

Estimation of Psychometric Properties of Leadership Style Questionnaire at Higher Education

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This study aimed to validate the Even & David-Hadar (2021) leadership style questionnaire for assessing head leadership in the context of Indian higher education. The three-factor structure (transformational, transactional, laissez-faire) was tested with data from 400 university teachers across science, engineering, humanities, and social sciences from both public and private institutions in Punjab.

Purposive random sampling was employed in two separate studies (n=200 each). Study 1 utilized exploratory factor analysis (EFA) to reveal three dimensions explaining 65.46% of the variance, with good internal consistency (>0.80). Study 2 confirmed these findings through confirmatory factor analysis (CFA), demonstrating moderate goodness of fit (CMIN/DF=2.114, GFI=0.89, TLI=0.92, CFI=0.93, RMSEA=0.074).

These results support the validity and reliability of the adapted questionnaire for measuring leadership styles in Punjab higher education. This 15-item, three-dimensional scale can be valuable for addressing behavioral and management issues among university teachers.

Keywords: leadership style, transformational, transactional, laissez faire, higher education, public and private universities, university teachers

INTRODUCTION

The term 'Leadership' has been discussed by experts in various contexts. Leadership is a process whereby one individual exert influence on others so that they strive toward the achievement of common goals (Khalili, 2013). Leadership is defined as an act or response which affects the attitude and act of another. Leadership is the behavior of the head that influences the behavior of subordinates. A good leader is a national asset and a precious dynamic force (Sadeghi and Pihie, 2013). The way of working by the leader in the organization is called leadership style. It is the way to get the work done by the team. The term

“Leadership style” was introduced in 1939 by Lewin, Lippitt and White. According to Lewin, “Leadership style is a way to provide leadership, implement plans and motivate people.” Leadership is a relative in which one person or leader influences others to work together, to achieve the happiness-related tasks that the leader wants’. It becomes an individual’s cooperation and collaborative efforts in the group (Terry, 1990).

The concept of leadership style started being used in every field of work. Various leadership styles developed with the needs of the time and situation. Different authors gave different concepts of leadership styles based on their characteristics. Major leadership styles are classified into the following table:

TABLE 1
SUMMARY OF LEADERSHIP STYLES

S.NO.	AUTHOR	YEAR	LEADERSHIP STYLES
1.	Lewin	1939	Autocratic leadership, Democratic leadership, Laissez faire leadership
2.	Max Weber	1944	Bureaucratic leadership
3.	Max Weber	1947	Transactional leadership
4.	Paul Hershey & Kenneth	1960	Coach style leadership
5.	James Mac Gregor Burns	1978	Transformational leadership
6.	Bruce J Avolio & Bernard M Bass	2004	Full Range Leadership (Transformational, transactional, laissez faire)

The concept of leadership styles in education is nowadays a subject of discussion among administrators, managers, and educationists because of its complex nature in Indian educational institutions. The whole working and success of the institution depends upon the leadership style of the head. The leadership style of the head affects the team members in every aspect. The working of team members is mainly directed by the leader and their working style (DeMary, 2011). Shahzad and Abbas (2010) have explained in their organizational behavior studies that Full range theory with transformational, transactional and laissez-faire leadership styles of heads have remained a key focus in the mainstream of research. These leadership styles have the content of all the leadership styles. Bass and Riggio (2006) explained that from various aspects of leadership styles, three major styles —transformational, transactional, and laissez-faire are very important for the practical working of the educational organization. Based on previous studies related to the leadership style of heads in educational institutions, in this study transformational, transactional and laissez-faire leadership styles have been selected. According to the theory transformational leaders are those leaders who take their followers with them in the direction of growth and perfection (Hall and Kepner, 2002). The transformational leader gives followers a real sense of power and confidence. They reassure them that they can overcome obstacles. Transformational leaders motivate his followers regarding the importance of excellent performance. The followers are inspired by vision so their responses are strengthened, and the leader practices as a role model. Transformational leaders take intelligent, goal-oriented actions that make followers active, strengthen their behaviour, and encourage them to take the right action (Yahaya and Ebrahim, 2016). The transactional leadership style of heads believes in the give-and-take relation with the team members. The leader connects the working of their team with rewards and punishment. They pay the followers for the good work done and *even* punish them if they make any mistake. Transactional leadership is related to positive feedback on good performance and criticism to negative feedback by the leader to the subordinate. A transactional leader motivates their followers through appealing them to their self-interests (Khanin, 2007). In the laissez-faire leadership style of the institutional heads, leader is not involved with their followers and members. The leader gives freedom to the team members to make decisions (Levine, 2018).

