression coefficients for a full model	Path coefficients for a full model	t values for a full model	Regression coefficients for a trimmed model	Path coefficients for a trimmed model	t values for a trimmed model
Subordinates' Competence						
Transformational Leadership	.133(.024)	.366	5.597***	.114(.019)	.312	6.144***
Transactional Leadership	.024(.018)	.087	1.326			
Organisational Structure	.018(.019)	.052	.980			
Span of Control	.003(.001)	.144	2.725**	.003(.001)	.127	2.493*
(Constant)	2.539(.183)		13.873***	2.795(.089)		31.487***
R^2	.108			.106		
F	11.428***			21.521***		
Df	4,342			2,344		
Role Ambiguity						
Transformational Leadership	-.655(.055)	-.659	-11.926***	-.591(.043)	-.595	-13.795***
Transactional Leadership	-.077(.043)	-.100	-1.812			
Organisational Structure	.092(.044)	.094	2.113*	.108(.042)	.111	2.564*
Span of Control	-.003(.003)	-.051	-1.147			
(Constant)	5.948(.422)		14.097***	5.272(.256)		20.581***
R^2	.362			.358		
F	50.098***			97.349***		
Df	4,342			2,344		
Inspirational Appeals						
Transformational Leadership	.416(.047)	.538	8.751***	.454(.038)	.588	11.852***
Transactional Leadership	-.041(.031)	-.068	-1.322			
Organisational Structure	.041(.032)	.055	1.299			
Span of Control	.001(.002)	.030	.718			
Subordinates' Competence	-.033(.095)	-.015	-.345			
Role Ambiguity	-.113(.041)	-.145	-2.736**	-.099(.039)	-.127	-2.562*
(Constant)	1.850(.499)		3.706***	1.550(.263)		5.901***
R^2	.446			.446		
F	47.472***			140.543***		
Df	6,340			2,344		

Table 5.9 (Cont'd)

Dependent and independent variables	Regression coefficients for a full model	Path coefficients for a full model	t values for a full model	Regression coefficients for a trimmed model	Path coefficients for a trimmed model	t values for a trimmed model
Consultation Tactics						
Transformational Leadership	.381(.042)	.526	9.101***	.388(.034)	.536	11.455***
Transactional Leadership	-.003(.027)	-.005	-.106			
Organisational Structure	-.004(.028)	-.005	-.130			
Span of Control	-.002(.002)	-.060	-1.518			
Subordinates' Competence	.227(.084)	.114	2.709**	.212(.083)	.107	2.554*
Role Ambiguity	-.146(.036)	-.201	-4.018***	-.144(.036)	-.197	-4.012***
(Constant)	1.497(.440)		3.399***	1.452(.379)		3.833***
R^2	.510			.511		
F	60.995***			121.412***		
Df	6,340			3,343		
Ingratiation Tactics						
Transformational Leadership	.334(.050)	.463	6.691***	.338(.040)	.468	8.382***
Transactional Leadership	.003(.033)	.005	.094			
Organisational Structure	.064(.033)	.090	1.914			
Span of Control	.002(.002)	.056	1.183			
Subordinates' Competence	.058(.100)	.030	.585			
Role Ambiguity	-.087(.043)	-.120	-2.008*	-.089(.041)	-.122	-2.190*
(Constant)	1.356(.525)		2.584**	1.832(.277)		6.626***
R^2	.299			.298		
F	25.651***			74.330***		
Df	6,340			2,344		
Exchange Tactics						
Transformational Leadership	-.037(.056)	-.051	-.659			
Transactional Leadership	.175(.036)	.312	4.821***	.189(.030)	.336	6.387***
Organisational Structure	.091(.037)	.128	2.447*	.090(.037)	.127	2.423*
Span of Control	-.005(.002)	-.117	- 2.230*	- .005(.002)	-.114	-2.180*
Subordinates' Competence	-.260(.112)	-.130	-2.328*	- .266(.111)	-.134	-2.397*
Role Ambiguity	-.114(.048)	-.156	-2.353*	-.098(.042)	-.135	-2.327*
(Constant)	3.270(.586)		5.584***	3.029(.457)		6.629***
R^2	.137			.139		
F	10.181***			12.151***		
Df	6,340			5,341		

