

Scale Validation: A Pilot study

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Abstract

This study aims to determine the reliability and validity of the measurement instrument for a research study examining the association of organizational justice and leadership style among citizenship behavior with mediation of commitment of academia employed in educational institutions. This study used self-administered questionnaire to collect data from 200 teachers working in educational institutions of Karachi Pakistan. Demographic information was to be provided in section I and measurement items for constructs were listed in Section II of the questionnaire. Statistics including factor loading, composite reliability (ρ_c), Cronbach alpha coefficient, reliability coefficient (ρ_a), average variance extracted (AVE), Fornell & Larcker Criterion, Heterotrait Monotrait Ratio and Cross Loadings. were used to test the reliability and validity of the instrument. SPSS was used for coding of data and Smart PLS was used to analyze the responses collected from respondents. Values for all statistical tests of this study met the critical values, therefore the study found the instrument reliable and valid for conducting the main study. The study validates the usefulness of the instrument in determining organizational justice and leadership style as predictors of citizenship behavior directly and with mediation of commitment.

Key words: Organizational justice, Leadership styles Commitment and Organizational Citizenship Behavior.

1.Introduction

In modern day complex and ever-changing work environment in role behavior of workforce is not sufficient alone. In order to exploit the advantage of rapidly changing work environment it is the demand of the time to motivate employees to perform responsibilities other than those prescribed in their job descriptions. Such prosocial behavior is essential to prompt response to challenges, preserve limited organizational resources for productive use, , amplify the efficiency of employees, attracting and retaining the proficient and outstanding employees and (Ahmad, Keerio, Jameel, & Kareem, 2020; Donglong, Taejun, Julie, & Sanghun, 2020). Demonstration of organizational citizenship behavior is a voluntary act of employees which is not stated in reward and punishment system therefore cannot be defined explicitly by the organization but keeping in view its significance in the quality performance of an organizations, management must attempt for the creation of an environment which leads them to show such behavior (Güneş & Küçüksüleymanoğlu, 2020).

2. Organizational Citizenship Behavior

Organizational citizenship behavior refers to employees' extra- role behavior for which varied terms like contextual performance, extra role behavior, civic organizational behavior, prosocial organizational behavior and organizational spontaneity are used in previous research. It is solely discretionary behavior which are not given in job description and not recognized in a formal reward system of an organization. Though employees are not bound to show such

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behavior but those who perform such behavior contributes tremendously in the operations of an organization and bring success to an entity as a whole (Massoudi, Jameel, & Ahmad, 2020; Verma, 2021).

It was noted in literature review that that many previous studies have identified several antecedents which motivate employees to show the organizational citizenship behavior. Some of them are organizational support, leader member exchange, organizational justice, psychological contract, leadership, positive organizational climate and organizational commitment (Bismala, 2019; Devi, 2022; Grego-Planer, 2019; Partina, Harsono, Sawitri, & Haryono, 2019; Soelton et al., 2020).

According to Patras, Sutisna, Entis, and Afif (2020) that if employees feel management fair in terms of policies, procedures, treatment and appraisal then they are ready to go extra mile beyond the set requirements of work which means that justice in organization is one of the major factor that motivate employees to exhibit organizational citizenship behavior of workforce. Sujono, Tunas, and Sudiarditha (2020)organizational citizenship behavior is directly, positively and optimistically influenced by organizational justice. Alternatively speaking if an entity ensures justice and equal treatment to its employees then it raise such behavior to highest degree among them (Aeknarajindawat & Jermsttiparsert, 2020; Jami & Qasim Agha, 2022; Perpetua & Godson, 2021; Ullah et al., 2021; Winarsih & Riyanto 2020; Yasa & Netra, 2021; Yorulmaz & Karabacak, 2021).

Nivya and Kalpana (2022) argued in their study that leadership styles predict organizational citizenship behavior. According to the research of Hamdi, Jameel, Massoudi, and Ahmad (2021) empowerment, participation in decision making, encouragement to think beyond self-interest, stimulating self-confidence and offering performance based incentives and rewards are some of the practices by superiors which lead teachers to exhibit discretionary work behavior.

