

DEVELOPING AND VALIDATING THE ORGANIZATIONAL HEALTH BEHAVIOR INDEX (OHBI): A STUDY AT UNIVERSITAS PANCASILA

Aulia Keiko Hubbansyah^{1*}, Iha Haryani Hatta², Safitri Siswono³, Afif Baharmus⁴
Universitas Pancasila, Jakarta

E-mail: akhubbansyah@univpancasila.ac.id^{1*}, ihaharyani@univpancasila.ac.id²,
safitrisiswono@univpancasila.ac.id³, afifbaharmus01@gmail.com

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Abstract

This study aims to develop and validate the Organizational Health Behavior Index (OHBI), a quantitative instrument for measuring organizational health at Universitas Pancasila. The instrument was designed around eight theoretical factors (32 Likert-scale items): Awareness, Relations, Appreciation, Internal Communication, Engagement, Employee Characteristics, Employee Voice, and Organizational Culture. The instrument was tested through content validity (CVR/CVI), exploratory factor analysis (EFA), Cronbach's Alpha reliability, and confirmatory factor analysis (CFA) on staged samples (minimum realized N of 6 experts, 100, and 150 respondents). Results show an empirical reduction to five final factors comprising 24 items—Awareness, Relations, Appreciation, Engagement, and Internal Communication & Employee Voice—with an excellent model fit (CFI = 0.996; RMSEA = 0.014) and high reliability ($\alpha = 0.832\text{--}0.864$), while Employee Characteristics and Organizational Culture failed to demonstrate consistent psychometric behavior and were excluded from the quantitative model. A mean-difference test of total OHBI scores across gender, sector, tenure, and managerial level showed no statistically significant differences, indicating an inclusive instrument. These findings support OHBI as a psychometrically sound quantitative instrument for measuring organizational health in a higher-education context.

Keywords: Confirmatory Factor Analysis; Higher Education; Organizational Health; Psychometric Validation

INTRODUCTION

Organizations, regardless of form or sector, are required to perform at a high level on a sustainable basis in order to survive and thrive amid a constantly changing environment. This capability rests on the internal condition of the organization itself—the extent to which employees show dedication, understand their roles and responsibilities, and are able to achieve superior performance. This internal condition is known in the organizational behavior literature as organizational health, that is, an organization's capacity to remain sustainable, survive within its environment, adapt to change, and continuously enhance its adaptive capacity (Charoghchian Khorasani et al., 2020). Healthy organizations have been shown to improve employee performance and productivity, which in turn positively affects organizational image (Ikechukwu et al., 2019); organizational culture, work climate, and superior work practices create an environment that supports employee health and safety while simultaneously improving organizational effectiveness, making organizational health a foundation for sustainable and successful business given the close relationship between organizational profitability and worker well-being (Grawitch & Ballard, 2016; Arnoux-Nicolas et al., 2016). Healthy organizations also foster employees' concern for the organization's future success (Tantry & Ali, 2020), and organizational efficiency has been shown to be positively, significantly, and directly related to indicators of organizational health (Gilani et al., 2023).

The need to build and maintain organizational health for high performance applies equally—and is arguably even more urgent—for higher education institutions, a type of organization currently facing unprecedented performance demands due to rapid changes in the policy, economic, industrial, and business environment. On the policy side, universities must adapt to national policies such as Merdeka Belajar-Kampus Merdeka (Independent Learning-Independent Campus), the strengthening of accreditation by BAN-PT and independent accreditation bodies (LAM), and demands for internationalization and digitalization of learning. On the economic and industrial side, universities—particularly private universities dependent on student enrollment—face increasingly intense inter-university competition, changing prospective-student preferences, demands for graduate employability in a labor market being transformed by automation and artificial intelligence (Industry 4.0/5.0), and pressure to control operational costs. Without a healthy internal organization—faculty and staff who are aware of the institution's strategic direction, maintain good working relationships, feel appreciated, are fully engaged, and receive effective

internal communication—universities will struggle to respond effectively to these demands, however strong their academic achievements may be. Recent evidence from higher-education institutions elsewhere reinforces this point: internal communication and employee engagement have been shown to jointly shape job satisfaction and employee loyalty among university staff, underscoring that these organizational-health factors are not merely corporate concerns but are directly relevant to the higher-education sector (Nguyen & Ha, 2023).

This challenge is faced directly by Universitas Pancasila (UP). As an institution that explicitly ties its identity to Pancasila values—gotong royong (mutual cooperation), kekeluargaan (kinship), and musyawarah (deliberative consensus)—UP faces a dual challenge: maintaining the consistency of its Pancasila-based values and character while remaining competitive and relevant amid the dynamics of higher-education policy, labor-market demands, and inter-university competition described above, in line with the targets set out in the UP Strategic Plan 2025-2029. For UP, ensuring that faculty and staff work within a healthy organization is not merely an academic discourse but a concrete prerequisite for achieving these strategic targets.

The problem is that the widely acknowledged urgency of organizational health is often not matched by the availability of adequate measurement tools to truly understand and monitor it. Existing organizational health instruments—including the McKinsey Organizational Health Index discussed further below—are generally developed for general corporate contexts, are purely quantitative in nature, and may not capture characteristics specific to higher-education institutions, such as the working relationship between academic and non-academic staff, academic culture, and the distinctive nature of employee voice within an institution such as UP. This gap underlies the need for a more comprehensive instrument—one capable of measuring organizational health quantitatively while producing a picture that is more complete and relevant to a higher-education context such as UP.

This need underlies the development and validation of the Organizational Health Behavior Index (OHBI) in the present study—a model and measurement tool for organizational health based on three categories of organizational needs (basic needs, corporate needs, and strategic needs) and eight main factors, namely awareness, relations, appreciation, internal communication, engagement, employee characteristics, employee voice, and organizational culture, following the methodological pattern of Jaafari et al. (2023). Organizational health in this study is defined as an organization's ability to face change and continue operating at a high level of performance through the maintenance of a sustainable work culture—a definition that directly addresses the need of universities such as UP to remain excellent amid the shifting policy, economic, industrial, and business environment described above.

Based on the foregoing, this study formulates two research questions: (a) what factor structure of the Organizational Health Behavior Index (OHBI) emerges empirically after undergoing content-validity testing, exploratory factor analysis (EFA), reliability testing, and confirmatory factor analysis (CFA); and (b) is there a difference in total OHBI scores based on respondents' demographic characteristics (gender, sector, tenure, and managerial level)? This study aims to develop and validate a comprehensive quantitative measure—OHBI—capable of accurately capturing the factors driving organizational-health behavior, so that the important domains of organizational health can be well accommodated.

