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Empirical analysis of collective human behavior for extraordinary events in blogosphere

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To uncover underlying mechanism of collective human dynamics, we survey more than 1.8 billion blog entries and observe the statistical properties of word appearances. We focus on words that show dynamic growth and decay with a tendency to diverge on a certain day. After careful pretreatment and fitting method, we found power laws generally approximate the functional forms of growth and decay with various exponents values between -0.1 and -2.5. We also observe news words whose frequency increase suddenly and decay following power laws. In order to explain these dynamics, we propose a simple model of posting blogs involving a keyword, and its validity is checked directly from the data. The model suggests that bloggers are not only responding to the latest number of blogs but also suffering deadline pressure from the divergence day. Our empirical results can be used for predicting the number of blogs in advance and for estimating the period to return to the normal fluctuation level.

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