Climate Change Perception according to Twitter: a Network Analysis

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Understanding Climate Change is important from a practical perspective, because it is related to the environment we live in and the health of the planet. Understanding Climate Change is also important from an academic perspective because it is related to public opinion on politics and economics. There is an extensive literature on Climate Change which ranges from entirely theoretical through to more recent empirical studies. One notable example is publication *International Public Opinion, Perception, and Understanding of Global Climate Change* which shows that over the past few years there has been a rise in public knowledge on the subject of climate change (Leiserowitz, 2007). However, given the recent increase in interest in big data and the use of novel analysis techniques from data science, new opportunities have arisen to examine empirical data about Climate Change in a broader way – for example, accounting for distributions that lie beyond the typical normal distribution (Gaussian) assumption, and also using visual and analytical representations in terms of complex networks.

In this paper, we analyze Climate Change using a dataset that looks at tweets from mid February 2019. Specifically, this dataset includes data at the individual user level whose tweets were directed to #climatechange or #globalwarming and any links, favorites and retweets that resulted. This allows a complex networks analysis to represent the implicit correlations in a visual way, as well as shedding light on heterogeneous classes of behavior. It also enables exploration of the possible self-similar power-law form of the various distributions, which in turn would suggest that the system's behavior is dominated by large fluctuations. Such self-similar distributions are in stark contrast to conventional assumptions of a near-Normal distribution and embrace extreme points instead of presuming they are outliers.

Results are presented of this dataset using these new complex-systems tools of networks. The implication of such findings of non-trivial network structure, non-normal distributions and non-Poisson timing of events, is that there may be a generative mechanism present that is common to a broader class of systems, and hence which offers broader insight into the role of feedback processes in the public discussion and opinion of Climate Change.