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Tripartite Linear Relationships Among Job Satisfaction, Organisational Commitment, and Organisational Citizenship Behaviour in Non-Western Settings: A Meta-Analysis and Meta-Regression Analysis

There is substantial evidence indicating a positive linear relationship among job satisfaction (JS), organisational commitment (OC), and organisational citizenship behaviour (OCB), with OC often serving as a mediating variable. The interaction among these constructs has garnered significant attention in organisational behaviour research due to its potential to enhance workplace dynamics and overall performance. However, discrepancies exist in the findings regarding the role of commitment and the nonlinear or reciprocal interrelations among these variables, as not all studies agree on the mediating or predictive capacity of OC and the unidirectionality of these latent variables. This underscores the necessity for a comprehensive meta-analysis and meta-regression, which will be conducted using R to quantify effect sizes and address existing inconsistencies. This analysis examines the linear relationship among JS, OC, and OCB in non-Western cultural contexts, addressing a literature gap. A total of 38 studies were analysed, encompassing 8,116 observations. Meta-analyses in R found correlations for random effect models: (JS-OCB) 0.414, (JS-OC) 0.463, and (OC-OCB) 0.410, indicating a moderate positive relationship. Heterogeneity statistics showed significant variability and genuine heterogeneity, and a funnel plot and Egger's linear regression confirmed publication bias. Subgroup analysis suggested further investigation of moderators to clarify their influence on outcomes. Meta-regression explored the moderating effects of sample size. This study provides valuable insights and has impactful potential for researchers and practitioners, establishing a foundation for targeted interventions aimed at enhancing organisational effectiveness across diverse contexts. Additionally, it enhances the understanding of the strength of these interrelationships.

Keywords: job satisfaction, organisational commitment, organisational citizenship behaviour, meta-analysis, meta-regression, non-Western contexts.

Introduction

Understanding the interplay among JS, OC, and OCB is crucial for addressing the multifaceted challenges faced by organisations. These constructs are vital for enhancing organisational performance,

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reducing turnover rates, and cultivating a positive workplace environment (Rose, Kumar, & Pak, 2009; Shore & Martin, 1989). Additionally, studies reveal the intricate relationships between JS, OC, job performance, and turnover intentions (Dinc, 2017; Rose et al., 2009). Research has demonstrated that OC is closely associated with turnover intentions, while JS exhibits a stronger correlation with job performance, highlighting the distinct roles these constructs play (Shore & Martin, 1989). Research conducted by Fitrio, Apriansyah, Utami, and Yaspita (2019) indicates that OC serves as a mediator in the relationship between JS and OCB, exhibiting a moderate to strong correlation of 0.598. Therefore, we can deduce that emphasising linear relationships and their potential as comprehensive solutions for organisational issues underscores the significance of strategic human resource management and organisational behaviour research in today's complex business landscape.

Despite extensive research on the interplay between JS, OC, and job performance, gaps persist, particularly in understanding these dynamics across diverse cultural contexts and industries. Literature lacks comprehensive studies that explore these relationships in non-Western settings, where cultural values may significantly influence work attitudes and behaviours (Yousef, 2000).

Numerous studies employ structural equation modeling (SEM) and regression analyses to demonstrate that JS predicts OC, which in turn predicts OCB (Bolon, 1997; Nurjanah, Pebianti, & Handaru, 2020; Prasetio, Yuniarsih, & Ahman, 2017; Rifai, 2005; Şeşen & Basim, 2012; Zeinabadi, 2010). Mediation analyses frequently reveal that OC either partially or fully mediates the relationship between JS and OCB (Bolon, 1997; Nurjanah et al., 2020; Prasetio et al., 2017; Qamar, 2012; Rifai, 2005; Şeşen & Basim, 2012; Zeinabadi, 2010).

While some studies report direct effects of JS on OCB, the majority of findings consistently support a linear, mediated model (Bolon, 1997; Na-Nan, Kanthong, Joungtrakul, & Smith, 2020; Nurjanah et al., 2020; Prasetio et al., 2017; Qamar, 2012; Rifai, 2005; Şeşen & Basim, 2012; Urbini, Chirumbolo, Caracuzzo, & Callea, 2021; Zeinabadi, 2010). In contrast, a study by Karuna (2021) in India and research by Sondeng and Husain (2020) in Indonesia indicate non-linear or reciprocal interrelations among the aforementioned latent variables. Additionally, research by Nurendra and Herliani (2023) in Indonesia found no mediation effect of OC. Furthermore, a study by Schappe (1998) in the United States reported a non-significant relationship between JS and OCB.

Although literature has increasingly examined these constructs outside of Western contexts, this expansion has revealed deep inconsistencies – such as conflicting evidence regarding reciprocal dynamics and the mediating role of OC. Consequently, **the fundamental problem addressed by this study** is the inability to draw a generalizable, overarching conclusion about the precise interrelationships among JS, OC, and OCB from the currently fragmented literature. Motivated by these contradictory findings, this meta-analysis and meta-regression study aims to bridge this research gap by synthesising existing data

to identify the true structural dynamics among these latent variables.

Therefore, **this study aims to investigate** the tripartite linear relationships among JS, OC, and OCB within non-Western contexts, specifically including Indonesia, India, Iraq, Thailand, Malaysia, Iran, Turkey, and Pakistan, utilising meta-analysis and meta-regression analysis. The primary objective is to ascertain the overall strength and direction of the relationships among these constructs while also exploring potential variations across diverse non-Western environments. By synthesising existing empirical evidence, this research intends to enhance both theoretical and practical understanding of employee attitudes and behaviours in non-Western organisational settings.

The paper is organised as follows: We begin by systematically reviewing recent literature to analyse the theoretical foundations and empirical evidence supporting the relationships among key variables. Next, we review relevant prior studies related to JS and OC, OC and OCB, and, most importantly, published articles that address the tripartite relationships among the primary latent variables of this study: JS, OC, and OCB. Subsequently, we outline the procedure for selecting appropriate articles in the research methodology section and highlight important considerations for data preparation based on the review of prior literature. Following this, meta-analyses and meta-regressions will be conducted using the R programming language to assess overall effect sizes, taking into account sample characteristics and country as moderator factors. Finally, we discuss the results, explain the significance of our contributions and practical implications, and provide recommendations for future research developments.

Literature Review

Theoretical framework of JS, OC, and OCB

The linear relationship among JS, OC, and OCB is well-supported by several established theories, including Social Exchange Theory, Attitude-Behavior Models (such as the Theory of Reasoned Action and the Theory of Planned Behavior), and the Three-Component Model of Commitment. According to Social Exchange Theory, positive workplace attitudes like JS foster a sense of obligation, which enhances OC and ultimately increases OCB as a form of reciprocation (Na-Nan et al., 2020; Nurjanah et al., 2020; Prasetio et al., 2017; Rifai, 2005; Şeşen & Basim, 2012; Urbini et al., 2021; Williams & Anderson, 1991; Zeinabadi, 2010).

