Multiple Regression

Michael Franzen

Allegheny General Hospital, Pittsburgh, PA, USA

Definition

Multiple regression is an extension of the general linear model to include multiple predictors (Allison 1999). The regression of each predictor on the criterion is calculated in a way that only unique variance, separate from the variance between the other predictors and the criterion, is measured. This can be especially useful when there may be correlations among the predictors creating overlapping shares of variance with the criterion. These regression weights are then combined in a linear equation that maximizes the relation of the sum of regression formulae to the criterion. When the linear combination is forced through the origin, standardized beta weights for each of the predictors reflect relative amounts of shared variance.

Current Knowledge

Multiple regression can be used in an exploratory fashion to find the best prediction of the criterion

or in hypothesis testing in which the relation of a specific predictor to the criterion is tested as to whether that predictor accounts for a statistically significant amount of variance in the criterion when the variance shared by other predictors is statistically partialled out (Pedhazur 1997). For example, a researcher might investigate whether the addition of duration of loss of consciousness contributes additional variance to score on a memory test when age and premorbid intelligence are already in the multiple regression equation. Assumptions of the approach include a linear relation between each predictor and the criterion and relative (but not necessarily total) independence of the predictors from each other.

Cross-References

► [Correlation Coefficient](#)

References

- Allison, P. (1999). *Multiple regression: A primer*. Thousand Oaks: Pine Forge Press.
- Pedhazur, E. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed.). New York: Harcourt Brace College Publishers.