Project Report

Group 4 | DANA 4830

Aim:

Exploring the relationship between Vietnamese Women Leadership Styles and their success at positions of responsibilities.

Team Members:

Bhargav Kakadiya : 100350875
Gaurav : 100350679
Guneesh Bhatia : 100346420
Ronak Batra : 100348475

Index

1. Introduction
2. Descriptive Analysis
    - 2.1 Contribution of scales in Leadership Behaviours
    - 2.2 Checking Assumptions
3. Inferential Analysis
    - 3.1 Principal Component Analysis
    - 3.2 Factor Analysis
    - 3.3 Confirmatory Factor Analysis
4. Interpretation and Suggestion
    - 4.1 Most significant Leadership style and reason for its adoption
    - 4.2 Relationship between specific style of adoption and women's internal behaviour.
    - 4.3 Relationship between leadership styles and organizational success.
5. Appendix

1. Introduction

Although leadership existed since the inception of humanity, it has become much more evident to truly understand the meaning of leadership and the effects of it on the organization in recent times. Today, leadership is studied and researched across a lot and still there isn't much clarity on its definition.According to house el tal "leadership is defined as a process to influence, motivate individuals to contribute to success, and effectiveness of an organization". While soon enough, leadership styles became a significant topic of research in pursuit of organizational success. This report focuses on unveiling such leadership styles and behaviours of Vietnamese women.

Women are a critical part of the economic developments of Vietnam and have a long tradition of participating actively in the labor force. However, only few studies investigate the success factors associated with women's leadership styles in Vietnam, given the country's Confucian-influenced values, patriarchal culture and male-dominated practices.

The aim of this report is to understand the leadership factors that relate to women's leadership styles corresponding to their success at a position of responsibility in small and medium enterprise (SMSE).

Leadership was investigated on three leadership styles named transactional, transformational, and passive avoidant. The success of leadership was measured on three attributes: effort, satisfaction, and effectiveness. The three leadership styles are: -

1. Transactional Leadership: -Transactional leadership style focuses on behaviour/success and offers rewards in exchange of efforts of their employees. Efficiency of the leader is measured by the success of the goals. Two components that define transactional leadership styles are: -
    - Contingency Reward: -Such an attribute contributes in motivating the employees by rewarding them for their efforts in terms of incentives.
    - Management by exception active: - Management by exception active is an attribute which is opposite to management by exception passive and the leaders here are stringent and take care of the protocols to be followed so as to minimize any errors and maintain the standard of the task.
2. Transformational Leadership: -

    Attributes that contribute to transformational leadership style are as follows: -
    - Inspirational Motivation: -Such leaders are optimistic about the future and try to instill bigger visions in the minds of their employees by giving them motivational speeches and believing in them.
    - Idealized Influence attribute and behaviour: - Leaders with such attributes tend to show loyalty and make decisions based on ethical and moral aspects. They inspire confidence and lead by example.
    - Intellectual Stimulation:- Leaders having such attributes try to make a change in tradition and belief of employees by encouraging them to imbibe new viewpoints and perspectives to solve a problem.

- Individualized Consideration: -Such leaders are interested in their employees needs and development. They tend to nurture them by giving them advice, training them on skills.

3. Passive Avoidant : -

   Laissez faire is an attribute of passive avoidant leadership style where the leader doesn't care about the employees and doesn't follow up with them. Also, such leaders are never available to their employees, even if they need help and ask for assistance. Leaders with such leadership style tend to have negative correlation with other organizational success and other behavioural attributes.
   Management by exception passive is another attribute of passive avoidant which refers to leaders being active only when the standards are not met. Such leaders do not intervene with their employee's task and don't direct them if the standards are met properly.

Research Questions: -

Further, this report answers the study on three key questions about the leadership style which are as follows: -

- Which is the most significant leadership style and the reason for its adoption.
- What is a relationship between specific leadership style and the women's internal perception such as personal and behavioural characteristics, level of knowledge and competency, and degree of power and ambition?
- What is a relationship between the leadership styles and its impact on the success of an organization.

Dataset: -

The survey in the question was observed to be divided into two parts, rater form and leader form. In the rater form, all the employees rated their respective leaders on 45 questions which were measured on a likert scale from 0-4. Similarly, in the leader form, leaders rated themselves on the similar scale. Also, the dataset had only one accuracy error in C29 of the leader form in which the likert scale value of 5 was converted to 1 as it is assumed to be a typo error.

Likert scale	Description
0	Not at all
1	Once in a while
2	Sometimes
3	Fairly
4	Frequently, if not always

Also,all 45 questions were divided across 9 leadership behaviours and 3 performance measures formed after factor analysis, which were mapped to three leadership styles transformational , transactional and passive avoidant.

Leadership styles	Questions
Transformational	C25,C29,C39,C41,C12,C18,C40,C42,C19,C23,C36,C46,C16,C24,C33,C44
Transactional	C21,C26,C11,C45,C14,C32,C34,C37
Passive Avoidant	C15,C17,C38,C43,C13,C22,C27,C30

Performance Measures:-

Effectiveness	C47,C50,C53,C55
Satisfaction	C48,C51
Extra Efforts	C49,C52,C54

2. Descriptive analysis

2.1 Contribution of scales in leadership behaviour

The table given below shows us the percentage of each scale for different leadership behaviours.