Initially, Wiener's (1982) studies establish the foundational perspectives on commitment, emphasising normative influences and the need for a unified understanding. Subsequently, Meyer, Allen, and Smith (1993) expand on the multidimensionality of OC, accentuating affective commitment's positive impact on workplace outcomes and advocating for culturally nuanced inquiries. Lastly, Meyer et al. (1993), alongside Ketchand and Strawser (2001), validate the robustness of commitment scales and highlight the necessity of acknowledging OC's multifaceted nature in research.

Attitude-behaviour models suggest that JS (an attitude) predicts OC (another attitude), which sequentially influences OCB (a behaviour) in a linear, causal way (Bolon, 1997; Na-Nan et al., 2020; Nurjanah et al., 2020; Prasetio et al., 2017; Qamar, 2012; Rifai, 2005; Şeşen & Basim, 2012; Urbini et al., 2021; Williams & Anderson, 1991; Zeinabadi, 2010). Empirical studies and meta-analyses consistently show that JS and OC are significant predictors of OCB, with commitment often mediating the relationship between satisfaction and OCB (Bolon, 1997; Na-Nan et al., 2020; Nurjanah et al., 2020; Prasetio et al., 2017; Qamar, 2012; Rifai, 2005; Şeşen & Basim, 2012; Urbini et al., 2021; Zeinabadi, 2010). While some research explores reciprocal or non-linear relationships, exemplified by Karuna (2021) and Nurendra and Herliani (2023), the majority of theoretical and empirical evidence supports a linear, unidirectional model, especially in applied organizational contexts (Bolon, 1997; Na-Nan et al., 2020; Nurjanah et al., 2020; Prasetio et al., 2017; Qamar, 2012; Rifai, 2005; Şeşen & Basim, 2012; Urbini et al., 2021; Williams & Anderson, 1991; Zeinabadi, 2010). These studies collectively offer a thorough understanding of the factors that influence JS, OC, and OCB.

Measurement approaches and scales

Extant literature uncovers strong construct validity for the Affective, Continuance, and Normative Commitment Scales, along with acknowledging the multiple dimensions of OC and their implications for future research (Allen & Meyer, 1996; Ketchand & Strawser, 2001). Allen and Meyer (1996) validated the Affective, Continuance, and Normative Commitment Scales, affirming their reliability and endorsing their ongoing use in research. Conversely, Ketchand and Strawser (2001) emphasised the existence of various dimensions of OC and urged the accounting field to expand its analysis beyond a singular dimension of OC, aligning with insights from industrial/organisational psychology and organisational behaviour. Collectively, these studies underscore the significance of utilising validated scales and recognising the multifaceted nature of OC when assessing JS, OC, and OCB.

Linear relationships among key constructs

This section addresses the research question regarding the overall strength of the tripartite relationships among JS, OC, and OCB in non-Western contexts. The literature generally indicates positive associations among these constructs, which significantly influence performance and turnover intentions. For example, Saif-Ud-Din and Adeel (2016) reported a negative relationship between OCB and turnover intention ($\beta = -0.178$) in Pakistan. However, findings concerning the role of OC remain inconsistent. While some studies found no significant mediating effect of OC (Nurendra & Herliani, 2023), others reported non-linear or reciprocal relationships among the constructs (Karuna, 2021; Sondeng & Husain, 2020), underscoring the need for further meta-analytic investigation. The following subsections review the key

latent variables and subsequently examine studies on the interrelationships among JS, OC, and OCB to facilitate a comprehensive meta-analysis in non-Western settings.

JS and OC

The relationship between JS and OC is a central theme in organisational research, with evidence consistently indicating a positive association between the two constructs. Several studies identify emotional intelligence as a key antecedent, demonstrating its positive effects on both JS and OC, which subsequently enhance employee engagement and reduce turnover intentions (Brunetto et al., 2012; Anari, 2012).

Research also highlights the importance of organisational support and workplace conditions in strengthening JS and OC. Fazio et al. (2017) found that perceived organisational and supervisor support directly reduce turnover intentions, while affective commitment partially mediates this relationship. Similarly, Lambert et al. (2021) reported that JS and OC positively contribute to life satisfaction among police officers, whereas job stress has detrimental effects.

Evidence further suggests that adverse workplace experiences undermine both JS and OC. Jung and Kim (2012) found that burnout decreases OC and increases turnover intention, while Wright and Bonett (2007) showed that JS is strongly associated with reduced turnover, particularly among employees with lower psychological well-being. Judge and Larsen (2001) also argued that individual dispositions influence JS, which in turn contributes to stronger organisational loyalty and commitment.

Other studies emphasise the role of personal and organisational resources in fostering JS and OC. Resilience positively predicts both constructs (Polat & İskender, 2018), while servant leadership, customer orientation, and person–job fit reduce burnout and turnover intentions and strengthen employee commitment (Babakus et al., 2010). Although Ariani (2015) found no direct effect of JS on service quality, the study suggests that JS may indirectly support organisational performance through greater employee commitment. Additionally, Al-Rubaish et al. (2011) underscored the importance of reliable measurement tools for assessing JS and its organisational outcomes.

Overall, the literature demonstrates a robust positive relationship between JS and OC across diverse settings. Factors such as emotional intelligence, organisational support, resilience, person–job fit, and psychological well-being play important roles in strengthening both constructs, whereas stress and burnout tend to weaken them.

OC and OCB

Research indicates that affective OC positively influences OCB (He, Murmann, & Perdue, 2012). He et al. (2012) identified affective commitment as a key mediator linking management's commitment to service quality and employees' discretionary behaviours. Employees who develop a stronger emotional attachment and identification with their organisation are more likely to engage in OCB by exceeding formal job requirements. The findings suggest that affective commitment enhances employee loyalty and promotes behaviours that benefit organisational effectiveness.

Consequently, organisations can foster OCB by cultivating supportive work environments that demonstrate concern for employees' well-being and professional development.

Tripartite relationships among JS, OC, and OCB

JS, OC, and OCB are closely related constructs that significantly influence workplace outcomes and performance (Dinc, 2017). Evidence consistently shows that employees with higher levels of JS and OC are more likely to exhibit OCB, including discretionary behaviors that extend beyond formal job requirements (Andreopoulos et al., 2023; Diniyah, Nurmayanti, & Premasinghe, 2024; Irawan, Wahono, & Adha, 2023; Kurniadi, Jimad, & Mardiana, 2022; Setyawati, Pakpahan, & Marsella, 2024; Tharikh et al., 2016). Some studies report particularly strong associations among these variables, indicating that their combined effects explain substantial variation in OCB (Setyawati et al., 2024).

