GLM as a unified framework for data analysis

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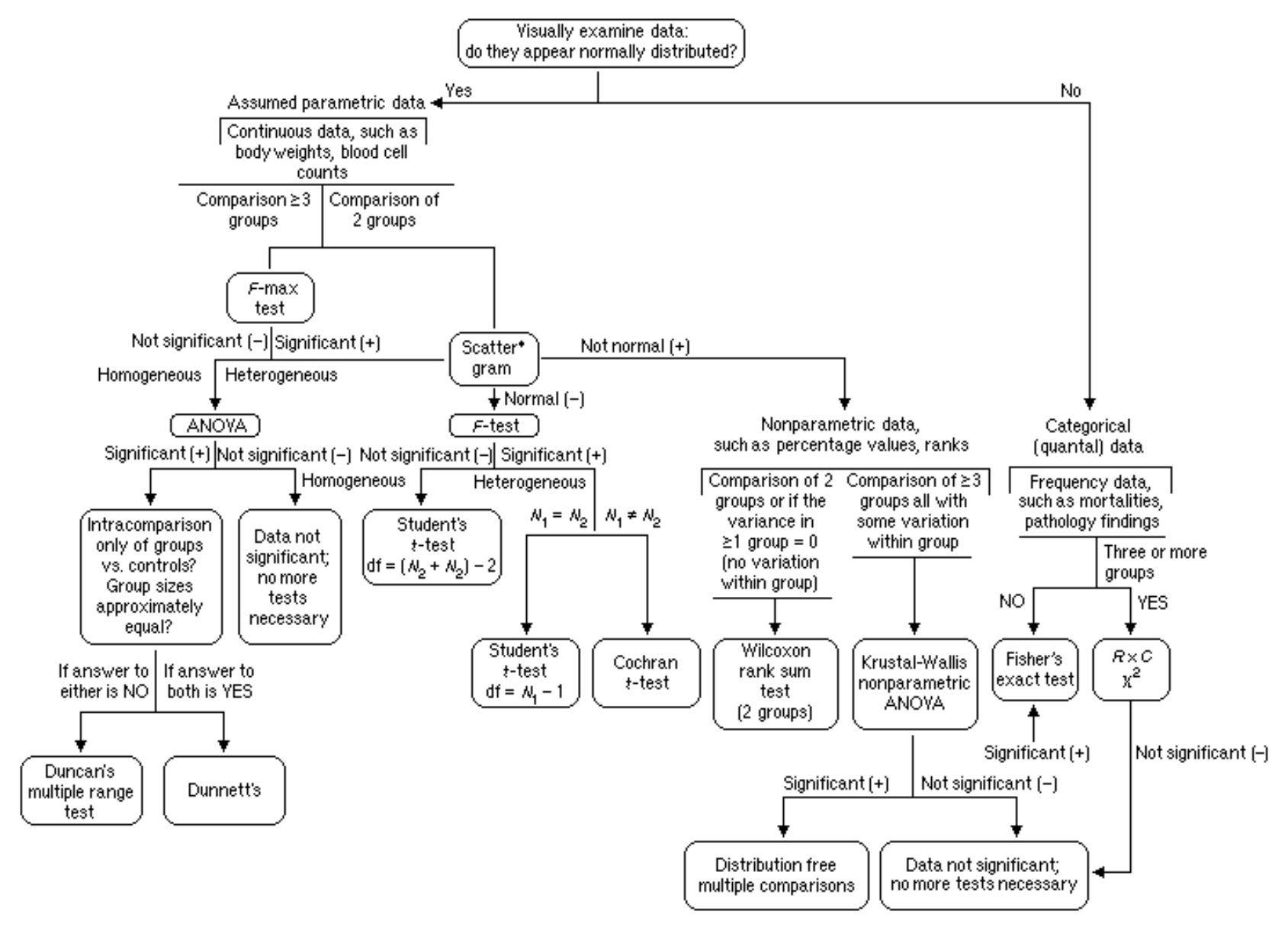
https://frodriguezsanchez.net