Table 5.9 (Cont'd)

Dependent and independent variables	Regression coefficients for a full model	Path coefficients for a full model	t values for a full model	Regression coefficients for a trimmed model	Path coefficients for a trimmed model	t values for a trimmed model
Pressure Tactics						
Transformational Leadership	-.063(.058)	-.081	-1.084			
Transactional Leadership	.192(.038)	.320	5.098***	.225(.029)	.375	7.663***
Organisational Structure	.028(.039)	.036	.712			
Span of Control	-.001(.002)	-.023	-.457			
Subordinates' Competence	-.312(.116)	-.147	-2.697**	-.384(.104)	-.181	3.689***
Role Ambiguity	.028(.050)	.036	.565			
(Constant)	3.343(.607)		5.511***	3.357(.383)		8.762***
R^2	.188			.189		
F	14.365***			41.251***		
Df	6,340			2,344		
Legitimating Tactics						
Transformational Leadership	.067(.067)	.081	1.005			
Transactional Leadership	.165(.044)	.257	3.782***	.141(.034)	.220	4.185***
Organisational Structure	-.046(.045)	-.057	-1.029			
Span of Control	6.01E-005(.003)	.001	.023			
Subordinates' Competence	.213(.134)	.094	1.589			
Role Ambiguity	.066(.058)	.079	1.137			
(Constant)	1.502(.704)		2.132*	2.630(.134)		19.561***
R^2	.045			.046		
F	3.694***			17.512***		
Df	6,340			1,345		

Table 5.9 (Cont'd)

Dependent and independent variables	Regression coefficients for a full model	Path coefficients for a full model	t values for a full model	Regression coefficients for a trimmed model	Path coefficients for a trimmed model	t values for a trimmed model
OCB						
Transformational Leadership	.303(.081)	.259	3.737***	.315(.071)	.269	4.443***
Transactional Leadership	.006(.047)	.007	.129			
Organisational Structure	.022(.046)	.019	.480			
Span of Control	.001(.003)	.008	.209			
Subordinates' Competence	.063(.142)	.020	.444			
Role Ambiguity	-.334(.062)	-.284	-5.436***	-.352(.058)	-.299	-6.114***
Inspirational Appeals	.190(.087)	.126	2.176*	.182(.079)	.120	2.294*
Consultation Tactics	.240(.091)	.149	2.640**	.257(.089)	.159	2.888***
Ingratiation Tactics	-.018(.086)	-.011	-.212			
Exchange Tactics	.088(.075)	.055	1.173			
Pressure Tactics	-.125(.074)	-.083	-1.696			
Legitimating Tactics	-.108(.063)	-.076	-1.707			
(Constant)	2.959(.784)		3.773***	2.743(.431)		6.358***
R^2	.506			.502		
F	30.478***			88.247***		
Df	12,334			4,342		
Satisfaction with Supervision						
Transformational Leadership	.304(.047)	.353	6.507***	.309(.041)	.359	7.475***
Transactional Leadership	-.009(.027)	-.014	-.336			
Organisational Structure	.044(.027)	.052	1.644			
Span of Control	.000(.002)	-.007	-.214			
Subordinates' Competence	-.101(.082)	-.043	-1.233			
Role Ambiguity	-.282(.035)	-.326	-7.962***	-.265(.033)	-.307	-8.010***
Inspirational Appeals	.154(.050)	.138	3.055***	.165(.046)	.149	3.626***
Consultation Tactics	.145(.052)	.123	2.771**	.135(.052)	.114	2.617**
Ingratiation Tactics	3.75E-005(.050)	.000	.001			
Exchange Tactics	.063(.043)	.053	1.443			
Pressure Tactics	-.154(.043)	-.139	-3.610***	-.135(.035)	-.122	-3.817***
Legitimating Tactics	-.020(.036)	-.019	-.546			
(Constant)	2.318(.452)		5.134***	2.098(.288)		7.297***
R^2	.696			.694		
F	67.056***			158.218***		
Df	12,334			5,341		