Leadership Behaviour/Scale	0	1	2	3	4
Idealized Influence Attribute	4.45	11.82	18.21	31.20	34.30
Idealized Influence Behaviour	5.03	9.68	19.37	33.72	32.17

Inspirational Motivation	3.48	7.94	18.99	32.75	36.82
Intellectual Stimulation	3.87	8.72	19.96	31	36
Individualized Consideration	4.26	10.27	20.15	32.94	32.36
Contingent Reward	3.48	8.13	15.89	36.62	35.85
Management by Exception: Active	5.03	14.14	20.15	28.68	31.97
Management by Exception: Active	17.05	32.94	22.67	10.07	17.24
Laissez Faire	29.26	23.25	18.99	12.20	16.27

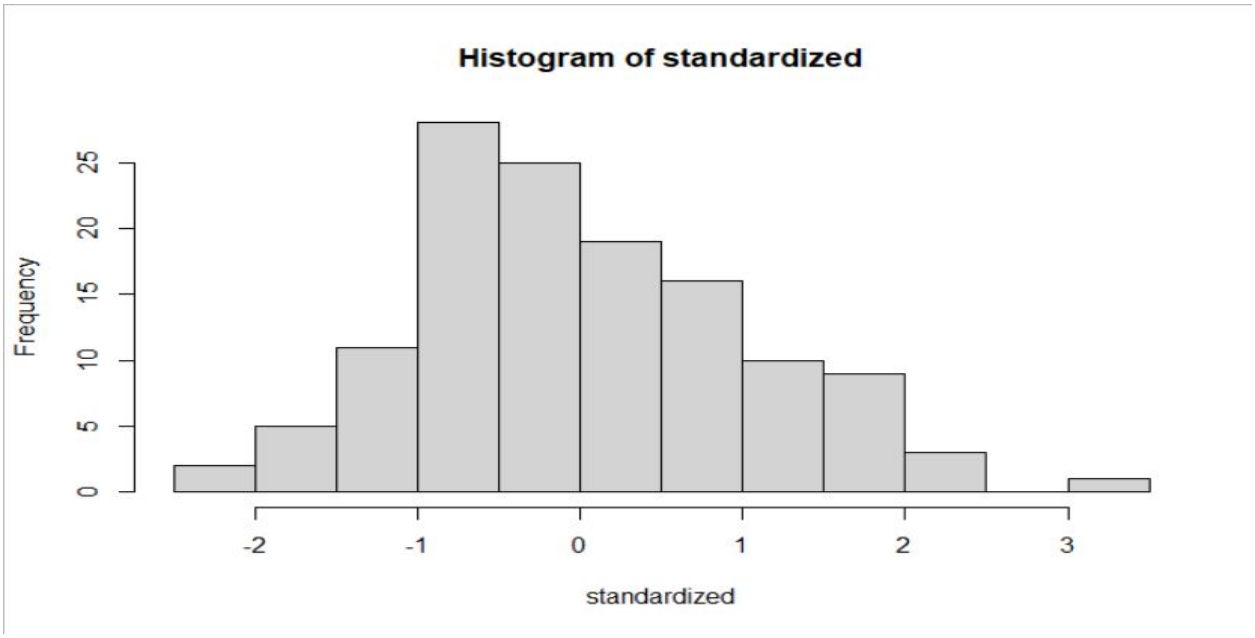
We can infer from the above table that most of the leaders were rated in the scale of 3 or 4.

2.2 Checking assumptions

The basic assumption for statistical analysis i.e. normality, linearity and homogeneity was checked.

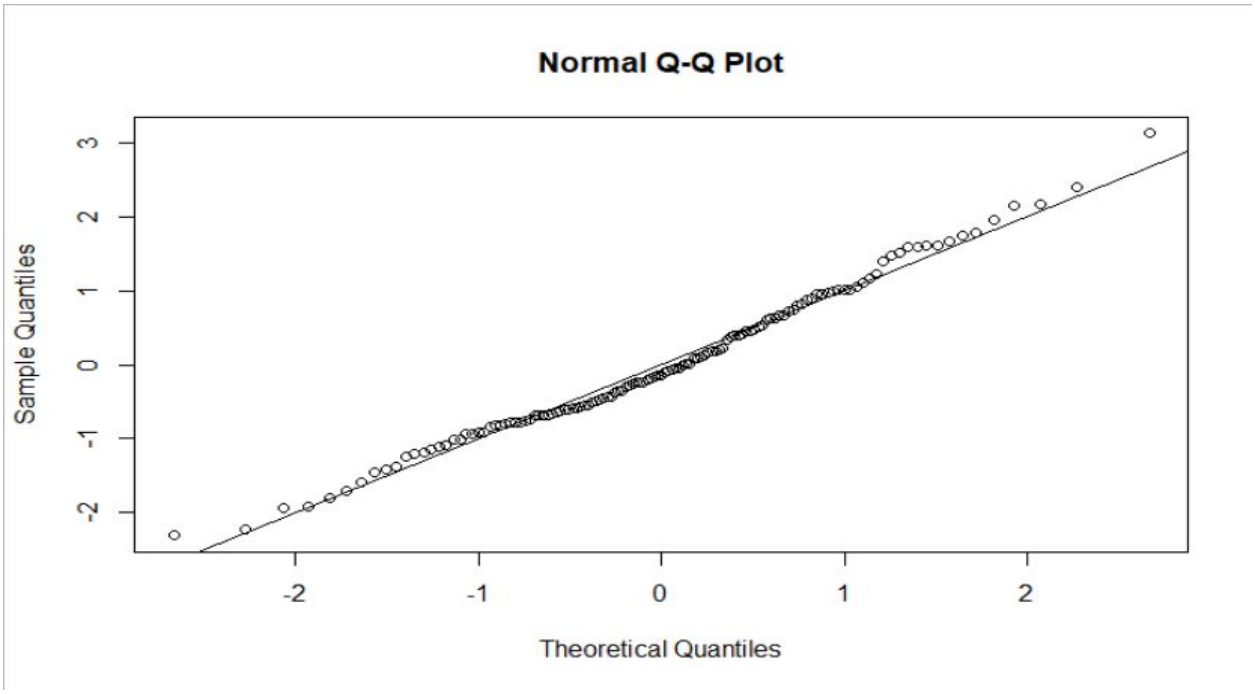
1. Normality

First we checked normality assumption with basic histogram. We found that histogram was skewed. Therefore, our normality assumption has been violated.



