Rechedk the diff between the models esp the link between PG & EF.

Model 0L Full model

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Aspect | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model5.1 |
| X2 | 126.5 | 61.3 | 61.3 | 61.3 | 45.4 | 42.6 |
| DF | 55 | 38 | 39 | 38 | 39 | 38 |
| P-value | >0.01 | 0.01 | 0.01 | 0.01 | 0.22 | 0.28 |
| CFI | 0.95 | 0.98 | 0.98 | 0.98 | 0.99 | 0.99 |
| TLI | 0.94 | 0.97 | 0.97 | 0.97 | 0.99 | 0.99 |
| RMSEA | 0.07 | 0.05 | 0.03 | 0.05 | 0.03 | 0.02 |
| SRMR | 0.07 | 0.07 | 0.07 | 0.07 | 0.06 | 0.05 |

\*Model 2: After removing PALS; Model3: After removing the SALES 🡪 EF path; model 4: After removing the PG 🡪 EF path; model 5 adding age as predictor of EF and keeping the link between PG & EF.

Model without SALES

lavaan WARNING: some estimated ov variances are negativelavaan 0.6-8 ended normally after 84 iterations

Estimator ML

Optimization method NLMINB

Number of model parameters 42

Used Total

Number of observations 248 270

Model Test User Model:

Standard Robust

Test Statistic 141.055 129.596

Degrees of freedom 57 57

P-value (Chi-square) 0.000 0.000

Scaling correction factor 1.088

Satorra-Bentler correction

Model Test Baseline Model:

Test statistic 1795.665 1671.147

Degrees of freedom 77 77

P-value 0.000 0.000

Scaling correction factor 1.075

User Model versus Baseline Model:

Comparative Fit Index (CFI) 0.951 0.954

Tucker-Lewis Index (TLI) 0.934 0.938

Robust Comparative Fit Index (CFI) 0.954

Robust Tucker-Lewis Index (TLI) 0.938

Loglikelihood and Information Criteria:

Loglikelihood user model (H0) -2761.403 -2761.403

Loglikelihood unrestricted model (H1) -2690.876 -2690.876

Akaike (AIC) 5606.807 5606.807

Bayesian (BIC) 5754.371 5754.371

Sample-size adjusted Bayesian (BIC) 5621.230 5621.230

Root Mean Square Error of Approximation:

RMSEA 0.077 0.072

90 Percent confidence interval - lower 0.061 0.056

90 Percent confidence interval - upper 0.093 0.087

P-value RMSEA <= 0.05 0.003 0.013

Robust RMSEA 0.075

90 Percent confidence interval - lower 0.058

90 Percent confidence interval - upper 0.092

Standardized Root Mean Square Residual:

SRMR 0.070 0.070

Parameter Estimates:

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

Latent Variables:

Estimate Std.Err z-value P(>|z|) Std.lv

SALES =~

MG\_S 1.000 0.790

TV 0.887 0.030 29.707 0.000 0.701

SE\_S 0.702 0.030 23.330 0.000 0.555

PG =~

PAV 1.000 0.696

PAp 1.022 0.112 9.126 0.000 0.711

PALS =~

MG\_P 1.000 0.582

SE\_P 0.918 0.060 15.266 0.000 0.534

EF =~

FM\_EFF\_Z 1.000 0.894

SS\_EFF\_Z 0.541 0.163 3.311 0.001 0.483

CB\_EFF\_Z 0.397 0.111 3.569 0.000 0.355

Learning =~

PostScore 1.000 3.405

Std.all

1.013

0.895

0.809

0.931

0.942

0.949

0.815

0.907

0.486

0.363

1.000

Regressions:

Estimate Std.Err z-value P(>|z|) Std.lv

Learning ~

EF 0.602 0.266 2.263 0.024 0.158

PreScore 0.411 0.048 8.615 0.000 0.121

PG -0.895 0.280 -3.196 0.001 -0.183

PALS 0.750 0.316 2.377 0.017 0.128

Age 0.475 0.193 2.464 0.014 0.140

EF ~

PG -0.199 0.099 -2.007 0.045 -0.155

PALS -0.133 0.134 -0.994 0.320 -0.087

Std.all

0.158

0.481

-0.183

0.128

0.152

-0.155

-0.087

Covariances:

