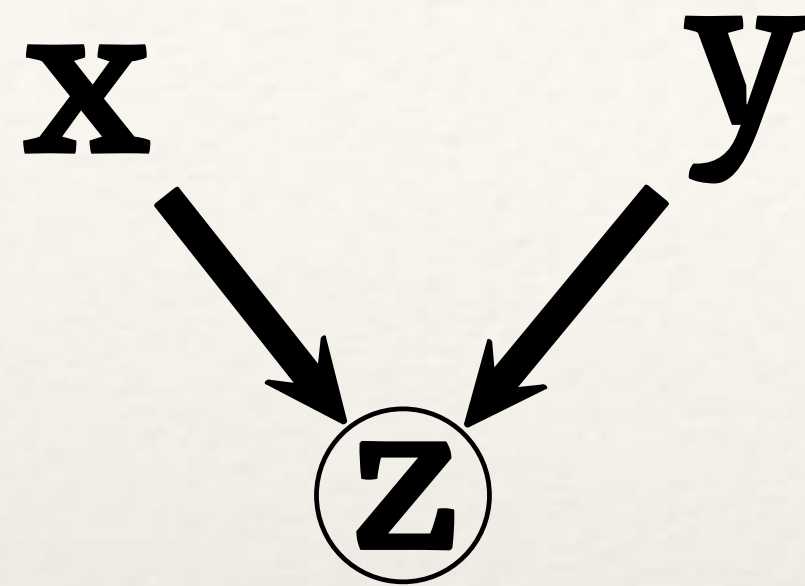
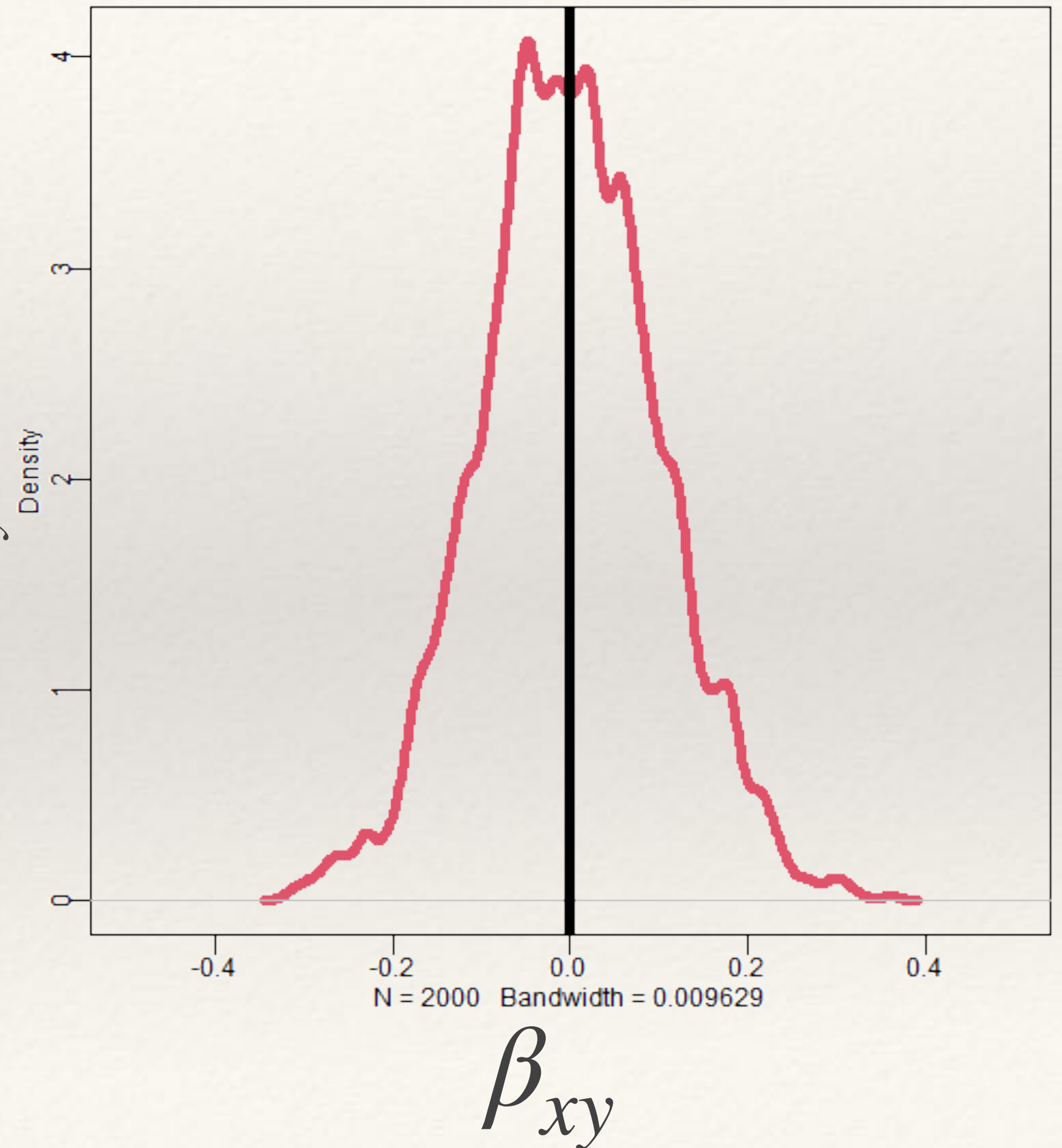