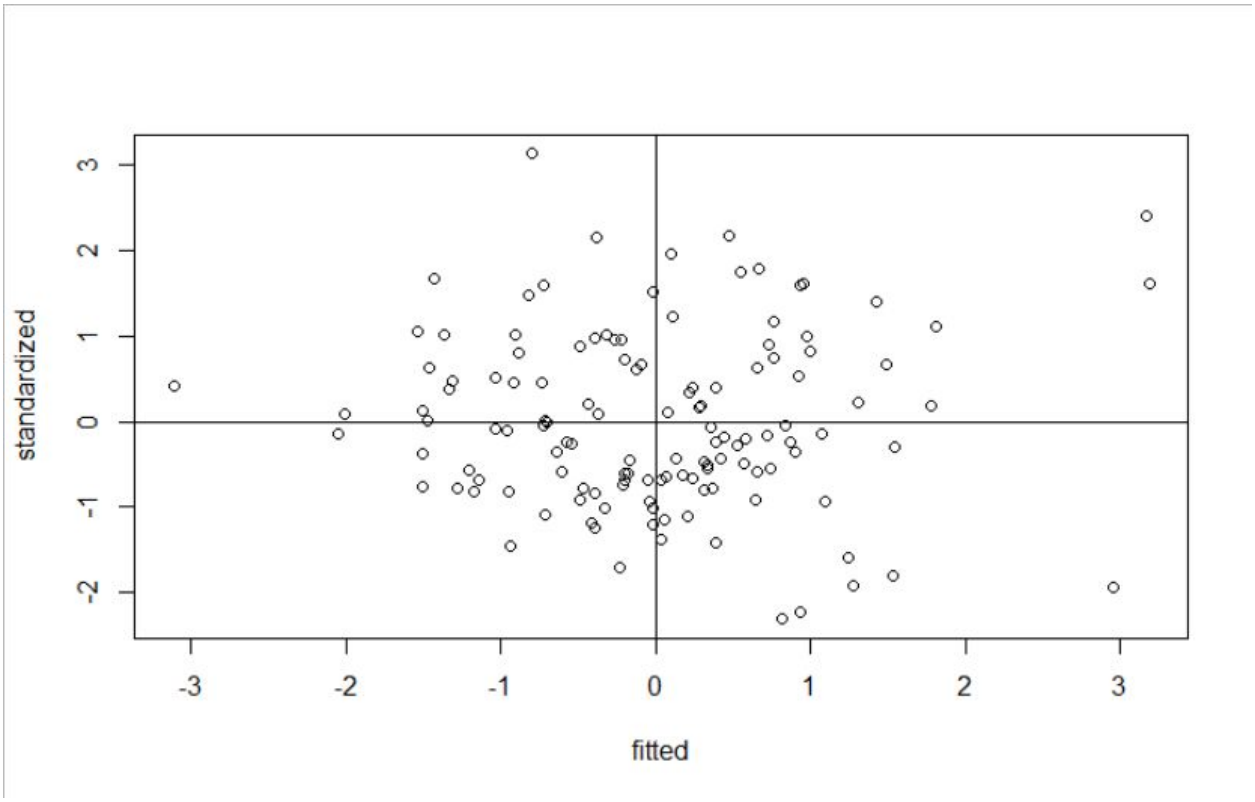
2. Linearity

Next, we checked linearity assumptions with help of Q-Q plot. In the diagram given below, we can see that most of the point lies on the straight lines. We can say that we have passed our linearity assumption.



3. Homogeneity

At last, we checked out the homogeneity assumption. Since all the points are not far from each other and are distributed uniformly. So, we can conclude that our homogeneity assumption has not been violated.



3. Inferential analysis

3.1 Principal Component Analysis (PCA)

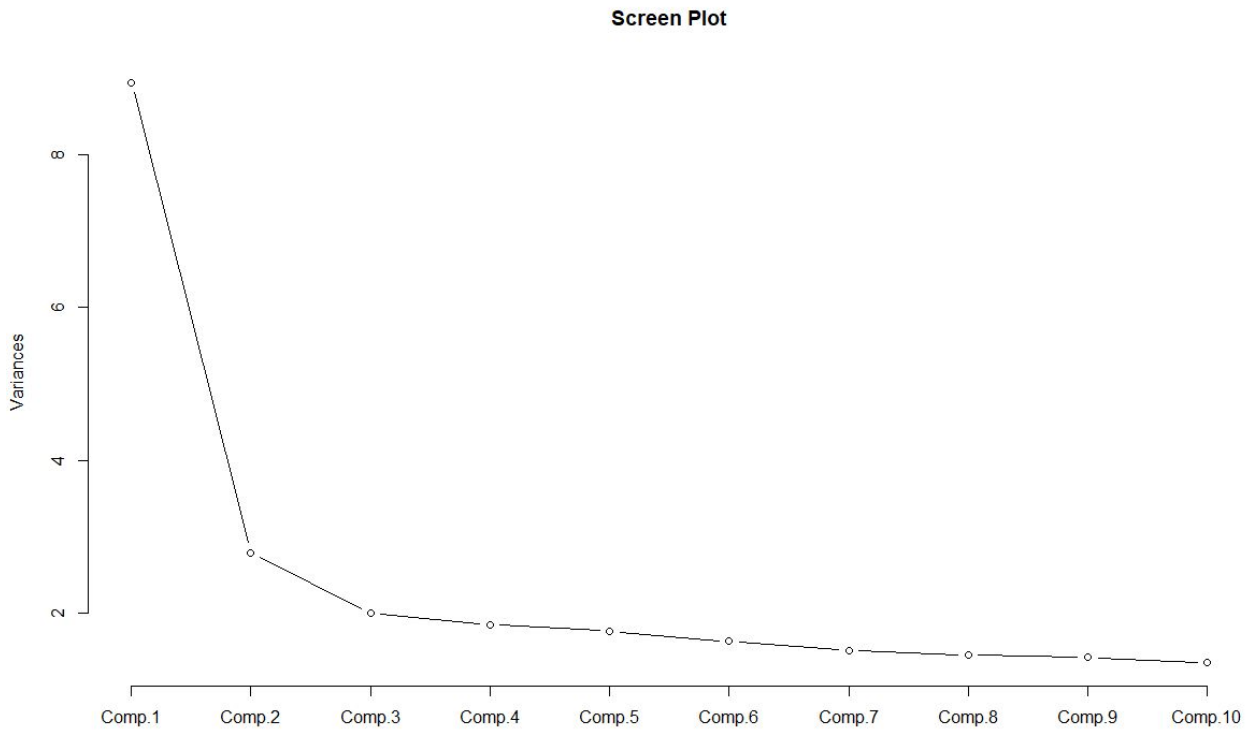
Using the Principal Component Analysis in our dataset, we aim to find the correlations among all the variables and identify a group of variables that can explain maximum variance.