If in an organization vision and mission is explicitly known to workers and their creativity is stimulated then they are ready to help other colleagues, and provide support to organizational functions voluntarily then it indicates that they are showing such discretionary behavior concluded by Abdullahi, Anarfo, and Anyigba (2020) and Purwanto, Purba, Bernarto, and Sijabat (2021)

Soelton et al. (2020) reported that high degree of employees' commitment increases the exhibition of extra role behavior as these two constructs are positively and significantly associated. Highly committed employees have psychological binding with the organization which includes loyalty, feeling of trust in the values of organization and work involvement. This feeling of attachment lead them to show prosocial behavior not described officially and known as organizational citizenship behavior. In other words organizational citizenship behavior of employees get influenced with their commitment in a positive and significant manner (Devi, 2022; Suwandana, Satrya, & Riana, 2022; Winarsih & Riyanto 2020; Yasa & Netra, 2021).

3.Methodology

Pilot testing or pilot study is a small scale study conducted before starting a main study especially in the field of social sciences, education and management sciences aimed to assess the reliability and validity of the measurement instrument , determining the appropriate sample size, time and cost effectiveness (In, 2017; Tseng & Sim, 2021; Wadood, Akbar, & Ullah, 2021).

3.1 Sample of the study

Sample is a certain fraction of a population drawn by a researcher (Nayak & Singh, 2021) whereas sample size is the number of participants or individual samples included in a study (Memon et al., 2020). Literature review revealed that primarily pilot studies do not aimed to test hypotheses (Maspero et al., 2019) rather they are multipurpose in nature (Tseng & Sim,

2021). Sample size may be arbitrary but should be reasonable (Andrade, 2020). Traditionally sample size in pilot studies is smaller as compare to main study usually comprising on 15-30 units but a larger size can be used depending upon the peculiarities of a study (Whitehead, Julious, Cooper, & Campbell, 2016 as cited in Nawang & Shukor, 2022). The sample size of this pilot study was 200 teachers employed in educational institutions of Karachi, Pakistan.

3.2 Data collection Instrument

To collect data from teachers self-administered questionnaire was used. The Questionnaire had two sections. Section I meant to collect demographic information of the respondents and section II comprises various items to measure the four variables of the study including, Organizational justice, Leadership style, organizational commitment and organizational citizenship behavior.

Previously validated scales were used and adapted in this study (Pattnaik & Tripathy, 2019). To measure organizational justice (OJ), an independent variable, a scale was used comprising items modified from most widely used scale of organizational justice developed by Colquitt in 2001. Five point Likert scale was used to rate responses to each item with anchors 5=Strongly Agree, 4=Agree, 3=Undecided, 2=Disagree and 1=Strongly Disagree. (Lönnqvist, Flinkman, Vehviläinen- Julkunen, & Elovainio, 2022).

Multifactor Leadership Questionnaire (MLQ5-X) developed by Bass and Avolio in 1997 was used to measure another independent variable, leadership styles (LS). (MLQ5-X) is found as widely used and reliable scale of measuring the leadership styles. This study used and adapted items from the original scale. Five-point Likert scale was used to rate responses to each item with anchors 5=Strongly Agree, 4=Agree, 3=Undecided, 2=Disagree and 1=Strongly Disagree. (Bajcar & Babiak, 2022; Batista-Foguet, Esteve, & van Witteloostuijn, 2021; Braathu, Laukvik, Egeland, & Skar, 2022; Meng, Mao, & Li, 2020)

Mediating variable, Organizational commitment was measured by using and modifying items from organizational commitment scale developed by Meyer and Allen in 1997 which is mostly used in research studies to measure this variable. Five point Likert scale was used to rate responses to each item with anchors 5=Strongly Agree, 4=Agree, 3=Undecided, 2=Disagree and 1=Strongly Disagree. (Al-Jabari & Ghazzawi, 2019).

Organizational citizenship behavior is a dependent variable measured by using and adapting items from scale constructed by Podsakoff, MacKenzie, Moorman, and Fetter in 1990, the original scale is validated and frequently used to measure the construct in research studies Five point Likert scale was used to rate responses to each item with anchors 5=Strongly agree, 4=Agree, 3=Undecided, 2=Disagree and 1=Strongly Disagree. (Kang, Byun, Law, Seo, & Ferris, 2020).

3.3. Data collection Procedure

Questionnaires were distributed among 220 respondents and 200 were returned so the response rate was 91 %. Questionnaires returned were checked for completeness and 200 were found completely filled. All respondents were teachers employed in educational institutions of Karachi Pakistan.

Questionnaires were distributed and collected by research assistants and mobile apps. Questionnaires were checked for completeness. Incomplete questionnaires were set aside. Quantitative data was coded by using SPSS, statistical package and Smart PLS was used to test the reliability and validity of the measurement instrument.