LITERATURE REVIEW

The Concept of Organizational Health

Organizational health is a term used in the literature to describe aspects of the work environment related to employee health. Miller et al. (1999) used the concept of organizational health to explain occupational stress, while Cotton and Hart (2003) defined organizational health as employee well-being within the work environment. Lencioni (2012), on the other hand, defined organizational health as a condition of alignment among management, operations, strategy, and culture within an organization. As organizations increasingly pay attention to organizational health, culture, work climate, and continuous-improvement efforts play a role in creating an environment that supports both organizational effectiveness and employee well-being.

The History of Organizational Health Measurement

The idea of organizational health first appeared in the literature more than 40 years ago. Warren Bennis (1962) was one of the earliest scholars to introduce organizational health as an approach to assessing organizational performance, proposing three main characteristics of a healthy organization: flexibility, clarity of identity, and the ability to understand the environment. The concept of organizational health represents a synthesis of ideas put forward by Parsons (1967), Miles (1969), and Etzioni (1990). Miles (1969) identified ten characteristics of a healthy organization: goal focus, adequate communication, optimal power equalization, resource utilization, cohesion,

morale, innovativeness, autonomy, adaptation, and problem-solving adequacy. These characteristics were grouped into three main requirements that an organization must fulfil, namely task, maintenance, and growth. According to Parsons, in order for an organization to survive and succeed, it must be able to manage four fundamental problems: adaptation, goal attainment, integration, and latency (the AGIL framework). These functions were later narrowed by Etzioni into two paired functions—(adaptation and goal attainment) and (integration and latency)—as summarized by Teresa et al. (2000).

The Organizational Health Index (OHI)

One key indicator of an organization's ability to produce consistent performance is the Organizational Health Index (OHI) score. McKinsey has tracked the health of more than 1,500 organizations across 100 countries over a ten-year period by combining employee and manager perspectives on actions taken to improve organizational health, finding that such activities correlate with improved financial performance. Keller and Price (2011) examined organizational health through five aspects intended to help organizations achieve the highest level of competitive advantage: aspiring, assessing, architecting, acting, and progressing. Under a related OHI framework, organizational health is understood through three clusters—internal alignment, quality of execution, and capacity for renewal—which together divide the OHI into a total of nine outcome dimensions and 37 management-practice indicators. More recently, Alzuman et al. (2025) extended this line of work by developing and validating the mixed-methods OHBI on a large Saudi Arabian workforce sample, and a follow-up study using the same instrument found that awareness, appreciation, and communication satisfaction significantly predict employee engagement, with communication acting as a contextual moderator (Alzuman et al., 2026). These recent applications indicate that the OHBI framework generalizes beyond its original validation context and continues to be actively developed.

Awareness and Organizational Health

Organizational health is defined in terms of characteristics and specifications such as communication, perceptions of organizational strategy and politics, employee competence, workforce capacity, management skills, employee morale, work environment, employee awareness of the organizational mission, cooperation, workforce demographic characteristics and education, and professional development and improvement, all of which influence employee behavior. Employees with good organizational awareness are able to complete their work more easily, understand what is happening within the organization, rarely make mistakes due to misunderstanding the organizational structure, and act appropriately within the organization.

Appreciation and Organizational Health

To create a dynamic and energetic workforce, maintaining high employee morale is a key objective. Employees feel valued and recognized for both small and large achievements when they receive individual appreciation. Appreciation plays an important role in organizations because it can strengthen positive relationships, social support, and employee well-being, reduce negative emotions in the workplace, and enhance organizational health and success (Rushing, 2021). A recent systematic review of employee-appreciation research further confirms that appreciation is fundamentally a communicative behavior, typically conveyed by supervisors and top management, that is consistently linked to positive outcomes such as job satisfaction and engagement (Wahl et al., 2026).

Relations and Organizational Health

Survey evidence indicates that 82 percent of workers would leave their job because of an unpleasant manager (Korolevich, 2022). Accordingly, a strong relationship between managers and employees can help reduce absenteeism and turnover rates. The working relationship between employees and managers is one factor that determines employee performance and productivity; a positive relationship with a manager is associated with higher motivation and performance, whereas a negative relationship is associated with lower performance (Dlamini et al., 2022).

Internal Communication and Organizational Health

Internal communication humanizes relationships within the company, increases employee awareness of their work, deepens their knowledge of specific topics, better integrates them into the work environment, and helps achieve company goals. The management of internal/employee communication is related to employee engagement, which in turn increases supportive communication and reduces intention to leave the organization (Faquir & Habib,

2016). Poorly managed and underutilized communication mechanisms, along with a lack of employee participation in decision-making, can in some conditions hinder employee performance, which ultimately affects organizational health.

Engagement and Organizational Health

The Social Exchange Theory (SET) model, which assumes that employees and employers engage in a social exchange relationship, can be used to explain the relationship among perceptions of organizational health climate, leaders' mindset toward health, work engagement, and job crafting. Employees tend to act in ways that benefit the organization when they perceive that they have a good relationship with it. Work engagement is a crucial intermediate step that maintains the linkage between job resources and work behavior (Zweber et al., 2016).

Employee Characteristics as an Antecedent of Organizational Health

Employee characteristics—such as skills, adaptability, motivation, and responsibility—are individual trait-like attributes that are conceptually distinct from collective perceptions of the organization. Miller et al. (1999), in their study of the role of conscientiousness (a personality dimension) in organizational health, emphasized that individual personality attributes do contribute to organizational health, but as an antecedent rather than as part of the organizational-health construct itself. This conceptual distinction between 'individual characteristics as an antecedent' and 'collective perception of the organization as the measured construct' provides the theoretical rationale for including Employee Characteristics as one of the eight theoretical factors tested in this study, while also anticipating that it may behave differently from the other, more clearly organizational-level factors.

Organizational Culture

According to Edgar Schein (2010), organizations do not form a culture in a single day; rather, culture develops over time as personnel experience various changes, adapt to the external environment, and solve various challenges together. The Competing Values Framework (CVF), developed by scholars at the University of Michigan (Cameron & Quinn, 2011), outlines four competing organizational cultures along with their associated leadership styles: controlling (hierarchy), competing (market), creative (adhocracy), and collaborative (clan). Because culture is layered, historical, and interpreted differently by each individual, it is theoretically more difficult to capture through a small number of generic Likert-type statements than through richer qualitative approaches—a consideration that is revisited in the Results and Discussion section of this study.