To begin with, first of all, we will check multicollinearity among all variables. To check the multicollinearity, we calculated the Variance Inflation Factor(VIF) for each variable. Below is the output:

C11	C12	C13	C14	C15	C16	C17	C18	C19
2.076846	2.501870	2.724124	1.720656	2.961903	1.526550	3.226587	1.924475	1.993364
C20	C21	C22	C23	C24	C25	C26	C27	C28
1.702016	2.311022	2.535767	2.263349	2.017756	2.000134	1.624255	2.468292	2.429239
C29	C30	C31	C32	C33	C34	C35	C36	C37
1.753448	2.722721	1.958916	1.756208	1.958349	1.938098	1.882790	1.831019	1.976253
C38	C39	C40	C41	C42	C43	C44	C45	C46
3.198075	1.892196	2.051665	2.800591	2.291994	3.039161	2.105482	2.176765	1.930451
C47	C48	C49	C50	C51	C52	C53	C54	
2.128984	2.027782	1.670719	2.255463	2.197691	2.886008	2.116733	3.243783	

As we can see, no variable has a VIF value greater than 5. Hence, there is no significant multicollinearity among any variables.

Next, we ran the PCA on all 45 variables and then we would choose the number of factors/components that explain the maximum number of variance. The scree plot given below tells us to us either 3 or 4 factors.



However, the standard deviation is greater than one for up to 16 factors explaining only 70 percent of the variance. The variance explained by the 4 factors is just 34 percent, which is very poor.

Similarly, we performed PCA for different groups of variables in our dataset to convert the higher-dimensional space to lower-dimensional space. The summary of all the analyses performed is given below. As we can see, the cumulative variance for other PCAs is around 60 percent, which is poor.

	PCA 1	PCA 2	PCA 3	PCA 4	PCA 5
No. of Var Used	45	20	8	8	9
Var Description	All	Transformational	Transactional	Passive/Avoidant	Satisfaction
No. of significant PCs	16	7	3	2	3
Cum. Proportion	70	58	52	60	58

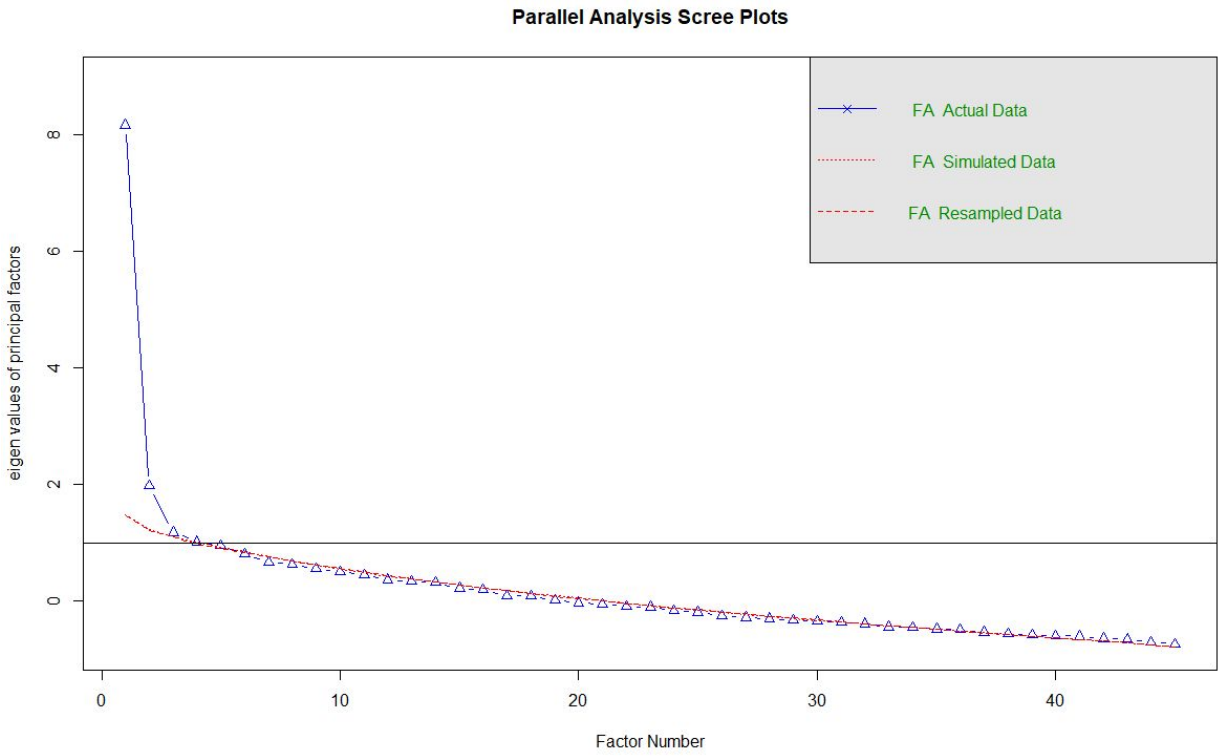
Hence, we conclude that PCA fails in reducing dimensionality for this particular dataset. The possible reason for its failure might be related to our categorical variables in the dataset and/or fewer observations.

