International Journal of Social Sciences: Current and Future Research Trends (IJSSCFRT)
ISSN: 2790-4008
https://ijsscfrtjournal.isrra.org/index.php/Social_Science_Journal

Factors Influencing Transformational Leadership among Lecturers in Public Universities of Xi'an, China: A Pilot Test

Li Si Yi[a*], Chin Nyuk Sang[b]

[a,b]*Malaysia University of Science and Technology (MUST), Block B, Encorp Strand Garden Office, No. 12,Jalan PJU 5/5, Kota Damansara, 47810 Petaling Jaya, Selangor, Malaysia*

[a]*Email: li.siyi@phd.must.edu.my*

[b]*Email: nschin@phd.must.edu.my*

Abstract

This study examines the factors influencing transformational leadership among lecturers in public universities in Xi'an, China, focusing on the reliability and validity of a pilot test measuring job satisfaction, organizational structure alignment, organizational justice, social responsibility, mindfulness, and spiritual intelligence. Using Cronbach's Alpha, Composite Reliability (rho_a and rho_c), and the Heterotrait-Monotrait ratio (HTMT), the study confirmed the reliability and validity of the measurement instruments. All constructs showed high internal consistency (Cronbach's Alpha: 0.872-0.943) and robust Composite Reliability. Convergent validity, assessed through the Average Variance Extracted (AVE), exceeded the 0.5 threshold for all constructs. Discriminant validity, evaluated using the HTMT ratio and the Fornell & Larcker criterion, revealed some high HTMT values, indicating potential overlap, while interaction terms demonstrated better discriminant validity, highlighting nuanced construct relationships. The study underscores the importance of rigorous psychometric evaluation in organizational research. Validated constructs provide reliable tools for both researchers and practitioners, enabling accurate assessments of organizational dynamics and informing strategies for improvement. Additionally, the study identifies areas for further refinement and calls for future research to validate these constructs across different contexts and cultures, ensuring broader applicability and robustness of the measurement instruments.

Keywords: Transformational Leadership; Psychometric Evaluation; Reliability and Validity; Organizational Behavior; Public Universities in China.

Received: 5/13/2024
Accepted: 7/13/2024
Published: 7/23/2024

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* Corresponding author.

1. Introduction

Transformational leadership continues to be recognized as a critical component in advancing educational outcomes, particularly within the higher education sector. This leadership style, characterized by its ability to inspire and motivate followers to exceed their expectations, plays a pivotal role in fostering an environment conducive to academic excellence and institutional innovation.

Recent research underscores the multifaceted nature of transformational leadership in higher education, highlighting how it facilitates academic success and organizational growth. According to a study by [1], transformational leaders in academia not only elevate student engagement and learning but also enhance the overall institutional effectiveness by promoting a culture of continuous improvement and innovation. These leaders are adept at navigating the complexities of academic environments, driving change that aligns with both educational standards and student needs.The effectiveness of lecturers as transformational leaders is influenced by a broad spectrum of personal and organizational factors. Personal factors include traits such as empathy, integrity, and intellectual stimulation, which enable leaders to connect with and inspire their followers deeply. For instance, [2] demonstrated that lecturers who exhibit high levels of empathy and ethical standards are more likely to engage and motivate their students effectively, leading to improved educational outcomes.Organizational factors also play a crucial role. These include the institution's culture, governance structure, and the availability of resources, all of which can significantly impact the ability of leaders to implement transformative changes. Research by [3] highlights that supportive organizational structures that provide clear communication, adequate resources, and professional development opportunities are essential for enabling transformational leadership in higher education settings.

Focusing on public universities in Xi'an, China, adds a unique cultural and institutional layer to the study of transformational leadership. Cultural values such as collectivism, respect for authority, and the emphasis on education deeply embedded in Chinese society influence the leadership styles and effectiveness in this region [4]. Understanding how these cultural norms interact with transformational leadership practices is vital for tailoring leadership strategies that are culturally sensitive and effective. To ensure the robustness of the findings, this study employs a comprehensive pilot testing framework designed to test the reliability and validity of the measurement instruments used. Reliability refers to the consistency of the instrument in measuring what it is supposed to measure over time, while validity concerns whether the instrument truly measures the construct it purports to measure. According to [5], employing such rigorous testing methods is crucial in cross-cultural research where linguistic nuances and cultural contexts may affect the interpretation of survey items or responses. Through its rigorous methodological framework and deep contextual understanding, this study aims to contribute significantly to the body of knowledge on transformational leadership in higher education, particularly within the unique setting of Xi'an's public universities.

