Confirmatory Factor Analysis: A Pocket Guide to Social Work Research Methods

Confirmatory Factor Analysis (Pocket Guide to Social Work Research Methods) by Donna Harrington

4.5 out of 5

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Confirmatory factor analysis (CFA) is a statistical technique used to test whether a hypothesized model of relationships between observed variables and latent variables fits the data. Latent variables are variables that cannot be directly observed, such as personality traits, attitudes, and beliefs. Observed variables are variables that can be directly observed, such as responses to survey questions or scores on standardized tests.

CFA is a type of structural equation modeling (SEM). SEM is a statistical technique used to test models of relationships between variables. SEM models can be used to test hypotheses about the relationships between observed variables, latent variables, and error terms.

CFA is a powerful tool that can be used to test a variety of hypotheses about the relationships between variables. CFA can be used to:

* Test the validity of a measurement instrument * Identify the latent variables that underlie a set of observed variables * Test hypotheses about the relationships between latent variables * Evaluate the fit of a model to the data

Assumptions of CFA

CFA makes a number of assumptions about the data. These assumptions include:

* The data are multivariate normal. * The relationships between the observed variables and the latent variables are linear. * The error terms are independent and normally distributed.

If these assumptions are not met, the results of the CFA may be biased.

Steps in CFA

The steps in CFA are as follows:

1. Specify the hypothesized model. The first step in CFA is to specify the hypothesized model of relationships between the observed variables and the latent variables. The hypothesized model can be based on theory, previous research, or a combination of both. 2. Collect the data. The next step is to collect the data that will be used to test the hypothesized model. The data can be collected from a variety of sources, such as surveys, interviews, or observational studies. 3. Prepare the data for analysis. The data must be prepared for analysis before it can be used in CFA. This

includes cleaning the data, removing outliers, and transforming the data if necessary. 4. Fit the model to the data. The next step is to fit the hypothesized model to the data. This is done using a statistical software program. The software program will estimate the parameters of the model and test the fit of the model to the data. 5. Interpret the results. The final step is to interpret the results of the CFA. The results will provide information about the validity of the hypothesized model, the relationships between the observed variables and the latent variables, and the fit of the model to the data.

Interpretation of CFA Results

The results of CFA can be interpreted in a number of ways. The most common way to interpret the results is to look at the fit indices. Fit indices are statistics that measure how well the model fits the data. The most common fit indices include:

* The chi-square test statistic * The root mean square error of approximation (RMSEA) * The comparative fit index (CFI) * The Tucker-Lewis index (TLI)

The chi-square test statistic is a measure of the overall fit of the model to the data. The RMSEA is a measure of the average discrepancy between the observed covariance matrix and the covariance matrix that is implied by the model. The CFI and TLI are measures of the relative fit of the model to the data.

In general, a model with a non-significant chi-square test statistic, a RMSEA of less than .08, and a CFI and TLI of greater than .95 is considered to be a good fit to the data.

In addition to the fit indices, the results of CFA can also be interpreted by looking at the parameter estimates. The parameter estimates provide information about the relationships between the observed variables and the latent variables. The parameter estimates can be used to test hypotheses about the relationships between the variables.

CFA is a powerful tool that can be used to test a variety of hypotheses about the relationships between variables. CFA is a complex technique, but it can be used to gain valuable insights into the relationships between variables.

If you are interested in using CFA in your research, I recommend that you consult with a statistician. A statistician can help you to choose the right CFA model for your data and interpret the results of your analysis.

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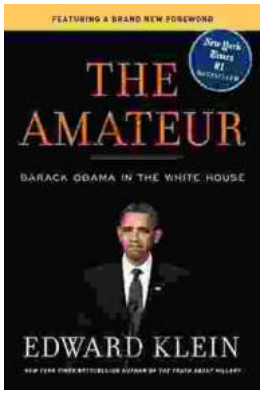

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