

Discrete Games in Endogenous Networks: Theory and Policy*

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First version: 6/1/2012

This version: 1/1/2014

Abstract. This paper develops a framework for analyzing individuals' choices in the presence of endogenous social networks and implements it with data on teen smoking decisions and friendship networks. By allowing actions and friendships to be jointly chosen, the framework extends the literature on social interactions, which either models choices, taking the social network as given, or which models friendship selection without incorporating additional choices. In the context of a large population network game, this paper also introduces the notion of k -player Nash stability. This solution concept subsumes the Nash equilibrium and, as k decreases, gradually relaxes the assumptions of rationality and coordination underlying the Nash play. I show how the strategic interactions of the static one-shot play are embedded in an evolutionary model of network formation, which I estimate with social network data from United States high schools. The empirical analysis demonstrates the importance of modeling the joint decisions of friendships and smoking in evaluating existing and proposed new policies targeting teen smoking prevalence. These include policies related to school racial desegregation, separating middle and high school grades, and anti-smoking campaigns. Neglecting the endogeneity of the friendship network leads to a downward bias of 10% to 15% on the predicted effect of these policies on adolescent smoking rates.

JEL Codes: D85, C73, L19

Keywords: Social Networks, Adolescent Smoking, Multiplicity, Discrete Games.

*I thank Kenneth Wolpin, Petra Todd, and George Mailath for continuous guidance throughout this project. I have benefited from discussions with Antonio Merlo, Steven Durlauf, Holger Sieg, Hanming Fang, Angelo Mele, James Heckman, Flavio Cunha, Katja Seim, Ali Jadbabaie, Michael Kearns and seminar audiences at Bocconi, Chicago, Duke, Minnesota, Penn, St. Louis, Tilburg, and Yale for useful comments. I gratefully acknowledge financial support from the TRIO (PARC/Boettner/NICHD) Pilot Project Competition. This work used the XSEDE, which is supported by National Science Foundation grant number OCI-1053575. All errors are mine.

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