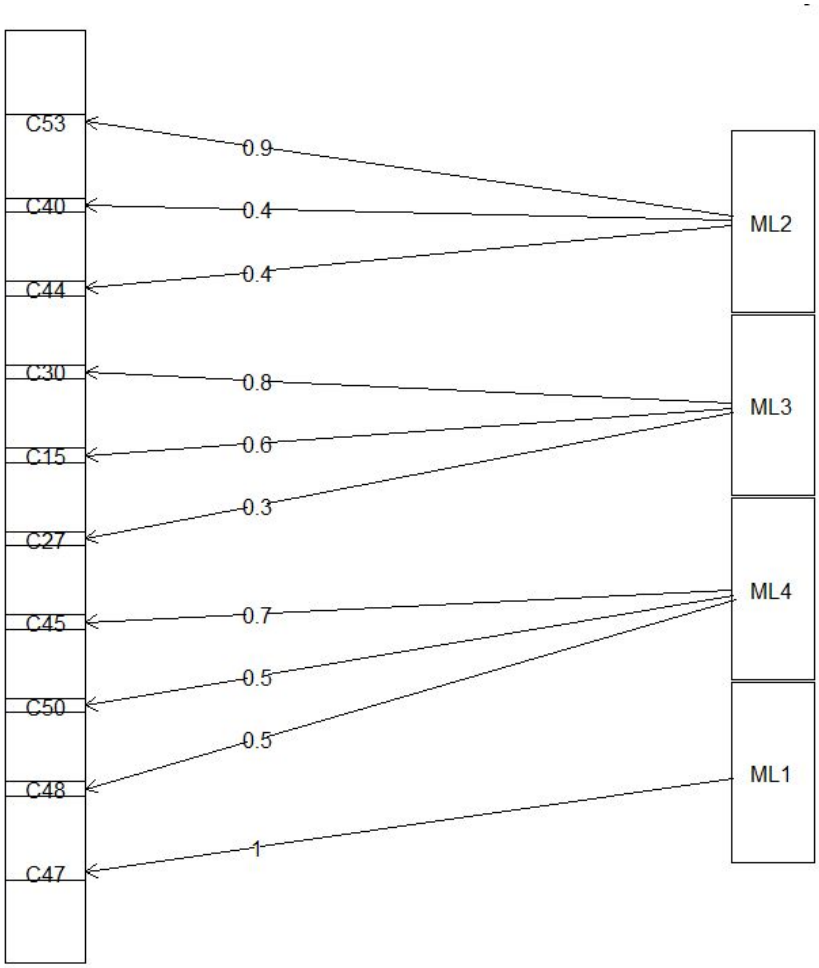
3.2 Factorial Analysis

Using the Factorial Analysis in our dataset, we aim to find the latent variables which explain the covariance between the variables.

Next, to decide how many factors we should use for Factorial analysis. Parallel analysis suggests 2 factors, old kaiser technique suggests 4 factors, new kaiser technique suggest 6 factors, scree plot suggest 4 factors. So, as per theory, we have 4 subscales in our dataset and hence we would proceed with 4 factors.

After running the FA on our dataset and removing the variables having either no loading or cross loading, we get following results





Below is the factor loadings:

```
Loadings:
    ML2    ML3    ML4    ML1
C15         0.615
C27         0.344
C30         0.831
C40  0.448
C44  0.382
C45                0.733
C47                       0.964
C48                0.484
C50                0.544
C53  0.908

                 ML2   ML3   ML4   ML1
SS loadings    1.353 1.325 1.181 1.028
Proportion Var 0.135 0.133 0.118 0.103
Cumulative Var 0.135 0.268 0.386 0.489
> fa.diagram(fa2)
```

And the model has TLI = 1.066, CFI= 0.99, RMSEA=0.

Hence, as TLI is greater than one, the model is just-identified with zero degrees of freedom. In this case, the model fit cannot be assessed.

3.3 Confirmatory Factor Analysis

Confirmatory Factor Analysis was performed to confirm the proposed three and nine factor model. To evaluate the fit index of both models, we used different aspects of model fit like RMSEA, comparative fit index (CFI) and Tucker-Lewis Index (TLI). For a model to be called adequately fit, RMSEA should be less than or equal to 0.06, comparative fit index and tucker lewis index should be greater than 0.90. The

For the three factor model, p-value came out to be zero which showed that our model was quite significant. RMSEA was reported to be 0.06 which proved that our residual fit statistics was excellent. CFI was reported to be 0.62 and TLI was reported to be 0.60 which means our goodness of fit statistics is quite poor.

For the nine factor model, p-value was reported to be zero which proved that our model is significant. Residual fit statistics came out to be excellent but goodness of fit statistics appeared to be poor.

The path diagram for 3 factor and 9 factor model is shown in figure 1 and 2 in the appendix. The diagram given below shows different aspects of model fit for different models:

Model	P-value	RMSEA	CFI	TLI
Model 3	0	0.06	0.62	0.60
Model 9	0	0.06	0.65	0.61

Cronbach's alpha

The observation of 129 participants was taken to check the reliability of leadership style and behaviour. The alpha for transactional leadership style was found out to be more than transformational leadership style.

