NATE NELIGH Fall 2017

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Placement Chair: Martin Uribe, <u>mu2166@columbia.edu</u> Placement Chair: Pierre-Andre Chiappori, <u>pc2167@columbia.edu</u> Placement Assistant: Amy Devine, (212) 854-6881, <u>aed2152@columbia.edu</u>

Education:

2018 (expected) Ph.D. Economics

Columbia University

Fields of Specialization:

Primary Fields: Behavioral, Experimental, Microeconomic Theory *Secondary Fields:* Complexity, Industrial Organization

Job Market Paper:

"Vying for Dominance: An Experiment in Dynamic Network Formation" Presented NYU-Columbia-Warton Graduate Student Conference on Experimental Economics October 2017

Abstract: Centrality in a network is highly valuable. This paper investigates the idea that the timing of entry into the network is a crucial determinant of a node's final centrality. We propose a model of strategic network growth which makes novel predictions about the forward-looking behaviors of players. In particular, the model predicts that agents entering the network at specific times will "vie for dominance"; that is, they will make more connections than is myopically optimal in hopes of receiving additional connections from future players and thereby becoming dominant. The occurrence of these opportunities varies non-monotonically with the parameters of the game. In a laboratory experiment, we find that players do exhibit "vying for dominance" behavior, but do not always do so at the predicted critical times. We find that a model of heterogeneous risk aversion best fits the observed deviations from initial predictions. Timing determines whether players have the opportunity to become dominant, but individual characteristics determine whether players exploit that opportunity.

Accompanying Technical Paper:

"The Theory of Vying for Dominance in Dynamic Network Formation" Presented NYU-Columbia-Warton Graduate Student Conference on Experimental Economics October 2017

Abstract: In many networks, a few highly central nodes have outsized impacts on the structure of the network and generate a large amount of value, but what determines which nodes become central? We hypothesize that the timing of entry into the network can also play a critical role. In this paper, we present a new dynamic model of network formation with history dependence, growth, and forward looking strategic agents. These features increase the importance of importance of the dynamics and generate novel strategic behaviors such as "vying for dominance," making a larger number of connections than is myopically beneficial in expectation of receiving more connections from future players. Due to the strategic richness, the model rapidly becomes intractable as the size of the network increases. However, if we restrict the model such that players must connect to one of the most central nodes as they join the network, we can restore tractability, and we find that all players either vying for dominance or playing myopically. Furthermore, if we assume players use a novelty seeking tie-breaking rule, players vie for dominance periodically, the solution is characterized by periodic vying for dominance separated by periods of low connection myopic play. Because vying becomes more expensive as the network grows, the time between vying agents increases exponentially over time.

Developed Working Papers:

"Experimental Tests of Rational Inattention" with Mark Dean (Submitted), Presented Information Frictions Workshop – Barcelona Summer Forum 2017; Society for Neuroeconomics Satellite Meeting, Zurich 2016; Society for Neuroeconomics Annual Conference, Munich 2016; and others

"Estimating Information Cost Functions in Models of Rational Inattention" with Ambuj Dewan, Presented NYU-Columbia-Warton Graduate Student Conference on Experimental Economics September 2016

Working Papers:

"Rational Attention with Perceptual Distances" (with Ambuj Dewan) "Optimal Memory and Recall with a Lossy Medium" "Propagation of Technological Advancement through Multiple Technology Levels"

Honors and Awards:

2017-2018, Dissertation Fellowship, Department of Economics, Columbia University Spring 2016, CELSS Graduate Student Research Grant Fall 2015, CELSS Graduate Student Research Grant (With Ambuj Dewan) 2014 – 2015, Institute for Humane Studies, Humane Studies Fellowship Fall 2013, CELSS Graduate Student Research Grant Fall 2017, CELSS Dissertation Fellowship

Other Professional Experiences and Employment:

Fall 2013 – Spring 2015, Columbia University, CELSS Lab Manager
Fall 2016 – Spring 2017, Columbia University, CELSS Lab Manager
Spring 2015 – Fall 2016, Research Assistant for Professor Francois Gerard
Summer 2014, Santa Fe Institute, Graduate Workshop in Computational Social Science Modeling and Complexity

Teaching Experience:

- Fall 2015, Industrial Organization, Columbia University, Teaching Assistant for Professor Katherine Emily Ho
- Spring 2016, Intermediate Microeconomics, Columbia University, Teaching Assistant for Professor Qingmin Liu
- Fall 2014 Spring 2017, Tutorial on zTree, Columbia University, Instructor once per semester

Personal:

Software Skills: zTree, R, Lyx, LaTex, Matlab, Python, STATA, Microsoft Office

References:

| Professor Alessandra Casella | 1030 International Affairs | <u>ac186@columbia.edu</u> |
|------------------------------|----------------------------|-------------------------------|
| Professor Mark Dean | 1031 International Affairs | mark.dean@columbia.edu |
| Professor Pietro Ortoleva | 392A Julis Romo Rabinowitz | pietro.ortoleva@princeton.edu |