The multifactor leadership style questionnaire with transformational, transactional, and laissez-faire leadership styles was used to measure the leadership style of the head in many types of research. It was adapted and validated by many researchers according to the needs of the studies. Some of the important validation summary is given in the following table 2:

TABLE 2
SUMMARY OF VALIDATION STUDIES OF MULTIFACTOR LEADERSHIP QUESTIONNAIRE

S. NO	AUTHOR	YEAR	DIMENSION	POPULATION	TECHNIQUE USED FOR VALIDATION	ITEMS RETAINED
1.	Hater and Bass	1988	Nine factor of leadership	California Public parks and recreation society	Reliability & Validity Method	73
2.	Bass et al	1995	Nine factor of leadership with outcome variables	Public and private health organizations.	Test-Retest Method	45
3.	Bruce J Avolio & Bernard M Bass	2000	Transformational, transactional, laissez faire	Sample from China, Kenya And United States	Reliability Method	36
4.	Munwar Hussain Pahi & Umair Ahmad	2015	Transformational (Five subscales), transactional (three subscales), laissez faire	Medical doctor of Sindh Province	EFA & CFA	29
5.	Bajar B & Babiak J	2020	Transformational, transactional, laissez faire (Short Form)	Polish Organizational Settings, Pakistan	CFA	18
6.	Even & David Hadar	2021	Transformational, transactional, laissez faire	School Teachers of Israel	EFA & CFA	15

The leadership style scale by Even & David-Hadar (2021) was used to measure the teachers' perception of the leadership style of their head. Teachers are the most important part of our education system. In the higher education system, the teachers are well-qualified and in large numbers, so it is a challenge for their heads to manage their teachers (Smith, 2016). The heads of the universities need to adopt appropriate leadership styles. If the leadership style of the head is favorable towards the teacher, then teachers' outcomes will be different, and if the leadership style of the leader is not favorable, then teachers' outcomes will be quite different (Chowdhury, 2014, Saini, 2019, Bass and Avolio, 2000). However, it is necessary to identify the head's leadership style from the teachers' perspective. Many studies have been conducted to study the leadership style of the head from the employees, but still, a gap exists in understanding this aspect of the universities of Punjab (India). It is due to the lack of a reliable measuring instrument for the leadership style of the head in the current time in academic setting. However, for a complete understanding of the leadership style, the presence of specific tools of leadership style in current academics is required.

The Present Study

Even & David-Hadar (2021) validated the scale on the school teachers, so it is very important to measure the scale in the current time and work environment of teachers from higher education of Punjab (Indian context). The internal consistency of transformational and transactional factors was reported 0.84 and 0.80, respectively that, was acceptable, while the laissez-faire factor had weak internal consistency at 0.60. Unfortunately, there are several limitations, so it needs to be understood in this questionnaire. First, the leadership style scale was validated on Israel's participants, which cannot be generalized to other ethnic and racial groups. Second, the leadership style scale was developed and validated on the theory of (Bass and Avolio, 2000), which shows that any instrument based on a single theory covers the limited area of construct. After understanding these limitations, the researcher decided to validate the leadership style scale on teachers of higher education in Punjab by examining the factorial validity and reliability.