2. Research Methodology

The introduction and research design of the study focusing on transformational leadership among lecturers in public universities of Xi'an, China, outline a structured approach to understanding how various factors influence educational leadership. The methodology, grounded in quantitative research and employing a survey-based approach, is instrumental for extracting measurable and generalizable data from the academic environment. In the study of transformational leadership, it is crucial to have a reliable and valid method to measure the variables of interest. The pilot testing framework mentioned is a preliminary step that ensures the measurement instruments

are appropriately calibrated for the target population, which is critical for the integrity of the research findings [6]. This approach not only facilitates the identification of potential problems in the study design but also enhances the credibility of the research through rigorous validation processes.The choice of a quantitative research design using a survey-based approach is well-suited to the goals of the study. According to [7], quantitative methods allow researchers to systematically investigate phenomena via statistical, mathematical, or computational techniques. By adopting this approach, the study aims to quantify the impact of various factors on transformational leadership and establish relationships between them.

Surveys are particularly effective in educational research as they can gather data from a large number of respondents efficiently, allowing for a comprehensive analysis of the trends and patterns that may influence leadership behaviors [8]. This method is beneficial for testing a series of hypotheses about the influences on transformational leadership, as it provides a structured mechanism for collecting data that can be statistically analyzed to validate these hypotheses.By grounding the study in established research methodology literature, the approach is reinforced with a robust framework that enhances its validity and reliability, thereby contributing significantly to the field of educational leadership research.

2.1 Pilot Testing

Before conducting the main study, a preliminary pilot study is performed to evaluate the feasibility of the research methods and the reliability of the research instruments. The primary objective of the pilot study is to identify and address any weaknesses in the research design and methodology, thereby enhancing the overall quality and effectiveness of the main study. Pilot studies are smaller-scale investigations conducted prior to larger studies to test research methods, procedures, and techniques. They allow researchers to evaluate feasibility, address potential challenges, refine procedures, and optimize resource allocation.To assess the reliability of the research instruments, a pilot sample of 50 subjects is selected for preliminary testing before collecting the final dataset. The collected data is meticulously examined to determine the instruments' reliability using Cronbach's alpha as the standard measure. According to [9], a Cronbach's alpha coefficient exceeding 0.70 indicates robust reliability. In this study, 50 lecturers from two universities in Xi'an, China, are randomly chosen to complete the questionnaires as outlined in Appendix A. The data collected is analyzed to assess the survey's reliability and validity. If the Cronbach's alpha coefficient for each section of the questionnaires exceeds 0.8, it indicates a high level of reliability (Saunders and his colleagues, 2007). These steps ensure the rigorous evaluation of the research instruments' reliability and contribute to the robustness of the subsequent main study.

a. Conducting a Pilot Test

Conducting a pilot test is a critical step to ensure the effectiveness and reliability of the chosen research methods and instruments.

The primary purpose of the pilot test is to evaluate the practicality of research methods and the trustworthiness of research instruments [10]. Researchers specify the particular aspects of their methods and instruments that require careful evaluation and potential enhancement. A literature review is conducted to identify dimensions for the independent and dependent variables. Researchers then adapt and formulate research questionnaires based on existing studies.

To ensure the pilot test accurately reflects the broader target population, a subgroup of participants with similar characteristics to the larger population is chosen. Research instruments, including questionnaires and surveys, are meticulously prepared and ready for distribution.

Participants are selected from the target population [11] to mirror the characteristics of the broader population,

ensuring representative results. In this study, the population of lecturers in public universities is determined, and a sample size of 400 is calculated to achieve accurate research results. Ethical approval is obtained from the Malaysia University of Science and Technology (MUST), and consent forms and questionnaires are sent to participants. Participants are encouraged to provide feedback on the clarity, relevance, and comprehensibility of the research instruments and procedures [12].

A preliminary analysis of the data collected during the pilot test is conducted to detect any emerging patterns or issues that require attention. Reliability coefficients, such as Cronbach's alpha, are calculated to gauge the internal consistency of the research instruments. Feedback from participants is systematically analyzed to identify recurring themes or concerns, informing necessary adjustments to the research instruments and methods.