* $p < .05$, ** $p < .01$, *** $p < .005$
Numbers in parentheses are the standard errors

5.3.4 Theory Trimming

The result of path analysis in Table 5.9 for the full model indicates that 68 path coefficients have been obtained from the solution of the regression equations. Interactions of this size are difficult to make sense of. As highlighted by Pedhazur (1997), a just identified model has no consequence for the assessment of the validity of the model. It would be necessary to simplify the model by eliminating some paths. This process will result in an overidentified model, since it will have more known elements (the correlation among the variables) than unknown (path coefficients). The systematic elimination of the path or the respecification of the model in terms of its causal sequence can result in both models' overspecification and provide an avenue for model testing. The model is made over-identified not only to give effect that the model is falsifiable but also to seek simplification of reality that remains useful and at the same time to make understanding of the reality more achievable.

A good model exhibits an appropriate balance between the efforts to represent a complex phenomenon in the simplest (most parsimonious) way and to retain enough complexity that (still) leads to the most meaningful (and hopefully correct) interpretation possible (Mueller, 1997). As shown by Pedhazur (1997), no matter how believable or attractive it may seem, the consistency of a causal model with a set of data is no proof of the validity of the model. The testing of the model should always take a cue from a theoretical perspective that is "when *a priori* ground exists for testing it" (Pedhazur, 1997, p.807).

In the interest of parsimony, some researchers have suggested (e.g., Duncan, 1975; Heise, 1969) that after having estimated the parameters of a model, path coefficients that

do not meet the criteria of statistical significance and or meaningfulness be deleted from the model – hence the name 'theory or model trimming' (Heise, 1969) to characterise this approach. This approach has also been described as model revision or respecification (Pedhazur, 1997). Testing a given path coefficient β is tantamount to testing the path corresponding to it. This is usually carried out using a *t* or *F* ratio.

Following the theory trimming approach, path coefficients whose *t* ratios are smaller than the tabled *t* at a prespecified level of significance are deleted. For example, James et al. (1982) suggested that coefficients not significant at the 10% acceptance level or better as being zero, should be excluded from the final estimation of path coefficients. When using multiple regression, one will notice that when more than one β in a given equation is statistically not significant, the deletion of one of the β*'s* from the equation may lead not only to changes in the magnitude of the remaining β*'s* but also to changes in the results of their tests of statistical significance. The *F* test can then be used to simultaneously test more than one path coefficient in a given equation. However, using the criterion of statistical significance may have its drawbacks, as it is noted that when the sample size is relatively large, even meaningless path coefficients may still be statistically significant. To overcome such problem, researchers may prefer to use the criterion of meaningfulness for the deletion of paths, even when their coefficients are statistically significant. Consequently, researchers tend to arbitrarily choose the often questionable criterion of meaningfulness for the deletion of the path coefficients (e.g. those smaller than 0.05).

It was decided that the criteria for model trimming in the present analysis is based on the test for significance. Similar approach is found to be used by several researchers

(Hill & Snell, 1989; Reger, Duhaime, & Stimpert, 1992; Schul, Davis, & Hartline, 1995; Wiersema & Bantel, 1993). All coefficients not significant at the 10% acceptance level or better are excluded from the final estimation of path coefficients. Furthermore, stepwise regression analysis is also employed to obtain an even more parsimonious and relevant set of variables for inclusion in the final trimmed model. This is somewhat necessary on theoretical grounds as in the case of multiple regressions, as the inclusion of more variables than necessary will sometimes alter the strength of the effects and the significance of the remaining variables. The path coefficients of the trimmed model are all significant at the 0.05 level. Path analysis results for both the full and trimmed models are shown in Table 5.9.