3.4 Statistical Analysis

Reliability and Validity of data collection instrument are the essential factors that make it possible for researchers to obtain beneficial output from their studies especially when number

of items in data collection instrument are adapted from previous studies (Sürücü & MASLAKÇI, 2020; Wadood et al., 2021).

3.4.1 Reliability

Reliability and Validity of data collection instrument are the essential factors that make it possible for researchers to obtain beneficial output from their studies especially when number of items in data collection instrument are adapted from previous studies (Sürücü & MASLAKÇI, 2020; Wadood et al., 2021).

To establish the reliability of a measurement scale various statistics were used including factor loading, composite reliability (**rho c**), Cronbach alpha coefficient (Hair Jr et al., 2021) and reliability coefficient (**rho a**) (Shoukat et al., 2021; Bello & Karupiah, 2022). The cut off value of factor loading is more than 0.708 for other three measures is 0.70 (Hair Jr et al., 2021).

Results of this pilot study for reliability are presented in Table I and II. All item loadings are above threshold value except one which is slightly below the cut off value but it is not deleted as factors having loadings between 0.40 and 0.708 may only be deleted if they do not affect the other reliability and validity measures (Hair Jr et al., 2021). All values for internal consistency of this measurement instrument are above cutoff value therefore internal consistency reliability of the instrument is established.

Table-1 Factor loadings

	LS	OC	OCB	OJ
OJ 1				0.942
OJ 2				0.963
OJ 3				0.952
OJ 4				0.947
OJ 5				0.943
OJ 6				0.941
OJ 7				0.934
OJ 8				0.927
OJ 9				0.94
LS 1	0.857			
LS 2	0.873			
LS 3	0.831			
LS 4	0.867			
LS 5	0.731			
LS 6	0.749			
LS 7	0.77			
LS 8	0.758			
LS 9	0.793			
LS 10	0.784			
LS 11	0.742			
LS 12	0.734			
LS 13	0.76			
LS 14	0.752			
LS 15	0.761			
LS 16	0.753			
LS 17	0.764			
OC 1		0.887		
OC 2		0.902		
OC 3		0.861		
OC 4		0.899		
OC 5		0.855		
OC 6		0.834		
OCB 1			0.935	
OCB 2			0.69	
OCB 3			0.913	
OCB 4			0.931	
OCB 5			0.926	

OCB 6	0.923
OCB 7	0.877
OCB 8	0.92
OCB 9	0.937
OCB 10	0.872

Table-2- Internal Consistency Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
LS	0.96	0.961	0.964
OC	0.938	0.94	0.951
OCB	0.972	0.973	0.976
OJ	0.984	0.985	0.986

3.4.2 Validity

Validity of a measuring instrument is the degree of accuracy in measuring a phenomenon it intends to measure. Validity of a research instrument is research specific therefore must be tested each time the instrument is used for a new research (Bahariniya, Ezatiasar, & Madadzadeh, 2021).

In literature review it is noted that large number of studies used construct validity, a type of validity to validate a research instrument. It shows that a research instrument actually measures the construct it claims to measure (Sürücü & MASLAKÇI, 2020).

Convergent validity and Discriminant validity are two techniques used to assess construct validity of an instrument. Convergent validity measures the degree of correlation among different instruments measuring the same construct whereas Discriminant validity measures that there should be no correlation among instruments measuring the different constructs. (Suryani & Tentama, 2020).

The instrument is said to have convergent validity if average variance extracted (AVE) values are less than composite reliability and AVE is greater than 0.5 (Sürücü & MASLAKÇI, 2020; Rehman et al., 2021). Results of this pilot testing presented in Table-III indicates that AVE value of all constructs are greater than cut off value therefore construct validity of the instrument is established.

TABLE-3 Average variance extracted (AVE)

	Average variance extracted (AVE)
LS	0.612
OC	0.763
OCB	0.801
OJ	0.89

Fornell & Larcker Criterion, Heterotrait Monotrait Ratio and Cross Loadings techniques were used to test discriminant validity of the instrument (Hayat, Shateri, Kamalian Fard, Sabzi Shahr Babak, & Faraji Dehsorkhi, 2023).

According to Fornell and Larcker (1981) the square root of AVE of all constructs should be greater than the correlation values among them . The square root of AVE of all the constructs shown in Table IV are more than the inter correlation between these constructs therefore the Fornell-Larcker criterion is met (Hayat et al., 2023; Sürücü & MASLAKÇI, 2020).