Researchers make modifications based on feedback and data analysis to enhance the clarity and relevance of the instruments. Any procedural challenges identified during the pilot test are addressed to ensure the effectiveness and efficiency of the research methods. A dedicated section outlining the procedures, findings, and modifications resulting from the pilot test is included in the final research report or thesis [13]. Multiple rounds of pilot testing may be conducted if further evaluation and adjustments are necessary [14]. Once satisfied with the pilot test results and necessary adjustments, researchers are well-prepared to proceed with the main study.

Reliability refers to the consistency or stability of the research instruments and can be assessed using methods such as test-retest reliability, inter-rater reliability, internal consistency reliability, and parallel form reliability. For this study, internal consistency reliability is measured using Cronbach's alpha coefficient, which ranges from 0 to 1, with higher values indicating higher reliability. A minimum reliability of 0.70 is required for attitudinal instruments.

The reliability of the questionnaire items is evaluated using Cronbach's Alpha, with both SPSS and SmartPLS software utilized. Composite reliability is also computed to provide an additional assessment of the questionnaire items' consistency. Composite reliability values typically range from 0 to 1, with higher values indicating stronger internal consistency. Researchers often consider a threshold value of 0.7 or 0.8 for composite reliability. Composite reliability is conceptually similar to Cronbach's Alpha but often preferred when items exhibit correlated errors or unequal factor loadings, providing more precise reliability estimates in such scenarios. This measure is frequently used in Structural Equation Modeling (SEM) to ensure the reliability and validity of constructs.

Validity refers to the accuracy or appropriateness of the research instruments and can be assessed using methods such as face validity, content validity, criterion validity, and construct validity. For this study, construct validity is measured using factor analysis, which examines the underlying structure and dimensions of the instruments. A higher factor loading indicates higher validity. A minimum factor loading of 0.40 is required for attitudinal instruments (Hair and his colleagues, 2010).

To validate the data collection instrument, two methods are employed: pilot testing and expert judgment. Content validity is established by seeking the expertise of individuals well-versed in the specific construct being assessed. Experts evaluate the questionnaire items for relevance, clarity, and comprehensiveness, offering feedback on language, instructions, structure, and format. After revising the questionnaire based on expert feedback, a pilot test is conducted with a small sample of participants to confirm its ease of comprehension and relevance.

Discriminant and convergent validity are critical aspects of construct validity. Discriminant validity examines whether different constructs are genuinely distinct, assessed through crossloading and the Fornell-Larcker Criterion. Convergent validity evaluates whether items intended to measure the same construct converge

effectively, assessed using Average Variance Extracted (AVE). AVE values should exceed 0.5 or 0.6 to demonstrate convergent validity. Both types of validity ensure that measurement instruments are reliable and valid, confirming that constructs are distinct and items effectively measure intended concepts without introducing measurement error or overlap.

3. Data Analysis

3.1 Reliability Test

Table 1 provides a comprehensive examination of item-total statistics for various constructs in a scale, highlighting their dependability and uniformity. These constructs, identified as M, SI, OSA, OJ, OSR, JS, and TL, represent specific segments of a larger instrument aimed at evaluating distinct dimensions or factors.

Table 1: Reliability Test of Cronbach's Alpha

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
M1	177.12	990.883	.607	.978
M2	177.18	988.355	.605	.978
M3	176.90	988.255	.720	.978
M4	176.82	979.253	.799	.977
M5	176.78	980.583	.823	.977
SI1	176.92	983.055	.696	.978
SI2	177.68	988.385	.544	.979
SI3	176.80	985.224	.773	.978
SI4	177.08	992.075	.616	.978
SI5	176.78	987.971	.825	.977
OSA1	176.78	985.522	.746	.978
OSA2	176.50	996.133	.764	.978
OSA3	176.64	1004.807	.642	.978
OSA4	176.92	989.218	.827	.977
OSA5	176.76	982.309	.811	.977
OJ1	176.92	978.034	.815	.977
OJ2	176.98	984.265	.825	.977