Employee Voice

Attention to employee voice is needed to improve organizational operations by integrating ideas conveyed by employees into the organizational system. Since the 1980s, the concept of employee voice has been prominent in the fields of employment relations, human resource management, and organizational behavior. The literature defines employee voice as various formal mechanisms for individual and collective employee input, such as grievance procedures, suggestion systems, consultation services, management-employee meetings, non-managerial work teams, quality networks, works councils, and participative management. Kang and Sung (2017) showed that symmetrical internal communication is a key mechanism mediating employee engagement and positive employee communication behavior, including the expression of voice/opinion, while Faquir and Habib (2016) emphasized that good internal-communication channels are a prerequisite for channeling employee participation and input into decision-making.

Based on a range of empirical studies and significant evidence, organizational health is a collection of interrelated components rather than a single entity. These components, or latent factors, define organizational-health behavior and influence overall organizational performance. These findings form the basis for the hypothesis of this study, namely that the Organizational Health Behavior Index (OHBI) is determined by several latent factors within the measurement instrument.

METHOD

This study adopts a quantitative research design to develop and validate the Organizational Health Behavior Index (OHBI), following the methodological pattern of Jaafari et al. (2023). The instrument of OHBI was designed around eight theoretical factors—Awareness (AWR), Relations (REL), Appreciation (APP), Internal Communication (COM), Engagement (ENG), Employee Characteristics (CHR), Employee Voice (VOI), and

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Organizational Culture (CUL)—comprising 32 statement items on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), with four items per factor.

The eight theoretical factors were further grouped into three tiered categories of organizational need, borrowing the logic of task, maintenance, and growth needs from Miles (1969): basic needs (Awareness, Employee Characteristics, Internal Communication), corporate needs (Relations, Appreciation, Employee Voice), and strategic needs (Engagement, Organizational Culture). Table 1 presents the full wording of all 32 items across the eight theoretical factors as originally designed prior to empirical testing.

Table 1. Item Statements of the Eight Theoretical Factors (Pre-Test Design)

Factor	Code	Item Statement
Awareness (AWR)	AWR1	I clearly understand the organization's vision and mission.
Awareness (AWR)	AWR2	I am aware of how my role contributes to the organization's goals.
Awareness (AWR)	AWR3	I understand the work policies and procedures applicable in this organization.
Awareness (AWR)	AWR4	I stay informed about the latest developments regarding the organization's strategic direction.
Relations (REL)	REL1	I have a good working relationship with my supervisor.
Relations (REL)	REL2	Colleagues in my unit support one another.
Relations (REL)	REL3	I feel comfortable discussing work-related problems with my supervisor.
Relations (REL)	REL4	Relationships among employees in my work unit run harmoniously.
Appreciation (APP)	APP1	I feel appreciated for the contributions I make.
Appreciation (APP)	APP2	My supervisor gives recognition for the achievements I attain.
Appreciation (APP)	APP3	The organization openly recognizes employee achievements.
Appreciation (APP)	APP4	I feel that my efforts are noticed by the organization.
Internal Communication (COM)	COM1	Important information is delivered in a timely manner in this organization.
Internal Communication (COM)	COM2	I receive clear information regarding organizational policies.
Internal Communication (COM)	COM3	Communication between units/divisions runs smoothly.
Internal Communication (COM)	COM4	I find it easy to express my opinions through internal communication channels.
Engagement (ENG)	ENG1	I feel actively involved in my work.
Engagement (ENG)	ENG2	I am enthusiastic about coming to work every day.
Engagement (ENG)	ENG3	I am fully committed to achieving the organization's goals.
Engagement (ENG)	ENG4	I am willing to put in extra effort for the organization's success.
Employee Characteristics (CHR)	CHR1	I have the skills required by my job.
Employee Characteristics (CHR)	CHR2	I am able to adapt to changes in the work environment.
Employee Characteristics (CHR)	CHR3	I have high motivation in completing my work.
Employee Characteristics (CHR)	CHR4	I demonstrate responsibility in every task assigned to me.
Employee Voice (VOI)	VOI1	I feel free to convey ideas to leadership.
Employee Voice (VOI)	VOI2	The organization provides official channels for employees to submit input.
Employee Voice (VOI)	VOI3	My opinions are taken into consideration in decision-making.

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Employee Voice (VOI)	VOI4	I feel heard when submitting complaints or suggestions.
Organizational Culture (CUL)	CUL1	This organization has a positive work culture.
Organizational Culture (CUL)	CUL2	Organizational values are consistently applied by all employees.
Organizational Culture (CUL)	CUL3	I feel that I fit well with the work culture in this organization.
Organizational Culture (CUL)	CUL4	The organization encourages cross-unit collaboration.

Given time and resource constraints, data collection at each research stage used the smallest sample size that could still be methodologically justified. Table 1 summarizes the realization of the research stages.

Table 2. Realization of Research Stages and Sample Size

Stage	Sample Group	n	Method/Operation
1	Subject-matter experts	6	Item identification & content validity (CVR/CVI)
2	Sample group 1	100	Exploratory Factor Analysis (EFA)
3	Sample group 2	150	Reliability testing
4	Sample group 2	150	Confirmatory Factor Analysis (CFA)

The minimum sample sizes at each stage were established based on methodological justifications from the psychometric literature: a 6-expert panel for CVR follows Lawshe's (1975) critical-value table and Lynn's (1986) recommendation of a minimum of 3-5 experts; $n = 100$ for EFA follows the absolute minimum most frequently cited for EFA (Kline, 1979; Gorsuch, 1983), with MacCallum et al. (1999) showing that factor structures can still be estimated stably at $n = 100$ -150 given high communalities and 3-4 indicators per factor; and $n = 150$ for reliability and CFA follows Wolf et al. (2013), who showed that a simple CFA model with loadings ≥ 0.65 and 3-4 indicators per factor can achieve stable parameter estimation at $n = 150$, although $n = 200$ is often cited as a general guideline (Kline, 2015).

The demographic mean-difference test on total OHBI scores was conducted on the combined reliability and CFA sample groups ($n = 250$ realized minimum), with the proportions of gender, sector (faculty/administrative staff), tenure, and managerial level maintained in line with the organization's population profile.

Data analysis used the Content Validity Ratio/Index (CVR/CVI), Exploratory Factor Analysis (EFA) with Varimax rotation, Cronbach's Alpha reliability testing, and Confirmatory Factor Analysis (CFA). The demographic mean-difference test on total OHBI scores used independent-samples t-tests (gender, sector) and one-way ANOVA (tenure, managerial level).

