RESEARCH STATISTICS

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Model testing

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Amos is short for Analysis of Moment Structures (covariance, variance, regression).

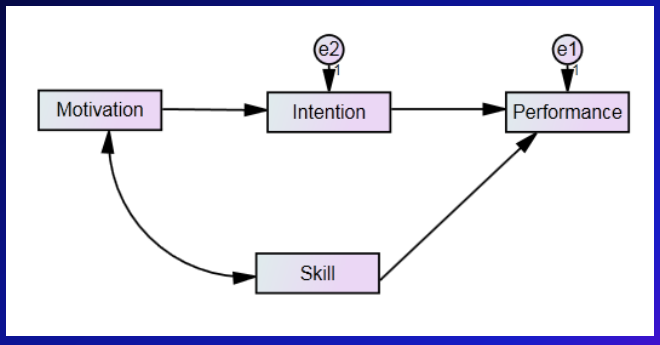
It implements the general approach to data analysis known as structural equation modeling (SEM), also known as analysis of covariance structures, or causal modeling.

This approach includes general linear model (univariate, multivariate & repeated measures analysis) and common factor analysis.

AMOS Advantages

- Easy to use for visual SEM (Structural Equation Modeling).
- Easy to modify, view the model
- Publication –quality graphics

SEM Model
Identify model fit



Identify model fit?

Model Fit

Goodness of Fit test

Badness of fit index

- **Mixed opinions on its value in reporting.**

Model Fit

Null hp:

The hypothesised model fits the data

Or

The hypothesised model is valid for the population of the study

Goodness of Fit test

- χ^2
- **p > .05 (fail to reject the null Hp)**

Model Fit

χ^2 Goodness of Fit test

- Historically used
- Desire a non-significant *p*-value, i.e.,
- $p \geq .05$
- Adversely affected by sample size
- Sample size is bigger, p will be smaller (implied model not fit the data), so χ^2 Goodness of Fit test is not reliable at big sample size (>200). We need to look at other fit indexes.

Model Fit

CFI

- Goodness of Fit test
- CFI ≥ .90

Model Fit

RMSEA

- Badness of fit index

- Root Mean Squared Error of Approximation Adjusts
- Badness of fit index :
- 0 best & higher values worse.
- Amount of error of approximation per model.
- RMSEA ≤ .05 close fit
- .05-.08 good
- ≤ .10 acceptable
- .10 and + poor fit

Model Fit

- Many other fit indexes
- Ideally
  - Nonsignificant χ^2 Goodness of Fit test, P ≥ .05 (n < 200)
  - CFI ≥ .95
  - RMSEA ≤ .08
- IF the model fits the data, then look at paths

Analysis for testing data-model fit

Null hp:

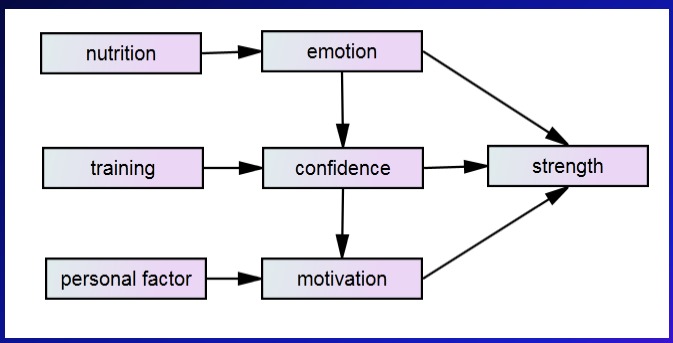
The hypothesised model fits the data

If p ≥ .05, or RMSEA ≤ 0.10, or CFI ≥ .90

Fail to reject the null hypothesis.

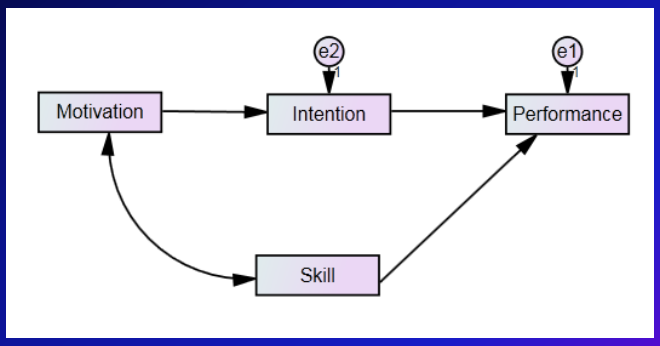
Report: The model fits the data; the model can be applied to the population

Exercise: Draw a SEM model for AMOS analysis and analyse it. (data: Ex1a)



The model after modification

- **Exercise: Draw a SEM model for AMOS analysis and analyse it. (data: Ex 3)**



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Model of the study

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