Research further demonstrates that JS and OC are significant predictors of OCB, with their combined influence often exceeding their individual effects (Andreopoulos et al., 2023; Diniyah et al., 2024; Irawan et al., 2023; Kurniadi et al., 2022; Setyawati et al., 2024; Tharikh et al., 2016). OCB also serves as an important mechanism linking JS and OC to employee performance (Indarti, Fernandes, & Hakim, 2017). Several studies identify OC as a mediator between JS and OCB, suggesting that satisfied employees are more likely to engage in citizenship behaviors through enhanced organisational commitment (Foote & Tang, 2008; Kurniadi et al., 2022; B. Siva, Devi, & Dr. M. Kamraj, 2022; Prasetio et al., 2017; Suparjo & Darmanto, 2015). Moreover, some evidence indicates that OC may be a stronger predictor of OCB than JS when other variables are controlled (Schappe, 1998).

Contextual factors further shape these relationships. Team commitment strengthens the JS–OCB link in self-directed teams (Foote & Tang, 2008), while intrinsic job satisfaction appears to predict OCB more strongly than extrinsic satisfaction (Lowery, Beadles, & Krilowicz, 2002; 한진욱, 2008). Collectively, the literature supports a robust and positive interrelationship among JS, OC, and OCB, highlighting their joint contribution to employee performance and organisational effectiveness (Alghifari & Yaman, 2024; Fazriyah, Hartono, & Handayani, 2019; Ginting, Lumbanraja, & Sirojuzilam, 2025; Karuna, 2021; Qamar, 2012; Ridlo, Wardahana, & Jessica, 2021; Saxena, Tomar, & Tomar, 2019; Wahyuni & Dirbawanto, 2022). A detailed analysis of the included literature, spanning both Western and non-Western regions, is provided in Table 1. Furthermore, studies that report tripartite interrelationships among latent variables have been isolated and compiled in the Annex.

Table 1. **Comprehensive analysis of notable published articles**

Study	Sample Size (N)	(JS-OCB)	(JS-OC)	(OC-OCB)	Context
Williams and Anderson (1991)	233 employees from a southeastern U.S. telephone company	0.305	0.53	0.265	United States
Bolon (1997)	186 hospital employees	0.32	0.60	0.35	Four hospitals in the southeastern United States
Schappe (1998)	130 employees of a mid-Atlantic insurance company	-0.06 (not significant)	0.57	0 .21	United States
Rifai (2005)	383 nurses working in private hospitals	0.121	0.342	0.233	Indonesia
Foote and Tang (2008)	242 full-time employees	0.20	0.40	0.44	Three geographically diverse manufacturing plants in the United States: urban Pennsylvania, rural Kentucky, and coastal Mississippi
Jaafar (2010)	83 employees at Public Water Company "Tirta Mahakam"	0.300	Not Reported	0.280	Indonesia
Zeinabadi (2010)	652 Teachers in Primary Schools	0.36	0.26	0.34	Tehran, Iran
Kashif, Khan, and Rafi (2011)	150 Employees from various telecommunication companies in Punjab	0.232	0.34	Tehran, Iran	Pakistan
Şeşen and Basim (2012)	275 teachers from 10 public high schools	0.425	0.35	0.485	Turkey
Aslam (2012)	150 teachers from the University of the Punjab	0.427	Not Reported	0.580	Lahore, Pakistan
Kaur, Kaur, Aneet, and Midha (2014)	165 Faculty members from two private universities around Chandigarh	0.32	0.455	0.755	Punjab, India
Suparjo and Darmanto (2015)	226 lecturers at private higher education institutions	0.453	0.217	0.479	Central Java, Indonesia
Hejazi, Mahboubi, Keshavarzi, and Zinat-Motlagh (2015)	300 Bank employees in Kermanshah	0.570	0.700	0.535	Iran
Pivi and Hassan (2015)	100 valid responses Dining restaurants (specifically, the Seduction Restaurant Group Sdn Bhd in Kuala Lumpur)	0.836	0.796	0.884	Malaysia
Tharikh et al. (2016)	200 secondary school teachers	0.451	0.510	0.450	Perak, Malaysia

continuation of Table 1

Study	Sample Size (N)	(JS-OCB)	(JS-OC)	(OC-OCB)	Context
Taghinezhad, Safavi, Raiesifar, and Yahyavi (2015)	373 nurses working in 15 educational-treatment centers in Tehran	0.27	0.52	0.42	Iran
Saif-Ud-Din and Adeel (2016)	140 employees Public and Private Banks Dera Ismail Khan (D.I. Khan), Khyber Pakhtunkhwa	0.511	0.812	0.291	Pakistan
Prasetio et al. (2017)	320 employees from a state-owned bank	0.334	0.610	0.142	Bandung, Indonesia
Indarti et al. (2017)	275 Respondents in Makassar, South Sulawesi, Indonesia, specifically at two private colleges: the Indonesian Muslim University and Muhammadiyah University Makassar	0.274	Not Reported	0.316	Indonesia
Adil, Owais, and Qamar (2018)	292 (after removal of outliers from an original 375 responses) Participants were from seven healthcare institutions in Karachi	0.200	0.113	0.460	Pakistan
Fazriyah et al. (2019)	51 employees Cirebon, specifically at PT. Astra International AUTO 2000 (Tbk)	0.213	0.211	0.245	Indonesia
Fitrio et al. (2019)	34 lecturers from Economics College of Indragiri Rengat,	0.613	0.864	0.693	Indonesia
Risna and Omar (2019)	173 Employees of state-owned postal firms in Karawang,	0.368	0.534	0.553	Indonesia
Tokasih, Matondang, and Wibowo (2019)	34 employees PT Karsa Prima Permata Nusa (PT KPPN)	0.946	Not Reported	0.134	Indonesia
Hidayat (2020)	142 teachers from State Vocational High Schools in Banjar Regency	0.438	Not Reported	0.389	Indonesia
Kristian and Ferijani (2020)	52 employees PT. Ulam Tiba Halim (Marifood Group), Semarang,	0.350	0.158	0.219	Indonesia
Massoud and Jameel (2020)	149 valid responses from hotel employees in Baghdad	0.156	Not Reported	0.583	Iraq
Nurjanah et al. (2020)	196 employees at Inspectorate General of the Ministry of Education and Culture, Jakarta	0.213	0.364	0.393	Indonesia