RESULTS AND DISCUSSION

Descriptive Statistics

A total of 250 respondents participated in the demographic mean-difference testing stage. Table 3 presents the distribution of respondents across five demographic characteristics.

Table 3. Demographic Characteristics of Respondents (n = 250)

Characteristic	Category	N	%
Gender	Male	99	39.6%
Gender	Female	151	60.4%
Sector	Academic staff (faculty)	148	59.2%
Sector	Administrative staff	102	40.8%
Tenure	< 5 years	94	37.6%
Tenure	5-10 years	89	35.6%
Tenure	> 10 years	67	26.8%
Managerial level	Staff	134	53.6%
Managerial level	Supervisor	68	27.2%
Managerial level	Section Head	32	12.8%
Managerial level	Leadership/Executive	16	6.4%

The sample is dominated by female respondents (60.4%) and academic staff (59.2%), reflecting the composition of a private university workforce in which teaching staff typically outnumber administrative staff. In terms of tenure, respondents are fairly evenly distributed across the three tenure bands, with a slightly larger proportion in the under-5-year category (37.6%), suggesting a workforce that includes both long-serving employees familiar with the institution's history and values, and newer employees still forming their perceptions of the organization. The managerial-level distribution is heavily weighted toward non-supervisory staff (53.6%), which is expected given the typical pyramidal structure of a higher-education institution, and provides a sufficient base for meaningful subgroup comparisons even though the leadership/executive category (6.4%, n = 16) is comparatively small. Overall, this demographic profile suggests that the sample reasonably approximates the actual composition of UP's workforce across academic and non-academic functions, tenure bands, and hierarchical levels, which strengthens the generalizability of the subsequent psychometric and mean-difference results to the broader UP employee population.

Content Validity (CVR/CVI)

The Content Validity Index (CVI) was calculated from the assessments of 6 experts regarding the 32 initial items of the instrument, producing an overall CVI of 0.930. Based on Lawshe's (1975) critical-value table, at N = 6 experts the critical CVR value remains very strict (0.99), which in practice requires unanimous or near-unanimous agreement among experts for an item to be declared statistically essential. All items in the factors of Awareness (AWR), Relations (REL), Appreciation (APP), Internal Communication (COM), and Engagement (ENG) achieved unanimous agreement (CVR = 1.00), while several items in Employee Characteristics (CHR), Employee Voice (VOI), and especially Organizational Culture (CUL2, CVR = 0.333) showed lower values and became a focus of attention in the subsequent EFA stage. The CHR and VOI factors were nonetheless carried forward to the EFA stage because content validity and construct validity are two complementary rather than substitutable forms of validity evidence—CVR/CVI is positioned as a necessary, not a sufficient, condition for an item's final acceptability; the final decision remains determined by EFA and CFA.

Exploratory Factor Analysis (EFA)

The first EFA iteration on all 32 items produced a Kaiser-Meyer-Olkin (KMO) value of 0.803 (a 'meritorious' category according to Kaiser, 1974) and a significant Bartlett's test of sphericity ($\chi^2 = 1448.78$; df = 496; $p < .001$), indicating that the correlation matrix was suitable for factoring. Table 4 summarizes these preliminary indicators.

Table 4. EFA Iteration 1 - Sampling Adequacy and Extraction Summary (32 Items)

Indicator	Value
Kaiser-Meyer-Olkin (KMO)	0.803
Bartlett's Chi-Square	1,448.78
Bartlett's df	496
Bartlett's Sig.	< 0.001
Eigenvalue > 1 (before cleaning)	9 components
Cumulative variance (8 factors)	64.13%

Despite the adequate KMO and Bartlett's results, initial extraction produced nine components with eigenvalues greater than 1, more than the eight theoretical factors planned at the instrument-design stage—a classic indication of over-extraction, which occurs when the extraction procedure (in this case, principal component analysis) is run without a strict limit on the number of components, and tends to keep 'finding' additional structure even from residual variance that is not substantively meaningful. For diagnostic purposes, extraction was therefore forced to the eight theoretically specified factors rather than the nine components suggested by the Kaiser criterion. Table 5 presents the resulting rotated loading matrix.

Table 5. EFA Iteration 1 Loading Matrix (32 Items, 8 Components, Varimax Rotation)

Item	F1	F2	F3	F4	F5	F6	F7	F8
AWR1	0.19	[0.78]	0.08	0.23	-0.03	0.07	0.14	-0.09
AWR2	0.11	[0.75]	0.05	0.21	0.19	0.14	0.02	-0.19
AWR3	0.24	[0.70]	0.12	0.22	-0.06	0.01	0.04	0.02
AWR4	0.30	[0.71]	0.20	0.03	-0.08	0.05	-0.09	0.05
REL1	0.05	0.12	[0.78]	0.17	-0.04	0.13	0.03	0.21
REL2	0.31	0.18	[0.71]	0.04	-0.01	0.10	0.03	0.05
REL3	0.19	-0.08	[0.77]	0.11	0.04	0.11	0.05	-0.17
REL4	0.15	0.22	[0.74]	0.04	-0.01	0.10	0.06	-0.01
APP1	0.32	0.02	0.22	0.05	-0.01	[0.79]	0.07	-0.05
APP2	0.29	0.00	0.08	0.05	-0.07	[0.70]	-0.04	0.07
APP3	0.22	0.12	0.19	0.28	0.01	[0.73]	0.09	0.08
APP4	0.11	0.15	0.03	0.12	0.08	[0.84]	-0.10	-0.10
COM1	[0.71]	0.17	0.09	0.19	0.09	0.15	0.01	-0.01
COM2	[0.63]	0.18	0.31	0.22	-0.04	0.27	-0.06	-0.02
COM3	[0.68]	0.13	0.15	0.11	-0.07	0.10	0.02	-0.12
COM4	[0.54]	0.41	0.24	0.22	0.10	0.09	-0.03	-0.05
ENG1	0.09	0.26	0.05	[0.68]	-0.24	0.12	-0.03	0.03
ENG2	0.30	0.26	-0.03	[0.73]	-0.01	0.15	-0.08	0.05
ENG3	0.11	0.05	0.14	[0.82]	0.07	0.11	0.07	-0.04
ENG4	0.17	0.26	0.29	[0.71]	0.10	0.11	-0.02	0.10
CHR1	-0.22	0.14	0.10	0.03	-0.11	-0.01	[0.62]	-0.04
CHR2	0.08	0.03	0.16	-0.19	-0.29	0.08	[0.69]	0.27
CHR3	0.15	-0.15	-0.11	0.10	0.29	-0.09	[0.57]	-0.21
CHR4	-0.10	-0.22	0.05	0.23	-0.06	-0.11	-0.01	[0.71]
VOI1	[0.67]	0.22	0.02	0.02	-0.16	0.25	-0.01	0.00
VOI2	[0.46]	0.40	0.13	0.20	-0.06	0.34	-0.17	0.16
VOI3	[0.68]	0.08	0.10	0.12	0.02	0.21	0.12	0.00