Estimate Std.Err z-value P(>|z|) Std.lv

SALES ~~

PG 0.073 0.034 2.146 0.032 0.133

PALS 0.306 0.032 9.458 0.000 0.665

PG ~~

PALS 0.095 0.029 3.232 0.001 0.234

Std.all

0.133

0.665

0.234

Intercepts:

Estimate Std.Err z-value P(>|z|) Std.lv

.MG\_S -0.047 0.049 -0.952 0.341 -0.047

.TV -0.048 0.050 -0.974 0.330 -0.048

.SE\_S 0.000 0.043 0.006 0.995 0.000

.PAV 0.044 0.047 0.941 0.347 0.044

.PAp 0.015 0.047 0.318 0.751 0.015

.MG\_P 0.028 0.039 0.733 0.463 0.028

.SE\_P 0.057 0.041 1.368 0.171 0.057

.FM\_EFF\_Z 0.001 0.060 0.018 0.986 0.001

.SS\_EFF\_Z 0.015 0.063 0.240 0.810 0.015

.CB\_EFF\_Z -0.032 0.061 -0.525 0.599 -0.032

.PostScore -0.034 2.510 -0.013 0.989 -0.034

SALES 0.000 0.000

PG 0.000 0.000

PALS 0.000 0.000

.EF 0.000 0.000

.Learning 0.000 0.000

Std.all

-0.060

-0.062

0.000

0.059

0.020

0.046

0.086

0.001

0.015

-0.033

-0.010

0.000

0.000

0.000

0.000

0.000

Variances:

Estimate Std.Err z-value P(>|z|) Std.lv

.MG\_S -0.016 0.013 -1.227 0.220 -0.016

.TV 0.123 0.019 6.374 0.000 0.123

.SE\_S 0.163 0.017 9.742 0.000 0.163

.PAV 0.075 0.053 1.419 0.156 0.075

.PAp 0.065 0.055 1.167 0.243 0.065

.MG\_P 0.038 0.025 1.525 0.127 0.038

.SE\_P 0.144 0.020 7.082 0.000 0.144

.FM\_EFF\_Z 0.172 0.179 0.960 0.337 0.172

.SS\_EFF\_Z 0.756 0.101 7.522 0.000 0.756

.CB\_EFF\_Z 0.829 0.085 9.749 0.000 0.829

.PostScore 0.000 0.000

SALES 0.624 0.065 9.589 0.000 1.000

PG 0.485 0.068 7.151 0.000 1.000

PALS 0.339 0.035 9.778 0.000 1.000

.EF 0.769 0.214 3.591 0.000 0.962

.Learning 7.295 0.888 8.218 0.000 0.629

Std.all

-0.026

0.200

0.345

0.134

0.113

0.100

0.336

0.177

0.764

0.868

0.000

1.000

1.000

1.000

0.962

0.629

R-Square:

Estimate

MG\_S NA

TV 0.800

SE\_S 0.655

PAV 0.866

PAp 0.887

MG\_P 0.900

SE\_P 0.664

FM\_EFF\_Z 0.823

SS\_EFF\_Z 0.236

CB\_EFF\_Z 0.132

PostScore 1.000

EF 0.038

Learning 0.371

npar fmin

42.000 0.284

chisq df

141.055 57.000

pvalue chisq.scaled

0.000 129.596

df.scaled pvalue.scaled

57.000 0.000

chisq.scaling.factor baseline.chisq

1.088 1795.665

baseline.df baseline.pvalue

77.000 0.000

baseline.chisq.scaled baseline.df.scaled

1671.147 77.000

baseline.pvalue.scaled baseline.chisq.scaling.factor

0.000 1.075

cfi tli

0.951 0.934

nnfi rfi

0.934 0.894

nfi pnfi

0.921 0.682

ifi rni

0.952 0.951

cfi.scaled tli.scaled

0.954 0.938

cfi.robust tli.robust

0.954 0.938

nnfi.scaled nnfi.robust

0.938 0.938

rfi.scaled nfi.scaled

0.895 0.922

ifi.scaled rni.scaled

0.955 0.954

rni.robust logl

0.954 -2761.403

unrestricted.logl aic

-2690.876 5606.807

bic ntotal

5754.371 248.000

bic2 rmsea

5621.230 0.077

rmsea.ci.lower rmsea.ci.upper

0.061 0.093

rmsea.pvalue rmsea.scaled

0.003 0.072

rmsea.ci.lower.scaled rmsea.ci.upper.scaled

0.056 0.087

rmsea.pvalue.scaled rmsea.robust

0.013 0.075

rmsea.ci.lower.robust rmsea.ci.upper.robust

0.058 0.092

rmsea.pvalue.robust rmr

NA 0.166

rmr\_nomean srmr

0.178 0.070

srmr\_bentler srmr\_bentler\_nomean

0.070 0.074

crmr crmr\_nomean

0.074 0.080

srmr\_mplus srmr\_mplus\_nomean

0.070 0.074

cn\_05 cn\_01

133.960 149.975

gfi agfi

0.972 0.949

pgfi mfi

0.533 0.844

ecvi

0.907

R Console

Description:df [13 × 10]

|  |
| --- |
|  |

|  | **name**  <chr> | **idx**  <dbl> | **nobs**  <dbl> | **type**  <chr> | **exo**  <dbl> | **user**  <dbl> | **mean**  <dbl> | **var**  <dbl> |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | MG\_S | 17 | 270 | numeric | 0 | 0 | -0.032 | 0.638 |  |
| 2 | TV | 16 | 270 | numeric | 0 | 0 | -0.028 | 0.634 |  |
| 3 | SE\_S | 15 | 270 | numeric | 0 | 0 | 0.015 | 0.484 |  |
| 4 | PAV | 12 | 270 | numeric | 0 | 0 | 0.060 | 0.577 |  |
| 5 | PAp | 13 | 270 | numeric | 0 | 0 | 0.039 | 0.589 |  |
| 6 | MG\_P | 14 | 270 | numeric | 0 | 0 | 0.025 | 0.372 |  |
| 7 | SE\_P | 11 | 270 | numeric | 0 | 0 | 0.066 | 0.426 |  |
| 8 | FM\_EFF\_Z | 20 | 257 | numeric | 0 | 0 | 0.000 | 1.000 |  |
| 9 | SS\_EFF\_Z | 21 | 270 | numeric | 0 | 0 | 0.000 | 1.000 |  |
| 10 | CB\_EFF\_Z | 22 | 256 | numeric | 0 | 0 | 0.000 | 1.000 |  |

Next

12

Previous

1-10 of 13 rows | 1-9 of 10 columns

data.frame

13 x 10

lavaan WARNING: some estimated ov variances are negativelavaan 0.6-8 ended normally after 84 iterations

Estimator ML

Optimization method NLMINB

Number of model parameters 42

Used Total

Number of observations 248 270

Model Test User Model:

Standard Robust

Test Statistic 141.055 129.596

Degrees of freedom 57 57

P-value (Chi-square) 0.000 0.000

Scaling correction factor 1.088

Satorra-Bentler correction

Model Test Baseline Model:

Test statistic 1795.665 1671.147

Degrees of freedom 77 77

P-value 0.000 0.000

Scaling correction factor 1.075

User Model versus Baseline Model:

Comparative Fit Index (CFI) 0.951 0.954

Tucker-Lewis Index (TLI) 0.934 0.938

Robust Comparative Fit Index (CFI) 0.954

Robust Tucker-Lewis Index (TLI) 0.938

Loglikelihood and Information Criteria:

Loglikelihood user model (H0) -2761.403 -2761.403

Loglikelihood unrestricted model (H1) -2690.876 -2690.876

Akaike (AIC) 5606.807 5606.807

Bayesian (BIC) 5754.371 5754.371

Sample-size adjusted Bayesian (BIC) 5621.230 5621.230

Root Mean Square Error of Approximation:

RMSEA 0.077 0.072

90 Percent confidence interval - lower 0.061 0.056

90 Percent confidence interval - upper 0.093 0.087

P-value RMSEA <= 0.05 0.003 0.013

Robust RMSEA 0.075

90 Percent confidence interval - lower 0.058

90 Percent confidence interval - upper 0.092

Standardized Root Mean Square Residual:

SRMR 0.070 0.070

Parameter Estimates:

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

Latent Variables:

Estimate Std.Err z-value P(>|z|) Std.lv

SALES =~

MG\_S 1.000 0.790

TV 0.887 0.030 29.707 0.000 0.701

SE\_S 0.702 0.030 23.330 0.000 0.555

PG =~

PAV 1.000 0.696

PAp 1.022 0.112 9.126 0.000 0.711

PALS =~

MG\_P 1.000 0.582

SE\_P 0.918 0.060 15.266 0.000 0.534

EF =~

FM\_EFF\_Z 1.000 0.894

SS\_EFF\_Z 0.541 0.163 3.311 0.001 0.483

CB\_EFF\_Z 0.397 0.111 3.569 0.000 0.355

Learning =~

PostScore 1.000 3.405

Std.all

1.013

0.895

0.809

0.931

0.942

0.949

0.815

0.907

0.486

0.363

1.000

Regressions:

Estimate Std.Err z-value P(>|z|) Std.lv

Learning ~

EF 0.602 0.266 2.263 0.024 0.158

PreScore 0.411 0.048 8.615 0.000 0.121

PG -0.895 0.280 -3.196 0.001 -0.183

PALS 0.750 0.316 2.377 0.017 0.128

Age 0.475 0.193 2.464 0.014 0.140

EF ~

PG -0.199 0.099 -2.007 0.045 -0.155

PALS -0.133 0.134 -0.994 0.320 -0.087

Std.all

0.158

0.481

-0.183

0.128

0.152

-0.155

-0.087

Covariances:

Estimate Std.Err z-value P(>|z|) Std.lv

SALES ~~

PG 0.073 0.034 2.146 0.032 0.133

PALS 0.306 0.032 9.458 0.000 0.665

PG ~~

PALS 0.095 0.029 3.232 0.001 0.234

Std.all

0.133

0.665

0.234

Intercepts:

Estimate Std.Err z-value P(>|z|) Std.lv

.MG\_S -0.047 0.049 -0.952 0.341 -0.047

.TV -0.048 0.050 -0.974 0.330 -0.048

.SE\_S 0.000 0.043 0.006 0.995 0.000

.PAV 0.044 0.047 0.941 0.347 0.044

.PAp 0.015 0.047 0.318 0.751 0.015

.MG\_P 0.028 0.039 0.733 0.463 0.028

.SE\_P 0.057 0.041 1.368 0.171 0.057

.FM\_EFF\_Z 0.001 0.060 0.018 0.986 0.001

.SS\_EFF\_Z 0.015 0.063 0.240 0.810 0.015

.CB\_EFF\_Z -0.032 0.061 -0.525 0.599 -0.032

.PostScore -0.034 2.510 -0.013 0.989 -0.034

SALES 0.000 0.000

PG 0.000 0.000

PALS 0.000 0.000

.EF 0.000 0.000

.Learning 0.000 0.000

Std.all

-0.060

-0.062

0.000

0.059

0.020

0.046

0.086

0.001

0.015

-0.033

-0.010

0.000

0.000

0.000

0.000

0.000

Variances:

Estimate Std.Err z-value P(>|z|) Std.lv

.MG\_S -0.016 0.013 -1.227 0.220 -0.016

.TV 0.123 0.019 6.374 0.000 0.123

.SE\_S 0.163 0.017 9.742 0.000 0.163

.PAV 0.075 0.053 1.419 0.156 0.075

.PAp 0.065 0.055 1.167 0.243 0.065

.MG\_P 0.038 0.025 1.525 0.127 0.038

.SE\_P 0.144 0.020 7.082 0.000 0.144

.FM\_EFF\_Z 0.172 0.179 0.960 0.337 0.172

.SS\_EFF\_Z 0.756 0.101 7.522 0.000 0.756

.CB\_EFF\_Z 0.829 0.085 9.749 0.000 0.829

.PostScore 0.000 0.000

SALES 0.624 0.065 9.589 0.000 1.000

PG 0.485 0.068 7.151 0.000 1.000

PALS 0.339 0.035 9.778 0.000 1.000

.EF 0.769 0.214 3.591 0.000 0.962

.Learning 7.295 0.888 8.218 0.000 0.629

Std.all

-0.026

0.200

0.345

0.134

0.113

0.100

0.336

0.177

0.764

0.868

0.000

1.000

1.000

1.000

0.962

0.629

R-Square:

