ex: children in household

$$\sum_x h(x)\,p(x)$$

$X \sim p(X) = 1/2$

random variable output options: 1, 2

$E(X^2)$? $= E(h(X))$

$h(1) \cdot p(1) + h(2) \cdot p(2)$

$1 \cdot 1/2 + 4 \cdot 1/2 = 5/2$

$E(X) = \sum x\,p(x) = 1 \cdot 1/2 + 2 \cdot 1/2 = 3/2$

$(E(X))^2 = 9/4$

$E(X^2) \neq (E(X))^2$

except h = linear

sums respect linear