EFFECT OF X ON Y WITHOUT THE COLLIDER

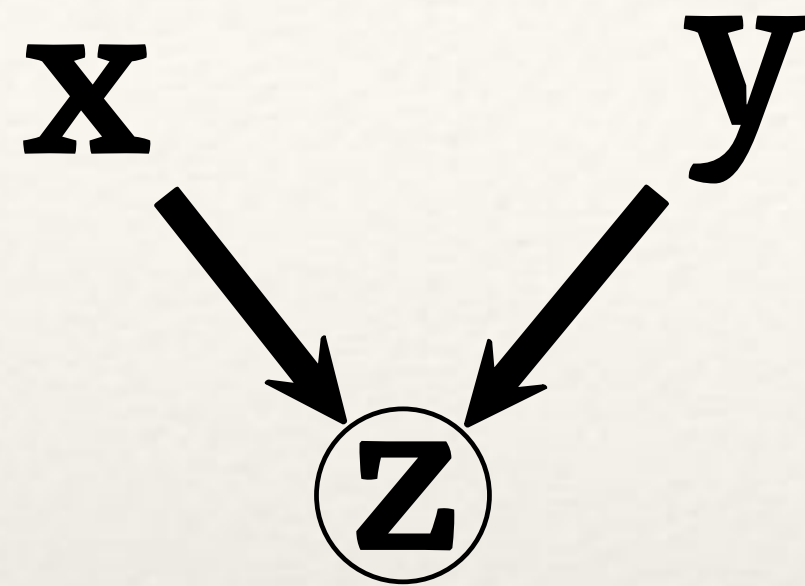


```
m1 = ulam(alist(  
  y ~ normal(a + bx*x, sigma),  
  a ~ normal(0, 0.3),  
  bx ~ normal(0, 0.3),  
  sigma ~ exponential(1)),  
  data = list(y = y, x = x),  
  iter = 1000, chains = 4, cores = 4)
```

$P(\beta_{xy} | x, y)$



EFFECT OF X ON Y WITH THE COLLIDER



```
m2 = ulam(alist(  
  y ~ normal(a + bx*x + bz*z, sigma),  
  a ~ normal(0, 0.3),  
  bx ~ normal(0, 0.3),  
  bz ~ normal(0, 0.3), # Collider  
  sigma ~ exponential(1)),  
  data = list(y = y, x = x, z = z),  
  iter = 1000, chains = 4, cores = 4)
```

