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Resultados: Comparando dos Modelos CFA Anidados para cada Par de Factores (Beltran-Ma)

Structural Equation Modelling

Models Info

Estimation Method	ML
Optimization Method	NLMINB
Number of observations	169
Free parameters	13
Standard errors	Standard
Scaled test	None
Converged	TRUE
Iterations	131
Model	F1 =~ age + weight_kg F2 =~ height_cm + bmd

Nota.

lavaan WARNING: some observed variances are (at least) a factor 1000 times larger than others; use varTable(fit) to investigate

Nota.

Covariance matrix of latent variables is not positive definite.

[3] [4]

Overall Tests

Model tests

Label	$\chi^2$	df	p
User Model	0.0215	1	0.884
Baseline Model	113.7057	6	< .001

Fit indices

95% Confidence Intervals				
SRMR	RMSEA	Lower	Upper	RMSEA p
0.002	0.000	0.000	0.100	0.906

User model versus baseline model

	Model
Comparative Fit Index (CFI)	1.000
Tucker-Lewis Index (TLI)	1.055
Bentler-Bonett Non-normed Fit Index (NNFI)	1.055
Relative Noncentrality Index (RNI)	1.009
Bentler-Bonett Normed Fit Index (NFI)	1.000
Bollen's Relative Fit Index (RFI)	0.999
Bollen's Incremental Fit Index (IFI)	1.009
Parsimony Normed Fit Index (PNFI)	0.167

Estimates

Measurement model

Latent	Observed	Estimate	SE	95% Confidence Intervals		$\beta$	z	p
				Lower	Upper			
F1	age	1.0000	0.00000	1.0000	1.0000	0.228		
	weight_kg	-1.6700	0.42796	-2.5088	-0.8312	-0.408	-3.90	< .001
F2	height_cm	1.0000	0.00000	1.0000	1.0000	0.466		
	bmd	0.0313	0.00592	0.0197	0.0429	0.696	5.29	< .001

Variable 1	Variable 2	Estimate	SE	95% Confidence Intervals		$\beta$	z	p
				Lower	Upper			
age	age	143.8881	16.55919	111.43271	176.3435	0.948	8.69	< .001
weight_kg	weight_kg	110.2806	19.26056	72.53057	148.0306	0.833	5.73	< .001
height_cm	height_cm	48.8980	5.82889	37.47364	60.3225	0.783	8.39	< .001
bmd	bmd	0.0142	0.00281	0.00872	0.0197	0.516	5.07	< .001
F1	F1	7.9022	7.53940	-6.87473	22.6792	1.000	1.05	0.295
F2	F2	13.5875	4.85697	4.06802	23.1070	1.000	2.80	0.005
F1	F2	-20.2298	5.77489	-31.54834	-8.9112	-1.952	-3.50	< .001

Intercepts

Variable	Intercept	SE	95% Confidence Intervals		z	p
			Lower	Upper		
age	63.632	0.948	61.774	65.489	67.142	< .001
weight_kg	64.666	0.885	62.931	66.400	73.081	< .001
height_cm	160.254	0.608	159.063	161.446	263.550	< .001
bmd	0.783	0.013	0.758	0.808	61.314	< .001
F1	0.000	0.000	0.000	0.000		
F2	0.000	0.000	0.000	0.000		

Los resultados presentados corresponden al ajuste de un modelo de análisis factorial confirmatorio (CFA) no restringido en Jamovi. A continuación se muestra una interpretación detallada de los resultados y una comparación con los obtenidos en R.

Modelo CFA No Restringido

Model tests (Pruebas del modelo)

User Model (Modelo del usuario):

$\chi^2=0.0215$

df = 1

p = 0.884

Baseline Model (Modelo base):

$\chi^2=113.7057$

df = 6

p < 0.001

Fit Indices (Índices de ajuste)

SRMR: 0.002

RMSEA: 0.000

Intervalo de confianza del 95%: [0.000, 0.100]

p = 0.906

CFI: 1.000

TLI: 1.055

NNFI: 1.055

RNI: 1.009

NFI: 1.009

RFI: 0.999

IFI: 1.000

PNFI: 0.167

Estimates (Estimaciones)

Cargas factoriales:

- F1: age (1.000), weight\_kg (-1.670)
- F2: height\_cm (1.000), bmd (0.0313)

Varianzas y covarianzas:

- Varianza de age: 143.8881
- Varianza de weight\_kg: 110.2806
- Varianza de height\_cm: 48.8980
- Varianza de bmd: 0.0142
- Covarianza entre F1 y F2: -20.2298

Resultado R:

```
Chi-squared Difference Test

      Df    AIC    BIC   Chisq Chisq diff   RMSEA Df diff Pr(>Chisq)
fit1  1 3589.0 3617.2  0.0215
fit2  2 3680.4 3705.5 93.4384    93.417  0.73949      1 < 2.2e-16 ***
---
signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

El error al ajustar el modelo restringido en Jamovi sugiere que el modelo puede ser demasiado restrictivo, lo que resulta en una falta de convergencia. Esto podría deberse a que las restricciones impuestas no son adecuadas para los datos o que los factores no son verdaderamente independientes.

Referencias

[1] The jamovi project (2024). *jamovi*. (Version 2.5) [Computer Software]. Retrieved from <https://www.jamovi.org>.

[2] R Core Team (2023). *R: A Language and environment for statistical computing*. (Version 4.3) [Computer software]. Retrieved from <https://cran.r-project.org>. (R packages retrieved from CRAN snapshot 2024-01-09).

[3] Gallucci, M., Jentschke, S. (2021). *SEMLj: jamovi SEM Analysis*. [jamovi module]. For help please visit <https://semlj.github.io/>.

[4] Rosseel, Y. (2019). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software*, 48(2), 1-36. [link](#).