continuation of Table 1

Study	Sample Size (N)	(JS-OCB)	(JS-OC)	(OC-OCB)	Context
Na-Nan et al. (2020)	450 employees at the operational level in automobile parts manufacturing companies in the Navanakorn Industrial Estate	0.214	0.70	0.686	Thailand
Sondeng and Husain (2020)	100 respondents 62 from Urban Poverty Alleviation Program. 38 from Foundation for Development of Rural Potential	0.72	0.63	-0.06 (Not significant)	Indonesia (specifically Southeast Sulawesi)
Ridlo et al. (2021)	40 employees from Bank Muamalat	0.416	Not Reported	0.761	Indonesia
Na-Nan, Kanthong, and Joungtrakul (2021)	400 (employees in the Thai automobile parts manufacturing industry	0.864	0.887	0.888	Thailand
Band, Shah, Naidu, and Lohi (2020)	445 valid responses were collected from employees of various IT companies	0.600	0.254	0.652	India
Malik (2021)	300 bank employees (150 male, 150 female)	0.006	0.006	0.004	Lahore, Pakistan
Azmy (2021)	100 respondent's Indonesian electrical contractor professional organizations	0.155	Not Reported	0.160	Indonesia
Karuna (2021)	309 executives from six public sector banks	0.123	-0.240	-0.244	Different cities of west Uttar Pradesh, India
Musringudin, Dinihari, and Afriantoni (2021)	90 (principals of public high schools in Jakarta	0.205	0.237	0.212	Indonesia
Purwanto, Purba, Bernarto, and Sijabat (2021)	220 senior high school teachers or managers in supply chain management companies Region: Banten Province	0.227	Not Reported	0.396	Indonesia
Wahyuni and Dirbawanto (2022)	33 employees	0.382	0.550	0.352	North Sumatra, Indonesia
Kelana and Pogo (2022)	60 doctors at St. Carolus Hospital, Jakarta	0.653	Not Reported	0.053 Not significant	Indonesia
Kurniadi et al. (2022)	180 employees	0.213	0.782	0.545	PT Cipta Agung Manis, a company in Southeast Sulawesi, Indonesia
Soehardi and Tjahjadi (2022)	81 Employees of PT. X	0.206	Not Reported	0.230	Indonesia
B.Siva et al. (2022)	530 employees from private banks	0.3771	0.9857	0.259	Hyderabad, Telangana, India

continuation of Table 1

Study	Sample Size (N)	(JS-OCB)	(JS-OC)	(OC-OCB)	Context
Sunaris, Wahyoedi, and Tecoalu (2022)	64 teachers	0.126	0.146	0.137	Indonesia
Nurendra and Herliani (2023)	134 non-medical employees working in hospitals	0.1083	0.4386	0.0552	Cirebon, West Java, Indonesia
Andreopoulos et al. (2023)	67 employees	0.258	Not Reported	0.379	XYZ Corporation Indonesia
Irawan et al. (2023)	115 employees	0.128	Not Reported	0.367	Indonesia
Ardiyansah and Mon (2023)	113 respondents from SOE (State-Owned Enterprises) insurance companies in Batam City	0.733	0.707	0.682	Indonesia
Baihaqi, Setiawan, and Romli (2023)	42 employees (total population of education staff at STTB Baleendah Campus	0.658	Not Reported	0.758	Indonesia
Alghifari and Yaman (2024)	75 employees PT Swadharma Sarana Informatika Operational Head Office	0.448	0.528	0.645	Indonesia
Diniyah et al. (2024)	75 employees PT at Sumber Purnama Sakti (SPS Motor), Lombok Timur Branch	0.458	0.418	0.558	Indonesia
Hermawan et al. (2024)	368 Employees from SMEs	0.754	0.797	0.618	Indonesia
Saluy, Syawal, Sudjono, Kemalasari, and Gustiah (2024)	91 civil servants from the Directorate of Treasury Systems, Ministry of Finance	0.431	0.295	0.045	Indonesia
Setyawati et al. (2024)	65 employees at PT Anugerah Sekuritas	0.899	0.926	0.906	Indonesia
Purnama et al. (2024)	65 employees from Clothing SMEs	0.318	0.379	0.350	Indonesia
Wibowo, Syah, Harahap, Fatmasari, and Nurcholis (2024)	346 factory employees	Not Reported	0.666	0.298	Indonesia
Ginting et al. (2025)	92 employees at PT. Bank Rakyat	0.691	Not Reported	0.213	Indonesia
Agus, Kusuma, Agung, Oka, and Gorda (2025)	147 employees Bali	0.631	0.029	0.154	Indonesia

Research Methodology

The deep and pro-analysis search strategies in Consensus were applied by all countries with no filtering criteria, as listed in Table 1, to ensure adequacy and subsequently normalise the frequency of countries. The search strategy specifically targeted studies from Indonesia, India, Iraq, Thailand, Malaysia, Iran, Turkey, and Pakistan that provided statistical analyses (e.g., R, beta coefficients) on the relationships among JS, OC, and OCB. Specific inclusion and exclusion criteria were applied to ensure methodological rigor: only peer-reviewed papers that reported quantitative data – including correlation and regression coefficients, sample size, and defined scope – were included. Qualitative-only studies and those lacking statistical details were excluded. Each country was examined individually using the same rigorous criteria, and all papers were downloaded and reviewed manually. Notably, the same articles appeared in both the deep search and the country-specific pro-analysis search, confirming the consistency of the methodology.

Despite the rigorous inclusion criteria applied in this study, several sampling-related limitations should be acknowledged. First, the distribution of studies across the selected non-Western countries was uneven, with Indonesia contributing the highest number of studies, whereas countries such as Iraq contributed relatively few. This imbalance may affect the representativeness and generalizability of the findings across non-Western contexts. Second, the included studies were concentrated in specific sectors and organisational settings, which may limit the applicability of the findings to other industries and institutional environments. Third, studies lacking complete statistical information were excluded to ensure methodological consistency and accuracy; however, this may have reduced the overall sample size and excluded potentially relevant evidence. Finally, the meta-analysis relied primarily on published peer-reviewed studies, which may introduce publication bias due to the underrepresentation of unpublished or non-significant findings.

For a detailed explanation of the article review procedure, information related to authors, year of study, sample size, country and sector, and coefficients of interrelations among key constructs were extracted from each paper individually. However, it is essential to acknowledge that certain studies did not provide complete statistical data. For instance, the research conducted by Singh and Singh (2019) did not report the relationships between JS-OCB and OC-OCB; thus, these variables are not reflected in Table 1. Similarly, some studies omitted reporting the interrelations between JS-OC, as indicated in the same table. These studies were excluded to ensure the highest level of accuracy and reliability. In total, 38 studies met the criteria for accuracy and completeness as appended in the appendix, each reporting the tripartite relationship among the three latent variables: JS, OC, and OCB.

Data Processing and Results

We conducted a meta-analysis in R using the meta and metafor packages, which offer effective and adaptable tools for quantitative data analysis (Viechtbauer, 2010). Initially, we utilised the functions head, structure, and summary in R to examine the first rows, structure, and summary of the dataset. The dataset is accessible via the link provided in the data availability statement. Table 2 presents the descriptive statistics for the numerical variables in the dataset. The sample size (N) ranged from 33 to 652 (M = 213.58), with R (JS-OCB) values spanning from 0.006 to 0.899 (M = 0.4066). R1 (JS-OC) values ranged from –0.2400 to 0.9857 (M = 0.4560), and R2 (OC-OCB) values ranged from –0.2440 to 0.9060 (M = 0.4014). The variables Study and Context were categorical and were therefore excluded from the numeric summary. Subsequently, we calculated the variance to perform the meta-analysis, including calculations of correlation for the random effects model, which illustrate the relationships among the key latent variables. The forest plots will be available via a link in the data availability statement, which includes the list of countries, authors, and publication years for all 38 studies. Additionally, there will be limitations on the inclusion of large figures in the manuscript. However, a funnel plot will be presented to assess publication bias. Furthermore, to further evaluate publication bias, Egger's regression test will be conducted. Following this, we will perform a subgroup analysis based on the moderator variable (Context) in this research. Subsequently, a meta-regression model will be conducted to assess the moderating effect of N, and a bubble plot will be depicted.

