







► The goal of MCMC is to construct a  $\pi$ -stationary Markov chain  $X_t$  initialised as  $X_0 \sim \mu$  satisfies the ergodic theorem and CLT



- Given a budget of  $T$  iterations decompose as tuning and sampling budget:

$$T = T_{\text{tune}} + T_{\text{sample}}$$

→ **soft** to **hard** **perceivable** **changes** **in** **parameters** **of** **sound**

→ Typical isoscarf thicknesses

Run long enough to forget the initial distribution  $\mu$  and exceed a  $\min$



it's not to go into detail for half the audience.

- ▶ Run long enough to achieve a target ESS or until estimates stabilise

$$T_{\text{ESS}}[f] = \frac{T_{\text{sample}}}{\tau_{\text{corr}}[f]}$$

- ▶ The goal of MCMC is to construct a  $\pi$ -stationary Markov chain  $X_t$  initialised as  $X_0 \sim \mu$  satisfies the ergodic theorem and CLT
- ▶ Given a budget of  $T$  iterations decompose as tuning and sampling budget:

$$T = T_{\text{tune}} + T_{\text{sample}}$$

- ▶ It's not uncommon for half the budget to go into tuning
- ▶ **Tuning phase (aka burn-in):**
  - ▶ Run long enough to forget the initial distribution  $\mu$  and exceed  $\tau_{\text{mix}}(\epsilon)$
  - ▶ Used to tune hyper parameters of chain
  - ▶ Typically discard these samples
- ▶ **Sampling phase:**
  - ▶ Run long enough to achieve a target ESS or until estimates stabilise

$$T_{\text{ESS}}[f] = \frac{T_{\text{sample}}}{\tau_{\text{corr}}[f]}$$