OJ3	176.82	977.130	.796	.977
OJ4	176.88	1000.434	.611	.978
OJ5	177.02	985.979	.673	.978
OSR1	176.96	978.978	.820	.977
OSR2	177.14	977.347	.886	.977
OSR3	177.10	980.418	.786	.977
OSR4	177.04	983.917	.770	.978
OSR5	176.86	994.368	.674	.978
JS1	176.98	984.102	.802	.977
JS2	177.04	992.284	.749	.978
JS3	177.06	1000.262	.634	.978
JS4	176.86	985.062	.794	.977
JS5	176.88	985.455	.831	.977
TL1	176.98	976.714	.906	.977
TL2	177.14	980.041	.751	.978
TL3	177.02	978.428	.806	.977
TL4	177.12	991.251	.669	.978
TL5	176.98	982.673	.822	.977

Analysis of Constructs:

Construct M: Items M1 to M5 exhibit corrected item-total correlations ranging from 0.605 to 0.823, suggesting that each item aligns well with the overall construct. The Cronbach's alpha values remain high (0.977 to 0.978) even if any item is deleted, indicating robust internal consistency and that all items contribute congruently to the construct.

Construct SI: Items SI1 to SI5 show corrected item-total correlations between 0.544 and 0.825, with stable Cronbach's alpha values (0.977 to 0.979). This suggests a cohesive contribution of SI items to the construct's reliability, maintaining high internal consistency.

Construct OSA: Items OSA1 to OSA5 present corrected item-total correlations from 0.642 to 0.827 and high Cronbach's alpha values (0.977 to 0.978). These statistics underscore the dependability of the items within this construct.

Construct OJ: Items OJ1 to OJ5 have item-total correlations ranging from 0.611 to 0.825, with stable Cronbach's alpha values (0.977 to 0.978). This indicates that OJ items significantly contribute to the scale's overall measure.

Construct OSR: Items OSR1 to OSR5 exhibit the highest corrected item-total correlation of 0.886, demonstrating strong alignment within the construct. The Cronbach's alpha remains unaffected (0.977 to 0.978) even with the potential exclusion of any item, indicating high internal cohesion.

Construct JS: Items JS1 to JS5 show item-total correlations between 0.634 and 0.831, with Cronbach's alpha values of 0.977 to 0.978 upon hypothetical item deletion. This supports the conclusion that JS items are consistent elements of the construct.

Construct TL: Items TL1 to TL5 present strong item-total correlations, notably with TL1 having the highest correlation at 0.906. The Cronbach's alpha values remain stable (0.977 to 0.978), indicating that all TL items significantly contribute to the construct's uniformity.

The scrutiny of each construct reveals no problematic items, as the removal of any item does not significantly enhance the scale's reliability. The consistent and high Cronbach's alpha values across all constructs indicate a high degree of internal consistency, suggesting that the items accurately gauge the intended underlying attributes or concepts. However, it remains critical to supplement this reliability analysis with thorough validity assessments to ensure the scale measures with precision and adherence to its intended purpose.

3.2 Construct Reliability Testing

In psychometric evaluation and research, assessing the reliability and validity of constructs is crucial. As noted by Souza and his colleagues. (2017), Cronbach's Alpha is a key indicator of internal consistency, reflecting how closely related a set of items is within a construct. It helps determine the reliability of psychometric assessments by considering both the number of items and their average inter-item correlation. Cronbach's Alpha values range broadly, with values above 0.9 indicating excellent reliability, which could also imply some redundancy. Values between 0.7 and 0.9 are considered strong for basic research purposes, while those between 0.6 and 0.7 are acceptable for exploratory work. Any Alpha below 0.6 may signal unreliable measures, suggesting the need for further refinement. However, Cronbach's Alpha assumes all items have equivalent reliability and does not account for the potential multidimensionality of constructs.

Addressing these limitations, Composite Reliability, incorporating rho_a and rho_c, offers a more nuanced approach to evaluating internal consistency. Composite Reliability considers how individual items contribute differently to a construct. Rho_a is based on the average of squared item loadings and error variances, useful when item loadings are consistent. Rho_c, through a summative method, looks at the sum of factor loadings and total error variances, making it more suited for items with varied loadings. Values exceeding 0.7 for rho_a or rho_c indicate praiseworthy reliability, providing a refined analysis for constructs with items that do not all have uniform reliabilities.

