Deterministic dynamics of daily mood over five years in a patient with affective disorder

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Objective: From a dynamical systems perspective, affective disorders may be disturbances of the dynamics of affective systems. If the future behaviour of a system is determined by its previous states, then its dynamics is deterministic. The dynamics of a large time series of daily mood in a patient with affective disorder was analysed and tested for the presence of determinism.

Methods: The analysis was performed on a published time series of daily mood records ($N = 1746$) from a single patient (Groot, Journal of Mental Health 2010;19(4):352–362). He was diagnosed with dysthymia and a major depressive episode at the start of recording, and was put on venlafaxine. Mood was rated with a scale based on self-selected criteria. Spectral analysis was performed. Presence of dynamical determinism was assessed through correlation dimension (CD). This is a measure of the number of state variables needed to represent the dynamics of a system and hence its time-structural complexity. Random systems have higher CD than deterministic ones. CD for the original series was compared to that of 10 random series with the same linear properties, obtained from surrogate data generation via iterated Amplitude Adjusted Fourier Transform. Finally, two forecasting models were tested for predictability - a linear Autoregressive Moving Average (ARMA) model, and a nonlinear model of K-nearest neighbours (K-NN)-based local linear approximation of the dynamics in time-delay state-space. Model fit was computed such that 100% is a perfect fit.

Results: Spectral analysis showed no clear periodic cycles, and a power spectrum compatible with a noise-like 1/f^ pattern. Estimated was 0.83. Correlation dimension of the original series tended towards convergence and differed from those of surrogates for all embedding dimensions >1. For embedding dimension 10, CD from the original series was 5.72, inferior to CD from surrogates, p.

Conclusion: Estimated from the power spectrum was similar to previous reports in patients with affective instability. A value closer to 0 would relate to behaviour more similar to white noise, and has been reported in healthy controls (Woyshville *et al.*, Biol Psychiatry 1999; 45:261–269). The loss of healthy "noisiness" may be a marker of affective disorder representing more rigid dynamics of mood. Mood variation for this patient was less complex (lower CD) than for a random linear system with similar behaviour, which is evidence of nonlinear determinism in the dynamics of mood. Convergence of CD suggests the possibility of modelling – and therefore predicting and controlling – the dynamics of mood in affective disorders, using a limited number of variables. However, measuring only one variable, it was not possible to achieve an operational model of mood variation at this stage.

Creativity and bipolar disorder: family study of 300 000 patients

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Objective: Creativity has long been associated with mental disorder in general, and bipolar disorder in particular. The aim of the present study was to the alleged association between bipolar disorder and creativity, and to investigate whether an association is due to environmental or genetic factors.

Methods: We performed a nested case-control study based on Swedish registries. The likelihood of holding a creative occupation in individuals, who had received inpatient treatment for schizophrenia, bipolar disorder, or unipolar depression between 1973 and 2003, was compared to controls. We also compared patients non-diagnosed relatives with relatives of controls.

Results: We identified 29 644 patients (11 910 males and 17 734 females) with bipolar disorder, 54 042 patients (29 479 males and 24 563 females) with schizophrenia, and 217 771 patients (84 352 males and 133 419 females) with unipolar depression. Patients with bipolar disorder as well as the healthy siblings of patients with bipolar disorder or schizophrenia were overrepresented in creative professions. Neither patients with unipolar depression nor their siblings differed from controls regarding creative professions.

Conclusion: This Swedish total population case-control study is several magnitudes larger than previous studies and demonstrates an increased likelihood for both patients with schizophrenia and bipolar disorder, as well as for their respective relatives, to hold a creative occupation, compared to controls. The absence of an association with depressed patients indicates that creative occupations are specifically linked to bipolar disorder and schizophrenia rather than to psychopathology per se. A familial cosegregation of both schizophrenia and bipolar disorder with creativity is suggested.

Prevention of postpartum psychosis in women at high risk

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Objective: Women with a history of bipolar disorder or postpartum psychosis are at extremely high risk of relapse postpartum. Although lithium prophylaxis has

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