

The Impact of Organizational Citizenship Behavior on Organizational Performance of Vietnamese Universities during the Covid-19 Pandemic: The Moderating Role of Transformational Leadership

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Abstract: In an organization, the relationship between leaders and employees has long been of interest not only to organizational managers but also to researchers in management science. The purpose of this study is to examine the moderating role of transformational leadership style on the impact of organizational citizenship behavior on organizational performance (case study in Vietnamese universities). We employed a mix of methodologies, including Bayesian analysis, exploratory factor analysis, and regression analysis, to achieve this objective. The results showed that organizational citizenship behavior positively impacts organizational performance at Vietnamese universities. Besides, we also found evidence that transformational leadership styles increase the positive impact of organizational citizenship behavior on organizational performance in Vietnamese universities. Theoretically, these results highlight the organizational performance elements. This finding demonstrates the managerial influence in inspiring people to contribute to the organization. Based on the research results, we also propose implications for Vietnamese universities to influence organizational citizenship behavior and transformative leadership styles to increase organizational performance. Finally, to the best of our knowledge, this is a rare study that applies Bayesian analysis in this area of research.

Keywords: organizational citizenship behavior, transformational leadership style, organizational performance, bayesian analysis

1. Introduction

In an organization, people are considered the most important resource. Organizations recruit people to work for the organization's development goals. On the contrary, people are the decisive force to the existence and development of the organization. Therefore, the study of people's perceptions, attitudes, and behaviors in organizations and the relationship between these behaviors and organizational performance is the content of increasing attention. In which, the impact of employees' organizational citizenship behavior on organizational performance has been of interest to many scholars.

There have been numerous empirical studies demonstrating that organizational citizenship behavior plays a role in enhancing productivity and quality in work, customer satisfaction, and organizational revenue and profitability (Sunday, 2016). However, there are still other research gaps on the impact of organizational citizenship behavior on organizational performance. Specifically, Podsakoff et al. (2000) argue that transformational leadership also promotes the positive influence of organizational citizenship behavior on organizational performance. Transformational leadership enhances the motivation, morale, and performance of followers through a variety of mechanisms, including communicating inspiration, understanding subordinates' strengths and weaknesses, organizing tasks appropriate service. This will motivate employees to perform above expectations.

Therefore, to fill the theoretical gap, this study was conducted to find evidence on the moderating role of transformational leadership on the relationship between organizational citizenship behavior and organizational performance at Vietnamese universities.

Besides, in terms of method, exploratory factor analysis is used in all of the studies related to this topic to discover the representative factors for organizational citizenship behavior, transformational leadership, and organizational performance (Barsulai et al., 2019; Kumari & Thapliyal, 2017; Majeed et al., 2017; Sadeghi et al., 2016). After that, the studies continued to use multiple regression to determine the cause-and-effect relationship between these factors (Barnard, 1963; Barsulai et al., 2019; Kumari & Thapliyal, 2017; Majeed et al., 2017; Sadeghi et al., 2016). Currently, these approaches face two major problems. The first problem is related to the identification of factors in the exploratory factor analysis method. Specifically, the factors are determined first, and then the observed variables are allocated to each factor. This method makes the identification of factors not really convincing and depends a lot on the original model as well as the researcher's personal opinion. The second problem is determining the impact between factors by the multivariable regression method based on the p-value. The testing of hypotheses based on p-value has been criticized by many researchers in recent times (Wasserstein & Lazar, 2016). Therefore, we solve the first problem in this study by integrating the Bayesian method

to exploratory factor analysis. In this way, the number of factors and observed variables allocated to each factor will be performed simultaneously and selected according to the probability. For the second problem, we consider the effect of factors in the model based on Bayesian regression analysis without using the p-value. With this approach, we hope to open a new methodological approach for future research.

The study is organized as follows: In Section 2, a literature review is presented, followed by study methods in Section 3, and empirical results in Section 4. Finally, in Section 5, the conclusion and implications are presented.

2. Literature Review

2.1. Definition of concepts

Organizational Citizenship Behavior

Organ (1988) has defined organizational citizenship behavior as intermittent behavior of an employee in an organization that is not directly or explicitly recognized in the compensation system. However, these behaviors have the role of motivating the organization to operate more effectively. In an organization, there are many jobs that are not official duties or responsibilities of employees and are not described in their job descriptions. And when unexpected problems arise, employees with organizational citizenship conduct work beyond organizational expectations.

According to Organ (1988) and a number of recent studies such as Intaraprasong et al. (2012), Mohamed (2016), organizational citizenship behavior of employees includes five dimensions as follows:

- (i) Altruism refers to how to help others solve problems (Organ, 1988).
- (ii) Conscientiousness shows the sincere dedication of employees to a level that exceeds the organization's expectations (Organ, 1988).
- (iii) Sportsmanship is the avoidance and non-expression of negative behaviors (Organ, 1988).
- (iv) Courtesy is related to the willingness to perform obligations of cooperation with other colleagues (Organ, 1988).
- (v) Civic virtue is the willingness to engage in organizational activities, responsible behavior, and concern for organizational survival (Anwar & Islam, 2012).

Transformational leadership style

Leadership style refers to the behavior and methods that leaders use to influence subordinates to accomplish organizational goals. Good leadership is essential for optimal performance and fosters positive employee behaviors. According to Burns (1978), transformational leadership is an ethical and moral expression that increases the positive factors in employee behavior. According to this leadership style, leaders

need to have high interaction with employees in order to increase employee engagement and motivation (Burns, 1978).

Organizational performance

Organizational performance is defined as the quality of work, employee effectiveness in decision-making, process improvement and development, employee relationships with their leadership, diversity of services and products, innovation, market share, employee skills and experience in problem solving, new methods, and modern product development techniques (Imran, 2014). Organizational performance is also referred to as the extent to which an organization meets its own needs and the needs of its stakeholders in order to survive and thrive (Pandey & Dutta, 2013).

