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Path Analysis

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Synonyms

Causal modeling

Definition

Path analysis is an attempt to investigate hypothesized causal relations among variables without the use of experimental design. It is not a replacement for experimental investigations, but it can be useful in those instances in which observations are naturalistic and where experimental manipulation of the variables is not possible (sometimes known as quasi-experimental designs). The variables are described in a possible set of causal pathways, and regression techniques are used to evaluate the fit of the observed data to the hypothesized models. Causal models can be nonrecursive, that is, with one-way specifications of the causal direction or recursive, that is, in which the variables can affect each other. Multiple regression can be used to evaluate the fit of the observed correlation matrix to more than one model. A goodness of fit statistic is calculated, and this statistic is compared among the different models. For more complex models or models in which latent variables are involved, structural equation modeling is typically used (Kenney 1979).

Experimental control over variables is rare in clinical neuropsychological research because many of the relevant variables, such as age, lesion site, disease type, etc., cannot be assigned or manipulated. Therefore, path analysis allows the researcher to investigate possible causal relations using data that is essentially observational in nature. For example, path analysis could be used to help delineate causal relations among risk factors for dementia and the development of cognitive and emotional changes. Path analysis often uses multiple regression methodology to estimate path coefficients.

Cross-References

▶ Structural Equation Modeling

References

Kenny, D. A. (1979). *Correlation and causality.* New York: Wiley.