Package: MultisiteMediation (via r-universe)

August 23, 2024

Version 0.0.1

Date 2017-02-25

Title Causal Mediation Analysis in Multisite Trials

Author Xu Qin, Guanglei Hong

Maintainer Xu Qin <xuqin@uchicago.edu>

Depends R (>= 3.1.0), lme4, statmod, Matrix

Description We implement multisite causal mediation analysis using the methods proposed by Qin and Hong (in press). It enables causal mediation analysis in multisite trials, in which individuals are assigned to a treatment or a control group at each site. It allows for estimation and hypothesis testing for not only the population average but also the between-site variance of direct and indirect effects. This strategy conveniently relaxes the assumption of no treatment-by-mediator interaction while greatly simplifying the outcome model specification without invoking strong distributional assumptions.

License GPL-2

RoxygenNote 6.0.1

URL https://github.com/Xu-Qin/MultisiteMediation

BugReports https://github.com/Xu-Qin/MultisiteMediation/issues

Repository https://xu-qin.r-universe.dev

RemoteUrl https://github.com/xu-qin/multisitemediation

RemoteRef HEAD

RemoteSha 85ad726399df8c0e753136df99c9c6e532226c8f

Contents

`msmediate` *Multisite Causal Mediation Analysis*

Description

Performs causal mediation analysis in multisite trials. It is used to estimate both the population average and between-site variance of direct and indirect effects.

Usage

```
msmediate(data, y, treatment, mediator, X, site)
```

Arguments

`data`	The data set for analysis.
`y`	The name of the outcome variable (string).
`treatment`	The name of the treatment variable (string).
`mediator`	The name of the mediator variable (string).
`X`	A vector of variable names (string) of pretreatment confounders, which will be included in the propensity score model. For now, the multilevel propensity score model only allows for one random intercept.
`site`	The variable name for the site ID (string).

Value

A list contains the estimates of the between-site variance of direct effect, that of indirect effect, and the correlation between the direct and indirect effects across sites ($Random_effects), and the population average direct and indirect effect estimates along with their hypothesis testing results ($Fixed_effects).

Author(s)

Xu Qin and Guanglei Hong

References

Qin, X., & Hong, G (in press). A weighting method for assessing between-site heterogeneity in causal mediation mechanism. Journal of Educational and Behavioral Statistics.

Examples

```
data(sim)

msmediate(data = sim, y = "y", treatment = "tr", mediator = "me", X = c("x1", "x2",
    "x3"), site = "site")
```

sim *Simulated data list*

Description

This simulated data list is for demonstration.

vartest.msmediate *Include Variance Testing for Multisite Causal Mediation Analysis*

Description

Performs hypothesis testing for the between-site variance of direct effect and that of indirect effect, besides providing the same output as given by the function msmediate().

Usage

```
vartest.msmediate(data, y, treatment, mediator, X, site, npermute = 200)
```

Arguments

data	The data set for analysis.
y	The name of the outcome variable (string).
treatment	The name of the treatment variable (string).
mediator	The name of the mediator variable (string).
X	A vector of variable names (string) of pretreatment confounders, which will be included in the propensity score model. For now, the multilevel propensity score model only allows for one random intercept.
site	The variable name for the site ID (string).
npermute	The number of permutations for the permutation test. The default value is 200. It may take a long time, depending on the sample size and the length of X.

Value

A list contains the hypothesis testing results of the between-site variance of the causal effects, besides the same output as given by the function msmediate().

Author(s)

Xu Qin and Guanglei Hong

References

Qin, X., & Hong, G (in press). A weighting method for assessing between-site heterogeneity in causal mediation mechanism. Journal of Educational and Behavioral Statistics.

Examples

```
data(sim)

vartest.msmediate(data = sim, y = "y", treatment = "tr", mediator = "me", X = c("x1",
    "x2", "x3"), site = "site", npermute = 2)
```

Index