Estimate

MG\_S NA

TV 0.800

SE\_S 0.655

PAV 0.866

PAp 0.887

MG\_P 0.900

SE\_P 0.664

FM\_EFF\_Z 0.823

SS\_EFF\_Z 0.236

CB\_EFF\_Z 0.132

PostScore 1.000

EF 0.038

Learning 0.371

npar fmin

42.000 0.284

chisq df

141.055 57.000

pvalue chisq.scaled

0.000 129.596

df.scaled pvalue.scaled

57.000 0.000

chisq.scaling.factor baseline.chisq

1.088 1795.665

baseline.df baseline.pvalue

77.000 0.000

baseline.chisq.scaled baseline.df.scaled

1671.147 77.000

baseline.pvalue.scaled baseline.chisq.scaling.factor

0.000 1.075

cfi tli

0.951 0.934

nnfi rfi

0.934 0.894

nfi pnfi

0.921 0.682

ifi rni

0.952 0.951

cfi.scaled tli.scaled

0.954 0.938

cfi.robust tli.robust

0.954 0.938

nnfi.scaled nnfi.robust

0.938 0.938

rfi.scaled nfi.scaled

0.895 0.922

ifi.scaled rni.scaled

0.955 0.954

rni.robust logl

0.954 -2761.403

unrestricted.logl aic

-2690.876 5606.807

bic ntotal

5754.371 248.000

bic2 rmsea

5621.230 0.077

rmsea.ci.lower rmsea.ci.upper

0.061 0.093

rmsea.pvalue rmsea.scaled

0.003 0.072

rmsea.ci.lower.scaled rmsea.ci.upper.scaled

0.056 0.087

rmsea.pvalue.scaled rmsea.robust

0.013 0.075

rmsea.ci.lower.robust rmsea.ci.upper.robust

0.058 0.092

rmsea.pvalue.robust rmr

NA 0.166

rmr\_nomean srmr

0.178 0.070

srmr\_bentler srmr\_bentler\_nomean

0.070 0.074

crmr crmr\_nomean

0.074 0.080

srmr\_mplus srmr\_mplus\_nomean

0.070 0.074

cn\_05 cn\_01

133.960 149.975

gfi agfi

0.972 0.949

pgfi mfi

0.533 0.844

ecvi

0.907

Model without PALS

lavaan WARNING: some estimated ov variances are negativelavaan 0.6-8 ended normally after 93 iterations

Estimator ML

Optimization method NLMINB

Number of model parameters 42

Used Total

Number of observations 248 270

Model Test User Model:

Standard Robust

Test Statistic 141.153 129.326

Degrees of freedom 57 57

P-value (Chi-square) 0.000 0.000

Scaling correction factor 1.091

Satorra-Bentler correction

Model Test Baseline Model:

Test statistic 1795.665 1671.147

Degrees of freedom 77 77

P-value 0.000 0.000

Scaling correction factor 1.075

User Model versus Baseline Model:

Comparative Fit Index (CFI) 0.951 0.955

Tucker-Lewis Index (TLI) 0.934 0.939

Robust Comparative Fit Index (CFI) 0.954

Robust Tucker-Lewis Index (TLI) 0.938

Loglikelihood and Information Criteria:

Loglikelihood user model (H0) -2761.453 -2761.453

Loglikelihood unrestricted model (H1) -2690.876 -2690.876

Akaike (AIC) 5606.905 5606.905

Bayesian (BIC) 5754.469 5754.469

Sample-size adjusted Bayesian (BIC) 5621.328 5621.328

Root Mean Square Error of Approximation:

RMSEA 0.077 0.072

90 Percent confidence interval - lower 0.061 0.056

90 Percent confidence interval - upper 0.093 0.087

P-value RMSEA <= 0.05 0.003 0.013

Robust RMSEA 0.075

90 Percent confidence interval - lower 0.058

90 Percent confidence interval - upper 0.092

Standardized Root Mean Square Residual:

SRMR 0.068 0.068

Parameter Estimates:

Standard errors Robust.sem

Information Expected

Information saturated (h1) model Structured

Latent Variables:

Estimate Std.Err z-value P(>|z|) Std.lv

SALES =~

MG\_S 1.000 0.790

TV 0.888 0.030 29.719 0.000 0.701

SE\_S 0.703 0.030 23.490 0.000 0.555

PG =~

PAV 1.000 0.690

PAp 1.041 0.111 9.376 0.000 0.718

PALS =~

MG\_P 1.000 0.586

SE\_P 0.907 0.060 15.090 0.000 0.531

EF =~

FM\_EFF\_Z 1.000 0.881

SS\_EFF\_Z 0.556 0.157 3.542 0.000 0.490

CB\_EFF\_Z 0.407 0.112 3.625 0.000 0.359

Learning =~

PostScore 1.000 3.392

Std.all

1.013

0.895

0.809

0.922

0.950

0.954

0.810

0.894

0.493

0.367

1.000

Regressions:

Estimate Std.Err z-value P(>|z|) Std.lv

Learning ~

EF 0.565 0.266 2.124 0.034 0.147

PreScore 0.410 0.047 8.753 0.000 0.121

PG -0.842 0.287 -2.935 0.003 -0.171

SALES 0.526 0.271 1.941 0.052 0.123

Age 0.433 0.194 2.234 0.025 0.128

EF ~

PG -0.245 0.093 -2.646 0.008 -0.192

SALES 0.056 0.067 0.835 0.404 0.050

Std.all

0.147

0.481

-0.171

0.123

0.139

-0.192

0.050

Covariances:

Estimate Std.Err z-value P(>|z|) Std.lv

SALES ~~

PG 0.073 0.034 2.183 0.029 0.134

PALS 0.306 0.032 9.485 0.000 0.663

PG ~~

PALS 0.094 0.029 3.236 0.001 0.233

Std.all

0.134

0.663

0.233

Intercepts:

Estimate Std.Err z-value P(>|z|) Std.lv

.MG\_S -0.047 0.049 -0.952 0.341 -0.047

.TV -0.048 0.050 -0.974 0.330 -0.048

.SE\_S 0.000 0.043 0.006 0.995 0.000

.PAV 0.044 0.047 0.941 0.347 0.044

.PAp 0.015 0.047 0.318 0.751 0.015

.MG\_P 0.028 0.039 0.733 0.463 0.028

.SE\_P 0.057 0.041 1.368 0.171 0.057

.FM\_EFF\_Z 0.001 0.060 0.018 0.986 0.001

.SS\_EFF\_Z 0.015 0.063 0.240 0.810 0.015

.CB\_EFF\_Z -0.032 0.061 -0.525 0.599 -0.032

.PostScore 0.549 2.523 0.218 0.828 0.549

SALES 0.000 0.000

PG 0.000 0.000

PALS 0.000 0.000

.EF 0.000 0.000

.Learning 0.000 0.000

Std.all

-0.060

-0.062

0.000

0.059

0.020

0.046

0.086

0.001

0.015

-0.033

0.162

0.000

0.000

0.000

0.000

0.000

Variances:

Estimate Std.Err z-value P(>|z|) Std.lv

.MG\_S -0.015 0.013 -1.218 0.223 -0.015

.TV 0.122 0.019 6.431 0.000 0.122

.SE\_S 0.162 0.017 9.813 0.000 0.162

.PAV 0.084 0.051 1.651 0.099 0.084

.PAp 0.055 0.055 1.003 0.316 0.055

.MG\_P 0.034 0.026 1.299 0.194 0.034

.SE\_P 0.148 0.021 7.166 0.000 0.148

.FM\_EFF\_Z 0.194 0.169 1.152 0.249 0.194

.SS\_EFF\_Z 0.750 0.098 7.661 0.000 0.750

.CB\_EFF\_Z 0.826 0.085 9.698 0.000 0.826

.PostScore 0.000 0.000

SALES 0.624 0.065 9.609 0.000 1.000

PG 0.476 0.066 7.179 0.000 1.000

PALS 0.343 0.035 9.760 0.000 1.000

.EF 0.748 0.198 3.780 0.000 0.963

.Learning 7.308 0.942 7.760 0.000 0.635

Std.all

-0.025

0.199

0.345

0.150

0.097

0.090

0.344

0.200

0.757

0.865

0.000

1.000

1.000

1.000

0.963

0.635

R-Square:

