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In Search of Stable and Robust Metrics to Study Level-Specific Self-Similarity in Hierarchical Organizational Networks.

There is interest in exploring the balance between cosmopolitan and hierarchical topography in a network as these properties can give insight into an organization's efficacy, efficiency, adaptability, and other functional attributes (Everton, 2012#. While some efforts have been made to quantify these properties at a network level, such as modularity maximization or clustering coefficients #Shakarian & Paulo, 2012#, we believe that insights can also be gained by quantifying the distribution and regularity of branching coefficients in a hierarchical network, leading us to explore level-specific self-similarity #LS3). This research explores several approaches to defining a quantifiable metric for LS3, measures the robustness and stability of these proposed metrics in pure and perturbed model networks, and uses these concepts to explore structural differences between large hierarchical organizations. (Received September 24, 2012)