Triadic closure amplifies homophily in social networks

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Much of the structure in social networks can be explained by two seemingly separate network evolution mechanisms [1]: triadic closure and homophily. While it is typical to analyse these mechanisms separately, empirical studies suggest that their dynamic interplay can be responsible for the striking homophily patterns seen in real social networks [2]. By defining a network model with tunable amount of homophily and triadic closure, we find that their interplay produces a myriad of effects such as amplification of latent homophily and memory in social networks (hysteresis). We use empirical network datasets to estimate how much observed homophily could actually be an amplification induced by triadic closure, and have the networks reached a stable state in terms of their homophily. Beyond their role in characterizing the origins of homophily, our results may be useful in determining the processes by which structural constraints and personal preferences determine the shape and evolution of society.

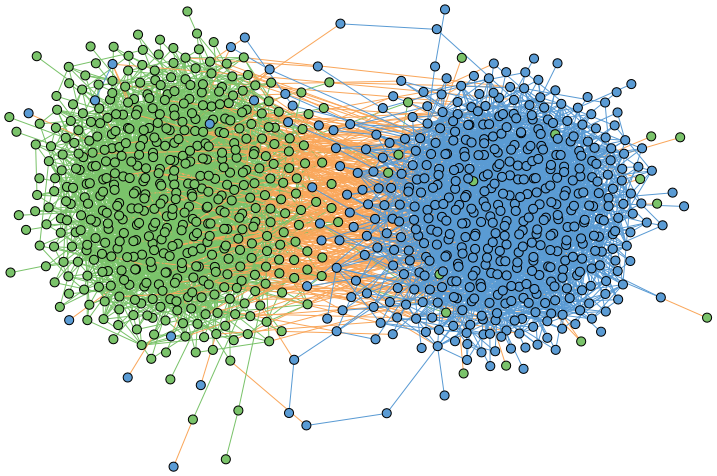

Figure 1: Visualization of a network with large observed homophily produced by the model. The network consists of 964 nodes each of which belongs to one of two groups (green or blue) so that the groups are equal in size. Out of the 5000 links 46.5% are between green nodes, 45.3% are between blue nodes and 8.2% are between a blue and a green node.

References

[1] Toivonen, R. et al., *Soc. Net.* **31**, 240–254 (2009).
[2] Kossinets, G. et al., *Am. J. Sociol.* **115**, 405–450 (2009).