



The Chinese University of Hong Kong
Department of Statistics

Seminar

Hypothesis Test of Causal Mediation Effect: From Univariate to Multivariate Mediators

By

Professor Huang, Yen-Tsung
Institute of Statistical Science
Academia Sinica

Abstract

For statistical inference, hypothesis test and estimation enjoy duality in most problems, but not in mediation analysis. Causal mediation analysis has been a popular approach to investigate whether an exposure or intervention has an effect on an outcome mediated through an intermediary factor termed mediator. The mediation effect involves two parameters: one for the exposure-mediator association, and the other for the mediator-outcome association conditional on the exposure. The hypothesis test for mediation is conducted under the null hypothesis where either one of two associations is zero or both are zeros. We study various existing testing procedures for mediation and show that their poor performance is due to two methodological challenges: 1) the null hypothesis of mediation is a composite null hypothesis, and 2) the test statistics does not necessarily converge to Gaussian. To address these, we propose two classes of methods: one for the setting where the null composition is not available (Huang 2018), and the other for the setting where the null composition may be inferred (Huang 2019a). We show that the proposed methods are size alpha tests and are applicable to single- and multi-mediator analyses (Huang 2018, 2019b). The utility will be demonstrated in simulation and genome-wide studies.

Date: November 5, 2019 (Tuesday)
Time: 2:30 p.m. - 3:30 p.m.
Venue: Lady Shaw Building, Room LT6
The Chinese University of Hong Kong

ALL INTERESTED ARE WELCOME !!