Estimate

MG\_S NA

TV 0.801

SE\_S 0.655

PAV 0.850

PAp 0.903

MG\_P 0.910

SE\_P 0.656

FM\_EFF\_Z 0.800

SS\_EFF\_Z 0.243

CB\_EFF\_Z 0.135

PostScore 1.000

EF 0.037

Learning 0.365

npar fmin

42.000 0.285

chisq df

141.153 57.000

pvalue chisq.scaled

0.000 129.326

df.scaled pvalue.scaled

57.000 0.000

chisq.scaling.factor baseline.chisq

1.091 1795.665

baseline.df baseline.pvalue

77.000 0.000

baseline.chisq.scaled baseline.df.scaled

1671.147 77.000

baseline.pvalue.scaled baseline.chisq.scaling.factor

0.000 1.075

cfi tli

0.951 0.934

nnfi rfi

0.934 0.894

nfi pnfi

0.921 0.682

ifi rni

0.952 0.951

cfi.scaled tli.scaled

0.955 0.939

cfi.robust tli.robust

0.954 0.938

nnfi.scaled nnfi.robust

0.939 0.938

rfi.scaled nfi.scaled

0.895 0.923

ifi.scaled rni.scaled

0.955 0.955

rni.robust logl

0.954 -2761.453

unrestricted.logl aic

-2690.876 5606.905

bic ntotal

5754.469 248.000

bic2 rmsea

5621.328 0.077

rmsea.ci.lower rmsea.ci.upper

0.061 0.093

rmsea.pvalue rmsea.scaled

0.003 0.072

rmsea.ci.lower.scaled rmsea.ci.upper.scaled

0.056 0.087

rmsea.pvalue.scaled rmsea.robust

0.013 0.075

rmsea.ci.lower.robust rmsea.ci.upper.robust

0.058 0.092

rmsea.pvalue.robust rmr

NA 0.169

rmr\_nomean srmr

0.181 0.068

srmr\_bentler srmr\_bentler\_nomean

0.068 0.072

crmr crmr\_nomean

0.072 0.077

srmr\_mplus srmr\_mplus\_nomean

0.068 0.072

cn\_05 cn\_01

133.867 149.872

gfi agfi

0.972 0.950

pgfi mfi

0.533 0.844

ecvi

0.908

lavaan 0.6-8 ended normally after 81 iterations

Estimator ML

Optimization method NLMINB

Number of model parameters 43

Used Total

Number of observations 248 270

Model Test User Model:

Standard Robust

Test Statistic 106.709 97.946

Degrees of freedom 45 45

P-value (Chi-square) 0.000 0.000

Scaling correction factor 1.089

Satorra-Bentler correction

Model Test Baseline Model:

Test statistic 1760.897 1592.068

Degrees of freedom 66 66

P-value 0.000 0.000

Scaling correction factor 1.106

User Model versus Baseline Model:

Comparative Fit Index (CFI) 0.964 0.965

Tucker-Lewis Index (TLI) 0.947 0.949

Robust Comparative Fit Index (CFI) 0.966

Robust Tucker-Lewis Index (TLI) 0.950

Loglikelihood and Information Criteria:

Loglikelihood user model (H0) -2761.614 -2761.614

Loglikelihood unrestricted model (H1) -2708.260 -2708.260

Akaike (AIC) 5609.229 5609.229

Bayesian (BIC) 5760.306 5760.306

Sample-size adjusted Bayesian (BIC) 5623.995 5623.995

Root Mean Square Error of Approximation:

RMSEA 0.074 0.069

90 Percent confidence interval - lower 0.056 0.051

90 Percent confidence interval - upper 0.093 0.087

P-value RMSEA <= 0.05 0.015 0.042

Robust RMSEA 0.072

90 Percent confidence interval - lower 0.052

90 Percent confidence interval - upper 0.091

Fit indices

|  |  |
| --- | --- |
| Aspect | value |
| X2 | 61.3 |
| DF | 39 |
| P-value | 0.011 |
| CFI | 0.98 |
| TLI | 0.96 |
| RMSEA | 0.049 |
| SRMR | 0.071 |

|  |  |
| --- | --- |
| Aspect | value |
| X2 | 35.2 |
| DF | 39 |
| P-value | 0.011 |
| CFI | 0.98 |
| TLI | 0.96 |
| RMSEA | 0.049 |
| SRMR | 0.071 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Standard Robust | Test Statistic 59.550 61.924 | Degrees of freedom 39 39 | P-value (Chi-square) 0.019 0.011 | Scaling correction factor 0.962 | Satorra-Bentler correction |  |
|  | User Model versus Baseline Model: |  | Comparative Fit Index (CFI) 0.984 0.981 | Tucker-Lewis Index (TLI) 0.978 0.974 |  | Robust Comparative Fit Index (CFI) 0.983 |
| Robust Tucker-Lewis Index (TLI) 0.976 |  | SRMR 0.071  **0.071** |  | Latent Variables: | Estimate Std.Err z-value P(>|z|) Std.lv Std.all | SALES =~ |
| MG\_S 1.000 0.806 1.034 | TV 0.851 0.033 25.612 0.000 0.686 0.876 | SE\_S 0.673 0.034 19.554 0.000 0.543 0.791 | PG =~ | PAV 1.000 0.681 0.910 | PAp 1.069 0.124 8.632 0.000 0.728 0.963 | EF =~ |
| FM\_EFF\_Z 1.000 0.873 0.886 | SS\_EFF\_Z 0.567 0.160 3.551 0.000 0.495 0.498 | CB\_EFF\_Z 0.413 0.114 3.622 0.000 0.361 0.369 |  | Regressions: | Estimate Std.Err z-value P(>|z|) Std.lv Std.all | PostScore ~ |
| EF 0.578 0.272 2.124 0.034 0.505 0.149 | PreScore 0.410 0.047 8.723 0.000 0.410 0.482 | SALES 0.493 0.247 1.994  **0.046 0.398 0.117** | PG -0.823 0.287 -2.865 0.004 -0.560 -0.165 | Age 0.433 0.194 2.233 0.026 0.433 0.139 | EF ~ | PG -0.244 0.095 -2.564 0.010 -0.190 -0.190 |

Table !table(Model1reg): Structural relations for model 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | Std. error | p-value | Std.Estimate |
| Learning ~ |  |  |  |  |
| EF | 0.53 | 0.25 | 0.027 | 0.15 |
| Pre-Score | 0.41 | 0.04 | >0.01 | 0.48 |
| SALES | 0.36 | 0.4 | 0.36 | 0.08 |
| PG | -0.9 | 0.28 | >0.01 | -0.18 |
| PALS | 0.21 | 0.47 | 0.656 |  |
| EF ~ |  |  |  |  |
| SALES | 0.23 | 0.12 | 0.06 | 0.19 |
| PALS | -036 | 0.2 | 0.09 | -0.02 |
| PG | -0.18 | 0.1 | 0.07 | -0.13 |

# Model 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Estimate | Std. error | p-value | Std.Estimate |
| Learning ~ |  |  |  |  |
| EF | 0.57 | 0.25 | 0.03 | 0.15 |
| Pre-Score | 0.41 | 0.04 | >0.01 | 0.48 |
| SALES | 0.48 | 0.4 | 0.049 | 0.12 |
| PG | -0.82 | 0.29 | >0.01 | -0.165 |
| EF ~ |  |  |  |  |
| SALES | 0.047 | 0.06 | 0.47 | 0.04 |
| PG | -0.25 | 0.09 | >0.01 | -0.19 |

Regressions:

Estimate Std.Err z-value P(>|z|) Std.lv Std.all

Learning ~

EF 0.572 0.268 2.130 0.033 0.149 0.149

PreScore 0.410 0.047 8.718 0.000 0.121 0.481

SALES 0.488 0.248 1.968 0.049 0.116 0.116

PG -0.824 0.288 -2.864 0.004 -0.165 -0.165

Age 0.433 0.194 2.234 0.025 0.128 0.139

EF ~

SALES 0.047 0.066 0.715 0.475 0.043 0.043

PG -0.250 0.094 -2.664 0.008 -0.193 -0.193