2.2. Impact of organizational citizenship behavior, transformational leadership on organizational performance

In recent years, relevant empirical studies on the impact of organizational citizenship behavior on organizational performance have all demonstrated that organizational citizenship behavior has a positive impact on organizational performance (Sadeghi et al., 2016; Barsulai et al., 2019). When a company is looking for a cooperative and helpful employee, according to Barnard (1963) and Katz (1964), cooperative and helpful employees tend to contribute more to their company than those who are not, resulting in improved organizational performance. Cooperation is a concept in organizational citizenship behavior that states that achieving organizational goals is contingent on people's desire to contribute to the communal good (Barnard, 1938). According to Katz (1964), in order for an organization to function effectively, employees must be recruited to do the job properly and to exceed the job requirements. Therefore, employees must be creative in achieving organizational goals.

The COVID-19 pandemic has impacted most countries around the world, disrupting many sectors of the economy. The education sector was significantly affected by the pandemic. Students, teachers, and staff could not go to school, making the activities of universities significantly affected. In order to maintain the functioning of universities, organizational citizenship behavior and its impact on university performance is an issue that needs research attention. Based on the above arguments, in this study, we propose the following hypothesis:

H1: Organizational citizenship behavior has a positive impact on organizational performance of Vietnamese universities.

With low labor productivity, workers have to face many new challenges in the current uncertain era. Getting through the COVID-19 pandemic requires a close connection between managers and employees. Such connections always have a significant impact on the performance of organizations. A leader needs foresight, discipline, objectivity, positive accountability. A leader should acknowledge and respect the characteristics of subordinates, which will lead to more loyalty and

attachment. In particular, in the context of the pandemic, to support the mental, emotional, and physical health of teachers and staff in universities, and leaders in university departments and faculties need to consider and arrange work reasonably, prioritizing cooperation instead of confrontation from an operational perspective. Unlike other organizations, teachers and staff in universities need respect and comfort in their work to adapt to the work context during the epidemic. Because one of the leader's roles is to control employee behaviors to accomplish desired goals, transformational leadership theory implies that leadership is positively associated with organizational performance. Furthermore, Vigoda-Gadot (2007) indicated that leadership style and organizational performance have a positive relationship.

Besides, there is also evidence that transformational leadership can increase the impact of organizational citizenship behavior on organizational performance. Employees are more likely to support the important role of good citizenship when their manager is viewed as a transformational leader. A transformative leader who is viewed as having professionalism and integrity, according to Vigoda-Gadot (2007), may establish a welcoming workplace in which workers can trust one another. This positive impact, in turn, will boost the performance of the organization.

As can be seen, domestic and foreign studies only consider the separate impact between organizational citizenship behavior and organizational performance, transformational leadership style and organizational citizenship behavior. These studies have not yet looked at the overall interaction between these factors. The results of previous studies have shown that transformational leadership can increase organizational citizenship behavior. Thus, when this factor increases, it can increase the positive impact of organizational citizenship behavior on organizational performance and vice versa. Therefore, in this study, the transformational leadership style factor is considered as a mediating variable in the relationship between organizational citizenship behavior and organizational performance. This research gap has also been proposed by recent studies by Sadeghi et al. (2016), Barsulai et al. (2019) for future research directions. Thus, in this study, we propose the following hypothesis:

H2: Transformational leadership increases the positive impact of organizational citizenship behavior on organizational performance of Vietnamese universities.

3. Research Method

This study was carried out through 2 phases, qualitative research, and quantitative research.

3.1. Qualitative research

Qualitative research aims to synthesize theories and research related to the topic, thereby developing hypotheses, research models, and scales. In the qualitative research step, interview and survey methods are used to adjust the scale of variables in the research model that has been developed to suit the working environment in Vietnamese universities.

On the basis of a brief review of related studies as presented in section 2.2, we propose the following research model:

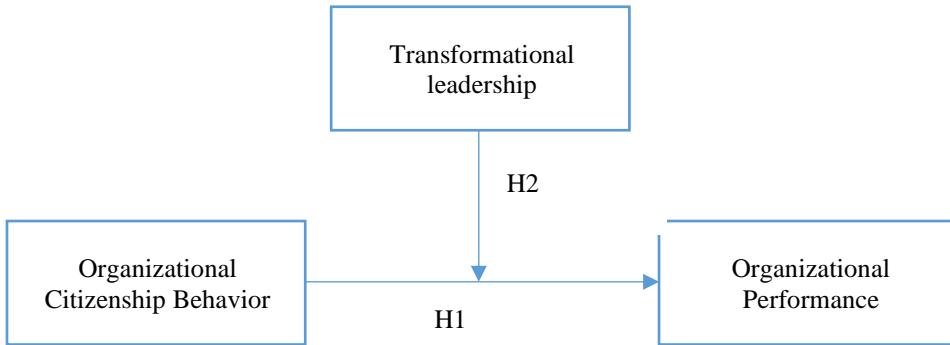


Fig. 1: Research model

The scales for the concepts in the research model are built based on previous studies. Qualitative and quantitative research results have shown that the scales in the specific model are as follows: the organizational citizenship behavior scale includes 5 factors which are altruism (including 5 observed variables), conscientiousness (including 4 observed variables), sportsmanship (including 4 observed variables), courtesy (including 4 observed variables), civic virtue (including 4 observed variables) are inherited from the research by Niehoff & Moorman (1993), Filadelfo León Cázares (2011). The organizational performance scale includes 4 observed variables inherited from the study of Filadelfo León Cázares (2011). The transformational leadership style scale includes 5 observed variables inherited from the study of Yoo et al. (2011).

