

Causal Inference with Noncompliance and Unknown Interference

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August, 2021

Abstract

In this paper, we investigate a treatment effect model in which individuals interact in a social network and they may not comply with the assigned treatments. We introduce a new concept of exposure mapping, which summarizes spillover effects into a fixed dimensional statistic of instrumental variables, and we call this mapping the instrumental exposure mapping (IEM). We investigate identification conditions for the intention-to-treat effect and the average causal effect for compliers, while explicitly considering the possibility of misspecification of IEM. Based on our identification results, we develop nonparametric estimation procedures for the treatment parameters. Their asymptotic properties, including consistency and asymptotic normality, are investigated using an approximate neighborhood interference framework by [Leung \(2021\)](#). For an empirical illustration of our proposed method, we revisit [Paluck *et al.*'s \(2016\)](#) experimental data on the anti-conflict intervention school program.

Keywords: exposure mapping; instrumental variables; local average treatment effect; network interference; spillover effects.

JEL Classification: C14, C31, C51.

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