METHODOLOGY

Sample and Data Collection

For data collection purposive random sampling technique was used. The participants included 200 university teachers for study 1 and 200 university teachers for study 2 from science, engineering & technology, and humanities & social science departments of public and private universities of Punjab. For this study, the questionnaire was shown to the English experts for the checking of the language according to the teachers of higher education. The investigator administered the selected tools on the selected sample of the study. The instructions of the test were made clear to them. Considering the sensitive nature of the research, questions addressed in this study, the leadership style of the head, and several ethical aspects were considered. Informed consent was obtained from the respondents. They were granted privacy so that they could openly contribute to the research. Anonymity of respondents was assured and the data's confidentiality was considered during the whole process. After filling up of the questionnaires by the respondents, they were collected.

Instrument

The leadership style questionnaire by Even & David-Hadar (2021) was used to measure the leadership style of the head as per the teachers' perception. The scoring of the tool was made according to the scoring scale in the respective manuals:

The scoring of the leadership style questionnaire items is on a 5-point Likert scale
0=not at all, 1=once in a while, 2=sometimes, 3=fairly often, 4=frequently, if not always.
The item distribution of the factors of the scale is presented in the following table 3:

TABLE 3
DIVISION OF ITEMS OF LEADERSHIP STYLE QUESTIONNAIRE

S. NO.	Factors		Items
1	Transformational Leadership	2,7,9,11,12,13,15	7
2	Transactional Leadership	1, 6,8,14	4
3	Laissez-faire Leadership	3,4,5,10	4
Total		15	

Validation Process of the Scale

Demographic Assessment

The respondents filled demographic survey questions before starting the leadership style questionnaire. The demographic survey included (a) the gender of the teacher, (b) the department, (c) *the* type of instruction. Further, to measure the meaning of the term 'leadership style of head' perceived by higher

education teachers in Punjab, the teachers were asked to rate each of the mentioned elements on the scale according to their perception of their head.

Data of 200 university teachers has been found to be completely correct and selected for the study 1. Again, data of 200 university teachers has been selected for the study 2. The sample was distributed on different variables viz. gender, department and type of institution. The data as per the distribution of the sample was quantified, processed and presented in the form of frequency distribution and percentage in the following table 4:

TABLE 4
DISTRIBUTIONS OF THE SAMPLE OF THE LEADERSHIP STYLE QUESTIONNAIRE

Variable Wise Distribution		Frequency of study 1	Frequency of study 2
Gender	Female	110 (55%)	105 (53%)
	Male	90(45%)	95(47%)
	Total	200 (100%)	200 (100%)
Stream	Science, Engineering & Technology	113(57%)	108(54%)
	Humanities & Social Science	87(43%)	92(46%)
	Total	200(100%)	200(100%)
Type Of University	Public	60(30%)	76(38%)
	Private	140(70%)	124(62%)
	Total	200(100%)	200(100%)

Source: Computed Data

Data Analysis

The researcher developed a two-study data analysis plan to examine the leadership style questionnaire. The study was split into two parts: Study 1 and Study 2. EFA was conducted in Study 1 to investigate factor structures of the leadership style questionnaire. In the study, the obtained factors were cross-validated in the model by the CFA. SPSS 23 and AMOS 23 were used to administrate the exploratory, confirmatory factor analysis and confirmatory factor analysis in study 1 and study 2 (Muth'en & Muth'en, 2017).

RESULTS

Even & David-Hadar (2021) proposed a three-factor structure for the leadership style questionnaire. It was based on an Israel sample; the researcher checked the fitness of the structure of the scale to the Indian data. The study 1 was utilized for EFA and item analysis. The three dimensions with 15 elements -7 elements under transformational leadership, 4 elements under transactional leadership, and 4 elements under laissez faire- were incorporated to test the factorability.

