Introduction to structural equation modelling - advanced modelling techniques

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Overview

- Interactions

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- Latent variables

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- Composite variables

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- Complex survey designs

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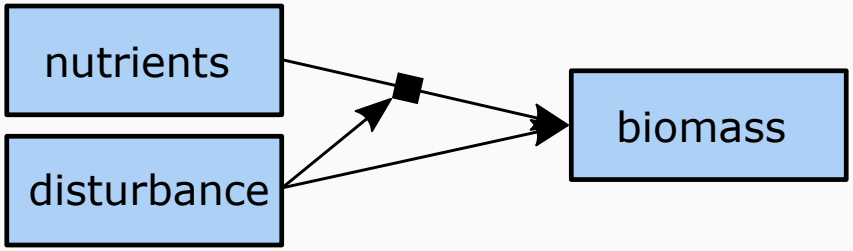
- Spatial autocorrelation

Interaction questions (Moderation)



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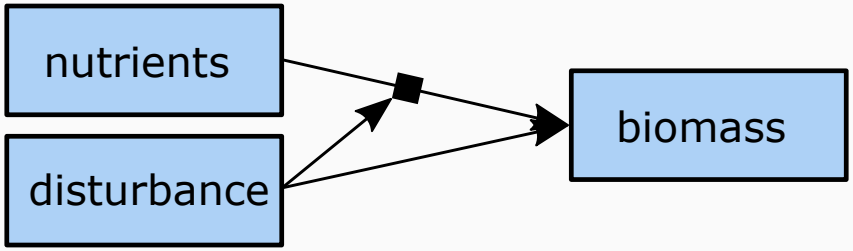

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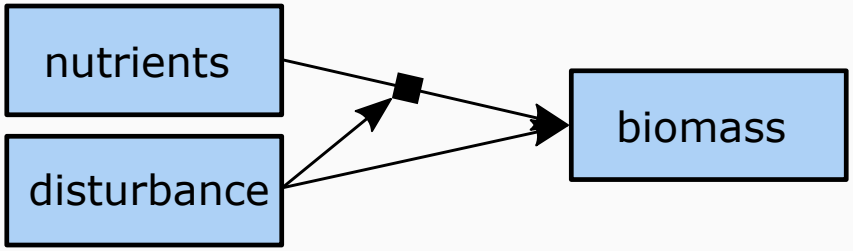

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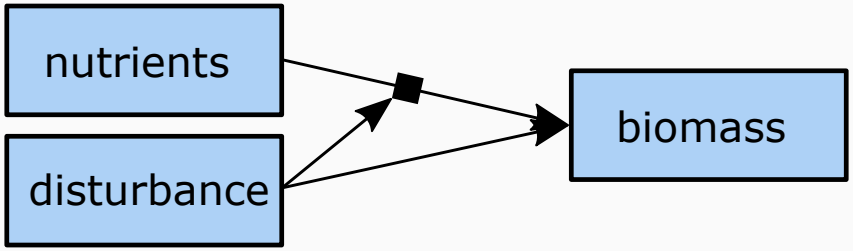

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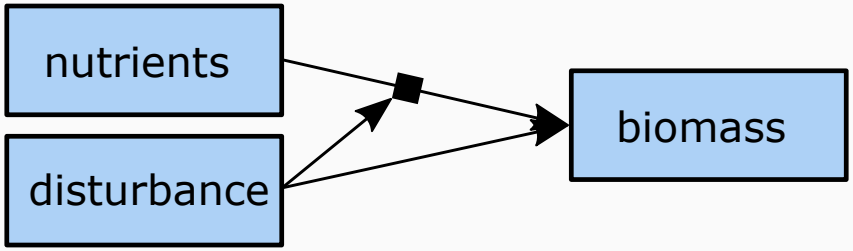

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- For instance, the effect of nutrients on plant growth, may depend on how disturbed the environment is.
- Such a behaviour is called an interaction, which indicates that the effect of the two main effects are different when combined.
- Both positive and negative interactions are possible.
- In regression, the interaction is represented by a coefficient that estimates the effect of the product of the two predictors.

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2) Composites

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- This allows coefficients to vary among groups.
- Lavaan offers the “group” argument to specify for which groups coefficients should be estimated.
- Importantly, groups have to be of categorical nature.

