STATISTICAL MODEL WITHOUT THE CONFOUNDER Z

Math

$$y \sim Normal(\mu, \sigma)$$

$$\mu = a + bx$$

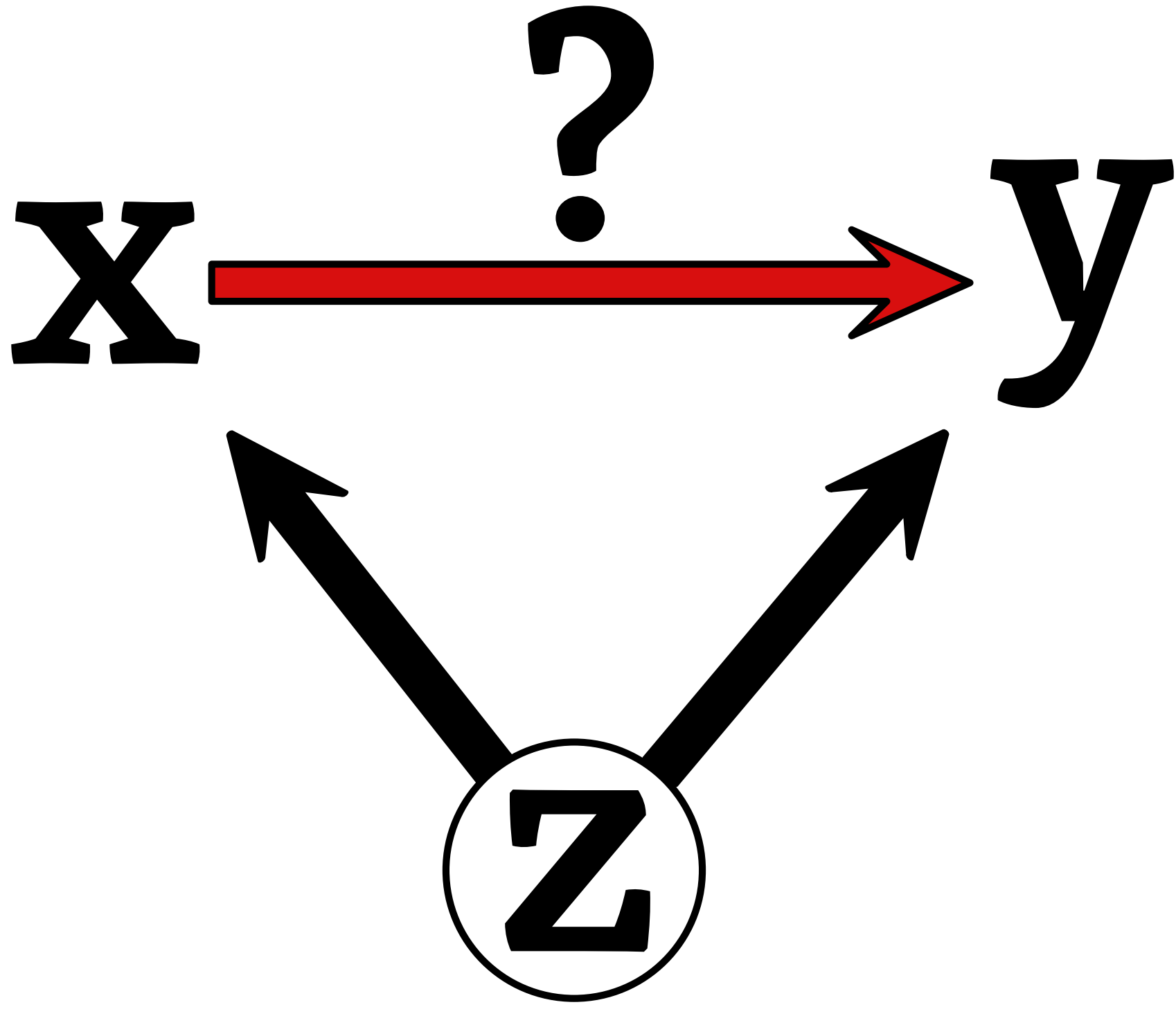
$$a \sim Normal(0,0.3)$$

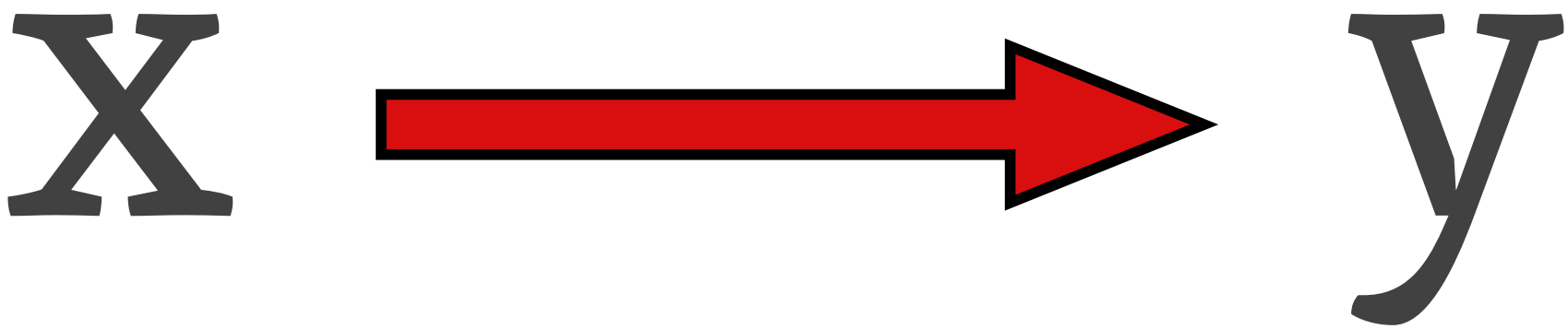
$$b \sim Normal(0,0.3)$$

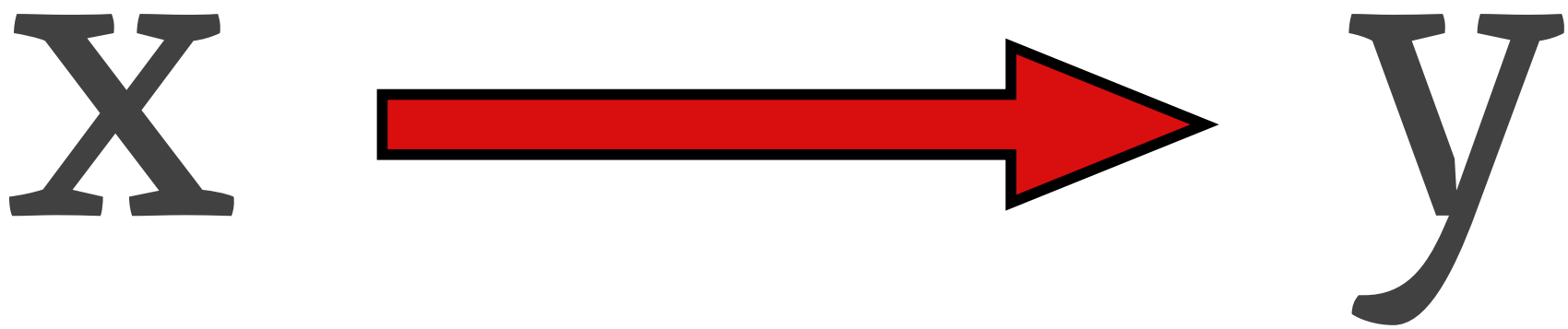
$$\sigma \sim Exponential(1)$$

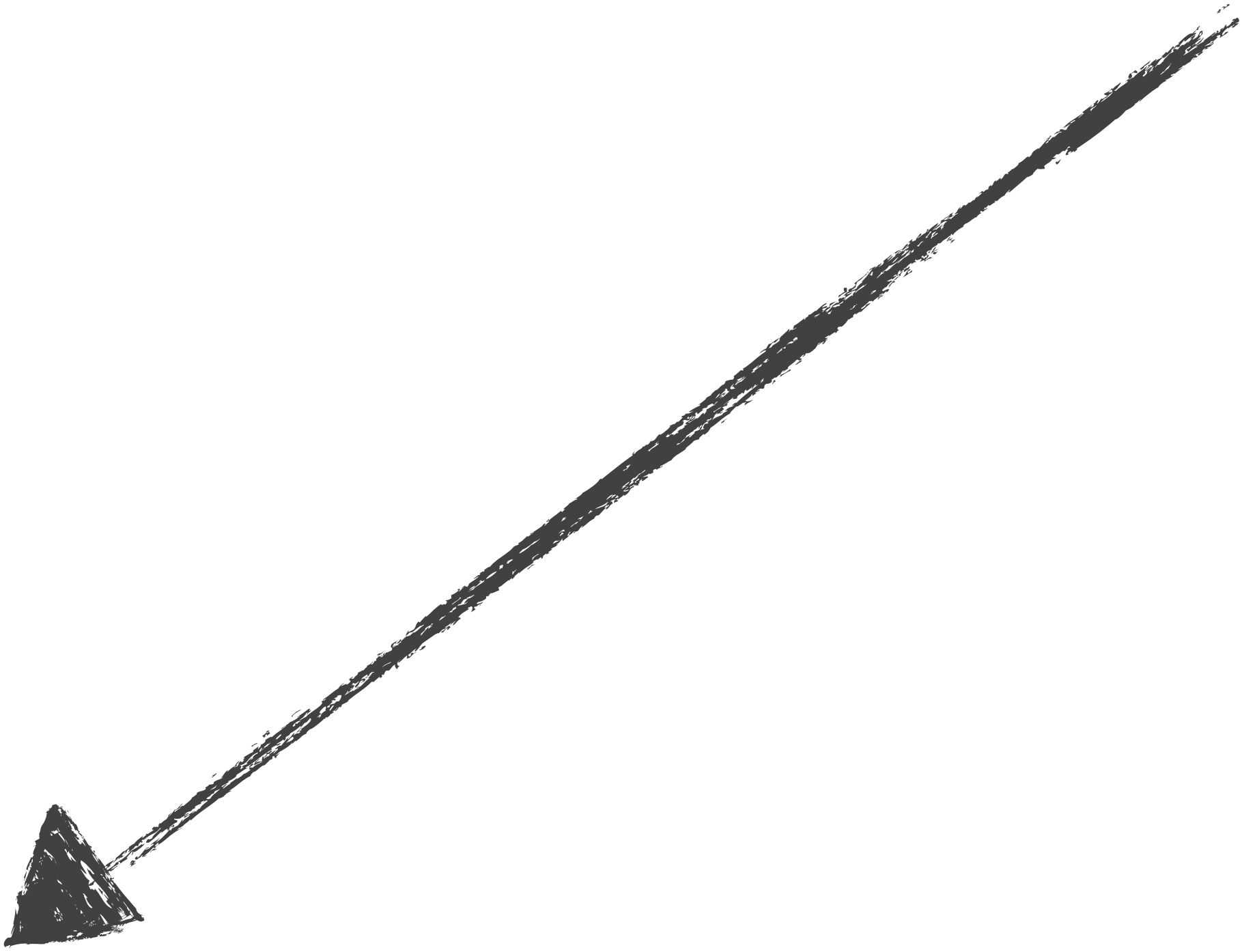
Rethinking Code

```
m1 = ulam(alist(
      y ~ normal(mu, sigma),