In this phase, we designed a draft questionnaire, which was adapted by education experts and administrators through face-to-face interviews. A pilot study was performed to test and revise the questionnaire before data collection. The responses were assessed on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree”.

3.2. Quantitative research

3.2.1. Data collection

The data was collected through a questionnaire coded in the form of a QR code to survey lecturers and staff at universities in Ho Chi Minh City. Due to the impact of the COVID-19 pandemic, a convenience sampling technique was used in this study. Specifically, we have asked universities for permission to stick QR codes at school gates, where employees must make a medical declaration before entering the office.

In Vietnam, according to the announcement No. 1279/BGDĐT-KHHC of the Ministry of Education and Training dated March 17, 2014, on the list of public universities and colleges, Ho Chi Minh City has 38 universities with 4334 employees. In this study, we chose an error of 5%. Therefore, the minimum sample size is:

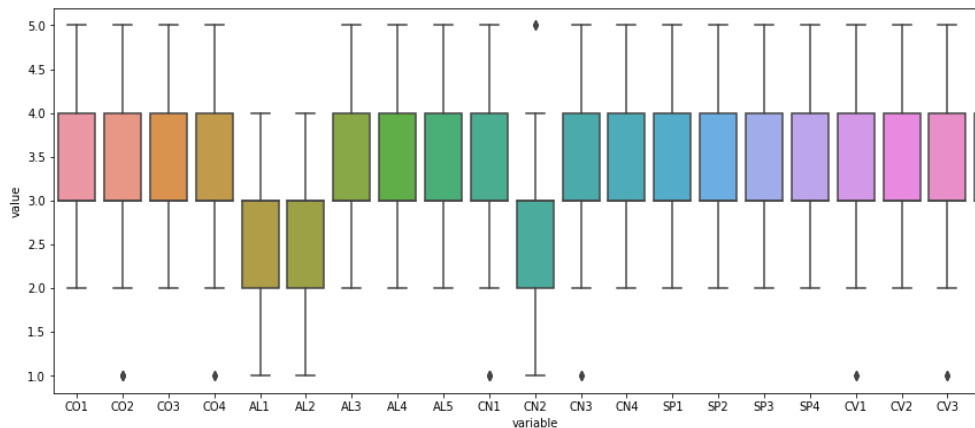
$$n = \frac{4334}{1 + 4334 \times (0.05)^2} = 366$$

During the survey period from August 2021 to October 2021, we obtained 519 responses. After removing 35 responses that were missing information, we were left with 484 responses.

3.2.2. Data processing method test for outliers

Before conducting the analysis, we perform tests and handle outliers in each observed variable. Test results for outliers were performed for each scale. Figure 2 shows the test results for outliers.

The results show that the observed variables contain outliers, including CO2, CO4, CN1, CN2, CN3, CV1, CV3, CV4, TLS1, TLS2, TLS3, TLS4, TLS5, OP1, OP2, OP3, OP4. We then performed the removal of these outliers. The total number of outliers excluded from the sample was 45. Thus, the sample size to conduct the analysis is 439 observations.



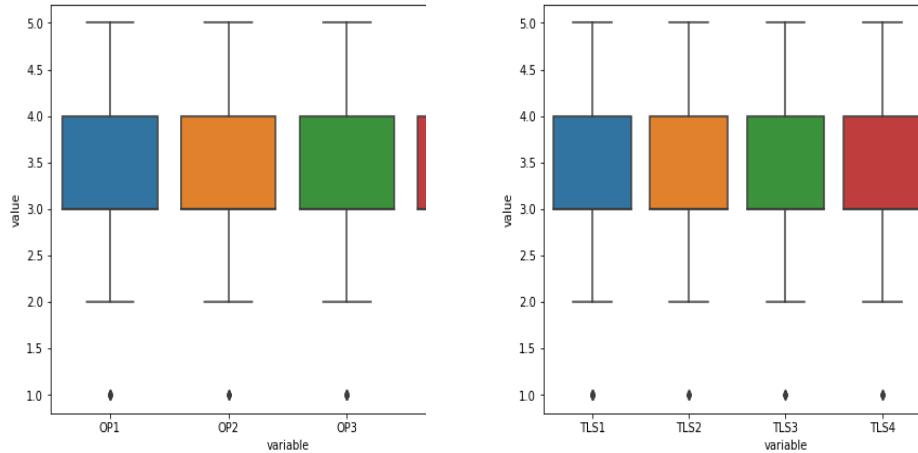


Fig. 2. Test results for outliers Bayesian exploratory factor analysis

In this study, we performed the Bayesian exploratory factor analysis based on the studies of Conti et al. (2014), Pham et al. (2021). The process includes the following steps:

Step 1: testing the scale's reliability by Cronbach's Alpha

Scales with a Cronbach's Alpha coefficient greater than 0.6, according to Nunnally & Bernstein (1994), are reliable. Furthermore, each scale's observed variables must have a Corrected item-total Correlation of more than 0.3.

Step 2: analyze the correlation matrix between the observed variables

The correlation coefficient between the observed variables will show the ability to measure the research concepts of the observed variables in the scales. This will imply the appropriateness of exploratory factor analysis.

Step 3: determine the number of factors and observed variables in each factor.

The number of factors and observed variables in each factor is determined based on the posterior distribution of the parameters in the Bayesian exploratory factor analysis. Specifically, the posterior distribution of the number of extracted factors will determine the number of extracted factors based on the greatest probability. The posterior distribution of the factor loading coefficient will show the posterior mean of the factor loading coefficient corresponding to each observed variable in the scale. An observed variable will be allocated to a corresponding factor when its posterior mean greater than 0.5.

Bayesian regression analysis

After identifying the factors representing the concepts in the research model, we use Bayesian regression analysis to assess the impact of organizational citizenship behavior, transformational leadership on organizational performance of universities in Vietnam.

