Assignment 12

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2018-10-24, 23:59 IST.

1) Select the INCORRECT statement

- Confirmatory factor analysis (CFA) is a type of SEM
- In CFA measurement error of indicators is removed during the estimation
- Both in EFA and CFA we specify the pattern of indicator-factor loadings
- CFA belongs to the common factor model family

No, the answer is incorrect.
Score: 0

Accepted Answers:
Confirmatory factor analysis (CFA) is a type of SEM

2) Which of the following criteria is not used to assess the quality of a measurement model in SEM?

- Fit indices
- Variance of factor loadings
- Discriminant validity
- Significance of factor loadings

No, the answer is incorrect.
Score: 0

Accepted Answers:
Fit indices

3) Which of the following is not a typical model fit index used in SEM?

- Root mean squared error of approximation (RMSEA)
- Adjusted R-square

No, the answer is incorrect.
Score: 0

Accepted Answers:
Root mean squared error of approximation (RMSEA)

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Root mean squared error of approximation (RMSEA)

4) We have a set of equations. So what can we say about the first equation: 
\[ \begin{align*}
Y_1 &= a_0 + a_1 Y_2 + a_3 Y_3 + a_4 X_1 + a_5 X_2 + e_1 \\
Y_2 &= b_0 + b_1 Y_3 + b_2 Y_1 + b_3 X_2 + e_2 \\
Y_3 &= c_0 + c_1 X_1 + c_2 X_2 + c_3 X_3 + e_3 
\end{align*} \]

- Unidentified
- Just identified
- Over identified
- It is not possible to tell whether the equation is identified

No, the answer is incorrect.
Score: 0
Accepted Answers: Unidentified

5) Consider again the system of equations in question 4. Which estimation method can be used for the third equation in the system:
1. Ordinary least squares
2. Two stage least squares
3. Indirect least squares

- 1 only
- 2 only
- 1 and 2 only
- All of 1, 2, and 3

No, the answer is incorrect.
Score: 0
Accepted Answers: 1 only

6) For a saturated model (where \(N\) = the number of parameters in the model and \(p\) the number of non-redundant elements in the sample covariance matrix):

- \((p(p+1)/2) – N = 0\)
- \((p(p+1)/2) – N > 0\)
- \((p(p+1)/2) – N < 0\)
- None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers: \((p(p+1)/2) – N = 0\)

7) Select the correct statement about Chi-square value:

- Chi-Square Value is a test statistic of the goodness of fit of the model, and it is used to test the null hypothesis that the model fits the analyzed covariance matrix perfectly
- One may consider the rejection of a model when its p value is smaller than the preset significance value (e.g., .05), and the retention of the model if this value is higher than the preset significance
- Increasing the sample size generally leads to an increase in Chi-Square Value
- All of the above
8) Choose of the correct statement about Root Mean Square Error of Approximation (RMSEA):

- RMSEA increases as there are more degrees of freedom (greater parsimony) or a larger sample size, keeping all else constant
- RMSEA = 0 implies that chi-square = 0
- RMSEA theoretically follows a noncentral chi-square distribution
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Chi-Square Value is a test statistic of the goodness of fit of the model, and it is used to test the null hypothesis that the model fits the analyzed covariance matrix perfectly

9) For the below output for a Data Set of N = 200

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square (dof)</td>
<td>54.340 (16)</td>
</tr>
<tr>
<td>p value</td>
<td>.000</td>
</tr>
<tr>
<td>Chi-square /dof</td>
<td>3.396</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.110</td>
</tr>
<tr>
<td>SRMR</td>
<td>.120</td>
</tr>
<tr>
<td>CFI</td>
<td>.941</td>
</tr>
<tr>
<td>GFI</td>
<td>.936</td>
</tr>
</tbody>
</table>

Choose the correct statement:

- reject the model as Chi-square /dof > 3, RMSEA > .08, SRMR > .10
- CFI > .90 and GFI > .90 are indicative of an acceptable model fit
- Both (a) and (b)
- None (a) and (b)

No, the answer is incorrect.
Score: 0

Accepted Answers:
RMSEA increases as there are more degrees of freedom (greater parsimony) or a larger sample size, keeping all else constant

10A confirmatory factor analysis (CFA) was executed to check for model goodness of fit. The normed chi-square was 2.168, the comparative fit index (CFI) was 0.954, RMSEA was 0.079, and all indicators were statistically significant (p<.01). Since these indices met recommended guidelines so model fit can be considered acceptable.

- TRUE
- FALSE

No, the answer is incorrect.
Score: 0

Accepted Answers:
reject the model as Chi-square /dof > 3, RMSEA > .08, SRMR > .10

11) Three strategies in model specification (and evaluation): (1) strictly confirmatory, where a single a priori model is studied; (2) model generation, where an initial model is fit to data and then modified (frequently with the use of modification indices) until it fits adequately; and (3) alternative models, where multiple a priori models are studied.

- TRUE
- FALSE
12 Small sample sizes are associated with lower power, ceteris paribus. Parameter estimates have lower reliability and fit indices are overestimated. To overcome these issues:

- Conduct and report statistical power
- Simpler models (fewer parameters estimated, higher degrees of freedom) are associated with higher power
- Use fit indices that are less biased to small sample size such as NNFI; avoid fit indices that are more biased, such as chi-square, GFI and NFI
- All of the above

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
**TRUE**

13 It is necessary to define which of the following covariance matrices while performing structural equation modeling:

- a covariance matrix for the exogenous latent variables LVs
- a covariance matrix for the measurement errors in the exogenous set of measured variables MVs
- a covariance matrix for the measurement errors in the endogenous MVs
- All of the above

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
a covariance matrix for the exogenous latent variables LVs

14 Path analysis assumes that survey measures are made without random measurement error. So, this method can partially disguise multicollinearity’s effects. Although SEM explicitly takes random measurement error into account, the results can produce less stability in the model’s estimated coefficients due to higher coefficient standard errors caused in part by multicollinearity.

- TRUE
- FALSE

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
**TRUE**

15 Suppose for an overidentified model that

Chi-square(5) = 18.30, p = .003
A direct effect is added to the model (dfM is reduced by 1), and the result is
Chi-square(4) = 9.10, p = .059
Given both results,

\[
dfD = 5 - 4 = 1
\]

Chi-square(1) = 18.30 – 9.10 = 9.20, p = .002
the overall fit of the new model with an additional path is statistically better than that of the original model at the .01 level.

The chi-square difference test is a univariate one because it concerns a single path ($df_D = 1$). When two hierarchical models that differ by two or more paths are compared ($df_D \geq 1$), the chi-square difference statistic is used to test the statistical significance of the increase in overall fit as free parameters are eliminated (trimming) and as free parameters are added (building).

The calculation of $df_D$ is wrong.

No, the answer is incorrect.
Score: 0

Accepted Answers:
the overall fit of the new model with an additional path is statistically better than that of the original model at the .01 level.