How I was taught statistics



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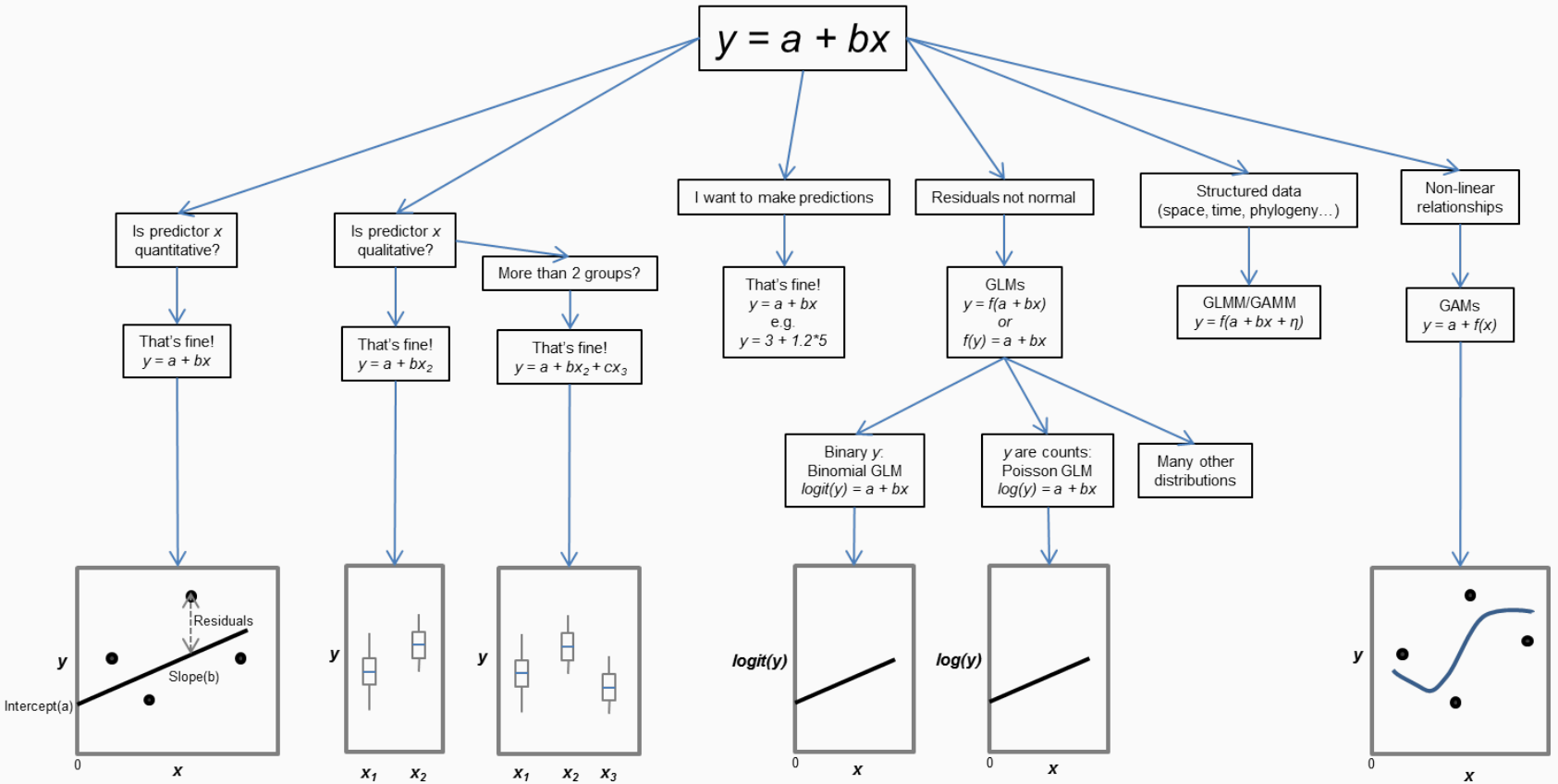
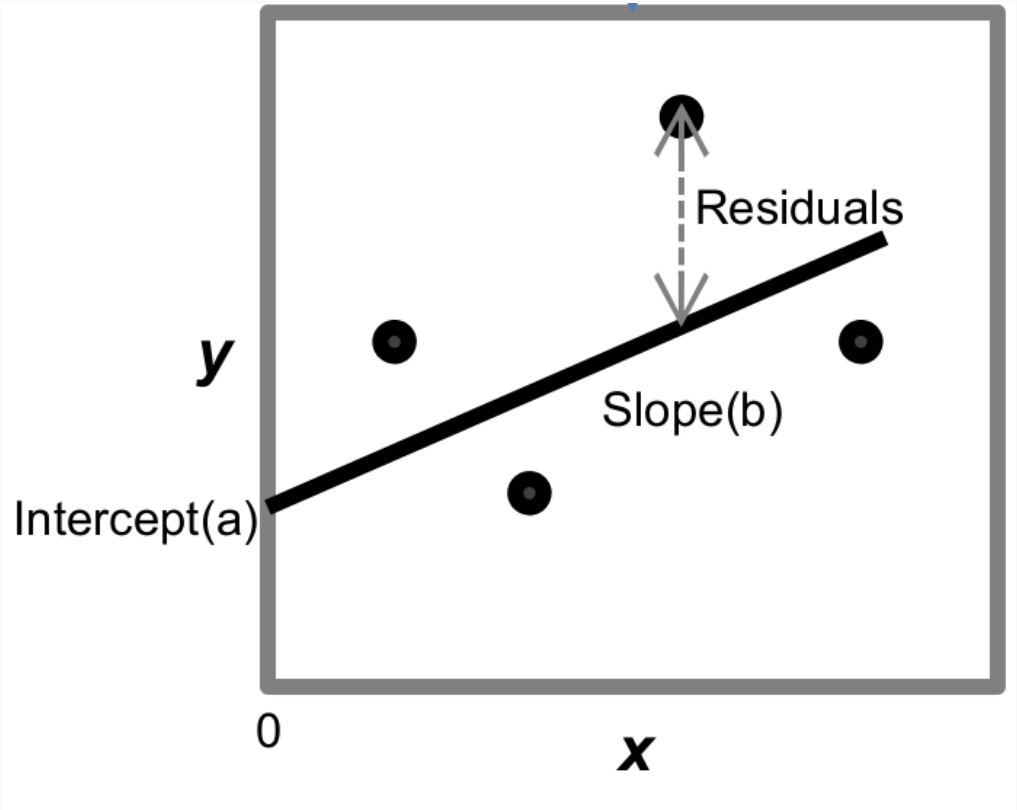
- Can I make **predictions**?