To perform the Bayesian regression analysis, we perform regression analysis using the least-squares method to determine the prior distributions for the regression coefficients in the model. Specifically, we use prior distributions of the regression coefficients, which are normal distributions with the mean and standard deviation, respectively being the value of the regression coefficient and the standard deviation of this coefficient obtained from the least-squares method.

4. Empirical Results

4.1. Testing the scale’s reliability

Cronbach’s Alpha is a method used to determine how reliable a scale is. Cronbach’s Alpha is a scale that evaluates the consistency of observed variables. Cronbach’s Alpha of more than 0.6 is considered good. Furthermore, the observed variables show a corrected item-total Correlation of more than 0.3. The reliability test results of the scales are shown in Table 1 below:

Table 1: Reliability test results

Scale	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach’s Alpha if Item Deleted	Cronbach’s Alpha
CO1	10.04	2.980	0.576	0.770	0.801
CO2	10.02	2.780	0.669	0.723	
CO3	9.99	3.020	0.596	0.760	
CO4	10.07	2.945	0.618	0.750	
AL1	13.00	5.322	0.643	0.839	0.860
AL2	12.91	5.248	0.666	0.834	

AL3	12.40	4.875	0.742	0.813	
AL4	12.37	5.046	0.655	0.836	
AL5	12.40	4.780	0.686	0.829	
CN1	9.79	3.146	0.667	0.815	0.847
CN2	10.34	3.206	0.718	0.792	
CN3	9.92	3.225	0.690	0.804	
CN4	9.76	3.318	0.667	0.814	
SP1	10.15	2.994	0.608	0.771	0.810
SP2	10.16	2.932	0.637	0.757	
SP3	10.19	3.011	0.610	0.769	
SP4	10.28	2.973	0.653	0.749	
CV1	10.13	3.495	0.635	0.777	0.820
CV2	10.08	3.453	0.657	0.766	
CV3	10.06	3.588	0.603	0.791	
CV4	10.26	3.315	0.673	0.759	
TLS1	13.72	7.353	0.803	0.902	0.921
TLS2	13.76	7.910	0.683	0.925	
TLS3	13.74	7.487	0.816	0.899	
TLS4	13.68	7.133	0.851	0.892	
TLS5	13.74	7.614	0.831	0.897	
OP1	10.24	3.471	0.731	0.751	0.830
OP2	10.19	3.676	0.629	0.799	
OP3	10.20	3.667	0.713	0.761	
OP4	10.19	3.986	0.563	0.826	

The findings revealed that all scales and their observed variables met the reliability criteria and were further analyzed for exploratory factors.

4.2. The correlation matrix

Figure 3 shows that the correlation coefficients of the observed variables in each scale have values greater than 0.5. Thus, the observed variables in each scale will be highly correlated with each other. This shows that these observed variables measure the same concept. Therefore, the factor analysis method is suitable.

	CO 1	CO 2	CO3	CO 4	AL 1	AL2	AL 3	AL 4	AL5	CN 1	CN2	CN 3	CN 4	SP1	SP2	SP3	SP4	CV 1	CV2	CV3	CV4	TLS 1	TLS 2	TLS 3	TLS 4	TLS 5	OP 1	OP 2	OP 3	OP 4	
CO1	1.00	0.52	0.49	0.53	0.19	0.15	0.18	0.21	0.23	0.23	0.22	0.21	0.15	0.25	0.14	0.2	0.24	0.17	0.16	0.16	0.19	0.30	0.25	0.31	0.27	0.30	0.40	0.40	0.42	0.29	
CO2	0.52	1.00	0.61	0.55	0.17	0.00	0.16	0.19	0.13	0.29	0.24	0.23	0.14	0.29	0.2	0.2	0.2	0.31	0.06	0.06	0.09	0.06	0.29	0.31	0.31	0.29	0.30	0.35	0.38	0.35	0.24
CO3	0.49	0.61	1.00	0.50	0.12	-0.01	0.02	0.12	0.08	0.27	0.34	0.25	0.23	0.28	0.2	0.2	0.3	0.34	0.11	0.05	0.19	0.12	0.36	0.36	0.32	0.33	0.36	0.32	0.34	0.32	0.21
CO4	0.53	0.55	0.50	1.00	0.06	0.15	0.16	0.22	0.17	0.20	0.28	0.28	0.13	0.22	0.1	0.1	0.1	0.16	0.12	0.16	0.15	0.15	0.25	0.22	0.22	0.22	0.23	0.26	0.29	0.31	0.13
AL1	0.19	0.17	0.12	0.06	1.00	0.53	0.59	0.52	0.58	0.14	0.14	0.12	0.11	0.19	0.2	0.1	0.17	0.16	0.05	0.09	0.08	0.34	0.33	0.30	0.32	0.27	0.36	0.35	0.30	0.36	
AL2	0.15	0.00	-0.01	0.15	0.53	1.00	0.60	0.56	0.55	0.21	0.11	0.16	0.09	0.25	0.2	0.2	0.2	0.15	0.26	0.08	0.07	0.17	0.34	0.34	0.36	0.31	0.30	0.34	0.31	0.40	0.30
AL3	0.18	0.16	0.02	0.16	0.59	0.60	1.00	0.60	0.59	0.26	0.22	0.22	0.19	0.29	0.1	0.1	0.1	0.12	0.21	0.11	0.08	0.08	0.32	0.39	0.32	0.30	0.31	0.41	0.39	0.43	0.33
AL4	0.21	0.19	0.12	0.22	0.52	0.56	0.60	1.00	0.55	0.23	0.15	0.16	0.06	0.31	0.1	0.1	0.2	0.01	0.36	0.19	0.24	0.24	0.38	0.38	0.32	0.34	0.29	0.40	0.42	0.43	0.43
AL5	0.23	0.13	0.08	0.17	0.58	0.55	0.59	0.55	1.00	0.24	0.21	0.19	0.12	0.36	0.1	0.1	0.1	0.10	0.16	0.00	-0.01	0.07	0.33	0.39	0.33	0.32	0.30	0.38	0.34	0.41	0.33
CN1	0.23	0.29	0.27	0.20	0.14	0.21	0.26	0.23	0.24	1.00	0.60	0.64	0.58	0.41	0.2	0.2	0.2	0.28	0.13	0.12	0.02	0.05	0.37	0.34	0.41	0.41	0.37	0.42	0.41	0.29	0.2
CN2	0.22	0.24	0.34	0.28	0.14	0.11	0.22	0.15	0.21	0.60	1.00	0.64	0.67	0.55	0.3	0.1	0.1	0.31	0.17	0.18	0.04	-0.01	0.39	0.31	0.39	0.39	0.34	0.38	0.34	0.33	0.33
CN3	0.21	0.23	0.25	0.28	0.12	0.16	0.22	0.16	0.19	0.64	0.64	1.00	0.59	0.67	0.2	0.2	0.1	0.29	0.14	0.20	0.05	0.04	0.35	0.34	0.42	0.37	0.40	0.42	0.39	0.29	0.2
CN4	0.15	0.14	0.23	0.13	0.11	0.09	0.19	0.06	0.12	0.58	0.67	0.59	1.00	0.67	0.2	0.2	0.2	0.26	0.13	0.10	0.06	0.00	0.39	0.38	0.45	0.44	0.45	0.45	0.39	0.36	0.29
SP1	0.25	0.29	0.28	0.22	0.19	0.25	0.19	0.11	0.12	0.27	0.36	0.27	0.25	0.56	1.0	0.4	0.4	0.56	0.24	0.12	0.12	0.20	0.31	0.37	0.34	0.32	0.31	0.33	0.33	0.33	0.33
SP2	0.14	0.20	0.25	0.10	0.24	0.20	0.18	0.13	0.10	0.25	0.19	0.25	0.26	0.49	0.4	1.0	0.5	0.54	0.13	0.07	0.18	0.08	0.34	0.31	0.33	0.32	0.32	0.32	0.32	0.32	0.29
SP3	0.23	0.20	0.31	0.15	0.19	0.21	0.16	0.21	0.18	0.23	0.15	0.16	0.25	0.53	0.4	0.5	1.0	0.53	0.20	0.10	0.13	0.20	0.36	0.34	0.39	0.36	0.36	0.33	0.33	0.33	0.33