Random effect model for JS-OCB

A meta-analysis of 38 studies (N = 8,116) revealed a moderately strong correlation under the random-effects model (r = 0.414, 95% CI: 0.338–0.489), with both results achieving statistical significance ($p < .001$) (Borenstein, Cooper, Hedges, & Valentine, 2009; Hedges & Vevea, 1998; Quintana, 2015). The analysis indicated substantial heterogeneity ($Q(37) = 1482.59$, $I^2 = 97.5\%$, $\tau^2 = 0.0513$), suggesting that most of the variability is attributable to genuine differences among the studies, which may indicate the presence of potential moderators (Quintana, 2015; Raudenbush, 2009; Viechtbauer, 2010).

Table 2. **Descriptive statistics for study variables**

Variable	K	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum
N	38	33.00	90.25	169.00	213.58	306.75	652.00
R	38	0.0060	0.2132	0.3725	0.4066	0.5553	0.8990
R1	38	-0.2400	0.2412	0.4468	0.4560	0.7000	0.9857
R2	38	-0.2440	0.2223	0.4065	0.4014	0.6030	0.9060

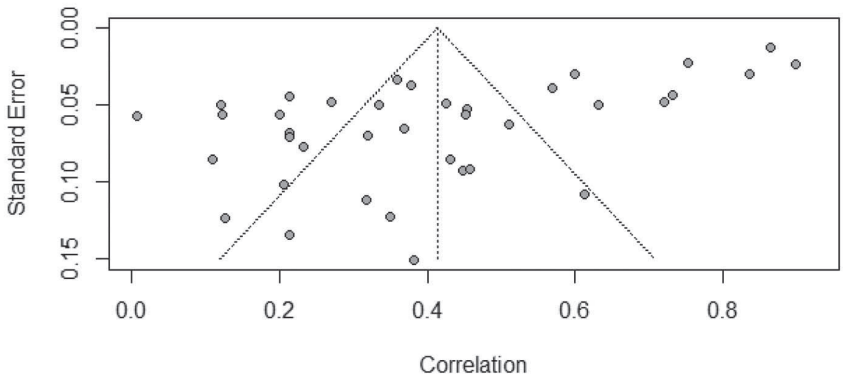

Fig. 1. **JS-OCB funnel plot for the random effect model**

Assessment of publication bias for JS-OCB

Figure 1 displays a funnel plot illustrating the relationship between study-specific correlation coefficients and their corresponding standard errors for the random-effects model. The random-effects model reveals a greater concentration of studies with higher correlations, particularly among those with larger standard errors. These patterns may signify potential publication bias, small-study effects, or heterogeneity in study characteristics. Since visual inspection alone cannot definitively ascertain the presence of bias, these findings should be interpreted with caution and supplemented by formal statistical tests for funnel plot asymmetry (e.g., Egger's regression test) (Light & Pillemer, 1984; Quintana, 2015; Rothstein, Sutton, & Borenstein, 2005; Sterne & Egger, 2001).

Random effect model for JS-OC

As in the previous section, a meta-analysis of 38 studies (N = 8,116) was performed to estimate the overall correlation coefficient. A random-effects model was employed, resulting in a more conservative correlation estimate of 0.463 (95% CI: 0.368–0.559, z = 9.55, $p < 0.0001$) (Borenstein et al., 2009; Hedges & Vevea, 1998; Quintana, 2015). The analysis utilised the inverse variance method and restricted maximum likelihood estimation for τ^2, employing untransformed correlations as the effect metric. These findings highlight a robust overall effect amidst substantial heterogeneity, indicating the need for further exploration of potential moderators through meta-regression (Quintana, 2015; Raudenbush, 2009; Viechtbauer, 2010).

Assessment of publication bias for JS-OC

In Figure 2, the distribution appears somewhat asymmetric, with a greater number of studies on the right-hand side (indicating positive correlations) compared to the left. This pattern may suggest the presence of potential publication bias or selective reporting that favours higher correlations. However,

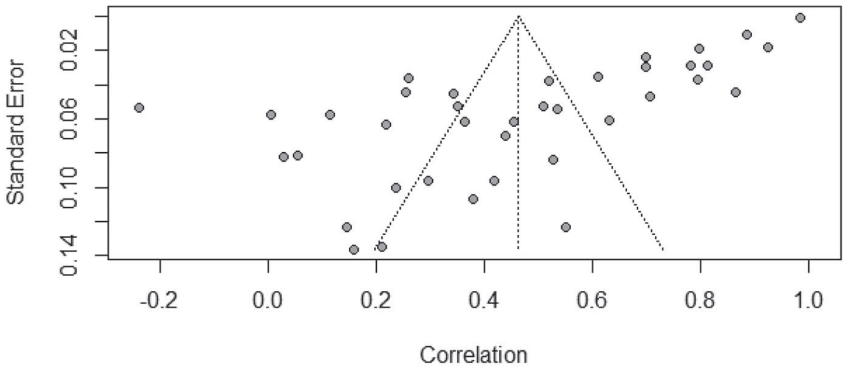

Fig. 2. **JS-OC funnel plot for the random effect model**

it is important to note that the observed asymmetry may also be influenced by genuine heterogeneity among the studies, rather than publication bias alone (Light & Pillemer, 1984; Quintana, 2015; Rothstein et al., 2005; Sterne & Egger, 2001).

Random effect model for OC-OCB

A meta-analysis was conducted, encompassing 38 studies and 8,116 observations, to estimate the overall correlation between random-effects models. The random-effects model, which accounts for this heterogeneity, yielded a moderate yet significant overall correlation ($r = 0.41$; 95% CI: 0.32 to 0.50; $z = 9.05$, $p < 0.001$) (Borenstein et al., 2009; Hedges & Vevea, 1998; Quintana, 2015). These findings underscore considerable inconsistency among study results, highlighting the need for further investigation into potential moderators or subgroup analyses to elucidate sources of heterogeneity and enhance the robustness of conclusions (Quintana, 2015; Raudenbush, 2009; Viechtbauer, 2010).

Assessment of publication bias for OC-OCB

Figure 3 presents a symmetrical inverted funnel centred around the pooled effect size (approximately $r \approx 0.4$). However, the distribution of points is somewhat asymmetric, with fewer studies on the left side of the mean effect, particularly among studies with smaller sample sizes. This may indicate potential publication bias, selective reporting, or genuine heterogeneity related to study size. Visual inspection alone is inadequate for a conclusive determination; therefore, Egger's regression test is necessary to confirm bias and formally establish the presence of publication bias in subsequent data analysis (Light & Pillemer, 1984; Quintana, 2015; Rothstein et al., 2005; Sterne & Egger, 2001).