Study 1: Exploratory Factor Analysis (EFA) of Leadership Style Questionnaire

In Study 1, EFA was conducted. Following the guidelines given by Fabrigger and Strahan (1999), the researcher referred the global fit index of the EFA model to explore the number of factors in the leadership style questionnaire. Total item correlation was analyzed to relation of the items; the result is presented in the following table 5:

TABLE 5
TOTAL-ITEM CORRELATION MATRIX

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
LS1	29.30	68.320	.677	.854	.886
LS2	29.25	68.420	.544	.952	.788
LS3	30.05	70.530	.651	.825	.805
LS4	30.54	69.888	.496	.893	.801
LS5	30.74	72.638	.685	.814	.808
LS6	29.28	68.522	.651	.904	.888
LS7	29.15	69.344	.586	.866	.787
LS8	29.34	66.244	.549	.911	.880
LS9	29.19	67.743	.516	.877	.784
LS10	30.86	75.321	.668	.868	.815
LS11	29.13	68.827	.442	.807	.789
LS12	28.94	66.841	.577	.892	.879
LS13	29.24	65.824	.581	.901	.878
LS14	29.38	68.389	.695	.874	.892
LS15	29.15	65.927	.785	.793	.778

Churchill's item precision method (Field, 2005) was used to analyze set of 15 items in Table 5 to approach scale precision. Here, item-total correlations more than 0.3 were considered significant and items less than that were suggested to be removed from the developmental scale. The above table results suggested that all chosen elements in inter-item correlations were above 0.4, thus satisfying the criteria. Thus, the findings suggested the high reliability of the scale used to measure the context.

Subsequently, the 15 elements -7 elements under transformational leadership, 4 elements under transactional leadership, and 4 elements under laissez-faire- were incorporated to test the factorability. Bartlett's test of sphericity was carried out to test the validity and Kaiser-Meyer-Olkin (KMO) to measure the homogeneity of variables (variables correlations matrix) was carried out to verify the factorial analysis of study 1. The test results are shown in the following table 6:

TABLE 6
KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.849
Bartlett's Test of Sphericity	Approx. Chi-Square
	Df
	Sig.
	150.630
	105
	.000

Table 6 explained that the KMO sampling adequacy was 0.849 and above the cut-off value of 0.6, meaning that sample subjects considered in the study were sufficient (Durmuş, Yurtkoru & Çinko, 2011). The significant result of Bartlett's Sphericity test allowed further extraction of the factors from the correlation matrix. Two factors were extracted from the data by the SPSS Statistics software Ver. 23. The

Barlett's test of Sphericity was significant. Total variance of the scale was measured and presented below in table 7:

**TABLE 7
TOTAL VARIANCE EXPLAINED**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.793	31.950	31.950	4.793	31.950	31.950	4.546	30.308	30.308
2	3.097	20.647	52.597	3.097	20.647	52.597	3.196	21.309	51.617
3	1.929	12.863	65.460	1.929	12.863	65.460	2.077	13.843	65.460
4	.741	4.940	70.400						
5	.727	4.848	75.247						
6	.601	4.005	79.252						
7	.536	3.576	82.828						
8	.482	3.215	86.043						
9	.425	2.833	88.876						
10	.364	2.429	91.305						
11	.341	2.274	93.579						
12	.279	1.860	95.439						
13	.261	1.741	97.180						
14	.227	1.514	98.695						
15	.196	1.305	100.000						

Extraction Method: Principal Component Analysis

Table 7 showed the three factors, with 15 items, using exploratory factor analysis, explained 65.460 percent of variance in the measured construct. The said 15 items underwent EFA under principal component analysis and varimax rotation. The item to -to-factor loading was standardized at 0.32 based on guidelines. Factor with a minimum of three items and a maximum of five or more items loading on it was retained and further considered for confirmatory factor analysis. Keiser's criterion of eigen value greater than 1 condition, which explained 65.460 % variance. 3 dimensions were extracted.

Here, a rotated component matrix with 15 items under three dimensions were analyzed against each component and as shown in table 8.

Table 8 presented the preliminary factor structure of the scale. As the loadings of each item are above 0.50, all the items were accepted and contributed to the scale's factor structure. As a result, the researcher fit the EFA model containing a three factor structure with Eigenvalues more than 1.0 to Sample 1.