4.3. The number of factors and observed variables in each factor

After analyzing the correlation matrix, we continue to perform Bayesian exploratory factor analysis to determine the number of factors representing the concepts in the research model. Bayesian exploratory factor analysis was performed with the MCMC size of 27500, of which 2500 times was the burn-in phase. Therefore, the MCMC size to conduct the analysis is 25000.

Figure 4 shows that Bayesian exploratory factor analysis extracted 7 factors representing 30 observed variables in the research model. Specifically, the trace plot shows that 25000 times of simulation, the number of factors extracted is 7. The posterior distribution of the number of factors also shows that the probability of extracting 7 factors is 100%.

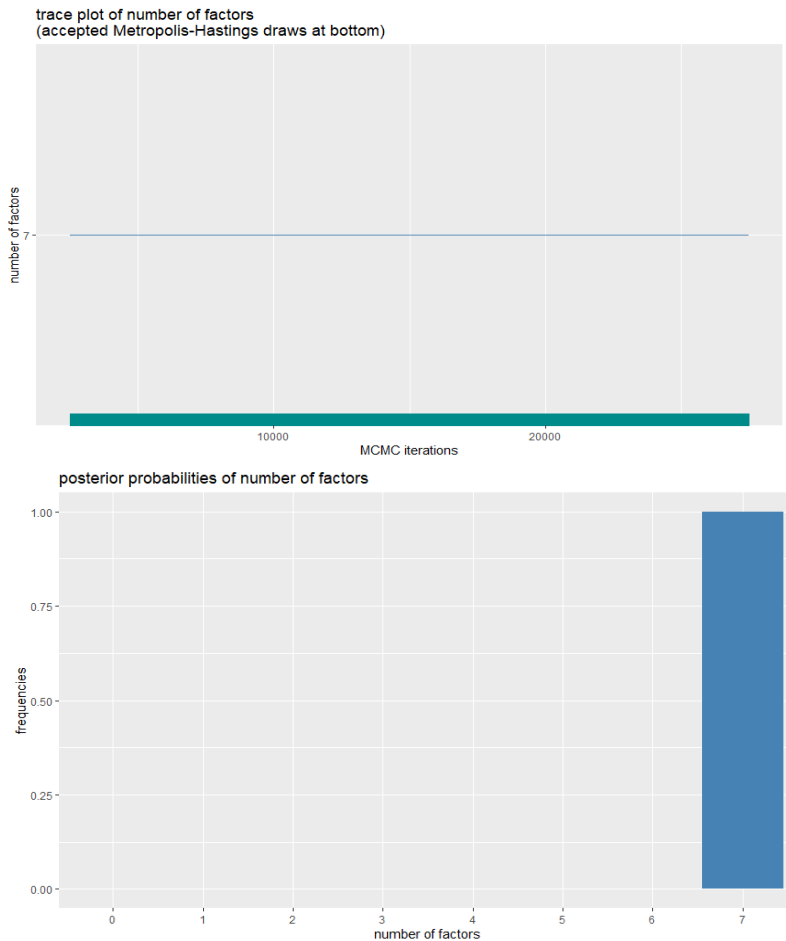


Fig. 4: Trade plot and posterior probabilities of the number of factors

At the same time, Bayesian exploratory factor analysis also allocates observed variables corresponding to each factor.

