

On the Formation of Networks and Groups

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Abstract. We provide an introduction to and overview of the volume on *Models of the Strategic Formation of Networks and Groups*.

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1 Introduction

The organization of individual agents into networks and groups has an important role in the determination of the outcome of many social and economic interactions. For instance, networks of personal contacts are important in obtaining information about job opportunities (e.g., Boorman (1975) and Montgomery (1991)). Networks also play important roles in the trade and exchange of goods in non-centralized markets (e.g., Tesfatsion (1997, 1998), Weisbuch, Kirman and Herreiner (1995)), and in providing mutual insurance in developing countries (e.g., Fafchamps and Lund (2000)). The partitioning of societies into groups is also important in many contexts, such as the provision of public goods and the formation of alliances, cartels, and federations (e.g., Tiebout (1956) and Guesnerie and Oddou (1981)).

Our understanding of how and why such networks and groups form and the precise way in which these structures affect outcomes of social and economic interaction is the main focus of this volume. Recently there has been concentrated research focused on the formation and design of groups and networks, and their roles in determining the outcomes in a variety of economic and social settings. In this volume, we have gathered together some of the central papers in this recent literature which have made important progress on this topic. These problems are tractable and interesting, and from these works we see that structure matters

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and that clear predictions can be made regarding the implications of network and group formation. These works also collectively set a rich agenda for further research.

In this introduction, we provide a brief description of the contributions of each of the papers. We also try to show how these papers fit together, provide some view of the historical progression of the literature, and point to some of the important open questions.

2 A Brief Description of Some Related Literatures

There is an enormous literature on networks in a variety of contexts.

The “social networks” literature in sociology (with some roots in anthropology and social psychology) examines social interactions from theoretical and empirical viewpoints. That literature spans applications from family ties through marriage in 15th century Florence to needle sharing among drug addicts, to networks of friendship and advice among managers. An excellent and broad introductory text to the social networks literature is Wasserman and Faust (1994). One particular area of overlap with economics is the portion of that literature on exchange networks. The Bienenstock and Bonacich (1997) paper in this volume (and discussed more below) is a nice source for some perspective on and references to that literature. The analysis of the incentives to form networks and groups and resulting welfare implications, the focus of most of the papers in this volume, is largely complementary to the social networks literature both in its perspective and techniques.

There are also various studies of networks in economics and operations research of transportation and delivery networks.¹ One example would be the routing chosen by airlines which has been studied by Hendricks, Piccione and Tan (1995) and Starr and Stinchcombe (1992). One major distinguishing feature of the literature that we focus on in this volume is that the parties in the network or group are economic or social actors. A second distinguishing feature is that the focus is on the incentives of individual actors to form networks and groups.

Thus, the focus here is on a series of papers and models that have used formal game theoretic reasoning to study the formation of networks and other social structures.²

¹ There is also a literature in industrial organization that surrounds network externalities, where, for instance a consumer prefers goods that are compatible with those used by other individuals (see Katz and Shapiro (1994)). There, agents care about who else uses a good, but the larger nuances of a network with links does not play any role. Young (1998) provides some insights into such interactions where network structures provide the fabric for interaction, but are taken to be exogenous.

² Also, our focus is primarily on the formation of networks. There is also a continuing literature on incentives in the formation of coalitions that we shall not attempt to survey here, but mention at a few points.