

- If we know nothing about a source variable X except for $p(x)$, then \hat{x}^* is the best estimate of X , and D_{max} is the **minimum expected distortion** between X and a constant estimate of X .
- Specifically, by taking $\hat{\mathbf{x}}^* = (\hat{x}^*, \hat{x}^*, \dots, \hat{x}^*)$ to be the reproduction sequence, D_{max} can be asymptotically achieved, because by WLLN,

$$d(\mathbf{X}, \hat{\mathbf{x}}^*) = \frac{1}{n} \sum_{k=1}^n d(X_k, \hat{x}^*) \rightarrow Ed(X, \hat{x}^*) = D_{max}$$

- Therefore it is not meaningful to impose a constraint $D \geq D_{max}$ on the reproduction sequence.