The posterior mean values of the factor loading coefficients and the probability that the observed variables are allocated respectively for each factor are presented in Table 2 and Figure 5.

Table 2: Posterior Mean of factor loading coefficient

Variable	Factor	Prob	Posterior Mean	SD	[95% HPD]	
alpha:CO1	1	100%	0.664	0.047	0.575	0.759
alpha:CO2	1	100%	0.772	0.045	0.685	0.863
alpha:CO3	1	100%	0.718	0.046	0.627	0.807
alpha:CO4	1	100%	0.690	0.046	0.602	0.782
alpha:AL1	2	100%	0.701	0.044	0.615	0.787
alpha:AL2	2	100%	0.729	0.043	0.644	0.813
alpha:AL3	2	100%	0.823	0.042	0.740	0.903
alpha:AL4	2	100%	0.732	0.044	0.647	0.819
alpha:AL5	2	100%	0.742	0.043	0.659	0.829
alpha:CN1	3	100%	0.734	0.044	0.647	0.818
alpha:CN2	3	100%	0.812	0.042	0.731	0.895
alpha:CN3	3	100%	0.759	0.043	0.673	0.843
alpha:CN4	3	100%	0.754	0.044	0.671	0.842
alpha:SP1	4	100%	0.714	0.046	0.622	0.802
alpha:SP2	4	100%	0.725	0.045	0.635	0.813
alpha:SP3	4	100%	0.693	0.046	0.604	0.783
alpha:SP4	4	100%	0.749	0.045	0.660	0.837
alpha:CV1	5	100%	0.746	0.046	0.656	0.835
alpha:CV2	5	100%	0.752	0.045	0.663	0.840
alpha:CV3	5	100%	0.671	0.047	0.579	0.763
alpha:CV4	5	100%	0.758	0.046	0.668	0.848
alpha:TLS1	6	100%	0.945	0.036	0.872	1.014
alpha:TLS2	6	100%	0.640	0.044	0.557	0.727
alpha:TLS3	6	100%	0.782	0.041	0.701	0.861
alpha:TLS4	6	100%	0.969	0.035	0.900	1.038
alpha:TLS5	6	100%	0.750	0.042	0.670	0.833
alpha:OP1	7	100%	0.807	0.042	0.725	0.888
alpha:OP2	7	100%	0.728	0.044	0.644	0.815
alpha:OP3	7	100%	0.798	0.041	0.719	0.882
alpha:OP4	7	100%	0.654	0.045	0.568	0.744

The “Prob” column in Table 2 shows the probability that an observed variable is allocated to a factor. The results show that the probability of allocating observed variables to each factor is 100%. Thus, each observed variable is only allocated to 1 factor. The “Posterior Mean” column in Table 2 shows the posterior mean of the factor loading. The results show that the posterior mean values are all greater than 0.5.

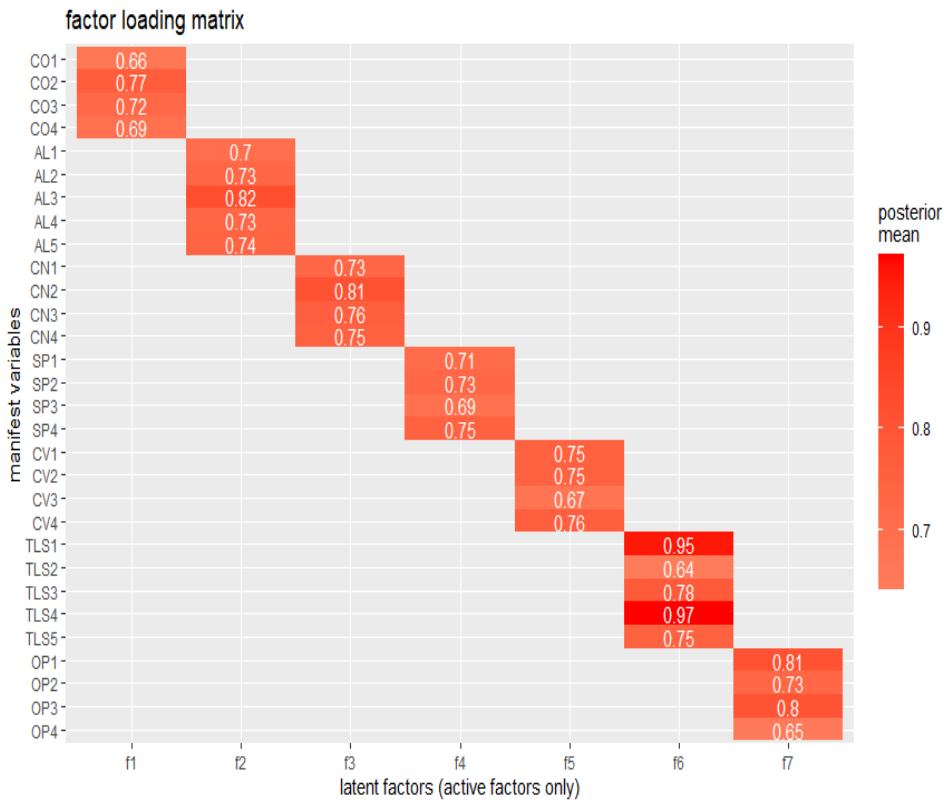


Fig. 5: Factor loading matrix

The results in Figure 5 show that the factor loading coefficients corresponding to each observed variable have values greater than 0.5. Besides, Figure 5 shows the observed variables corresponding to each factor. Specifically:

The observed variables CO1, CO2, CO3, and CO4 are measured for the same factor. Name this factor CO, representing the courtesy factor.

The observed variables AL1, AL2, AL3, AL4, and AL5 are measured for the same factor. Name this factor AL, representing the altruism factor.

