Twitter reciprocal reply networks exhibit assortativity with respect to happiness

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Abstract

Several recent studies have examined the topology of a network inferred from Twitter users and their "followers." We argue against the use of networks inferred from following behavior and propose an alternative construction based on reciprocal replies. In this study, we take a more dynamic view of the network, accounting for the "unfriending problem" and detecting temporal network changes at the level of days, weeks and months. Furthermore, we construct a null model to test the effect of network topology on the assortativity of happiness for 40 million message pairs posted between September 2008 and February 2009. We find users' average happiness scores to be positively correlated with nearest neighbors' average happiness scores one, two and three links away, and that these correlations decrease with increasing path length. This work provides evidence of a social sub-network structure within Twitter and raises several methodological points of interest with regard to social network constructions.

Key words:
Social networks, Sentiment tracking, Collective mood, Emotion, Hedonometrics