Table- 4 Fornell & Larcker

	LS	OC	OCB	OJ
LS	0.782			
OC	0.719	0.873		
OCB	0.663	0.624	0.895	
OJ	0.696	0.579	0.485	0.943

Heterotrait Monotrait Ratio is widely used to test discriminant validity (Henseler, Ringle, & Sarstedt, 2015 as cited in Hanafiah, 2020). Heterotrait-monotrait ratio presented in Table V are less than the cut off value 0.90 or more conservative criterion of 0.85, it means the discriminant validity of the instrument is established (Roemer, Schuberth, & Henseler, 2021).

Table-5 Heterotrait Monotrait Ratio

	LS	OC	OCB	OJ
LS				
OC	0.75			
OCB	0.679	0.646		
OJ	0.709	0.6	0.49	

Under cross loadings an indicator's outer loading on the related construct should be greater than all its cross-loadings (i.e., its correlation) on other constructs (Al-Emran, Mezhuyev, & Kamaludin, 2019; Rashid et al., 2021). Table VI shows cross loading of all statements included in the instrument of this pilot study get fit to the criteria therefore there is no issue of discriminant validity.

Table-6. Cross Loadings

	LS	OC	OCB	OJ
OJ 1	0.653	0.518	0.455	0.942
OJ 2	0.646	0.546	0.45	0.963
OJ 3	0.649	0.52	0.48	0.952
OJ 4	0.69	0.578	0.505	0.947
OJ 5	0.657	0.538	0.468	0.943
OJ 6	0.645	0.529	0.409	0.941
OJ 7	0.668	0.566	0.444	0.934
OJ 8	0.663	0.585	0.458	0.927
OJ 9	0.629	0.531	0.441	0.94
LS 1	0.857	0.523	0.601	0.75
LS 2	0.873	0.558	0.59	0.747
LS 3	0.831	0.518	0.572	0.718
LS 4	0.867	0.569	0.589	0.735
LS 5	0.731	0.715	0.495	0.539
LS 6	0.749	0.508	0.529	0.419
LS 7	0.77	0.495	0.517	0.452
LS 8	0.758	0.5	0.551	0.429
LS 9	0.793	0.501	0.506	0.471
LS 10	0.784	0.447	0.53	0.458
LS 11	0.742	0.629	0.399	0.503
LS 12	0.734	0.378	0.465	0.417
LS 13	0.76	0.615	0.478	0.472
LS 14	0.752	0.652	0.448	0.512
LS 15	0.761	0.612	0.471	0.479
LS 16	0.753	0.664	0.451	0.523

LS 17	0.764	0.587	0.595	0.541
OC 1	0.674	0.887	0.572	0.563
OC 2	0.665	0.902	0.589	0.546
OC 3	0.594	0.861	0.508	0.486
OC 4	0.601	0.899	0.561	0.482
OC 5	0.583	0.855	0.512	0.453
OC 6	0.642	0.834	0.522	0.495
OCB 1	0.581	0.542	0.935	0.406
OCB 2	0.635	0.58	0.69	0.402
OCB 3	0.534	0.463	0.913	0.373
OCB 4	0.553	0.508	0.931	0.395
OCB 5	0.538	0.511	0.926	0.404
OCB 6	0.572	0.562	0.923	0.441
OCB 7	0.571	0.577	0.877	0.452
OCB 8	0.601	0.563	0.92	0.434
OCB 9	0.606	0.533	0.937	0.418
OCB 10	0.676	0.677	0.872	0.558

4. Conclusion

This was a pilot study aimed to establish the reliability and validity of a research instrument before conducting the main study. Two hundred teachers employed in educational sector of Karachi Pakistan were recruited as a sample. In order to establish the reliability and validity of the instrument various data analysis tests were conducted. Reliability of the measurement instrument was tested by factor loadings, composite reliability (rho c), Cronbach alpha coefficient and reliability coefficient (rho a). All constructs of this study had values greater than the critical values of the statistical tests conducted for testing the reliability. To test the construct validity convergent and discriminant validity techniques were applied. The AVE of all constructs of this study were more than critical value therefore the convergent validity found adequate, additionally discriminant validity of the instrument is tested by using Fornell & Larcker Criterion Heterotrait Monotrait Ratio and Cross Loadings techniques and all results met the respective criteria found in literature review.

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