Leadership Style	Cronbach Alpha Value
Transactional Leadership	0.77
Transformational Leadership	0.55
Passive Avoidant Leadership	0.84

For the leadership behaviours, the cronbach alpha for most of them was reported to be less than 0.70 except for laissez faire. In other way, we can say that leadership behaviour didn't have relatively high internal consistency (except laissez faire)

Leadership Behaviour	Cronbach Alpha Value
Idealized Influence Attribute	0.49
Idealized Influence Behaviour	0.31
Inspirational Motivation	0.53
Intellectual Stimulation	0.39
Individualized Consideration	0.49
Contingent Reward	0.53
Management by Exception: Active	0.34
Management by Exception: Active	0.65
Laissez Faire	0.80

4. Interpretations and suggestions

4.1 What is the most significant leadership style and the reasons for its adoption?

To find out the most significant leadership style, the mean of all responses pertaining to the corresponding leadership style and subscale was calculated. Mathematically, the absolute mean of responses, would explain the general trend of the particular leadership style. But since the mean of responses of Likert scale response (0-4), is 2, it will create a bias towards the neutral responses, and will affect the quality of our inference.

To resolve, the neutral response '2' was replaced by the median of the corresponding variable, and then the mean was calculated for every leadership style and subscale was calculated and is tabulated below in the figure 3.1.

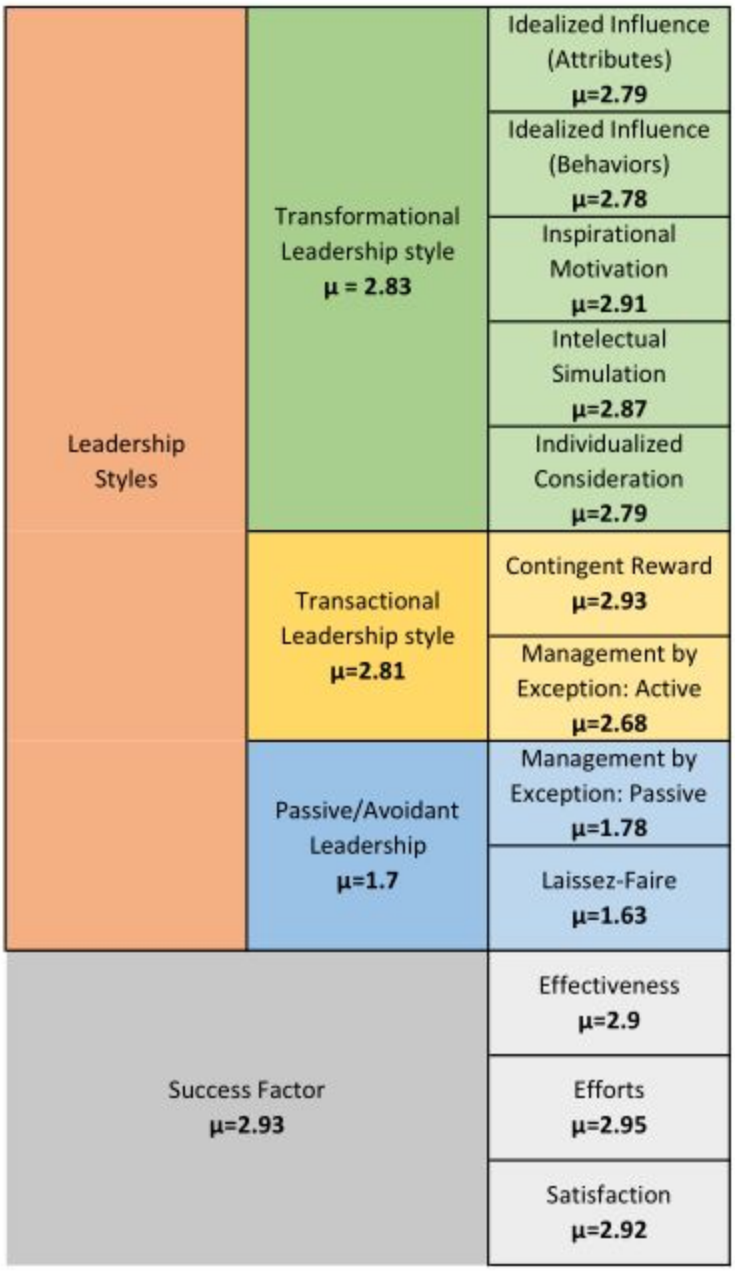


Fig: 3.1

The **Transformational Leadership style** was found to be the most significant leadership style, followed closely by the Transactional Leadership style. Although, the contingent reward subscale (a factor of transactional leadership style) was found to be most significant.

4.2 What is the relationship between a specific style of adoption and a woman's internal perceptions, such as personal and behavioural characteristics, level of knowledge and competency, and degree of innate power and empowerment ambition?

The specific style of a woman's leadership was influenced by how the rater, i.e. the employees perceived their leader. It was the traits that the leader exhibited. While, to find out how the leader's internal perception we referred to the rating leaders gave themselves.

To establish a relationship between the two groups, the mean of every response for each subscale of leadership was calculated for both groups. Then the absolute difference between the scale of one group and the corresponding subscale of the other group was calculated.

The results are in the appendix, and a snapshot of the result are tabulated below in figure 3.2.

Transactional		Passive-Avoidant	
	MA	MP	LF
0.38	1.38	0.48	0.30
0.23	0.50	1.90	2.18
0.55	0.70	0.95	0.33
0.11	0.19	0.61	0.25
0.28	0.50	0.14	0.08
0.64	0.61	1.31	1.64
0.18	1.00	0.93	2.45
0.15	1.43	0.40	1.00
0.32	0.50	0.21	1.07
0.47	0.69	0.28	0.25
0.14	0.25	0.64	0.89

Fig 3.2

Every point denotes the difference in the mean of subscale value of the two groups for a single leader. The points having a difference greater than one were observed to infer the relation between the two groups. Higher the frequency of difference more than one denotes that the perception of leaders of their own leadership style does not match how their employers perceive the employees.

We observed that Passive/Avoidant leadership style had the maximum number of conflicts, and the Laissez-faire subscale had the most conflicts.

It matches our theoretical understanding of the data, as how any leader wouldn't consider themselves following the passive/avoidant style of leadership even if their actual style matches that.

