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Mediation models

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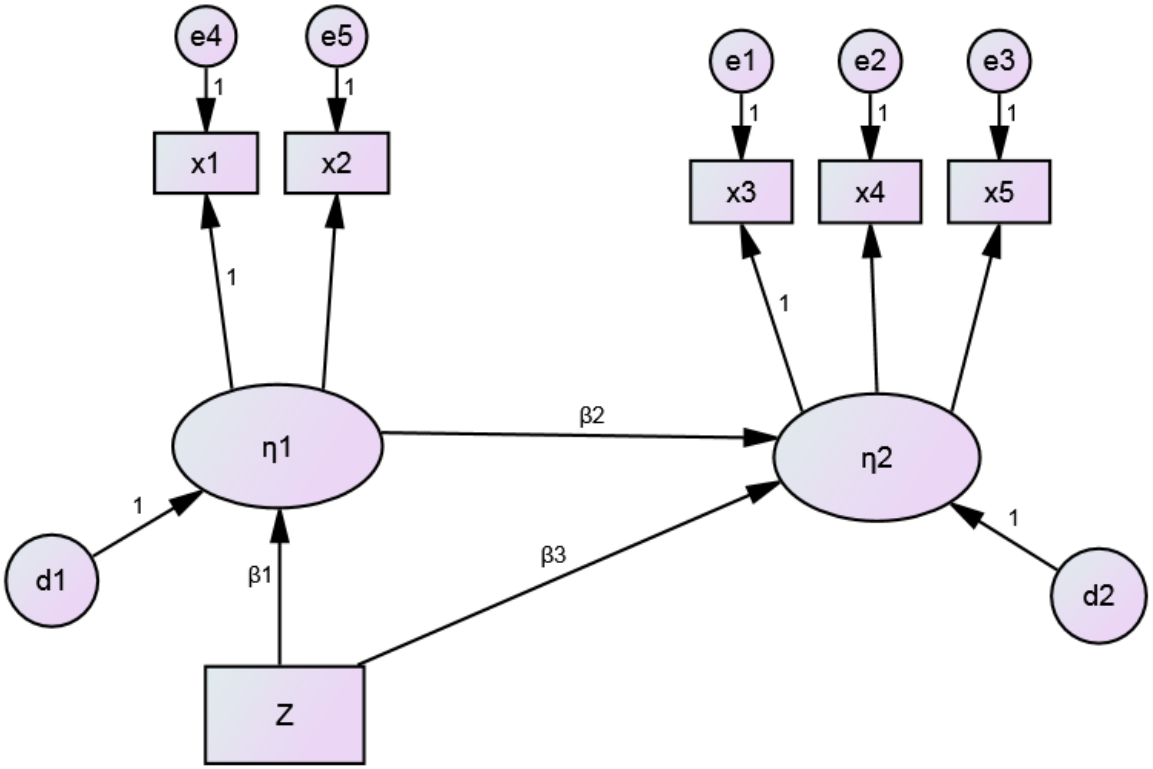
Direct, Indirect & Total Effects

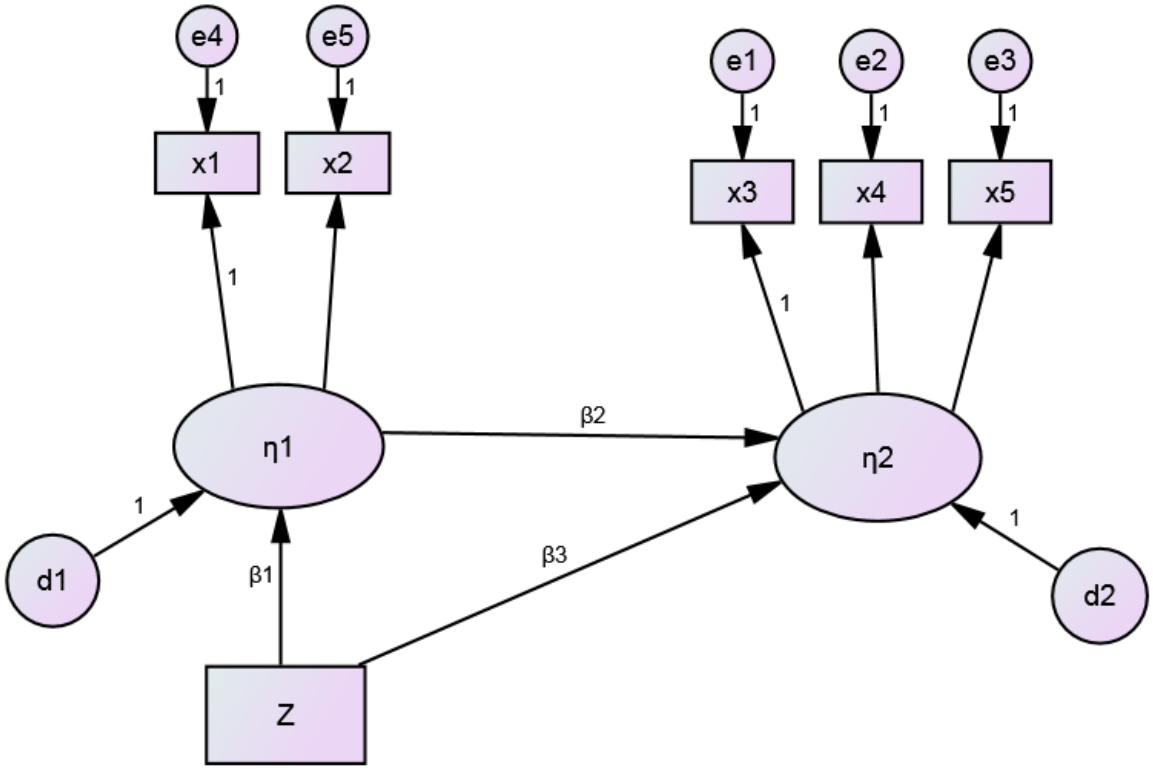
- OLS models yield direct effects of predictors
- Often, however, we are interested in indirect and total effects as well as direct effects
- E.g. gaining a degree increases earnings
  - Does it do this by increasing skills/productivity?
  - Or is it just a 'credential'?

