Model: Rank-2 RNN

$$I = c_A I^A + c_B I^B + \gamma_A I_{ctx,A} + \gamma_B I_{ctx,B}$$

$$c_A, c_B \in [[0,1],[1,0]] \quad \gamma_A, \gamma_B \in [[\gamma_{LO}, \gamma_{HI}], [\gamma_{HI}, \gamma_{LO}]]$$

$$m^{(1)} = y_A + \rho_m I_{ctx,A} + \beta_m w$$

$$n^{(1)} = y_B + \rho_n I_{ctx,A} + \beta_n w \qquad y_A, y_B, I^A, I^B \sim \mathcal{N}(0, 1.2)$$

$$m^{(2)} = y_A + \rho_m I_{ctx,B} + \beta_m w \quad I_{ctx,A}, I_{ctx,B} \sim \mathcal{N}(0, 1.0)$$

$$n^{(2)} = y_B + \rho_n I_{ctx,B} + \beta_n w$$

Behavior: Context dep. discrimination

$$y = \beta_m(\kappa_1 + \kappa_2)\langle[\phi_i']\rangle \quad f_{CDD,A}(z) = y_{ctxA,A} - y_{ctxA,B}$$

$$f_{CDD,B}(z) = y_{ctxB,B} - y_{ctxB,A}$$

$$E\begin{bmatrix} f_{CDD,A}(z) \\ f_{CDD,B}(z) \end{bmatrix} = \begin{bmatrix} 0.3 \\ 0.3 \end{bmatrix} \quad Var\left(\begin{bmatrix} f_{CDD,A}(z) \\ f_{CDD,B}(z) \end{bmatrix}\right) = \begin{bmatrix} .001 \\ .001 \end{bmatrix}$$

DSN:

$$z = \begin{bmatrix} g \\ \rho_m \\ \rho_n \\ \beta_m \\ \beta_n \\ \gamma_{LO} \\ \gamma_{HI} \end{bmatrix}$$