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VOI4	[0.67]	0.20	0.24	0.02	0.06	0.15	-0.19	0.06
CUL1	0.41	0.01	0.04	-0.13	0.37	0.23	0.12	[0.54]
CUL2	-0.34	0.13	-0.11	-0.20	0.35	0.08	-0.22	[0.43]
CUL3	-0.10	-0.11	0.05	0.10	[0.70]	-0.08	-0.14	-0.03
CUL4	0.06	0.11	-0.03	-0.10	[0.72]	0.06	0.02	0.07

Note: bracketed values indicate the highest (primary) loading for each item.

From this extraction, it is evident that CHR and CUL do not each cohere within a single component (Table 5). Substantively, the failure of the CHR (Employee Characteristics) items to form a convincing loading on any single factor can be explained by the nature of the construct being measured. CHR items essentially measure trait-like individual attributes—such as personal skills and motivation—that conceptually reflect an individual's inherent characteristics more than their perception of the organization they work for. Because variation in responses to such items is driven more by inter-individual personality differences than by shared experiences of organizational health, it is reasonable that these items struggle to form a coherent factor within a measurement framework such as OHBI. This finding led to the decision to remove the CHR item in the subsequent EFA iteration.

This finding is consistent with earlier arguments in the organizational-behavior literature, for example by Miller et al. (1999) in their study on the role of conscientiousness (a personality dimension) in organizational health. Miller et al. (1999) emphasized that individual personality attributes do contribute to organizational health, but as an antecedent—not as part of the organizational-health construct itself. In other words, the EFA results at this stage empirically confirm the conceptual separation long proposed in the literature between 'individual characteristics as an antecedent' and 'collective perception of the organization as the construct being measured.'

Table 6. Inter-Item Correlation Matrix and Item-Total Correlation for CHR (n = 100)

Item	CHR1	CHR2	CHR3	CHR4	Item-Total Correlation
CHR1	1.00	0.24	0.05	0.04	0.189
CHR2	0.24	1.00	0.15	0.02	0.242
CHR3	0.05	0.15	1.00	-0.12	0.051
CHR4	0.04	0.02	-0.12	1.00	-0.026

It should be emphasized that the loading values of CHR1-CHR3 in Table 5 (ranging from 0.57 to 0.69 on F7) appear reasonably acceptable when viewed in isolation. However, two findings indicate that CHR is not viable as a coherent factor. First, the four CHR items did not load on the same component—CHR1-CHR3 clustered on F7, while CHR4 loaded on F8, an entirely different component mixed with residual loadings from CUL1/CUL2, indicating that the four items do not truly measure a single, common construct. Second, and more importantly, when the four CHR items were tested as a single scale (as is customary at the reliability stage), the result was very poor: Cronbach's Alpha of only 0.226, with near-zero and even negative inter-item correlations (CHR3 with CHR4, $r = -0.12$), and very weak item-total correlations (0.05 to 0.24, one of which was negative). This reliability check reveals that CHR1-CHR4 essentially do not correlate meaningfully with one another, so the decision to remove CHR was based not on loadings alone, but on its failure to form a consistent and reliable single construct.

EFA Iteration 2: Six Factors

After the CHR item was removed, EFA was repeated on the remaining 28 items. Table 6 summarizes the resulting sampling-adequacy indicators.

Table 7. EFA Iteration 2 - Sampling Adequacy and Extraction Summary (28 Items)

Indicator	Value
Kaiser-Meyer-Olkin (KMO)	0.824
Bartlett's Chi-Square	1,352.45
Bartlett's df	378
Bartlett's Sig.	< 0.001
Cumulative variance (6 factors)	62.96%

After the problematic CHR item was removed, the KMO value increased from 0.803 to 0.824, providing concrete evidence that the item-cleaning process genuinely improved the quality and clarity of the instrument's underlying factor structure. The cumulative variance of 62.96% produced at this iteration also falls within the range commonly regarded as adequate for social-science research, that is, above the 60% threshold recommended by Hair et al. (2010). Table 7 presents the resulting rotated loading matrix.

Table 8. EFA Iteration 2 Loading Matrix (28 Items, 6 Final Factors, Varimax Rotation)

Item	F1 (COM+VOI)	F2 (AWR)	F3 (REL)	F4 (ENG)	F5 (CUL)	F6 (APP)
AWR1	0.17	[0.77]	0.08	0.23	-0.05	0.05
AWR2	0.07	[0.77]	0.04	0.20	0.11	0.12
AWR3	0.22	[0.70]	0.13	0.22	-0.03	0.01
AWR4	0.24	[0.73]	0.20	0.01	-0.04	0.09
REL1	0.00	0.14	[0.80]	0.14	-0.01	0.17
REL2	0.30	0.17	[0.71]	0.07	0.05	0.09
REL3	0.21	-0.06	[0.76]	0.10	-0.03	0.09
REL4	0.11	0.23	[0.75]	0.05	-0.02	0.10
APP1	0.30	0.02	0.22	0.07	0.01	[0.78]
APP2	0.24	0.04	0.10	0.04	-0.04	[0.72]
APP3	0.18	0.12	0.22	0.30	0.04	[0.73]
APP4	0.09	0.14	0.01	0.14	0.08	[0.82]
COM1	[0.72]	0.19	0.08	0.22	0.15	0.15
COM2	[0.59]	0.25	0.32	0.17	-0.04	0.32
COM3	[0.74]	0.15	0.12	0.12	-0.03	0.09
COM4	[0.50]	0.46	0.26	0.17	0.06	0.14
ENG1	0.09	0.25	0.05	[0.71]	-0.19	0.12
ENG2	0.22	0.33	-0.01	[0.68]	-0.04	0.21
ENG3	0.14	0.04	0.13	[0.84]	0.04	0.09
ENG4	0.12	0.28	0.31	[0.71]	0.11	0.13
VOI1	[0.62]	0.27	0.04	-0.00	-0.11	0.32
VOI2	[0.42]	0.41	0.12	0.21	0.08	0.38
VOI3	[0.66]	0.12	0.12	0.10	0.03	0.24
VOI4	[0.61]	0.26	0.24	0.00	0.13	0.22
CUL1	0.33	0.00	0.10	-0.13	[0.54]	0.30
CUL2	[-0.47]	0.13	-0.07	-0.20	0.45	0.14
CUL3	-0.05	-0.17	-0.00	0.20	[0.73]	-0.17
CUL4	0.03	0.11	-0.03	-0.08	[0.70]	0.03

Note: bracketed values indicate the highest (primary) loading for each item.