4.3 What is the relationship between leadership styles and organizational success?

Any organization's success or a leader's success is a measure of how effective their team is, how satisfied the employees are with their jobs and how much extra effort they are ready to put towards their job. In the given dataset, success is represented through three different factors, 'Extra Effort', 'Effectiveness', and 'Satisfaction', spread across 9 variables.

To find the relationship between the organization's success and leadership style, different analysis techniques such as LDA and stepwise regression were considered.

In LDA, we would have to select one response variable to create the model, but it would have resulted in the loss of information as an organization's success is a measure of 9 variables. Moreover, LDA has been more useful if we were trying to predict the success of any organization. For similar reasons, stepwise regression was also not considered as an appropriate tool for analysis.

To make sure that information from all 9 variables were included in the analysis, we took the mean of all the success responses and we found the correlation with the mean response of the three different leadership styles.

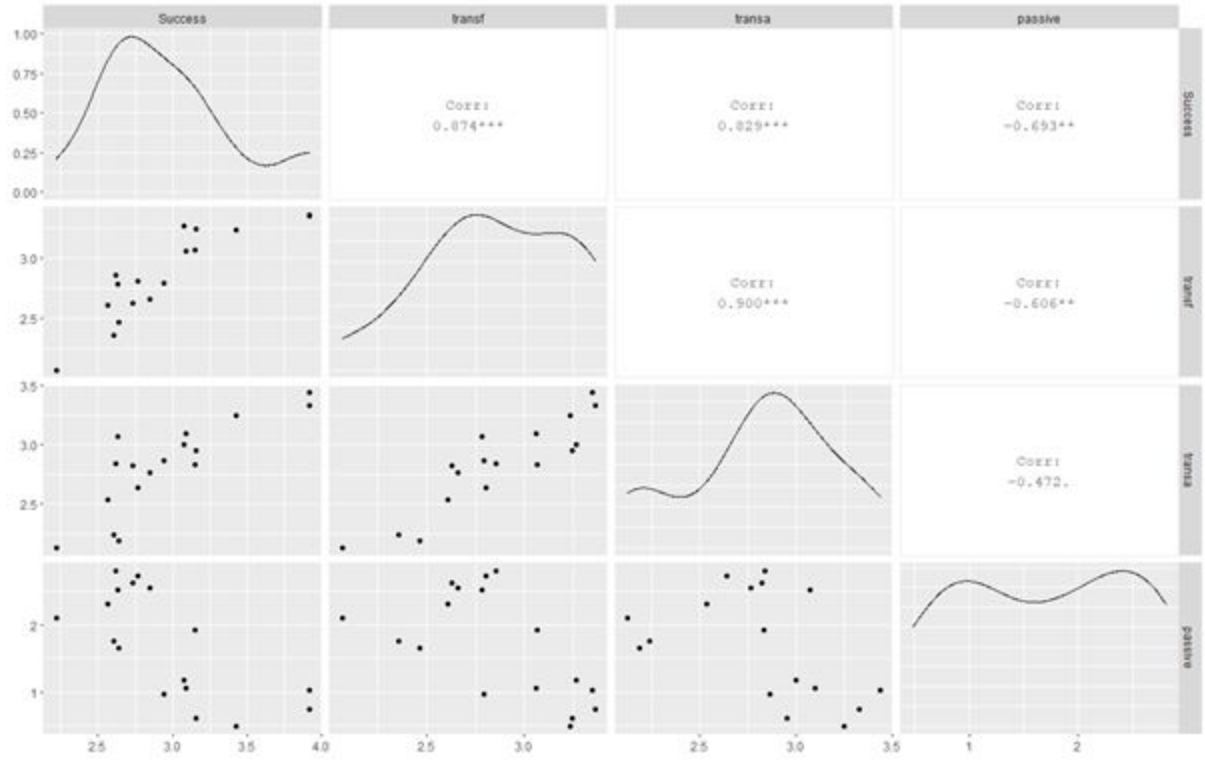


Fig: 3.3

As seen in figure 3.3, the transformational leadership style was found to be the most highly correlated with organizational success.

It coincides with our theoretical knowledge of the domain; when the leaders are more nurturing towards their employees, the organization's success rates are higher.