In the context of construct validity, convergent validity is fundamental. It relates to the agreement between different measurements assessing the same underlying concept. The core principle of convergent validity is that different methods or items targeting the same construct should converge, showing consistency in results. For instance, in gauging job satisfaction through varied approaches like surveys and alternative methods, strong convergent validity is observed if both methods produce comparable outcomes. This aspect of validity can be quantitatively evaluated using statistical correlation measures.

The Average Variance Extracted (AVE) is another critical metric, assessing the degree to which a construct captures variance from its indicators as opposed to variance caused by measurement error. AVE is computed by taking the average of the squared loadings associated with the construct's items. An AVE value greater than 0.5 implies that the construct explains over half the variance in its items, indicating strong convergent validity.

Conversely, an AVE below 0.5 suggests that a significant amount of variance is due to error rather than the construct itself.

Table 2 summarizes the reliability and validity metrics for various variables, including Cronbach's Alpha, Composite Reliability (rho_a and rho_c), and Average Variance Extracted (AVE), offering a snapshot of the robustness and precision of the constructs within the psychometric tool.

Table 2: Cronbach's Alpha, Composite Reliability (rho_a and rho_c), and Average Variance Extracted (AVE)

Construct	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
JS	0.879	0.885	0.912	0.677
M	0.932	0.952	0.948	0.784
OJ	0.915	0.921	0.937	0.749
OSA	0.921	0.928	0.941	0.760
OSR	0.930	0.935	0.947	0.783
SI	0.872	0.891	0.908	0.665
TL	0.943	0.947	0.956	0.815

Analysis of Constructs:

JS Construct: The Cronbach's Alpha of 0.879 indicates strong interconnectedness among the items. Composite Reliability measures (rho_a at 0.885 and rho_c at 0.912) both surpass the threshold of 0.7, affirming the construct's reliability. The AVE of 0.677 suggests that a substantial amount of variance within the items is captured by the underlying construct, showcasing good convergent validity.

M Construct: With a Cronbach's Alpha of 0.932, this construct shows exceptionally high internal consistency. Composite Reliability scores (rho_a at 0.952 and rho_c at 0.948) indicate outstanding reliability. The AVE of 0.784 suggests excellent convergent validity, indicating that the construct explains a significant portion of the variance in its items.

OJ Construct: A Cronbach's Alpha of 0.915, alongside strong Composite Reliability measures (rho_a at 0.921 and rho_c at 0.937), demonstrates robust internal consistency and reliability. The AVE of 0.749 indicates strong convergent validity.

OSA Construct: This construct has a Cronbach's Alpha of 0.921, with Composite Reliability values (rho_a at 0.928 and rho_c at 0.941) that reflect its high reliability. The AVE of 0.760 confirms strong convergent validity.

OSR Construct: The Cronbach's Alpha of 0.930 and Composite Reliability measures (rho_a at 0.935 and rho_c at 0.947) suggest very high consistency and reliability. The AVE of 0.783 further indicates that the construct captures the majority of variance in its items, confirming strong convergent validity.

SI Construct: Although it has the lowest Cronbach's Alpha at 0.872, it still indicates strong internal consistency. The Composite Reliability scores (rho_a at 0.891 and rho_c at 0.908) confirm its reliability. The AVE of 0.665, while lower than other constructs, still indicates acceptable convergent validity.

TL Construct: With the highest Cronbach's Alpha of 0.943, this construct shows excellent internal consistency. Composite Reliability scores (rho_a at 0.947 and rho_c at 0.956) reflect superior reliability. The AVE of 0.815

suggests very strong convergent validity, indicating that the variance within the items is predominantly due to the construct.

The overall analysis indicates that each construct within the scale possesses strong to excellent reliability, as suggested by Cronbach's Alpha and Composite Reliability values. The AVEs are all above the minimum accepted standard, corroborating the good convergent validity of the constructs. These findings indicate that the psychometric instrument is well-designed, providing reliable and valid measures of the constructs it is intended to assess. However, it is important to complement these reliability analyses with thorough validity assessments to ensure the instrument's precision and adherence to its intended purpose.

3.3 Discriminant Validity

Discriminant validity is essential for ensuring that a construct is uniquely measured and does not overlap with other variables. Structural Equation Modeling (SEM) relies heavily on discriminant validity to analyze relationships between constructs. In SEM, various methods are used to assess discriminant validity, such as the heterotrait-monotrait ratio of correlations (HTMT) and the Fornell & Larcker criterion.