Mediation Model



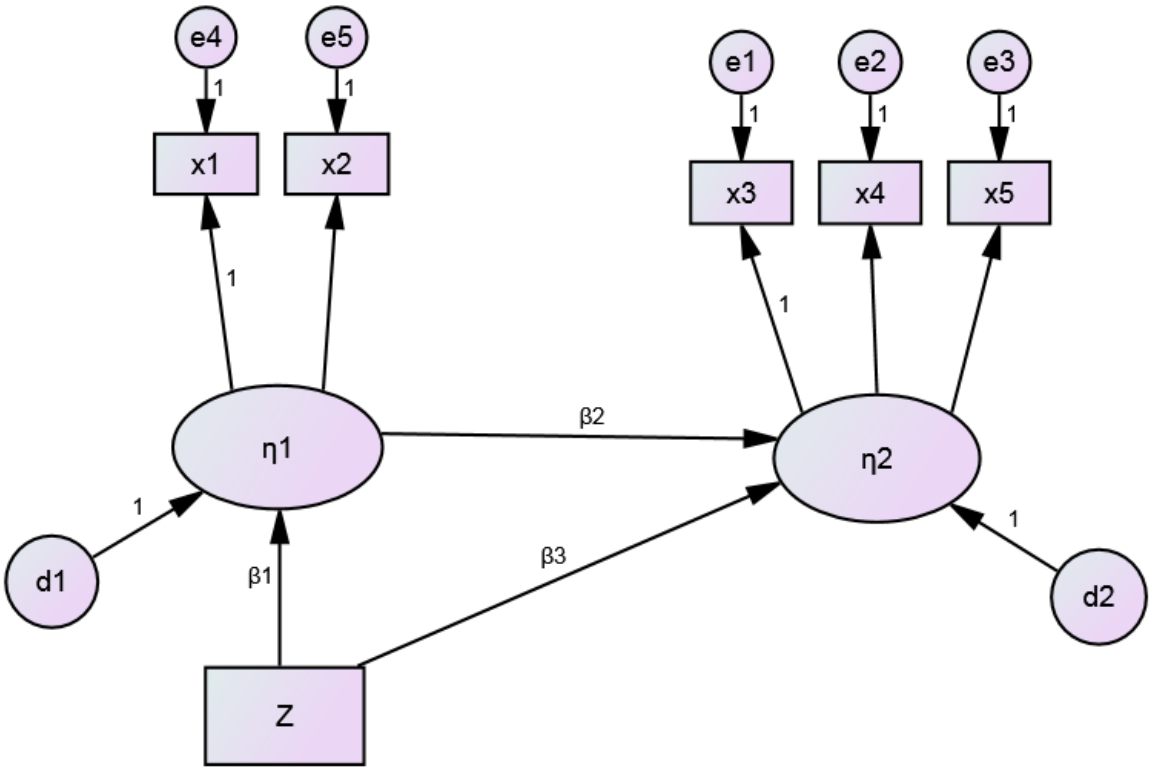
Direct effect of Z on $\eta_2 = \beta_3$

