THE KEY ASSUMPTIONS:

(i) $E_{out}(\underbrace{h_g}_{(h_g)}) \leq E_{\mathcal{D}_0} + \underbrace{\sqrt{\frac{8}{N}\ln\frac{4[(2N)^{d_{VC}}+1]}{\delta}}}_{\text{BASED ON } \mathcal{H}_0.}$

ASSUMES:

1. $\mathcal{D}_0$ AND $\mathcal{H}_0$ MUST BE CONSISTENT.*
2. INFO. IN $\mathcal{D}_0$ CAN'T BE USED TO CONSTRUCT $\mathcal{H}_0$.
3. $N = N_{\mathcal{D}_0}$.

(ii) $E_{out}(h_g) \leq E_{Test}(h_g) + \sqrt{\frac{1}{2N}\ln\frac{2M}{\delta}}$,

$M = 1$.

ASSUME:

1. INFO. IN $\mathcal{D}_{Test}$ CAN'T INFLUENCE CHOICE OF h_g.
2. $N \cong N_{Test}$.

(MORE ON $\mathcal{D}_{Val}$, MODEL SELECTION, DATASET USAGE, LATER).

* I.E., $\mathcal{D}_0$ IS USED TO CHOOSE h_g OUT OF $\mathcal{H}_0$.