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Manifest Variable Granger Causality Models for Developmental Research: A Taxonomy

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Abstract

Granger models are popular when it comes to testing hypotheses that relate series of measures causally to each other. In this article, we propose a taxonomy of Granger causality models. The taxonomy results from crossing the four variables Order of Lag, Type of (Contemporaneous) Effect, Direction of Effect, and Segment of Dependent Series Targeted. Among the uses of such a taxonomy are that existing models can be embedded in the context of possible other models, new models can be derived, models can be compared, and the relation of statistical models to theories of causality can be specified. Sample models are depicted, and parameters of interest are indicated. For two new models, empirical data examples are provided from research on the development of aggression in adolescents.

Notes

[1]In this article, we follow the tradition that cells are labeled by row number–column number (in this order).

[2]Note that the same conceptual framework as counterfactual causality is used in Rubin's (1977) approach to statistically investigating causal hypotheses. This approach is considered among the most influential existing statistical approaches to causality testing.

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