A unified framework



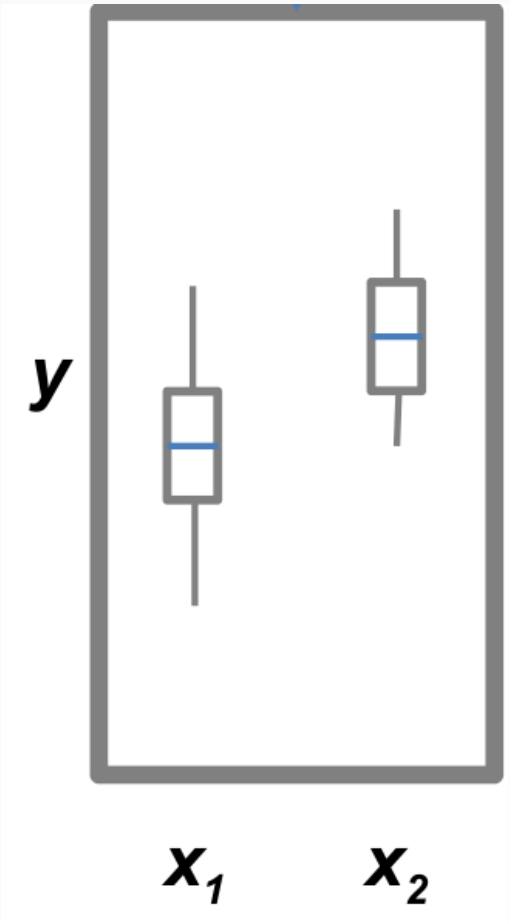
Linear regression

$$y = a + bx$$



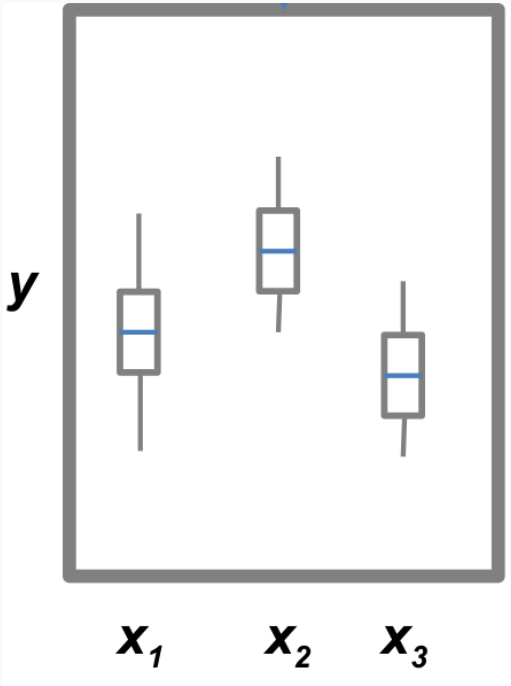
Is predictor X qualitative?

$$y = a + bx_2$$



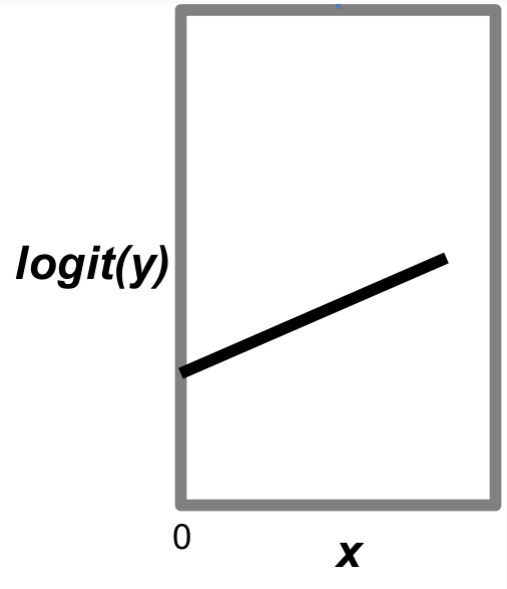
More than 2 groups?

$$y = a + bx_2 + cx_3$$



My data (residuals) are not Normal

$$y = f(a + bx)$$

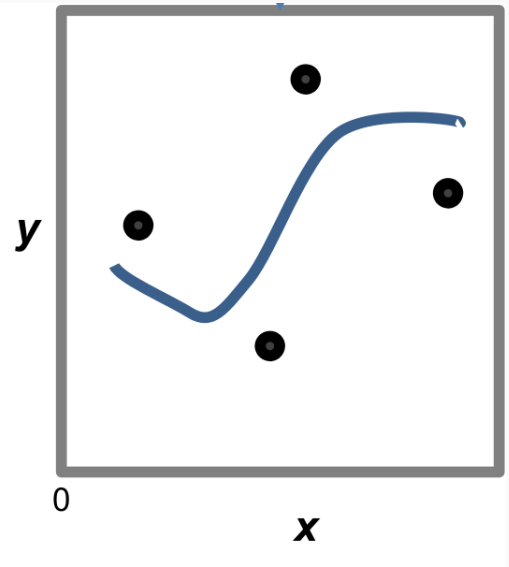


My data are structured (space, time, phylogeny)

$$y = f(a + bx + \eta)$$

Relationships are not linear

$$y = a + f(x)$$



t-tests

ANOVA

regression

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are special cases of GLM

With GLM we can analyse

many different types of data

using many predictors

(quantitative & qualitative)

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- **GLMM** (mixed models): accomodate data structure & variation (space, time, phylogeny)

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- **Model-based multivariate** statistics
- **Bayesian** modelling