Four of the six factors produced at this iteration—Awareness (AWR), Relations (REL), Appreciation (APP), and Engagement (ENG)—show a very clear structure, with each item loading strongly (ranging from 0.66 to 0.82) on a single factor without meaningful cross-loading on other factors.

Organizational Culture (CUL), although it did form its own component (F5) with two strongly loading items (CUL3 = 0.73; CUL4 = 0.70), was not entirely solid. CUL1 shows a fairly substantial cross-loading onto F1 (0.33) alongside its primary loading onto F5 (0.54), while CUL2 instead loads dominantly and negatively onto F1 (-0.47), a larger magnitude than its positive loading onto F5 (0.45). CUL therefore shows an instability pattern not unlike that of CHR, which had already been removed; the decision to retain CUL through the reliability stage was based solely on the fact that two of its four items (CUL3, CUL4) still showed sufficiently convincing loadings to warrant further testing.

The most substantive finding at this stage is that all Employee Voice (VOI) items merged into the same factor as Internal Communication (COM), rather than forming a separate factor as originally specified in the theoretical model. Conceptually, this finding indicates that voice or opinion is essentially one form of internal communication within the organization. As a consequence, at the final model stage the VOI items were treated as part of a combined Internal Communication & Employee Voice factor rather than as a stand-alone factor.

Since the concept of employee voice became prominent in the 1980s, the literature has consistently defined employee voice as one of the formal mechanisms of employee communication—encompassing grievance procedures, suggestion systems, and management-employee meetings—which is, at its core, a communication channel rather than a construct standing apart from the organizational-communication umbrella. Kang and Sung (2017) showed that symmetrical internal communication is in fact the key mechanism mediating employee engagement and positive employee communication behavior, including the expression of voice/opinion. Similarly, Faquir and Habib (2016) emphasized that good internal-communication channels are a prerequisite for channeling employee participation and input in decision-making. The merging of VOI into the COM factor is therefore not an empirical anomaly but rather a confirmation of the conceptual linkage long proposed between internal communication and employee voice as a single, mutually reinforcing construct.

Reliability Testing of the Six EFA-Derived Factors

Table 9. Reliability Test Results for the Six EFA-Derived Factors

Code	Dimension	N Items	Cronbach's Alpha	Decision
AWR	Awareness	4	0.838	Retained
REL	Relations	4	0.853	Retained
APP	Appreciation	4	0.832	Retained
ENG	Engagement	4	0.844	Retained
CUL	Organizational Culture	4	0.400	Excluded
COM	Internal Communication + Employee Voice	8	0.864	Retained

Five of the six factors that survived the EFA stage show Cronbach's Alpha coefficients in the good-to-excellent range, from 0.832 to 0.864, well above the general 0.70 threshold recommended by Nunnally (1978) for scale-development research. The overall reliability of the instrument (28 items), reaching 0.925, further confirms strong internal consistency at the aggregate level.

Table 10. Inter-Item Correlation Matrix and Item-Total Correlation for CUL (n = 150)

Item	CUL1	CUL2	CUL3	CUL4	Item-Total Correlation
CUL1	1.00	0.11	0.21	0.17	0.251
CUL2	0.11	1.00	0.16	0.08	0.172
CUL3	0.21	0.16	1.00	0.14	0.262
CUL4	0.17	0.08	0.14	1.00	0.191

Nonetheless, the Organizational Culture (CUL) factor shows an alpha of 0.400, far below the acceptable threshold. Further examination of the item-total correlations of its four items (ranging from 0.17 to 0.26) indicates that these items do not correlate strongly enough with one another to be considered a consistent measure of a single latent construct. Consequently, the CUL factor was excluded from the quantitative questionnaire model. This pattern of construct failure for organizational culture in quantitative measurement is consistent with the reference study (Jaafari et al., 2023), which, in a very different cultural and sectoral context, likewise found that the culture factor was not sufficiently reliable to be retained as part of a quantitative scale.

The failure of CUL as a quantitative factor is in fact consistent with Schein's (2010) theoretical view of the nature of organizational culture, which emphasizes that culture is not formed in a single day but develops gradually as organizational members experience various changes, adapt to the external environment, and solve shared challenges. The layered, historical nature of culture, interpreted differently by each individual, is inherently difficult

to capture through four generic Likert statements that demand a uniform response. This theoretical consideration—together with the Competing Values Framework (Cameron & Quinn, 2011) discussed earlier—suggests that future research on organizational culture within OHBI would benefit from complementary qualitative approaches capable of capturing this richer, more contextual picture, a direction noted as a limitation of the present quantitative-only design.

Confirmatory Factor Analysis (CFA)

The final five-factor model (24 items) was tested via CFA on the $n = 150$ sample. Table 10 shows that all model-fit indices fall in the excellent category.

Table 11. Goodness-of-Fit Indices for the CFA Model

Fit Index	Value	Threshold	Category
Chi-Square/df	1.03	< 3.00	Good
CFI	0.996	≥ 0.90	Excellent
TLI	0.995	≥ 0.90	Excellent
RMSEA	0.0138	< 0.08	Excellent
SRMR	0.0539	< 0.08	Excellent

Table 12. Construct Reliability (CR) and Average Variance Extracted (AVE)

Code	Dimension	N Items	Mean Loading	CR	AVE
AWR	Awareness	4	0.755	0.842	0.571
REL	Relations	4	0.772	0.855	0.597
APP	Appreciation	4	0.747	0.836	0.563
ENG	Engagement	4	0.754	0.843	0.577
COM	Internal Communication & Employee Voice	8	0.666	0.865	0.448

