

Analysis of an entropic anomaly in 23 years of truly random data

ABSTRACT:

Background

Beginning in 1998, a network of electronic truly random number generators located around the world has continuously recorded samples of truly random bits. Data from this “Global Consciousness Project” (GCP) were used to explore a hypothesis that predicts the emergence of anomalous structure in random data correlated with events that attract widespread human attention. Such events include acts of terrorism, large sporting events, deaths of celebrities, and so on. A formal experiment testing this hypothesis in 500 events from 1998 to 2015 found a highly significant (7.3 sigma) deviation from chance expectation. However, the duration of the selected events comprised less than 5% of all data available through 2022.

Aims

The present analysis examined the full database, from 1998 through 2022, to see if emergence of non-random structure was limited to the formal experiment’s selected 500 events, or if the data reflected a persistent, if subtle, relationship between collective mind from small and large groups around the world, versus matter in the form of truly random data. In other words, we explored if the full database behaved in alignment with a chance-expected random walk, or if temporal structure was “hidden” in these data.

Method

Two analytical methods were used to study possible emergent structure in time-series data: multiscale entropy and a novel deconvolution technique. The former is used in many disciplines that deal with time-series data, including analysis of electrocortical and other physiological signals. The latter was developed for purposes of the present study; it is conceptually similar to the deconvolution of a complex signal by a Fourier transform.

Results

Both analytical methods provided significant statistical evidence (above 4 sigma) consistent with the hypothesis that the GCP data contained temporal structure that would not be expected by chance. This unexpected structure appeared most robustly at time-scales of about 8 to 15 minutes, which is consistent with human-centric periods of attention. That is, analysis of much faster (seconds) and much longer (days) sequences showed results that conformed to random expectation.

Conclusions

This study showed that some aspect of collective consciousness appears to be anomalously correlated with objective effects in the physical world, as reflected in the present case by the outputs of hardware-based random number generators. This suggests the presence of a continual mind-matter interaction phenomenon operating at a global scale.

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Keywords

Mind-matter interaction, Collective consciousness, Entropy, World events, Multi-scale entropy, Deconvolution,

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