Egger's regression test

Egger's regression test was employed to evaluate funnel plot asymmetry for three variables (R, R1, and R2), utilising the standard error of the effect size as the predictor alongside inverse-variance

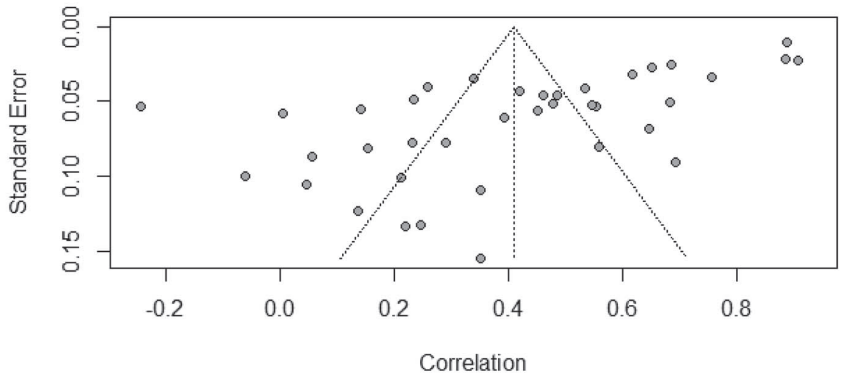

Fig. 3. **OC-OCB funnel plot for random effect model**

weights. In all analyses, the intercepts exhibited substantial magnitudes (bias estimates ranging from −8.56 to −9.71) and were highly significant ($p < 0.0001$), indicating considerable asymmetry consistent with small-study effects and potential publication bias. Additionally, residual heterogeneity was significant across all cases ($\tau^2 = 17.91–21.02$). Given the considerable between-study variability, these findings should be interpreted with caution, as the observed asymmetry may also stem from methodological diversity, variations in study quality, or genuine differences in effect sizes. Nevertheless, the persistent and statistically significant bias estimates indicate non-random asymmetry, which warrants careful consideration when interpreting the pooled results (Egger, Smith, Schneider, & Minder, 1997; Quintana, 2015).

Subgroup analysis based on the study's context

The meta-analyses revealed significant moderate overall correlations across all three datasets (R, R1, R2), with correlation coefficients (COR) ranging from 0.41 to 0.46 (all $p < .001$), indicating consistent positive associations. Considerable heterogeneity was observed in all analyses ($I^2 = 97.5\%$ to 99.1%), necessitating subgroup analyses by context to identify potential sources of variability. Subgroup analyses demonstrated that effect sizes varied across countries, with Malaysia and Thailand exhibiting the strongest correlations (CORs up to 0.79), while Pakistan and India displayed weaker and more variable effects. Tests for subgroup differences indicated significant moderation by context in datasets R1 and R2 ($Q = 20.40$, $df = 6$, $p = .0024$; $Q = 18.88$, $df = 6$, $p = .0044$, respectively), but not in dataset R ($Q = 4.83$, $df = 6$, $p = .566$). These findings underscore the importance of contextual factors in explaining heterogeneity in meta-analytic results and suggest that cultural or regional differences may influence the magnitude of observed effects (Viechtbauer, 2010). Notably, variations across individual countries were explored; however, because six of the seven identified countries contained four or fewer studies, testing for moderation

at the national level lacked sufficient statistical power, was statistically unstable because of the small number of studies per country and risked spurious findings regarding the moderation effect of context. Nevertheless, country-level subgrouping was retained because aggregating studies into broader regional categories could mask important national and contextual differences in organisational behaviour patterns across non-Western settings. Tables 3, 4, and 5 summarise the key statistics for each subgroup (Context), including the number of studies (k), pooled COR with 95% confidence interval (CI), tau-squared (τ^2), tau (τ), Q statistic, I-squared (I^2), and p-values for subgroup differences.

Meta-regression

We conducted a meta-regression analysis in R using the following syntax: Metareg_X <-rma (yi<- rma(yi = R, vi = variance, mods = ~ N, data = Second_Draft_Dataset, method = "ML") as in the accompanying R script to the

Table 3. **Subgroup meta-analysis results by context for dataset R**

Context	k	COR	95% CI	tau²	tau	Q	I² (%)
Indonesia	22	0.42	[0.32, 0.52]	0.0502	0.2240	508.55	95.9
Iran	3	0.40	[0.23, 0.57]	0.0218	0.1476	27.42	92.7
Pakistan	4	0.24	[0.03, 0.44]	0.0400	0.2000	35.37	91.5
Turkey	1	0.43	[0.33, 0.52]	—	—	0.00	—
India	4	0.36	[0.16, 0.55]	0.0371	0.1926	65.43	95.4
Malaysia	2	0.65	[0.27, 1.02]	0.0721	0.2684	36.11	97.2
Thailand	2	0.54	[-0.10, 1.18]	0.2102	0.4584	193.02	99.5
Test for subgroup differences						4.83	p = .566

Table 4. **Subgroup meta-analysis results by context for dataset R1**

Context	k	COR	95% CI	tau²	tau	Q	I² (%)
Indonesia	22	0.48	[0.37, 0.58]	0.0592	0.2434	563.25	96.3
Iran	3	0.49	[0.24, 0.74]	0.0479	0.2188	87.81	97.7
Pakistan	4	0.25	[-0.13, 0.63]	0.1440	0.3795	262.99	98.9
Turkey	1	0.35	[0.25, 0.45]	—	—	0.00	—
India	4	0.37	[-0.13, 0.86]	0.2565	0.5065	864.77	99.7
Malaysia	2	0.66	[0.38, 0.94]	0.0388	0.1971	19.92	95.0
Thailand	2	0.79	[0.61, 0.98]	0.0171	0.1309	50.44	98.0
Test for subgroup differences						20.40	p = .0024

Table 5. **Subgroup meta-analysis results by context for dataset R2**

Context	k	COR	95% CI	tau^2	tau	Q	I^2 (%)
Indonesia	22	0.38	[0.27, 0.49]	0.0609	0.2467	526.67	96.0
Iran	3	0.43	[0.32, 0.54]	0.0082	0.0907	13.09	84.7
Pakistan	4	0.25	[0.06, 0.44]	0.0341	0.1846	38.33	92.2
Turkey	1	0.49	[0.39, 0.58]	—	—	0.00	—
India	4	0.36	[-0.09, 0.80]	0.2028	0.4503	316.59	99.1
Malaysia	2	0.67	[0.24, 1.10]	0.0923	0.3039	51.21	98.0
Thailand	2	0.79	[0.59, 0.99]	0.0200	0.1415	55.42	98.2
Test for subgroup differences						18.88	p = .0044

Table 6. **Meta-regression results for models R, R1, and R2**

Model	k	τ^2	I^2 (%)	R^2 (%)	QE (df)	p(QE)	QM (df)	p(QM)	β_0 (SE) [95% CI]	β_1: N (SE) [95% CI]
R	38	0.0025	1.21	67.93	9.30 (36)	1.000	0.89 (1)	0.346	0.295 (0.160) [-0.019, 0.609]	-0.0005 (0.0006) [-0.0017, 0.0006]
R1	—	—	—	—	—	—	—	—	—	—
R2	—	—	—	—	—	—	—	—	—	—

