Considering Network Effects in the Design and Analysis of Field Experiments on State Legislatures

Sayali Phadke * Bruce A. Desmarais †

March 7, 2018

Abstract

Recent work on legislative politics has documented complex patterns of interaction and collaboration through the lens of network analysis. In a largely separate vein of research, the field experiment—with many applications in state legislatures—has emerged as an important approach in establishing causal identification in the study of legislative politics. The stable unit treatment value assumption (SUTVA)—the assumption that a unit's outcome is unaffected by other units' treatment statuses—is required in conventional approaches to causal inference with experiments. When SUTVA is violated via networked social interaction, treatment effects spread to control units through the network structure. We review recently developed methods that can be used to account for interference in the analysis of data from field experiments on state legislatures. The methods we review require the researcher to specify a spillover model, according to which legislators influence each other, and specify the network through which spillover occurs. We discuss these and other specification steps in detail. We find moderate evidence for spillover effects in data from two previously published field experiments. Our replication analyses illustrate how researchers can use recently developed methods to test for interference effects, and support the case for considering interference effects in experiments on state legislatures. [1]

*PhD Student, Departments of Statistics, Pennsylvania State University, sayalip@psu.edu.

†Associate Professor, Department of Political Science, Pennsylvania State University, bdesmarais@psu.edu.

[1]Presented at the 2016 Political Networks Conference, Washington University, St. Louis. Work supported in part by National Science Foundation grants SES-1558661, SES-1619644, CISE-1320219, and IGERT Grant DGE-1144860, Big Data Social Science. Any opinions, findings, and conclusions or recommendations are those of the authors and do not necessarily reflect those of the sponsor.