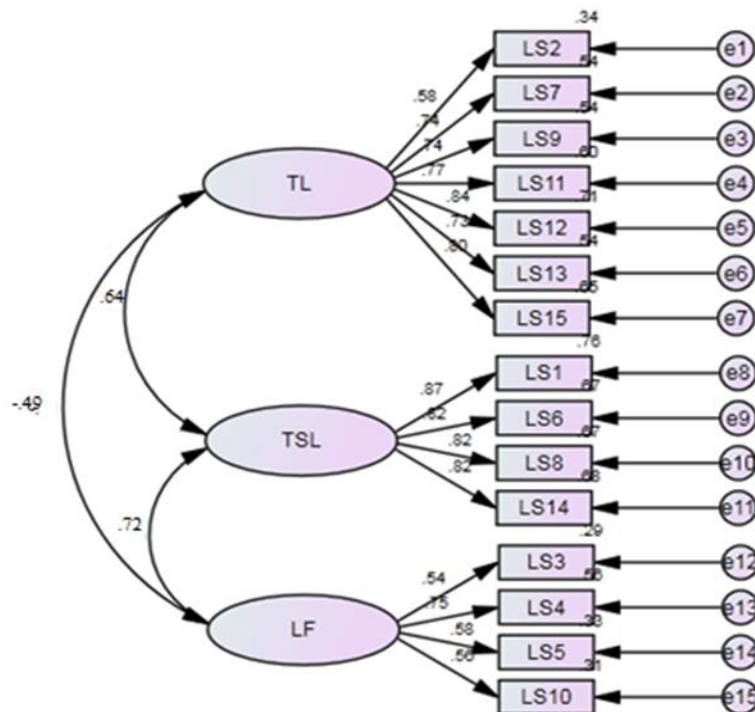
TABLE 8
ROTATED FACTOR STRUCTURE OF THE SCALE

Item	Transformational	Transactional	Laissez Faire
1		0.875	
2	0.708		
3			0.513
4			0.769
5			0.768
6		0.855	
7	0.798		
8		0.818	
9	0.788		
10			0.737
11	0.810		
12	0.849		
13	0.783		
14		0.849	
15	0.859		

Study 2: Cross-Validation (CFA) of the Factor Model of the Leadership Style Questionnaire

The 15 items passed the EFA test and item analysis. After examining the factor structure of the leadership style questionnaire, the researcher cross-validated the structure by incorporating the data from Study 2 using IBM AMOS 23 version. The 200 university teachers were utilized in study 2. The CFA was conducted on three- a dimensional scale with fifteen items and the results are discussed below.

FIGURE 1
CONFIRMATORY FACTOR MODEL FOR LEADERSHIP STYLE QUESTIONNAIRE



**TABLE 9
THE FITNESS ESTIMATES OF THE MODEL**

Measure	P value	CMIN/DF	RMSEA	GFI	IFI	TLI	CFI
Benchmark	>0.05	< 3	<0.08	>0.90	>0.90	>0.90	>0.90
Result	0.00	2.11	0.07	0.89	0.93	0.91	0.93

**TABLE 10
STANDARDIZED FACTOR LOADINGS OF THE ITEMS OF
LEADERSHIP STYLE QUESTIONNAIRE**

Dimensions	Item Number	STANDARDIZED FACTOR LOADING
Transformational leadership	2	0.58
	7	0.74
	9	0.74
	11	0.77
	12	0.84
	13	0.73
	15	0.80
Transactional leadership	1	0.87
	6	0.82
	8	0.82
	14	0.82
Laissez faire leadership	3	0.54
	4	0.75
	5	0.58
	10	0.56

The investigator used SPSS Amos 23 version, from the path diagram (Figure: 1), it was evident that the three factors and their respective items loaded well and meaningfully on each other. Table 9 represents the fitness estimates of the model. The CMIN/DF was 2.114. The incremental fit index (IFI) was 0.932. Also, the Tucker- Lewis index and Comparative Fit Index estimates were 0.917 and 0.931. The Goodness Fit Index (GFI) was 0.890. The root mean square error of the approximation RMSEA estimate was 0.074. Mostly, all the value of the model fit indices satisfied the threshold values. So, it can be said that model was moderately fit. Also, Table 10 represents the factor loading of all the items ranging from 0.54 to 0.87. Therefore, the CFA validated the three-factor model (Ding & Ng, 2008). After the validation, the researcher chose the three-factor model. The factorial pattern of the model was interpreted by ignoring factor loadings below 0.4 (Stevenson, 1992).

