

Human Resource Management Practices and Organizational Commitment: The Mediating Role of Work Engagement and The Integration of Necessary Condition Analysis

Online Appendix

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Appendix A: Supplementary Discriminant Validity Results

Table A1: Fornell–Larcker Criterion Matrix for Assessing Discriminant Validity Among the Study Constructs

Fornell–Larcker	01 CO	02 CL	03 SYR	04 CYD	05 RYC	06 SL	07 PE	08 ED
01 CO	0.696							
02 CL	0.753	0.771						
03 SYR	0.548	0.647	0.702					
04 CYD	0.580	0.603	0.718	0.870				
05 RYC	0.531	0.523	0.558	0.603	0.900			
06 SL	0.679	0.650	0.582	0.583	0.585	0.851		
07 PE	0.592	0.594	0.634	0.696	0.551	0.647	0.880	
08 ED	0.549	0.545	0.544	0.573	0.525	0.538	0.579	0.904

Source: Own elaboration. *Note:* Diagonal values represent the square root of the Average Variance Extracted (AVE) for each construct. Discriminant validity is supported when diagonal values exceed inter-construct correlations. CO = Organizational Commitment; CL = Work Engagement; SYR = Selection and Recruitment; CYD = Training and Development; RYC = Rewards and Compensation; SL = Job Security; PE = Employee Participation; ED = Performance Appraisal.

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Appendix B: Supplementary Collinearity Diagnostics

Table A2: Variance Inflation Factor (VIF) Values for Assessing Internal Collinearity in the Structural Model

	01 CO	02 CL
01 CO	—	—
02 CL	1	
03 SYR		2.382
04 CYD		2.796
05 RYC		1.896
06 SL		2.099
07 PE		2.500
08 ED		1.787

Source: Own elaboration.

Note: All VIF values remained below the recommended threshold of 3.3, indicating the absence of problematic multicollinearity (HairAlamer2022). CO = Organizational Commitment; CL = Work Engagement; SYR = Selection and Recruitment; CYD = Training and Development; RYC = Rewards and Compensation; SL = Job Security; PE = Employee Participation; ED = Performance Appraisal.

Appendix C: Supplementary Necessary Condition Analysis Results

Table A3: Necessary Condition Effect Sizes Estimated Through CE-FDH and CR-FDH Methods

	CE-FDH	CR-FDH
LV scores – 02 CL	0.362	0.334
LV scores – 03 SYR	0.000	0.000
LV scores – 04 CYD	0.000	0.000
LV scores – 05 RYC	0.017	0.009
LV scores – 06 SL	0.127	0.128
LV scores – 07 PE	0.095	0.065
LV scores – 08 ED	0.133	0.117

Source: Own elaboration. *Note:* CE-FDH = Ceiling Envelopment-Free Disposal Hull; CR-FDH = Ceiling Regression-Free Disposal Hull. Larger effect sizes indicate stronger necessity relationships between predictors and organizational commitment. CL = Work Engagement; SYR = Selection and Recruitment; CYD = Training and Development; RYC = Rewards and Compensation; SL = Job Security; PE = Employee Participation; ED = Performance Appraisal.

Appendix D: Supplementary Structural Model Results

Table A4: Effect Sizes (f^2) of Human Resource Management Practices on Work Engagement and Organizational Commitment

Path	β	f^2	Effect size
SYR \rightarrow CL	0.277	0.077	Small
CYD \rightarrow CL	0.086	0.007	Negligible
RYC \rightarrow CL	0.035	0.001	Negligible
SL \rightarrow CL	0.309	0.095	Small
PE \rightarrow CL	0.070	0.005	Negligible
ED \rightarrow CL	0.120	0.014	Small
CL \rightarrow CO	0.759	0.576	Large

Source: Own elaboration.

Note: Effect sizes were interpreted according to **HairAlamer2022**<empty citation>: $f^2 = 0.02 =$ small, $f^2 = 0.15 =$ medium, and $f^2 = 0.35 =$ large. CO = Organizational Commitment; CL = Work Engagement; SYR = Selection and Recruitment; CYD = Training and Development; RYC = Rewards and Compensation; SL = Job Security; PE = Employee Participation; ED = Performance Appraisal.

Appendix E: Detailed Structural Path Coefficients

Table A5: Structural Path Coefficients and Hypothesis Testing Results

Hypothesis	Structural relationship	Coefficient β	p -value	Significance
H1	SYR \rightarrow CL	0.277	0.000	Significant
H2	CYD \rightarrow CL	0.086	0.164	Not significant
H3	RYC \rightarrow CL	0.035	0.265	Not significant
H4	SL \rightarrow CL	0.309	0.000	Significant
H5	PE \rightarrow CL	0.070	0.170	Not significant
H6	ED \rightarrow CL	0.120	0.031	Significant
H7	CL \rightarrow CO	0.759	0.000	Significant

Source: Own elaboration. *Note:* Statistical significance was assessed using bootstrapping with 10,000 subsamples and a one-tailed significance test. CO = Organizational Commitment; CL = Work Engagement; SYR = Selection and Recruitment; CYD = Training and Development; RYC = Rewards and Compensation; SL = Job Security; PE = Employee Participation; ED = Performance Appraisal.

Appendix F: Detailed Bottleneck Thresholds

Table A6: Bottleneck Thresholds Required to Achieve Different Levels of Organizational Commitment

Bottleneck	01 CO	02 CL	03 SYR	04 CYD	05 RYC	06 SL	07 PE	08 ED
0%	1.000	NN	NN	NN	NN	NN	NN	NN
10%	1.400	NN	NN	NN	NN	NN	NN	NN
20%	1.800	NN	NN	NN	NN	NN	NN	NN
30%	2.200	1.598	NN	NN	NN	NN	NN	NN
40%	2.600	2.107	NN	NN	NN	NN	NN	NN
50%	3.000	2.414	NN	NN	NN	NN	NN	NN
60%	3.400	2.651	NN	NN	NN	NN	NN	NN
70%	3.800	2.887	NN	NN	NN	2.300	NN	NN
80%	4.200	3.852	NN	NN	NN	2.471	2.000	2.505
90%	4.600	4.078	NN	NN	NN	2.471	2.527	3.495
100%	5.000	4.545	1.000	1.000	2.000	2.471	2.527	3.990

Source: Own elaboration. *Note:* NCA = Necessary Condition Analysis; CE-FDH = Ceiling Envelopment–Free Disposal Hull; CR-FDH = Ceiling Regression–Free Disposal Hull; NN = no minimum level required. Bottleneck values indicate the minimum level of each predictor required to achieve a given level of organizational commitment. CO = Organizational Commitment; CL = Work Engagement; SYR = Selection and Recruitment; CYD = Training and Development; RYC = Rewards and Compensation; SL = Job Security; PE = Employee Participation; ED = Performance Appraisal.