Mediation Analysis: Estimating natural direct and indirect effects

Mediation analysis can be used to quantify the extent to which a causal influence is exerted through a specific pathway. DoWhy supports the estimation of the *natural direct effect* and the *natural indirect effect*:

Natural direct effect: Effect due to the path v0->y **Natural indirect effect**: Effect due to the path v0->FD0->y (mediated by FD0).

For more details, see Interpretation and Identification of Causal Mediation by Judea Pearl.

Using DoWhy's effect estimation framework, we can perform a mediation analysis by adjusting the estimand_type argument accordingly:

Identification

```
>>> # Natural direct effect (nde)
>>> identified_estimand_nde = model.identify_effect(estimand_type="nonparametric-n
>>>                                                 proceed_when_unidentifiable=Tr
>>> print(identified_estimand_nde)
```

```
>>> # Natural indirect effect (nie)
>>> identified_estimand_nie = model.identify_effect(estimand_type="nonparametric-n
>>>                                                 proceed_when_unidentifiable=Tr
>>> print(identified_estimand_nie)
```

Estimation

Skip to main content

```
>>>                                                 method_name="mediation.two_stage_r
>>>                                                 confidence_intervals=False,
>>>                                                 test_significance=False,
>>>                                                 method_params = {
>>>                                                     'first_stage_model': dowhy.cau
>>>                                                     'second_stage_model': dowhy.ca
>>>                                                 })
>>> print(causal_estimate_nie)
```

```
>>> causal_estimate_nde = model.estimate_effect(identified_estimand_nde,
>>>                                                 method_name="mediation.two_stage_r
>>>                                                 confidence_intervals=False,
>>>                                                 test_significance=False,
>>>                                                 method_params = {
>>>                                                   'first_stage_model': dowhy.causa
>>>                                                   'second_stage_model': dowhy.caus
>>>                                                 })
>>> print(causal_estimate_nde)
```

Related example notebooks

- Mediation analysis with DoWhy: Direct and Indirect Effects

Previous
Quantify Causal Influence

Next
Direct Effect: Quantifying Arrow Strength