5.3.5 Direct, Indirect and Mediating Effects

The direct effect (*DE*) of one variable on another is indicated by the path coefficient obtained from the path analysis. This can be interpreted as the amount of expected change in a dependent variable as a result of a unit change in a particular independent variable controlling for all the variables that affect the dependent variable in question. Thus, it is a measure of that part of the total effect which is not transmitted via intervening variables.

The part of the correlation between independent and dependent variable through a mediating variable is termed the indirect effect (*IE*). Indirect effects are those parts of a variable's total effect, which are transmitted or mediated by variables specified as intervening between the cause and effect of interest in a model. That is, they explain how much of a given effect occurs, because the manipulation of the antecedent variable of

interest leads to changes in other variables, which in turn change the consequent variable. Although Pedhazur (1997) highlighted that in a typical causal model, variable *X* can affect variable *Y* indirectly through the multiple compound path, it stands to reason that indirect effects through certain paths may be more meaningful and or stronger than others. The interest in specific indirect effects resulted in several definitions of them being put forward (Fox, 1980; Greene, 1977). This study however, adopts Greene's (1977) definition, which confines the specific indirect effect to one mediator only. The indirect effect of variable *X* on variable *Y* through a mediating variable *Z* is then calculated as the product of the direct effect of variable *X* on variable *Z* and variable *Z* on variable *Y*. Additionally, the effects that are caused by more than one mediating variable are termed as 'other indirect effects' and are calculated by multiplying the path coefficients of all intervening variables in the causal sequence. This is however, not evaluated in the present study as it plays an insignificant role in explaining the phenomena.

The significance of indirect paths involving a single mediating variable was assessed by a procedure outlined by Venkatraman (1989). Using this procedure, an approximate t-statistic can be computed to test the significance of an indirect path through a mediator (Sobel, 1982). This statistic is computed using the following formula:

$$t = (ab) / \sqrt{(b^2sa^2 + a^2sb^2)}$$

where *a* and *b* refer to direct regression coefficients before and after the mediator, *ab* refers to the product of these two paths, and *sa* and *sb* refer to the standard errors of estimate of the respective path. The standard errors and *t-values* are reported in the unstandardised coefficients because standard errors of standardised parameters may,

under certain circumstances, be incorrect (Bollen, 1989; Cudeck, 1989). The result of this computation is shown in Table 5.10.

Table 5.10: Test of Significance of Indirect Effect through a Mediator

Measurement path	Before mediator		After mediator		t-statistic
	Regression coefficient (a)	Standard errors (sa)	Regression coefficient (b)	Standard errors (sb)	$t= (ab)/\sqrt{(b^2sa^2+a^2sb^2)}$
X1 → X5 → X8	0.133	0.024	0.227	0.084	2.429*
X1 → X6 → X7	-0.655	0.055	-0.113	0.041	2.685**
X1 → X6 → X8	-0.655	0.055	-0.146	0.036	3.839***
X1 → X6 → X9	-0.655	0.055	-0.087	0.043	1.995*
X1 → X6 → X13	-0.655	0.055	-0.334	0.062	4.908***
X1 → X6 → X14	-0.655	0.055	-0.282	0.035	6.673***
X1 → X7 → X13	0.416	0.047	0.190	0.087	2.120*
X1 → X7 → X14	0.416	0.047	0.154	0.050	2.909***
X1 → X8 → X13	0.381	0.042	0.240	0.091	2.533*
X1 → X8 → X14	0.381	0.042	0.145	0.052	2.665**
X3 → X6 → X10	0.092	0.044	-0.114	0.048	-1.569
X4 → X5 → X10	0.003	0.001	-0.005	0.002	-1.921

Degrees of freedom = N-1 = 346
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

X1 = Transformational Leadership
X2 = Transactional Leadership
X3 = Organisational Structure
X4 = Span of Control
X5 = Subordinates' Competence
X6 = Role Ambiguity
X7 = Inspirational Appeals
X8 = Consultation Tactics
X9 = Ingratiation Tactics
X10 = Exchange Tactics
X11 = Pressure Tactics
X12 = Legitimating Tactics
X13 = Organisational Citizenship Behaviour
X14 = Satisfaction with Supervision