Title: *Mediation Analysis for Binary Outcomes*

Speaker: Marco Doretti,
            Research fellow in Statistics, University of Perugia, Italy

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Abstract

In this talk, we present some recent advances in statistical mediation analysis, both in an associational (i.e., non-causal) and a formal causal inference framework. Specifically, we focus on a setting where the outcome and the mediator are binary variables, and a logistic regression model can be specified for them. For the associational setting, we derive the relationships existing between marginal and conditional effects when the exposure variable is continuous or binary. Parallels with the well-known Cochran's formula holding in the linear case are shown. For the causal setting, we offer the exact parametric expressions of natural direct and indirect effects, on the odds-ratio scale. Such an effect decomposition does not require the outcome be rare and generalizes the existing one, allowing for interactions between both the exposure and the mediator and confounding covariates. It throws light on the relationship between the causal effects and the correspondent pathway-specific logistic regression parameters. A simulation study shows that our exact estimators outperform those based on the rare outcome assumption, not only at high prevalence levels, for the natural direct effect and the total effect. Our findings are also applied to data from a randomized experiment in microfinance performed in Bosnia and Herzegovina (Augsburg et al., 2015). Specifically, we assess whether – and to what extent - the effect of randomly allocated microcredit loans on clients' "bankability" (that is, the capability to attract credit from financial institutions) is mediated by owning a business.