$$Z_i = 0$$
 (true absence) with probability $1 - \psi$
 $Z_i = 1$ (true presence) with probability ψ

$$|| If Z_i = 0 || If Z_i = 1$$

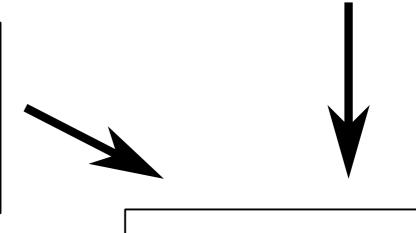
Paranthropus sampling probability at site *i* is zero $(p_i = 0)$



recovered Paranthropus specimens at site *i* is zero $(X_i = 0)$

Paranthropus sampling probability at site *i* distributed following monotonic, one-parameter beta distribution w/ shape parameter 🔥 (mean $p_i > 0$)

Observed total # mammal fossil specimens at site i (n_i)



recovered Paranthropus specimens at site *i* ≥ zero $(X_i \geq 0)$

absent from site i

Paranthropus was truly: Paranthropus was present at site i but may not have been sampled yet