Note. Model R1 and Model R2 could not be estimated due to division-by-zero errors caused by non-positive sampling variances (negative variances constrained to zero).

data availability statement. This analysis evaluated the association between sample size (*N*) and outcome **R**. The model demonstrated that the moderator accounted for a significant proportion of the observed between-study heterogeneity (R^2 = 67.93%), while residual heterogeneity was negligible (τ^2 = 0.0025; I^2 = 1.21%). The regression coefficient for *N* was negative, although small and statistically non-significant (β = –0.0005, SE = 0.0006, z = –0.94, p = 0.346), indicating no systematic relationship between sample size and the magnitude of **R**. The intercept (β = 0.2947, p = 0.066) suggested a positive, marginally non-significant mean effect when N = 0. For outcomes **R1** and **R2**, meta-regression could not be performed due to several studies reporting non-positive sampling variances, which led to computational instability when calculating inverse-variance weights. Such variance issues typically arise when effect sizes are reported without sufficient precision or when within-study variability is underestimated. These factors impede the reliable estimation of moderator effects within the random-effects framework. Alternative approaches – such as applying a small constant to sampling variances, utilizing robust variance estimation, or excluding studies with invalid variance estimates – may enhance future analyses of these

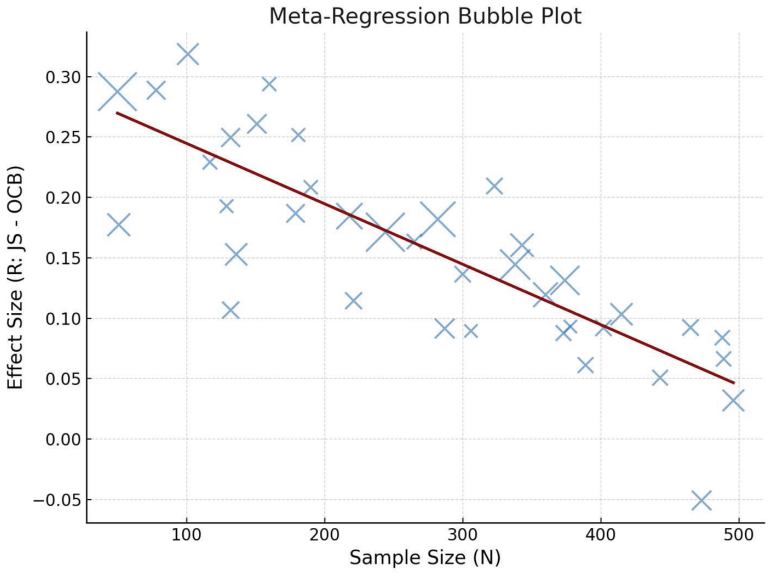

Fig. 4. **Meta-regression plot**

outcomes while preserving statistical validity (Berkey, Hoaglin, Mosteller, & Colditz, 1995; Hedges, Tipton, & Johnson, 2010; Quintana, 2015; Van Houwelingen, Arends, & Stijnen, 2002; Viechtbauer, 2010). Table 6 presents the meta-regression results for Models R, R1, and R2.

According to the specified syntax for Model R and the syntax used for the bubble plot: bubble (Metareg_X, xlab = "N", ylab = "R") class (Metareg_X), the bubble plot in Figure 4 illustrates the relationship between sample size and effect size across the studies included in the meta-analysis. Each bubble represents an individual study, with its size reflecting the study's weight (inverse variance). The x-axis indicates sample size, while the y-axis shows the correlation between JS-OCB. A red meta-regression line, fitted using weighted regression based on study precision, reveals a negative association between sample size and effect size/correlation. This finding suggests that larger studies tend to report smaller effects, while smaller studies tend to report larger effects. This trend may indicate potential publication bias, where smaller studies with non-significant results are underrepresented, or it may reflect genuine variation in effect magnitude related to study design or quality. However, this observed relationship does not imply causation, as other confounding factors may also influence this pattern.

Conclusion

We conducted this meta-analysis to examine the overall strength of correlation among the tripartite interrelations of JS, OC, and OCB. This research is primarily motivated by the dearth of meta-analyses on this topic in non-Western contexts, as noted by Yousef (2000), alongside other studies that have reported non-significant, reciprocal, or non-linear

relationships among these three latent variables, as highlighted in studies by Karuna (2021), Malik (2021), Nurendra and Herliani (2023), Saluy et al. (2024), and Sondeng and Husain (2020). Our analysis identified an overall moderate positive relationship among JS, OC, and OCB. Notably, meta-analyses employing across 38 studies demonstrate that these factors serve as critical predictors. There are indications that OC may mediate the relationship or exhibit a stronger predictive effect; however, some studies suggest it does not function as a mediator, as indicated by Nurendra and Herliani (2023) in Indonesia. Despite the existence of reciprocal interrelations among the three latent variables reported by some studies, such as Karuna (2021) in India, as well as non-significant relationships noted by Malik (2021), Saluy et al. (2024), and Sondeng and Husain (2020) in Indonesia, we conclude that the generalizability of our meta-analysis and meta-regression thoroughly evaluates the relationships among these constructs, providing a comprehensive understanding of their interconnections. Our findings reveal overall positive correlations among JS, OC, and OCB within this study. Subgroup analyses demonstrate that effect sizes vary across countries, with Malaysia and Thailand exhibiting the strongest correlations, while Pakistan and India display weaker and more variable effects. Tests for subgroup differences indicate significant moderation by context between JS-OC and OC-OCB, but not between JS-OCB. These findings underscore the importance of contextual factors in explaining heterogeneity in meta-analytic results and suggest that cultural or regional differences may influence the magnitude of observed effects. This highlights how these interrelated factors can serve as potential solutions for addressing workplace issues, such as employee turnover, low productivity, and a poor organisational climate, as indicated by Saif-Ud-Din and Adeel (2016) in Pakistan. Therefore, we assert that the significance of JS, OC, and OCB in developing strategic solutions for organisational challenges is unequivocally substantiated.

Practical implications

A synthesis of current literature in organisational behaviour and psychology reveals robust, generalizable positive correlations among core latent variables, offering an empirical basis for evidence-based managerial policy. Driven by the objective of organisational profitability, practitioners may judiciously allocate resources toward interventions that cultivate these variables, including leadership development, supportive work climates, and equitable practices. The underlying mechanism supporting this recommendation is the consistently positive and context-independent interrelationship among JS, OC, and OCB.