Appendix

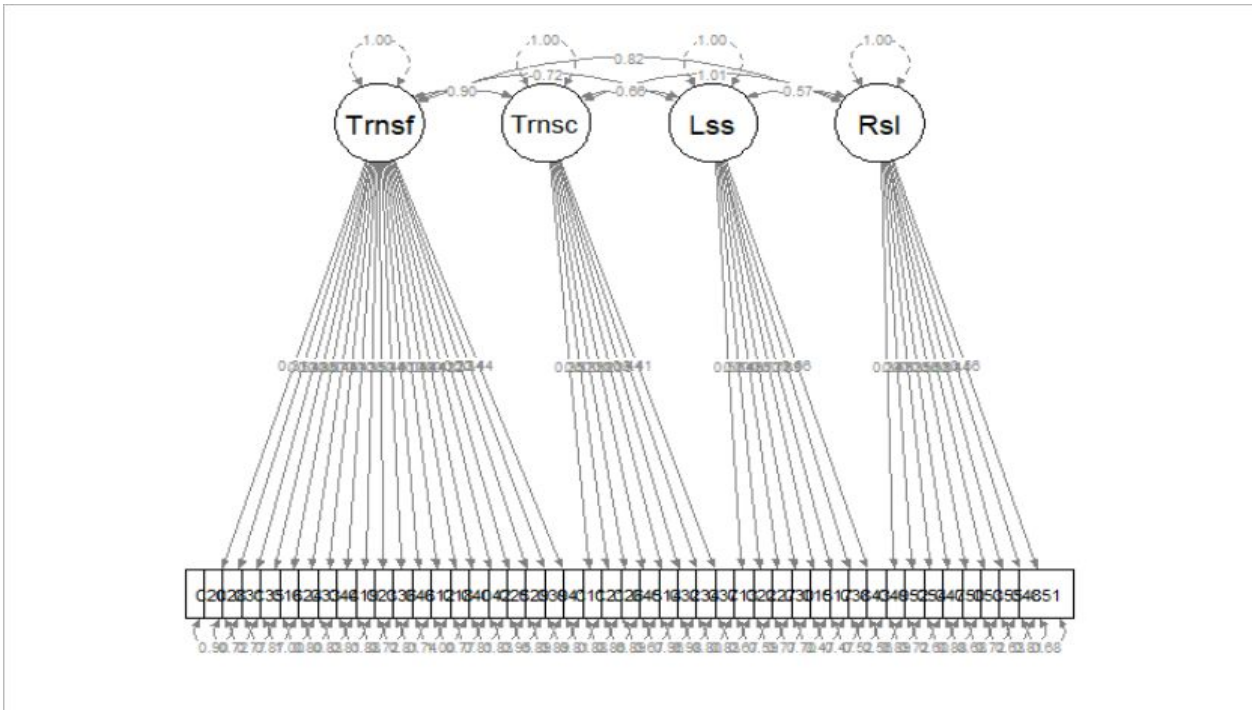


Fig 1: Three factor model path diagram

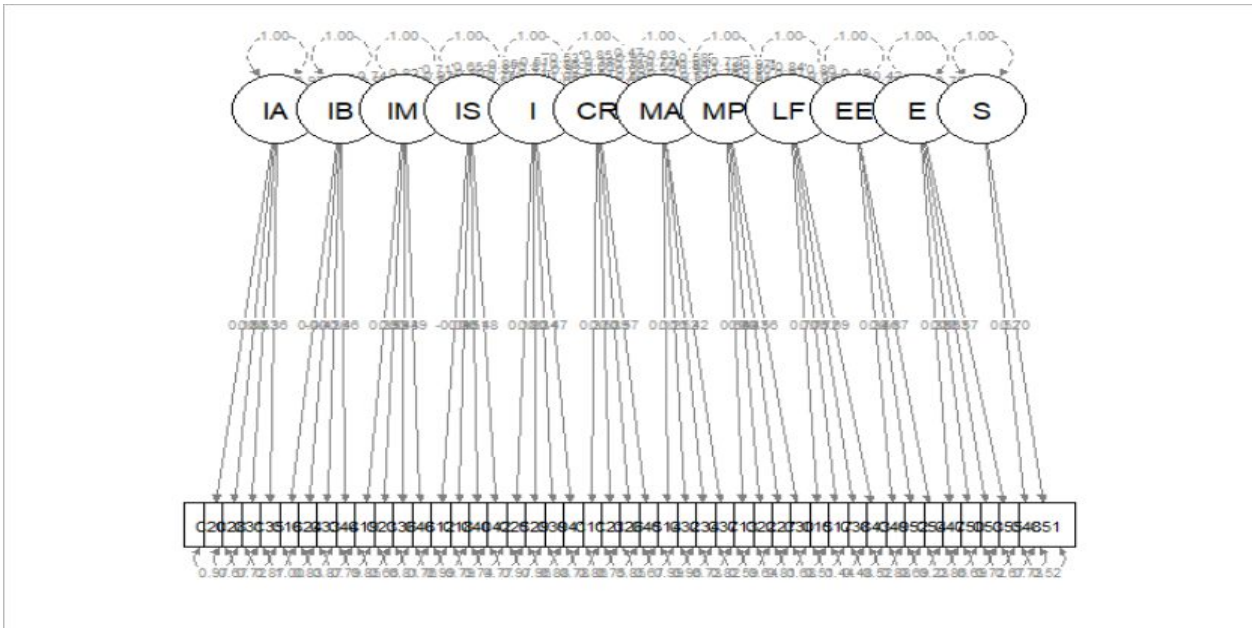


Fig 2: Nine factor model path diagram

Leader No.	Transformation					Transactional		Passive-Avoidant	
	IA	IB	IM	IS	I	CR	MA	MP	LF
2	0.08	0.13	0.13	0.05	0.65	0.38	1.38	0.48	0.30
3	0.78	0.35	0.40	0.45	0.05	0.23	0.50	1.90	2.18
4	0.13	0.15	0.18	0.43	0.65	0.55	0.70	0.95	0.33
6	0.33	0.17	0.14	0.75	0.58	0.11	0.19	0.61	0.25
7	1.86	0.28	0.31	0.50	0.44	0.28	0.50	0.14	0.08
8	0.86	0.42	1.00	0.61	1.03	0.64	0.61	1.31	1.64
9	0.48	0.05	0.02	1.08	0.98	0.18	1.00	0.93	2.45
10	0.60	0.53	0.13	1.05	0.25	0.15	1.43	0.40	1.00
11	1.29	0.18	0.86	0.32	0.21	0.32	0.50	0.21	1.07
12	0.83	0.56	0.58	0.47	0.56	0.47	0.69	0.28	0.25
13	0.57	0.61	0.93	0.82	0.57	0.14	0.25	0.64	0.89
14	0.04	0.29	0.29	0.54	0.25	0.04	0.36	0.21	0.50
16	0.19	0.19	0.38	0.19	0.81	0.81	0.06	0.69	0.75
17	0.08	0.42	0.25	0.50	0.17	0.00	0.08	1.00	0.83
18	0.34	0.84	1.41	0.75	1.72	0.25	0.41	2.09	2.19
19	0.00	0.58	0.25	0.08	0.17	0.08	0.42	0.50	0.42
20	0.00	1.00	0.13	1.06	0.25	0.63	1.00	0.94	0.38
Conflict Count	2	1	2	3	2	0	4	4	6

Fig 3: Relationship between adopted leadership style and the leaders internal perception.