The observed variables CN1, CN2, CN3, and CN4 are measured for the same factor. Name this factor CN, representing the conscientiousness factor.

The observed variables SP1, SP2, SP3, and SP4 are measured for the same factor. Name this factor SP, representing the sportsmanship factor.

The observed variables CV1, CV2, CV3, and CV4 are measured for the same factor. Name this factor CV, representing the civic virtue factor.

The observed variables TLS1, TLS2, TLS3, TLS4, and TLS5 are measured for the same factor. Name this factor TLS, representing the transformational Leadership factor.

The observed variables OP1, OP2, OP3, and OP4 are measured for the same factor. Name this factor OP, representing the organizational Performance factor.

Table 3: The results of evaluating the moderating effects of transformational leadership by Ordinary least squares

Variable	(1)		(2)		(3)		(4)		(5)		(6)	
	Coefficients	Std. Error	Coefficients	Std. Error	Coefficients	Std. Error	Coefficients	Std. Error	Coefficients	Std. Error	Coefficients	Std. Error
(Constant)	-0.924***	0.187	-0.203	0.236	-0.180	0.237	-0.169	0.236	-0.206	0.235	-0.194	0.234
CO	0.255***	0.039	0.217***	0.039	0.023	0.061	0.215***	0.039	0.220***	0.039	0.214***	0.039
AL	0.415***	0.038	0.166***	0.064	0.361***	0.038	0.361***	0.038	0.362***	0.038	0.360***	0.038
CN	0.221***	0.039	0.148***	0.041	0.146***	0.041	-0.050	0.066	0.146***	0.041	0.147***	0.041
SP	0.232***	0.041	0.193***	0.040	0.197***	0.040	0.189***	0.040	0.018	0.059	0.192***	0.040
CV	0.191***	0.034	0.171***	0.033	0.170***	0.033	0.172***	0.033	0.170***	0.033	-0.014	0.053
TLS_AL			0.058***	0.012								
TLS_CO					0.055***	0.011						
TLS_CN							0.056***	0.011				
TLS_SP									0.052***	0.011		
TLS_CV											0.056***	0.011

*** statistically significant at the 1% level.

** statistically significant at the 5% level

* statistically significant at the 10% level

4.4. Bayesian regression analysis

To perform Bayesian regression analysis, we estimate the impact model of organizational citizenship behavior on organizational performance at Vietnamese universities using the Ordinary least squares method. The moderating effects of transformational leadership are also considered in this model. The model estimation results are presented in Table 3.

As mentioned before, the testing of hypotheses based on p-values has received much criticism in recent times. In particular, the p-value does not indicate the probability that the hypothesis is likely to occur but only the probability of having data when the hypothesis is true.

Therefore, we only use the Ordinary least squares method to determine the prior distributions for the regression coefficients. Then, Bayesian regression analysis will be performed to draw conclusions about the research hypothesis.

With the results in Table 3, we determine the prior distributions for the regression coefficients to be normal distributions with means and standard deviations, respectively being the regression coefficients and standard errors, which are obtained from the Ordinary least squares method. The results in Table 3 showed that factors including CO, AL, CN, SP and CV positively impacted OP. In addition, the interaction variables between transformational leadership style and components of organizational citizenship behavior have a positive impact on organizational performance.

Next, we perform Bayesian regression analysis with the MCMC size of 27500, of which 2500 times was the burn-in phase. Therefore, the MCMC size to conduct the analysis is 25000. The results are presented in Table 4 below.

Table 4: The results of evaluating the moderating effects of transformational leadership by Bayes regression analysis

Variable	(1)			(2)			(3)			(4)			(5)			(6)		
	Mean	Equal-tailed [95% Cr. Interval]		Mean	Equal-tailed [95% Cr. Interval]		Mean	Equal-tailed [95% Cr. Interval]		Mean	Equal-tailed [95% Cr. Interval]		Mean	Equal-tailed [95% Cr. Interval]		Mean	Equal-tailed [95% Cr. Interval]	
CO	0.258	0.207	0.310	0.216	0.161	0.271	0.023	0.021	0.025	0.216	0.151	0.273	0.217	0.167	0.274	0.232	0.186	0.280
AL	0.416	0.366	0.464	0.167	0.086	0.248	0.348	0.307	0.391	0.361	0.314	0.411	0.364	0.314	0.417	0.375	0.329	0.423
CN	0.222	0.171	0.275	0.146	0.091	0.198	0.145	0.094	0.201	0.049	0.130	0.031	0.148	0.093	0.203	0.131	0.082	0.178
SP	0.231	0.177	0.287	0.191	0.139	0.244	0.208	0.166	0.251	0.187	0.136	0.241	0.018	0.016	0.020	0.194	0.140	0.252
CV	0.189	0.143	0.235	0.168	0.124	0.214	0.169	0.116	0.215	0.174	0.118	0.225	0.167	0.119	0.211	0.009	0.074	0.056
TLS_AL				0.058	0.043	0.072												
TLS_CO							0.054	0.044	0.066									
TLS_CN										0.056	0.043	0.071						
TLS_SP													0.052	0.040	0.062			
TLS_CV																0.055	0.042	0.068
Constant	Yes			Yes			Yes			Yes			Yes			Yes		

