

## Causal Inference with Networked Treatment Diffusion

**Weihua An, PhD**

**Associate Professor**

**Department of Sociology and Quantitative Theory and Methods  
Emory University**

**12:00 Noon Eastern time, Tuesday, September 29, 2020**

**Virtual seminar via Zoom**

### **ABSTRACT**

Causal inference under treatment interference (i.e., one unit's potential outcomes depend on other units' treatment) is a challenging but important problem. Past studies usually make strong assumptions on the structure of treatment interference. In this study, I will highlight the importance of collecting data on actual treatment diffusion in order to more accurately measure treatment interference. Furthermore, I will show that with accurate measures of treatment interference, one can identify and estimate a series of causal effects that are previously unavailable, including the direct treatment effect, the treatment interference effect, and the treatment effect on interference. Last, I will use exponential random graph models to model treatment diffusion networks in order to reveal covariates and network processes that significantly correlate with treatment diffusion. I will illustrate the ideas and methods through a case study of a smoking prevention intervention conducted in six middle schools in China. The findings provide an empirical basis to evaluate previous assumptions on the structure of treatment interference, are informative for imputing treatment diffusion when it is unavailable; and help improve designs of future interventions that aim to optimize treatment diffusion.