Power in the Heterogeneous Connections Model:

The Emergence of Core-Periphery Networks*

Dotan Persitz**

Tel Aviv University

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Abstract

The heterogeneous connections model is a generalization of the homogeneous connections model of Jackson and Wolinsky (1996) in which the intrinsic value of each connection is set by a discrete, positive and symmetric function that depends solely on the types of the two end agents. Core periphery networks are defined as networks in which the agents' set can be partitioned into two subsets, one in which the members are completely connected among themselves and the other where there are no internal links. A two-type society is defined as "power based" if both types of agents prefer to connect to one of the types over the other, controlling for path length. An exhaustive analysis shows that core periphery networks, in which the "preferred" types are in the core and the "rejected" types are in the periphery, are crucial in the "power based" society. In particular, if the linking costs are not too low and not too high, at least one such network is pairwise stable. Moreover, in many cases these networks are the unique pairwise stable networks and in all cases they are the unique strongly efficient networks. The set of efficient networks often differs from the set of pairwise stable networks, hence a discussion on this issue is developed. These results suggest heterogeneity accompanied by "power based" linking preferences as a natural explanation for many core-periphery structures observed in real life social networks.

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** Contact: Phone: 972-3-6405816, Fax: 972-3-6409908, Email: persitzd@post.tau.ac.il.