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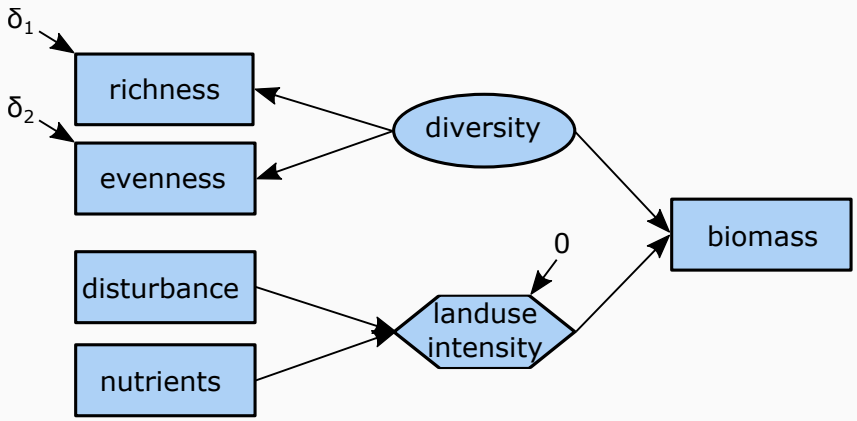
Interactions (Moderation)

- Lavaan allows to introduce equality constraints on various aspects via the `group.equal` argument:

```
mod <- sem(model, group = "age_class", group.equal =
c("regressions"), data = dd)

group.equal=c(
"intercepts",
"means",
"regressions",
"residuals",
"residual.covariances")
```

Latent variables



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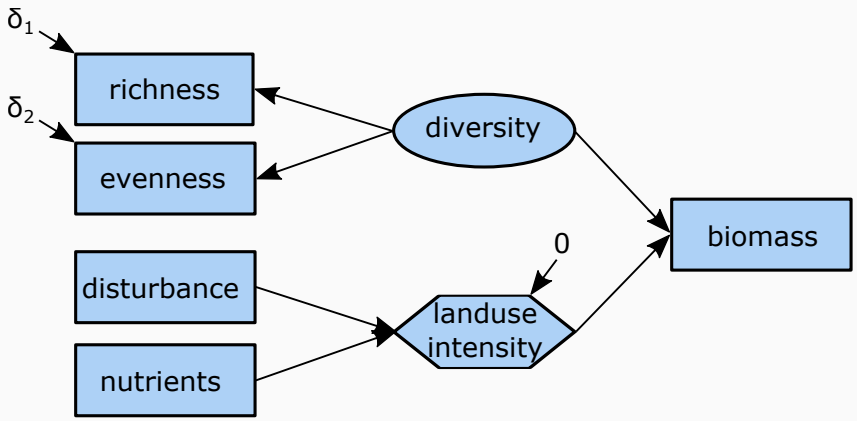

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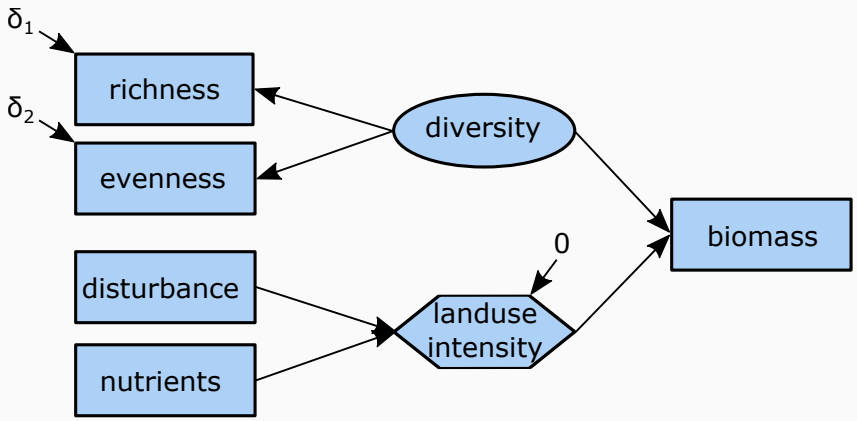

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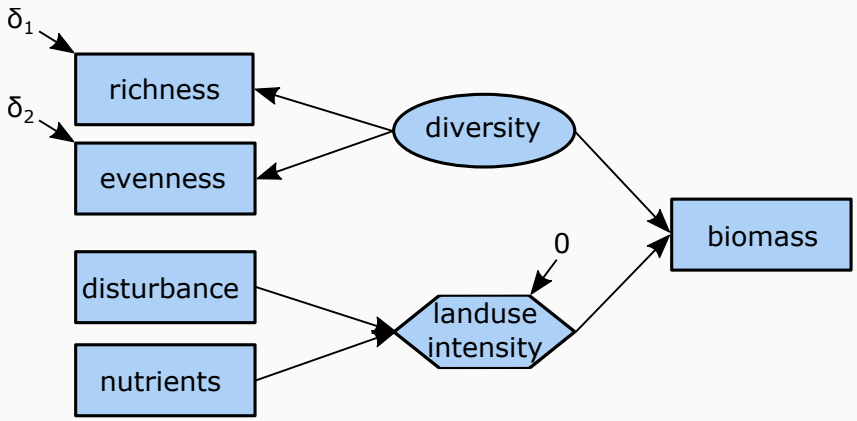

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- They are useful for capturing complex or conceptual properties of a system that are difficult to quantify or measure directly.
- First, the direction of causality is reversed from what you might expect: from the latent variables to the observed variable. This is because the indicator variable is an emergent manifestation of the

Composite variables

Composite variables specify the influences of collections of other variables (examples)