

Further Adventures in Statistical Modelling

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Unified Framework for Modelling

glm

- anova
- Linear regression
- Binary outcomes (logit)
- Categorical models
- Poisson regression
- Ordered categorical models

Radical Claim...

The glm is simply a special case of the glmm

Generalized Linear Mixed Model glmm

$$Y_i = \beta_0 + \beta_1 X_{1i} + \dots + \beta_k X_{ki} + u_i + \varepsilon_i$$

LHS = Right Hand Side + Error

The glmm

Unified modelling framework for analysing

1. Hierarchies & Clusters (e.g. multi-levels or geography)
2. Longitudinal data (e.g. panel models)
3. Frailty (e.g. unobservable effect)

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glmm

- Clustered data
- Hierarchical data structures
- Repeated contacts (panel)
- Frailty

Unified Framework for Modelling

glm

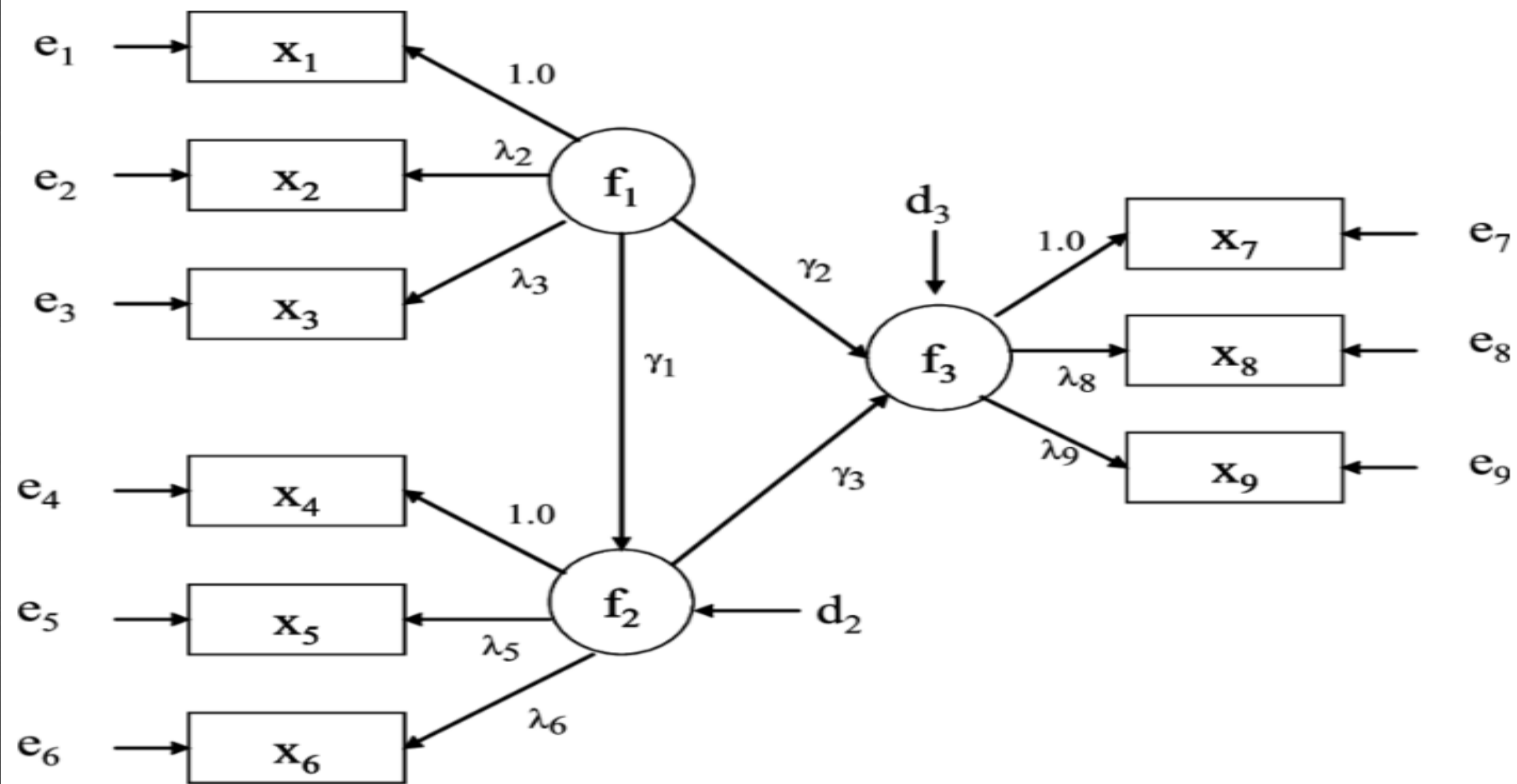
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- Factor analysis
- Latent variables
- Structural Equations



The path diagram for a structural equation model with three factors.

In Your Future Work

- Working with large-scale datasets
- Often nationally representative
- Frequently with complex designs and selection strategies
- Usually testing an idea (detailed empirical work)
- Tends to be a sophisticated description (i.e. a multivariate analysis) rather than an 'causal' analysis

- Data quality
- Appropriately representing survey design and selection
- Undertaking sensitivity analyses
- Thinking about the (potential) effects of missing data
- Maintaining a good workflow (e.g. with electronic research notebooks such as Jupyter)
- Duplicate; Replicate

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