Mediation Model



Indirect effect of Z on $\eta_2 = \beta_1 * \beta_2$

Mediation Model



Perfect mediation when B3 non-significant after inclusion of eta1

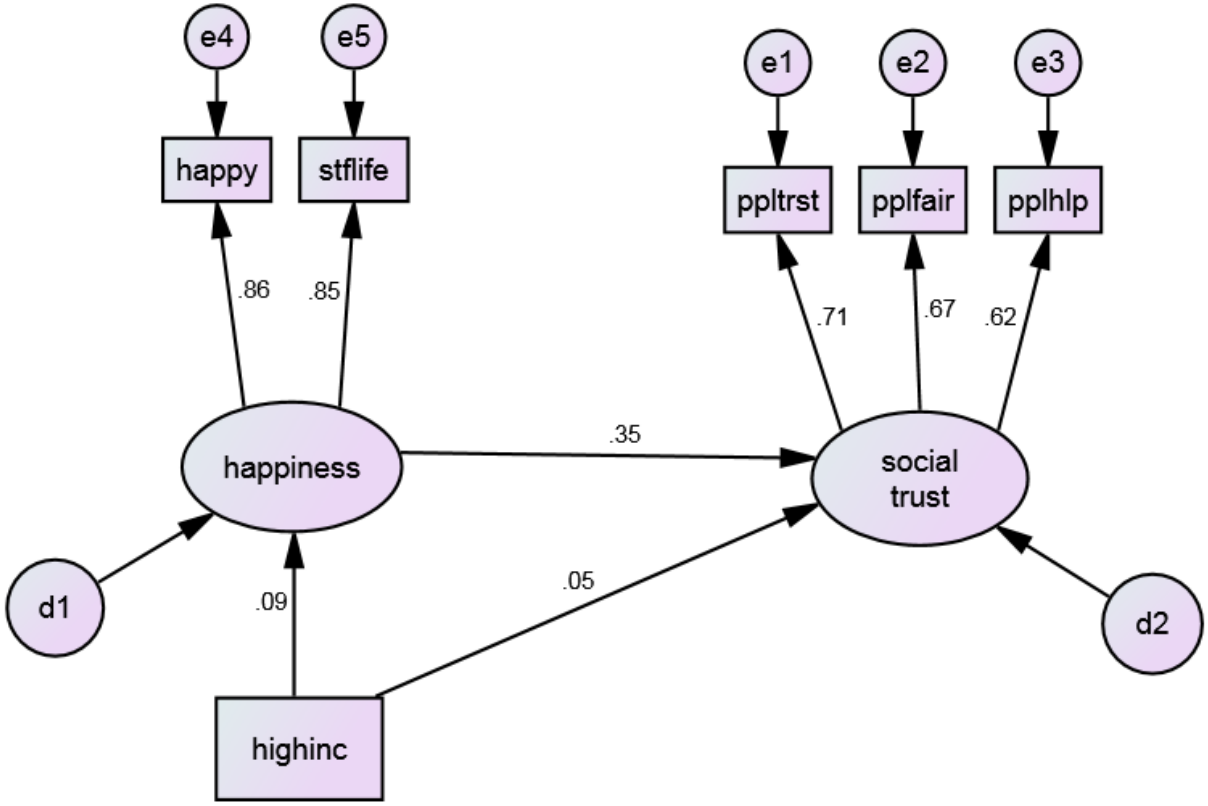
Partial mediation when B3 significantly lower after Inclusion of eta1

Total effect of Z on $\eta_2 = \beta_3 + (\beta_1 * \beta_2)$

standard errors for mediated paths

- Parametric approach is the ‘Delta method’
- Assumes normal coefficients
- Can also use non-parametric bootstrapping
- Resampling with replacement from sample data generates empirical sampling distribution
- Need to use raw data, not covariance matrix

Example: Income, trust, happiness



Chi2=6; df=7; p=.571;
RMSEA=0; CFI=1

Data: European Social Survey 2004, GB only

Indirect effects (standardised)

	highinc	happiness	social_trust
happiness	.000	.000	.000
social_trust	.032	.000	.000
stflife	.079	.000	.000
happy	.080	.000	.000
pplhlp	.050	.216	.000
pplfair	.054	.233	.000
ppltrst	.057	.245	.000

Indirect Effects - Two Tailed p values(BC)

	highinc	happiness	social_trust
happiness	...	...	...
social_trust	.004	...	...
stflife	.012	...	...
happy	.011	...	...
pplhlp	.019	.006	...
pplfair	.010	.010	...
ppltrst	.009	.005	...

New Approaches to Mediation

- The approach considered here is limited to continuous mediators
- Does not yield causal effect estimates, just decomposes covariances
- More recent approaches based on counter-factual/potential outcomes framework (Rubin 1978)
- G-computation (Muthen, 2011)

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