From the strategic standpoint of policy and system-level viewpoints, we emphasise the importance of integrating organisational culture, structure, and control systems to maximise effectiveness. Managers should adopt a foundational strategy to balance outcome, behavioural, and clan controls to optimise performance, recognising that these controls are complementary and context-dependent (Chiaburu, Chakrabarty, Wang,

& Li, 2015; Hartnell, Ou, Kinicki, Choi, & Karam, 2019). Additionally, addressing organisational justice and support is crucial, as these factors significantly influence employee attitudes, OCB, and help reduce counterproductive behaviours (Aguinis, Jensen, & Kraus, 2021; Cen, Wang, & Huang, 2024; Dalal, 2005; Kong, Tsai, Tsai, Huang, & De La Cruz, 2018). The generalizability of the findings indicates that managers involved in strategic decision-making to tackle internal challenges and foster a productive workplace must adopt strategies that support resource allocation toward interventions with demonstrated, cross-contextual effectiveness. It is imperative to establish policies and training programs that exhibit a strong confidence in their impact on employees and organisational outcomes (Kong et al., 2018; N. Podsakoff, Whiting, Podsakoff, & Blume, 2009; Wolfe & Lawson, 2020; Wu & Nguyen, 2019). Transitioning from isolated, anecdotal decision-making to strategies grounded in cumulative scientific evidence is essential.

Methodological Considerations and Recommendations

In the course of this research and comprehensive review of related studies, several methodological considerations emerged, particularly with respect to quantitative analyses, which were essential for the selection and evaluation of qualified published papers. A significant aspect emphasised in the literature is the essential role of these considerations in improving meta-analytic outcomes, particularly in the context of this study, which seeks to offer valuable insights for future research on the interrelations among JS, OC, and OCB. The following key considerations are presented:

1. The validation of the Organisational Commitment Questionnaire (OCQ) across six languages underscores the necessity of rigorous adaptation processes to ensure the reliability and validity of research instruments in international studies (Kanning & Hill, 2013). This highlights the importance of methodological rigour in cross-cultural quantitative research to improve comparability.
2. SEM is identified as a versatile and powerful tool in psychological research, applicable across various research designs and issues. However, concerns regarding its application, including methodological challenges that may impact results, are discussed, emphasising the need for careful implementation and reporting (Anderson & Gerbing, 1988; Hooper, Coughlan, & Mullen, 2008; MacCallum & Austin, 2000). These studies collectively advocate for a structured approach to SEM, including a recommended two-step process to enhance theory testing and development (Anderson & Gerbing, 1988).
3. The issue of common method biases in behavioural research is examined in detail, identifying potential sources and suggesting remedies (P. M. Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This study stresses the importance of recognising and addressing methodological biases to enhance the credibility and reliability of quantitative research findings.

4. Furthermore, the inclusion of a paper on business research methods reflects the increasing need for managers to navigate and organise vast amounts of data, integrating both quantitative and qualitative analyses to make informed business decisions (Hair Jr, Page, & Brunsveld, 2019). This indicates the broader applicability and necessity of robust research methods beyond the academic context.
5. The exploration of Exploratory Factor Analysis (EFA) provides foundational insights into the conceptual and methodological underpinnings of this method, which are essential for the construction, adaptation, and validation of psychological tests (Pérez & Medrano, 2010). It emphasizes EFA's role in qualitative research, particularly in the initial stages of instrument development.

Lastly, the impact of emerging workplace trends, such as remote work and digitalization, on these dynamics remains underexplored. Therefore, the research agenda should incorporate an examination of the effects of modern workplace trends on JS, OC, and job performance, especially OCB.

Data Availability Statement

The dataset generated and/or analysed, along with the R script and R console outputs, is available in the Zenodo repository: https://zenodo.org/records/16837153

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***Appendix*: Extracted studies for data analysis**

Study	N	R	R1	R2	Context
Rifai (2005)	383	0.121	0.342	0.233	Indonesia
Zeinabadi (2010)	652	0.36	0.26	0.34	Iran
Kashif, Khan, and Rafi (2011)	150	0.232	0.055	0.232	Pakistan
Şeşen and Basim (2012)	275	0.425	0.35	0.485	Turkey
Kaur, Kaur, Aneet, and Midha (2014)	165	0.32	0.455	0.755	India
Suparjo and Darmanto (2015)	226	0.453	0.217	0.479	Indonesia
Hejazi, Mahboubi, Keshavarzi, and Zinat-Motlagh (2015)	300	0.57	0.7	0.535	Iran
Pivi and Hassan (2015)	100	0.836	0.796	0.884	Malaysia
Tharikh et al. (2016)	200	0.451	0.51	0.45	Malaysia
Taghinezhad, Safavi, Raiesifar, and Yahyavi (2015)	373	0.27	0.52	0.42	Iran
Saif-Ud-Din and Adeel (2016)	140	0.511	0.812	0.291	Pakistan
Prasetio et al. (2017)	320	0.334	0.61	0.142	Indonesia
Adil, Owais, and Qamar (2018)	292	0.2	0.113	0.46	Pakistan
Fazriyah et al. (2019)	51	0.213	0.211	0.245	Indonesia
Fitrio, Apriansyah, Utami, and Yaspita (2019)	34	0.613	0.864	0.693	Indonesia
Risna and Omar (2019)	173	0.368	0.534	0.553	Indonesia
Kristian and Ferijani (2020)	52	0.35	0.158	0.219	Indonesia
Nurjanah et al. (2020)	196	0.213	0.364	0.393	Indonesia
Na-Nan et al. (2020)	450	0.214	0.7	0.686	Thailand
Sondeng and Husain (2020)	100	0.72	0.63	-0.06	Indonesia
Na-Nan, Kanthong, and Joungtrakul (2021)	400	0.864	0.887	0.888	Thailand
Band, Shah, Naidu, and Lohi (2020)	445	0.6	0.254	0.652	India
Malik (2021)	300	0.006	0.006	0.004	Pakistan
Karuna (2021)	309	0.123	-0.24	-0.244	India
Musringudin, Dinihari, and Afriantoni (2021)	90	0.205	0.237	0.212	Indonesia
Wahyuni and Dirbawanto (2022)	33	0.382	0.55	0.352	Indonesia
Kurniadi et al. (2022)	180	0.213	0.782	0.545	Indonesia
Siva et al. (2022)	530	0.3771	0.9857	0.259	India
Sunaris, Wahyoedi, and Tecoalu (2022)	64	0.126	0.146	0.137	Indonesia
Nurendra and Herliani (2023)	134	0.1083	0.4386	0.0552	Indonesia
Ardiyansah and Mon (2023)	113	0.733	0.707	0.682	Indonesia
Alghifari and Yaman (2024)	75	0.448	0.528	0.645	Indonesia
Diniyah et al. (2024)	75	0.458	0.418	0.558	Indonesia
Hermawan et al. (2024)	368	0.754	0.797	0.618	Indonesia
Saluy, Syawal, Sudjono, Kemalasari, and Gustiah (2024)	91	0.431	0.295	0.045	Indonesia
Setyawati et al. (2024)	65	0.899	0.926	0.906	Indonesia
Purnama et al. (2024)	65	0.318	0.379	0.35	Indonesia
Agus, Kusuma, Agung, Oka, and Gorda (2025)	147	0.631	0.029	0.154	Indonesia