

## **Elite, Periphery and Symmetry in Social Networks: An Axiomatic Approach**

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Many societies exhibit a two-tier structure composed of a social **elite**, namely, a relatively small but well-connected and highly influential group of powerful individuals, and the rest of society (referred to hereafter as the **periphery**). This paper is concerned with the size of the elite and the powers that shape it. It is argued that the elite size is affected by conflicting social forces competing to increase or decrease it. The main contribution of this paper is an axiom-based model for the relationships between the elite and the periphery. Assuming that an elite exists and it is **dominant**, **robust** and **compact**, we prove that its size must be  $\Theta(\sqrt{m})$  (where  $m$  is the number of edges in the social network). We then present an empirical study on a number of large real-world online social networks, approximating elites by **rich-clubs** of various sizes. Where information on the time of edge creation is available, we also analyse how properties of rich clubs of different sizes vary over time. Our findings indicate that in these networks, rich-clubs exhibit elite properties such as disproportionate dominance, robustness and compactness. Of particular interest is the behavior of elites whose external and internal influence is near-balanced (namely, elites around the symmetry point).

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