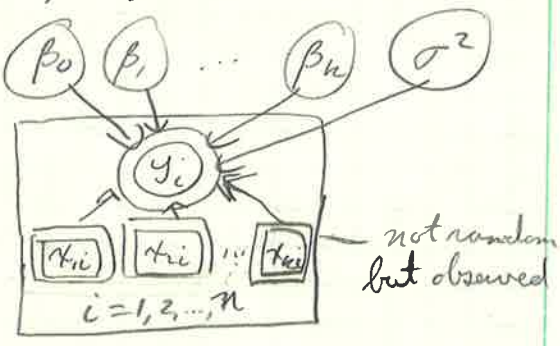
$$y_i = \underbrace{\beta_0 + \beta_1 x_{1i} + \cdots + \beta_k x_{ki}}_{\text{mean}} + \underbrace{\varepsilon_i}_{\text{error}}, \quad \varepsilon_i \overset{iid}{\sim} N(0, \sigma^2), \; i = 1, \ldots, n$$

$$y_i \mid \underset{\sim}{x}_i, \underset{\sim}{\beta}, \sigma^2 \overset{ind}{\sim} N(\beta_0 + \beta_1 x_{1i} + \cdots + \beta_k x_{ki}, \sigma^2)$$



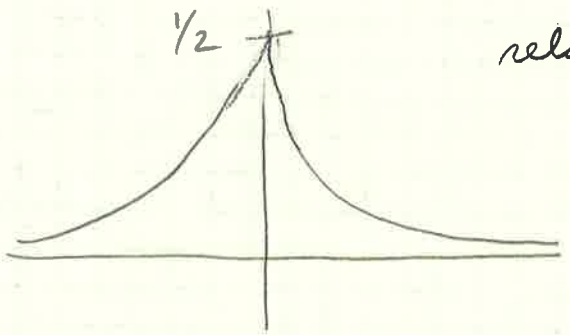
$\beta_0 \sim p(\beta_0)$, $\beta_1 \sim p(\beta_1)$, ...

$\sigma^2 \sim p(\sigma^2)$ (maybe IG)

usually normal or multivariate normal

Laplace prior

$$p(\beta) = \frac{1}{2} e^{-|\beta|}$$



related to the LASSO

Factors:	sound	font size
Levels	music no music	small medium large

g_i ~ group of subject i

$\underset{\sim}{\mu}$ ~ vector of G group means

$$y_i \mid g_i, \underset{\sim}{\mu}, \sigma^2 \overset{ind}{\sim} N(\mu_{g_i}, \sigma^2)$$

$$g_i \in \{1, \ldots, G\} \quad , i = 1, \ldots, n$$

Alternative

$$E(y_i) = \beta_0 + \beta_1 \underset{I(g_i=1)}{x_{1,i}} + \cdots + \beta_{G-1} \underset{I(g_i=G-1)}{x_{G-1,i}}$$

x's are indicators or dummy variables

		B = 1	B = 2	B = 3
A	1	$\mu_{1,1}$	$\mu_{1,2}$	$\mu_{1,3}$
	2	$\mu_{2,1}$	$\mu_{2,2}$	$\mu_{2,3}$

A, B ~ Factors

6 treatment groups

Additive model: (good for no interactions between factors)

$$E(y_i) = \mu + \alpha_2 I(a_i = 2) + \beta_2 I(b_i = 2) + \beta_3 I(b_i = 3)$$

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