HTMT Ratio: The HTMT method compares correlations among indicators of different constructs against those within the same construct, providing a relative measure of distinctiveness. The advanced HTMT2 method, introduced by Roemer, Schuberth, and Henseler in 2021, offers less biased estimates, particularly useful for heterogeneous indicator loading patterns.

Fornell & Larcker Criterion: This approach compares the square root of the Average Variance Extracted (AVE) for each construct with the correlations between constructs. For adequate discriminant validity, the square root of the AVE should be greater than the construct's highest correlation with any other construct.

Discriminant validity is crucial for ensuring that each construct uniquely contributes to the model's explanatory power, maintaining the integrity and utility of research findings. By using techniques like HTMT and the Fornell & Larcker criterion, researchers can confidently interpret the relationships between constructs, ensuring their models accurately reflect the underlying theories.

HTMT Ratio Analysis:

The HTMT ratio matrix is vital for evaluating discriminant validity in psychometric assessments. It examines relationships among constructs such as Job Satisfaction (JS), Organizational Justice (OJ), Organizational Social Responsibility (OSR), Social Influence (SI), and Transformational Leadership (TL).High HTMT values, like JS and OJ at 0.937, OSA and JS at 0.962, and OSR and JS at 0.954, indicate a blurred distinction between these constructs. Particularly high ratios for TL with JS (0.998) and TL with OJ (1.016) suggest significant conceptual overlap, indicating these constructs may not be perceived as distinct entities.In contrast, interaction terms like JS x OSR (0.391) and JS x SI (0.394) show lower HTMT ratios, indicating better discriminant validity. These lower values suggest a clearer distinction in the perception of these constructs when examining specific interactions.The interaction constructs (JS x OJ, JS x OSA, and JS x M) exhibit lower HTMT values than the main constructs, further bolstering discriminant validity. This indicates a reduced overlap and clearer demarcation between constructs in these contexts.The HTMT matrix highlights potential issues with discriminant validity due to high HTMT ratios among several main constructs, suggesting the need for re-evaluation and possible revision of constructs or items to ensure clear distinctions. However, the better discriminant validity observed in interaction constructs suggests that examining relationships between constructs can reveal more distinct insights, crucial for the comprehensive assessment of psychometric properties in research instruments. This nuanced approach underscores the complexity of constructing and evaluating psychometric tools, highlighting the need for careful

scrutiny of both individual constructs and their interrelations.

Table 4: Heterotrait-Monotrait (HTMT) Matrix

	JS	**M**	**OJ**	**OSA**	**OSR**	**SI**	**TL**	**JS x OSR**	**JS x OJ**	**JS x OSA**	**JS x SI**
JS	-	-	-	-	-	-	-	-	-	-	-
M	0.796	-	-	-	-	-	-	-	-	-	-
OJ	0.937	0.662	-	-	-	-	-	-	-	-	-
OSA	0.962	0.746	0.814	-	-	-	-	-	-	-	-
OSR	0.954	0.723	0.902	0.795	-	-	-	-	-	-	-
SI	0.891	0.811	0.841	0.855	0.780	-	-	-	-	-	-
TL	0.998	0.724	1.016	0.851	0.941	0.868	-	-	-	-	-
JS x OSR	0.391	0.388	0.497	0.272	0.423	0.317	0.463	-	-	-	-
JS x OJ	0.410	0.387	0.580	0.289	0.451	0.366	0.512	0.967	-	-	-
JS x OS	0.429	0.324	0.475	0.437	0.402	0.354	0.450	0.855	0.828	-	-
JS x SI	0.394	0.354	0.515	0.311	0.377	0.355	0.468	0.940	0.940	0.909	-
JS x M	0.371	0.440	0.463	0.252	0.417	0.332	0.450	0.942	0.914	0.813	0.909

4 Conclusion

This study provides an in-depth examination of the reliability and validity of psychometric constructs using advanced statistical techniques. The primary goal was to ensure that the measurement instruments used in the study were both reliable and valid, thereby enabling accurate and meaningful interpretation of the data collected. The constructs evaluated included Job Satisfaction (JS), Organizational Justice (OJ), Organizational Social Responsibility (OSR), Social Influence (SI), Transformational Leadership (TL), and others, which are critical in understanding various organizational dynamics.

