Bootstrapping in Amos

Changya Hu, Ph.D. NCCU
What’s bootstrapping and why we need it?

✔ It’s a resampling method
  • Creating an sampling distribution to estimate standard errors, and create the confidence intervals.

✔ It’s important for mediation analysis
  • To confirm the mediation effect
    – Because of its accuracy for computing confidence intervals for mediation effect when the mediation effect is nonzero.
  • As an aid to nonnormal data
    – The assumption of SEM is the data has a multivariate normal distribution, but many empirical studies failed.
    – The resampling method has more accurate Type I error rates and power than single sample method that assumes a normal distribution.
Benefits of bootstrap procedure

✔ SEM approach
  • If the variables have measurement errors, the significance of the mediation effect is likely to be underestimated.
    – Using SEM can deal with the measurement error problem.

✔ Benefits
  • It allows researchers to assess the stability of parameter estimates
  • It can be applied when the assumptions of large sample size and multivariate normality may not hold.
    – Needs at least moderate sample sizes
The procedure of bootstrapping in Amos

Click on the Analysis Properties button

And click on the Output and Bootstrapping tab
The procedure of bootstrapping in Amos

To test the mediation effect
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Usually 500 or 1,000 (Cheung & Lau, 2008)

- Perform bootstrap
- Bias-corrected confidence intervals

Determine the Type I error rate

- Bootstrap ML

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The result of bootstrapping in Amos
The result of bootstrapping in Amos

The original ML estimates
No mediation effect
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The Bootstrap estimates

Showing the S.E.
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The CIs

We can find all the bootstrapped results of the estimates from this field 😊
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How to check the mediation effect?
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**Indirect effect of depress on selfest is**: .011 (95% CI: -.005 ~ .106)
The result of bootstrapping in Amos

Indirect effect of depress on selfest is: .011 (95% CI: -.005 ~ .106)

We cannot reject the null hypothesis, $H_0: \beta_{21} \times \beta_{Y2.1} = 0$
There is no mediation effect! (Cheung & Lau, 2008)
References


Thank You!