The prior distributions of regression coefficients: In model 1: $prior\{op:co\}, normal(0.255,0.039*0.039)$ $prior\{op:al\}, normal(0.415,0.038*0.038)$ $prior\{op:cn\}, normal(0.221,0.039*0.039)$ $prior\{op:sp\}, normal(0.232,0.041*0.041)$ $prior\{op:cv\}, normal(0.191,0.034*0.034)$; In model 2: $prior\{op:co\}, normal(0.217,0.039*0.039)$ $prior\{op:al\}, normal(0.166,0.064*0.064)$ $prior\{op:cn\}, normal(0.148,0.041*0.041)$ $prior\{op:sp\}, normal(0.193,0.040*0.040)$ $prior\{op:cv\}, normal(0.171,0.033*0.033)$ $prior\{op:tls_al\}, normal(0.058,0.012*0.012)$; In model 3: $prior\{op:co\}, normal(0.023,0.061*0.061)$ $prior\{op:al\}, normal(0.361,0.038*0.038)$ $prior\{op:cn\}, normal(0.146,0.041*0.041)$ $prior\{op:sp\}, normal(0.197,0.040*0.040)$ $prior\{op:cv\}, normal(0.170,0.033*0.033)$ $prior\{op:tls_co\}, normal(0.055,0.011*0.011)$; In model 4: $prior\{op:co\}, normal(0.215,0.039*0.039)$ $prior\{op:al\}, normal(0.361,0.038*0.038)$ $prior\{op:cn\},$

*normal(-0.050,0.066*0.066)) prior({op:sp}, normal(0.189,0.040*0.040)) prior({op:cv}, normal(0.172,0.033*0.033)) prior({op:tls_cn}, normal(0.056,0.011*0.011)); In model 5: prior({op:co}, normal(0.220,0.039*0.039)) prior({op:al}, normal(0.362,0.038*0.038)) prior({op:cn}, normal(0.146,0.041*0.041)) prior({op:sp}, normal(0.018,0.001*0.001)) prior({op:cv}, normal(0.170,0.033*0.033)) prior({op:tls_sp}, normal(0.052,0.011*0.011)); In model 6: prior({op:co}, normal(0.214,0.039*0.039)) prior({op:al}, normal(0.360,0.038*0.038)) prior({op:cn}, normal(0.147,0.041*0.041)) prior({op:sp}, normal(0.192,0.040*0.040)) prior({op:cv}, normal(-0.014,0.053*0.053)) prior({op:tls_cv}, normal(0.056,0.011*0.011)). MCMC size for analysis is 25000.*

5. Discussion and Implications

5.1. Discussion

Model (1) in Table 4 shows the impact of organizational citizenship behavior on organizational performance at Vietnamese universities. The moderating effects of transformational leadership are not considered in this model. The “means” column and “Equal-tailed” column in Table 4 show the posterior mean of the regression coefficient and the 95% credible interval of the posterior mean, respectively. The 95% credible interval in the Bayesian regression analysis is different from the 95% confidence interval in the least-squares regression analysis. Table 4 shows that the posterior mean values are all positive, and the lower bounds of the 95% credible intervals are all greater than 0. Therefore, CO, AL, CN, SP, and CV all positively affect OP. In other words, organizational citizenship behavior will positively impact organizational performance at Vietnamese universities. This result supports our hypothesis H1 and is also consistent with the studies of Sadeghi et al. (2016), Barsulai et al. (2019).

Models (2), (3), (4), (5), (6) examine The moderating role of transformational leadership on the impact of organizational citizenship behavior on organizational performance at Vietnamese universities. Table 4 shows that the regression coefficients of TLS_AL, TLS_CO, TLS_CN, TLS_SP, TLS_CV all have positive values, and the lower bounds of the 95% credible intervals are all greater than 0. Therefore, TLS_AL, TLS_CO, TLS_CN, TLS_SP, and TLS_CV all positively affect OP. This result shows that transformational leadership can increase the positive impact of organizational citizenship behavior on organizational performance at Vietnamese universities. This result supports our hypothesis H2 and is also consistent with the studies of Vigoda-Gadot (2007), Sadeghi et al. (2016), Barsulai et al. (2019).

Looking back at the results in Table 3, we see a convergence between the results of hypothesis testing by p-value and Bayesian analysis. However, it is very clear that we have performed a more modern analysis. Therefore, the results we obtained from this study are reliable.

5.2. Implications

Improve organizational performance on the altruism and courtesy factors. In the education industry and in any unit or organization, the relationship between colleagues is always a key issue for formation and development. Therefore, to improve the performance of the organization, leaders need to build an open and equal environment so that employees can share and help each other not only at work but also in life.

Improve organizational performance with respect to the civic virtue factor. With the particularity of the educational environment, the majority of employees are people

with certain qualifications. In order to have a good grasp of the working process and necessary soft skills, leaders need to organize many professional skills training classes for employees, especially administrative staff and new employees. In addition, leaders also need to regularly listen to the thoughts and aspirations of employees.

In order to improve the performance of the organization for the sportsmanship and conscientious factors, leaders need to regularly organize movement activities in the school. Leaders need to reward collective achievements, not those of an individual.

Leaders at universities must build their own image through professionalism, exemplary work, and demonstrating professional competence in activities such as publishing scientific works, organizing scientific conferences and seminars, and international cooperation in order to improve organizational performance, particularly in the context of the COVID-19 pandemic. In a university, the majority of employees have strong self-esteem and expect their work to be judged fairly and objectively. As a result, departmental heads must view work as a task rather than a position, and they should not force their will on personnel by administrative directives or positional dominance. From there, leaders will create trust and attraction to employees.

5.3. Limitations and further research

Although achieving the research objectives set out, this study still cannot avoid some limitations as follows:

The study was conducted with a relatively large sample size of 439 observations. However, a larger sample size can give more general results. Therefore, further studies can increase the sample size by surveying more lecturers and staff in other areas outside of Ho Chi Minh City.

In addition, organizational performance is also affected by factors other than organizational citizenship behavior and transformational leadership style. Therefore, future studies may add new factors to the model to find different results than this study.

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Data Availability Statement: The primary data used to support this study's findings has been uploaded to the Github repository (<https://github.com/anhle32/The-impact-of-Organizational-Citizenship-Behavior-on-Organizational-performance.git>).

Conflicts of Interest: The authors declare no conflict of interest.

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