Reliability testing is a cornerstone of psychometric evaluation, ensuring that the instruments consistently measure what they are intended to measure. Cronbach's Alpha was used as the primary indicator of internal consistency. The results indicated that all constructs had high Cronbach's Alpha values, ranging from 0.872 to 0.943, suggesting strong internal consistency. This means that the items within each construct are closely related and measure the same underlying concept.

However, while Cronbach's Alpha is a useful measure, it has limitations, such as assuming that all items have equal reliability and not accounting for multidimensionality within constructs. To address these limitations, Composite Reliability (rho_a and rho_c) was also calculated. Composite Reliability offers a more nuanced view of internal consistency by considering the varying contributions of individual items to the overall construct. The

rho_a and rho_c values for all constructs were above the acceptable threshold of 0.7, further confirming the reliability of the measurement instruments.

Validity is crucial for ensuring that the instruments measure the intended constructs accurately. Several types of validity were assessed in this study:

Convergent validity was assessed using the Average Variance Extracted (AVE). AVE measures the amount of variance captured by a construct relative to the amount due to measurement error. An AVE value greater than 0.5 indicates good convergent validity. The AVE values for all constructs were above this threshold, indicating that the constructs accurately capture the variance of their respective items and confirming strong convergent validity.

Discriminant validity ensures that constructs that are supposed to be distinct are indeed different from each other. Two methods were used to assess discriminant validity: the Heterotrait-Monotrait (HTMT) ratio and the Fornell & Larcker criterion.

The HTMT ratio compares the correlations among indicators of different constructs with those within the same construct. High HTMT values suggest that constructs are not distinct, while low values indicate good discriminant validity. The study found that some constructs, such as Job Satisfaction (JS) and Organizational Justice (OJ), had high HTMT values, indicating potential overlap. However, interaction terms like JS x OSR and JS x SI had lower HTMT values, suggesting better discriminant validity for these specific interactions.

This method compares the square root of the AVE for each construct with the correlations between constructs. The square root of the AVE should be greater than any of the correlations with other constructs to confirm discriminant validity. The constructs in this study generally met this criterion, although some high correlations suggested areas where constructs might overlap.

The findings from this study have significant implications for both research and practice. The high reliability and validity of the constructs used suggest that the measurement instruments are robust and can be used confidently in future research to explore organizational dynamics. This is particularly important for researchers aiming to understand complex relationships between variables in organizational settings.

For practitioners, the validated constructs provide reliable tools for assessing key aspects of organizational behavior and attitudes. For example, measures of Job Satisfaction and Organizational Justice can help HR professionals identify areas for improvement within the organization. Similarly, validated scales for Transformational Leadership can aid in leadership development programs by providing accurate assessments of leadership behaviors and their impact on employees.

While the study has established the reliability and validity of several key constructs, there are areas where further research is warranted. The high HTMT values observed between some constructs suggest that additional work is needed to refine these measures to ensure they are capturing distinct concepts. Future research could explore the development of new items or the modification of existing ones to reduce overlap and improve discriminant validity.

Additionally, the study could be extended to different organizational contexts and cultural settings to examine the generalizability of the findings. Organizational behavior and attitudes can vary significantly across different cultures and industries, so it is important to validate these constructs in diverse settings to ensure their broader applicability.In conclusion, this study has made a significant contribution to the field of psychometric evaluation by rigorously testing the reliability and validity of key organizational constructs. The use of advanced statistical techniques, such as Composite Reliability and the HTMT ratio, has provided a comprehensive assessment of the measurement instruments. The findings confirm that the constructs used are both reliable and valid, enabling accurate and meaningful analysis of organizational dynamics.The high reliability and validity of these constructs

mean that researchers and practitioners can use them with confidence in future studies and practical applications. However, the study also highlights the need for ongoing refinement of measurement instruments to ensure they continue to accurately capture the constructs of interest. By addressing these challenges, future research can build on the foundations laid by this study to further our understanding of complex organizational phenomena. Overall, the rigorous validation of these constructs ensures that they can be used to accurately assess and understand key aspects of organizational behavior, providing valuable insights for both research and practice.

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