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Detecting nonlinearity in the associations between depression and cortisol

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Detecting nonlinearity in the associations between depression and cortisol

1. Dewdrop embeddings could provide a method to distinguish groups based on nonlinear dynamical properties that cannot be detected by linear statistical methods (chapter 2).
2. Linear aggregation of ordinal diary data may not be an optimal way to obtain time series for nonlinear dynamical analysis (chapter 3).
3. Convergent cross mapping analysis of cortisol and negative affect shows the presence of possibly nonlinear dynamical relationships between those two variables in some persons (chapter 2).
4. To detect relationships between cortisol and negative affect it may be necessary to apply concepts of causality that are based on nonlinear dynamical methods, such as convergent cross mapping (chapters 2, 3, 5).
5. The direction of causality in convergent cross mapping appears counterintuitive when compared with granger causality, due to their fundamentally different nature.
6. In the presence of an external forcing variable, that results in cyclical time series, bundle embeddings provide a nonlinear dynamical solution to deal with the inflation of statistical significance that is caused by the cyclical components (chapter 4).
7. Grouping cyclical data in bundles that are based on time-of-day may also be possible in conventional linear analysis techniques (chapter 5).
8. Extensive analysis with simulated data is necessary to obtain better insight into the applicability of nonlinear dynamical techniques in the presence of noise.
9. Negative affect mainly influences next day's morning-cortisol value; subsequent cortisol values show a predominantly autonomous decay (chapter 5).