RELIABILITY ANALYSIS

The reliability of the leadership style questionnaire was calculated by using below-mentioned method. In order to determine the reliability of the scale and each dimension, Cronbach Alpha was applied by using IBM SPSS version 23. The internal consistency of the dimensions was found as 0.84 for

transformational, 0.80 for transactional, and 0.87 for laissez faire, respectively. All the dimensions were found to be reliable. Results are presented in the below mentioned table 11.

TABLE 11
RELIABILITY OF LEADERSHIP STYLE SCALE

S.No	Dimensions	Item No	Total Items	Cronbach's Alpha
1	Transformational leadership	2,7,9,11,12,13,15	7	0.84
2	Transactional leadership	1, 6,8,14	4	0.80
3	Laissez faire leadership	3,4,5,10	4	0.87

DISCUSSIONS

The leadership style of the head plays a significant role in the performance of the higher education teachers. The objective of this study was to validate the leadership style questionnaire with higher education teachers in Punjab. The researcher examined the factor model of the Leadership Style Questionnaire to confirm whether the original three-factor structure is compatible with the data collected from universities in Punjab. Furthermore, our data with university teachers in Punjab confirm the original three-factor structure of the Leadership Style Questionnaire.

Transformational leadership is an important component of leadership style that shows the style of working of lead where the leader motives and guide the teachers by working with them. Transformational leadership affects the behavior, performance and overall growth of higher education teachers (Bass and Avolio 2003). Therefore, the impact of transformational leadership is reflected in the growth of an organization. The second factor is transactional leadership. Transactional leadership can be conceptualized as another important component of leadership style that shows the leadership style of working of lead where the leader motivates the teachers for more work by rewards and punishments. Transactional leadership affects the behaviour, motivation and overall work capacity of higher education teachers. Therefore, transformational leadership affects the pace of working in the growth of an organization (Wegner, 2004). Laissez-faire leadership style is the third factor where leaders make the teachers free to take their own decisions. The findings around the third factor have positive and negative effects on the organization. Laissez-faire leadership is an important and critical subset of leadership style because it can function both constructively and destructively (Trottier, Wart & Wang, 2008). This study shows the importance of leadership style in the work culture of higher education teachers. Therefore, the importance of leadership style is reflected in the organization's growth and expands the earlier findings from Western samples to Indian samples. The study also confirmed the reliability and validity of our leadership style questionnaire. The results explained that factors of leadership style are associated with each other. This finding supports the previous theories of leadership style scale.

LIMITATIONS OF THE STUDY

The present research work contributes to the existing literature. All possible efforts had been made to maintain the study's objectivity, validity and reliability, yet the study suffers from certain limitations that could provide future research opportunities.

1. The lack of cooperation from university heads in the data collection process was a major obstacle since the sample of the study was university teachers.
2. The investigator approached more than 480 university teachers but could collect data of 400 university teachers.
3. Research on leadership style in the Indian context is limited. As a result, quality literature reviews to present state of art on this topic are insufficient.

SUGGESTION FOR FUTURE RESEARCH

Although the results obtained through the study are very enlightening, the need of further research can never be neglected. In light of the problem undertaken the areas for further research can be:

1. The present study can be taken up by choosing the sample from other Eastern Asian countries with different ethical and racial groups.
2. A comparative study on leadership style is recommended to be conducted on teachers of western and Eastern cultures as well as at various levels school, colleges and universities.
3. This study was limited to Punjab state only. The studies are suggested to be conducted on other states also.
4. Another similar study can be conducted at college and school level also.
5. A comparative study can be conducted on the educational system of the developed countries.

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