# Perturbed Foosball

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There are certain things you simply don't do with an $n\times n$ matrix..."

"Just say No" $\longrightarrow$ "Just do it"

"bound variable" "free variable"

$$y_i=\sum a_{ij}x_j$$

| $\omega$ | $a$ | $S$ |
|---|---|---|
| $a$ | $\alpha$ | $\theta$ |
| $S$ | $\phi$ | $\Xi$ |

$\xrightarrow{dS^a}$

| $\alpha\omega/\sigma_a$ | $a$ | $S$ |
|---|---|---|
| $a$ | $1/\alpha$ | $\theta/\alpha$ |
| $S$ | $-\phi/\alpha$ | $(\alpha\Xi-\phi\theta)/\alpha$ |

$_{T_a\to T_a^{-1}}$

$$y_l=\alpha x_l+\theta x_r \qquad x_l=\frac{1}{\alpha}(y_l-\theta x_r)$$

$$y_r=\phi x_l+\Xi x_r \qquad y_r=\frac{\phi}{\alpha}y_l+\left(\Xi-\frac{\phi\theta}{\alpha}\right)x_r$$