All standardized loading values exceed 0.65 and are statistically significant at $p < .001$, indicating results that confirm this study's hypothesis, namely that OHBI is determined by several latent factors within the measurement instrument. The pattern of inter-factor correlations is also noteworthy: all correlations are positive and fall in a moderate range, indicating that the five factors belong to the same broad conceptual umbrella of organizational health while remaining empirically distinguishable from one another (discriminant validity is preserved). The highest correlation was found between Appreciation (APP) and Internal Communication & Employee Voice (COM) at $r = 0.724$, indicating that recognition of employee contribution is largely channeled and experienced through organizational communication—consistent with Rushing's (2021) argument that effective appreciation must be delivered openly through interaction/communication. The correlation between Awareness (AWR) and Engagement (ENG) at $r = 0.591$ is also fairly high, consistent with the Social Exchange Theory-based explanation outlined by Zweber *et al.* (2016), namely that employees who clearly understand their organization's strategic direction and goals (high awareness) tend to reciprocate with higher work engagement, as a form of reciprocity within the social-exchange relationship between employees and the organization. Conversely, the lowest correlation was found between AWR and REL ($r = 0.375$)—although still positive and significant, this more moderate relationship indicates that understanding the organization's strategic direction (Awareness) and building good working relationships (Relations) are two relatively independent pathways in shaping overall perceptions of organizational health, consistent with the argument by Dlamini *et al.* (2022) that the quality of working relationships is determined more by direct interpersonal dynamics between employees and supervisors than by employees' cognitive understanding of the organization's strategic direction.

One important note concerns the Average Variance Extracted (AVE) value for the Internal Communication & Employee Voice (COM) factor, at 0.448, slightly below the conventional 0.50 threshold, even though its Construct Reliability remains high (0.865)—a pattern that makes statistical sense given that Construct Reliability tends to increase with the number of items on a factor, and the COM factor in this model has eight items—twice as many as the other factors, each of which has only four—as a consequence of the VOI items merging into this factor at the EFA stage. AVE, meanwhile, measures the average proportion of variance genuinely explained by the latent factor

for each item, a metric that is naturally somewhat 'diluted' when two originally distinct constructs (communication and employee voice) are combined into a single measurement factor.

Final Composition of OHBI

Of the 32 original items, 24 items (75%) were ultimately used to compute the final quantitative OHBI score. The final structure of OHBI consists of five factors: Awareness (AWR, 4 items), Relations (REL, 4 items), Appreciation (APP, 4 items), Engagement (ENG, 4 items), and Internal Communication & Employee Voice (COM, 8 items—a combination of the original COM items and the VOI items). This structure can also be interpreted through Miles's (1969) classification: AWR represents the organization's need for goal focus and appropriate resource utilization, REL and APP represent maintenance needs in the form of cohesion and work morale, and ENG represents growth needs in the form of autonomy and commitment. The combined Internal Communication & Employee Voice (COM) factor is consistent with Miles's emphasis on communication adequacy as one of the core characteristics of a healthy organization. This mapping is also consistent with Keller and Price's (2011) three-cluster OHI model: AWR and COM are closer to the internal-alignment cluster, REL and APP to the quality-of-execution cluster, while ENG reflects the organization's capacity for renewal through active employee engagement.

Demographic Mean-Difference Test on Total OHBI Scores

Total scores were calculated from the 24 items of the final five-factor model. Table 12 summarizes the mean-difference test results across four demographic characteristics.

Table 13. Demographic Mean-Difference Test on Total OHBI Scores

Variable	Test Statistic	p-value	Result
Gender	$t = -0.544$	0.587	Not significant
Sector	$t = 1.177$	0.240	Not significant
Tenure	$F = 0.924$	0.398	Not significant
Managerial level	$F = 1.498$	0.216	Not significant

The mean-difference tests show that none of the four demographic characteristics examined produced a statistically significant difference in total OHBI scores ($p > .05$ for all four tests). This finding carries important implications for the instrument's suitability as an inclusive measurement tool—OHBI scores do not appear to be biased toward any particular demographic subgroup, supporting the principle of equity, diversity, and inclusion (EDI) that is one of the central concerns underlying the development of this instrument. This pattern is consistent with Lowe's (2010) argument that organizational health is fundamentally a collective property of the system and work culture experienced relatively similarly by all members of the organization, rather than merely a function of individual demographic attributes such as gender or length of service. In other words, if the OHBI score truly measures organizational health as a systemic phenomenon, then the score should theoretically be relatively invariant across given demographic characteristics, and more sensitive to factors that can be shaped by organizational policy, such as communication, appreciation, and engagement.

CONCLUSION

This study concludes that the Organizational Health Behavior Index (OHBI) is indeed determined by several latent factors within the measurement instrument, thereby supporting this study's hypothesis. The final structure of OHBI consists of five quantitative factors (24 items)—Awareness, Relations, Appreciation, Engagement, and Internal Communication & Employee Voice—with an excellent confirmatory model fit ($CFI = 0.996$; $RMSEA = 0.014$) and high reliability ($\alpha = 0.832$ - 0.864). Two other theoretical factors, Employee Characteristics and Organizational Culture, did not show consistent psychometric behavior on Likert-type measurement and were excluded from the final quantitative model, an outcome that is theoretically consistent with the conceptual distinction between individual antecedents and collective organizational constructs, and with the layered, historically situated nature of organizational culture.

OHBI was also shown to be relatively unbiased with respect to gender, sector, tenure, and managerial level, supporting the principle of equity, diversity, and inclusion in the development of an organizational-health instrument for the higher-education context. As a limitation, this study did not re-run EFA on the 24 remaining items after the Organizational Culture item was excluded at the reliability stage, in order to avoid double-dipping between the

exploratory and confirmatory samples; consequently, the possibility of a shift in the internal structure of the Internal Communication & Employee Voice factor following the removal of CUL was not verified exploratively, although the CFA fit for the final model remained excellent. Future research is recommended to replicate OHBI on a larger sample and at other universities to test measurement invariance across contexts, and to complement the quantitative OHBI with qualitative approaches—for example, in-depth interviews or focus groups—to more richly capture the Employee Characteristics and Organizational Culture constructs that proved difficult to measure through Likert-type items alone.