      mu = a + bx*x,
      a ~ normal(0, 0.3),
      bx ~ normal(0, 0.3),
      sigma ~ exponential(1)
), data = list(y = y, x = x))
```

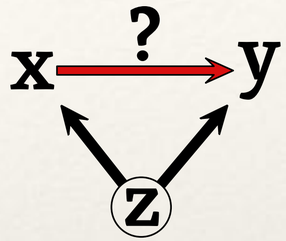

?
x
y
z


x
y


x
y



STATISTICAL MODEL WITHOUT THE CONFOUNDER Z



Math

x → y

$$y \sim Normal(\mu, \sigma)$$
$$\mu = a + bx$$
$$a \sim Normal(0,0.3)$$
$$b \sim Normal(0,0.3)$$
$$\sigma \sim Exponential(1)$$

Rethinking Code

x → y

```
m1 = ulam(alist(
    y ~ normal(mu, sigma),
    mu = a + bx*x,
    a ~ normal(0, 0.3),
    bx ~ normal(0, 0.3),
    sigma ~ exponential(1)
), data = list(y = y, x = x))
```

MODEL ESTIMATES WITHOUT THE CONFOUNDER

```
> precis(m1)
       mean   sd 5.5% 94.5% n_eff Rhat4
a      0.54 0.14 0.32  0.77  1274     1
bx     1.47 0.08 1.34  1.60  1432     1  # Estimate of the effect of x on y
sigma  1.33 0.10 1.19  1.49  1418     1
```