$$\Pr(\alpha, \beta, \sigma | H_i, W_i) = \frac{\Pr(W_i | H_i, \alpha, \beta, \sigma) \Pr(\alpha, \beta, \sigma)}{Z}$$

$$W_i \sim \text{Normal}(\mu_i, \sigma)$$

$$\mu_i = \alpha + \beta H_i$$

W is distributed normally with mean that is a linear function of H