REFERENCES

- Alzuman, A., Al Jaafari, M., Ali, Z., Ali, R., & Bakadam, L. I. (2025). Development and validation of the organizational health behavior index: A mixed-methods instrument for measuring organizational health. *Frontiers in Psychology*, 16, Article 1689559. <https://doi.org/10.3389/fpsyg.2025.1689559>
- Alzuman, A., Jaafari, M., Ali, Z., Ali, R., & Bakadam, L. I. (2026). The role of awareness, appreciation, and communication satisfaction in shaping employee engagement: Evidence from the organizational health behavior index. *Frontiers in Psychology*, 17, Article 1671007. <https://doi.org/10.3389/fpsyg.2026.1671007>
- Arnoux-Nicolas, C., Sovet, L., Lhotellier, L., Di Fabio, A., & Bernaud, J. L. (2016). Perceived work conditions and turnover intentions: The mediating role of meaning of work. *Frontiers in Psychology*, 7, Article 704. <https://doi.org/10.3389/fpsyg.2016.00704>
- Bennis, W. G. (1962). Towards a "truly" scientific management: The concept of organization health. *Industrial Management Review*, 4(1), 1-24.
- Cameron, K. S., & Quinn, R. E. (2011). Diagnosing and changing organizational culture: Based on the competing values framework (3rd ed.). Jossey-Bass.
- Charoghchian Khorasani, E., Tavakoly Sany, S. B., Tehrani, H., Doosti, H., & Peyman, N. (2020). Review of organizational health literacy practice at health care centers: Outcomes, barriers and facilitators. *International Journal of Environmental Research and Public Health*, 17(20), Article 7544. <https://doi.org/10.3390/ijerph17207544>
- Comrey, A. L., & Lee, H. B. (1992). A first course in factor analysis (2nd ed.). Lawrence Erlbaum Associates.
- Cotton, P., & Hart, P. M. (2003). Occupational wellbeing and performance: A review of organisational health research. *Australian Psychologist*, 38(2), 118-127.
- Dlamini, N. P., Suknunan, S., & Bhana, A. (2022). Influence of employee-manager relationship on employee performance and productivity. *Problems and Perspectives in Management*, 20(3), 28-42. [https://doi.org/10.21511/ppm.20\(3\).2022.03](https://doi.org/10.21511/ppm.20(3).2022.03)
- Etzioni, A. (1990). Modern organizations. Prentice Hall.
- Faqir, I., & Habib, L. (2016). Impact of internal communication in organizational development. *International Journal of Trend in Research and Development*, 3(4), 269-273.
- Gilani, S., Gernal, L., Tantry, A., Yasin, N., & Sergio, R. (2023). Leadership styles adopted by Scottish micro-businesses during the COVID-19 pandemic. *Digital Opportunities and Challenges in Business*, 1, 144-156.
- Gorsuch, R. L. (1983). Factor analysis (2nd ed.). Lawrence Erlbaum Associates.
- Grawitch, M. J., & Ballard, D. W. (2016). The psychologically healthy workplace: Building a win-win environment for organizations and employees. American Psychological Association.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Multivariate data analysis (7th ed.). Pearson.
- Ikechukwu, N. P., Achori, T. D., Uchenna, E. S., & Okechukwu, A. K. E. (2019). Work environment as a tool for improving employees performance and organizational productivity. *International Journal of Advanced Research*, 5, 241-247.
- Jaafari, M., Alzuman, A., Ali, Z., Tantry, A., & Ali, R. (2023). Organizational Health Behavior Index (OHBI): A tool for measuring organizational health. *Sustainability*, 15(18), Article 13650. <https://doi.org/10.3390/su151813650>

- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31-36. <https://doi.org/10.1007/BF02291575>
- Kang, M., & Sung, M. (2017). How symmetrical employee communication leads to employee engagement and positive employee communication behaviors: The mediation of employee-organization relationships. *Journal of Communication Management*, 21(1), 82-102. <https://doi.org/10.1108/JCOM-04-2016-0026>
- Keller, S., & Price, C. (2011). Organizational health: The ultimate competitive advantage. *McKinsey Quarterly*, 2, 94-107.
- Kline, P. (1979). *Psychometrics and psychology*. Academic Press.
- Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.
- Korolevich, S. (2022, January 11). Horrible bosses: A survey of the American workforce. GoodHire. <https://www.goodhire.com/resources/articles/horrible-bosses-survey/>
- Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology*, 28(4), 563-575. <https://doi.org/10.1111/j.1744-6570.1975.tb01393.x>
- Lencioni, P. M. (2012). *The advantage: Why organizational health trumps everything else in business*. Jossey-Bass.
- Lowe, G. (2010). *Creating healthy organizations: How vibrant workplaces inspire employees to achieve sustainable success*. University of Toronto Press.
- Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research*, 35(6), 382-385.
- MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods*, 4(1), 84-99. <https://doi.org/10.1037/1082-989X.4.1.84>
- Miles, M. B. (1969). Planned change and organizational health: Figure and ground. In F. D. Carver & T. J. Sergiovanni (Eds.), *Organizations and human behavior: Focus on schools* (pp. 375-391). McGraw-Hill.
- Miller, R. L., Griffin, M. A., & Hart, P. M. (1999). Personality and organizational health: The role of conscientiousness. *Work & Stress*, 13(1), 7-19. <https://doi.org/10.1080/026783799296156>
- Nguyen, C. M. A., & Ha, M.-T. (2023). The interplay between internal communication, employee engagement, job satisfaction, and employee loyalty in higher education institutions in Vietnam. *Humanities and Social Sciences Communications*, 10, Article 329. <https://doi.org/10.1057/s41599-023-01806-8>
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.
- Parsons, T. (1967). Some ingredients of a general theory of formal organization. In *Administrative theory in education* (pp. 40-72). Macmillan.
- Rushing, K. (2021, May 5). Workplace appreciation and its link to organizational health. Blue Hen.
- Schein, E. H. (2010). *Organizational culture and leadership* (4th ed.). Jossey-Bass.
- Tantry, A., & Ali, Z. (2020). Job satisfaction among non-teaching staffs of secondary schools. *Annals of Tropical Medicine and Public Health*, 23, 1371-1376.
- Teresa, R., Robinson, A., Vincent, A., Anfara, J. R., Christopher, L., Henderson, A. E., Buehler, W. L., Stein, J., & Victoria, D. (2000). Principal leadership for equity and excellence: A case study of an inclusive exemplary school [Conference paper].
- Wahl, I., Stranzl, J., Ruppel, C., & Einwiller, S. A. (2026). Employee appreciation: A systematic review and research recommendations. *Annals of the International Communication Association*, 50(1), 30-47. <https://doi.org/10.1093/anncom/wlaf024>
- Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. *Educational and Psychological Measurement*, 73(6), 913-934. <https://doi.org/10.1177/0013164413495237>
- Zweber, Z. M., Henning, R. A., & Magley, V. J. (2016). A practical scale for multi-faceted organizational health climate assessment. *Journal of Occupational Health Psychology*, 21(2), 250-259. <https://doi.org/10.1037/a0039895>