# Chimpanzees

*Stat 341 — Spring 2017*

*April, 2017*

## Chimpanzees

```
library(rethinking)
data(chimpanzees)
Chimps <- chimpanzees %>%
  select(- recipient) %>%   # to avoid missing data when making Stan models
  mutate(
    combo = paste0(prosoc_left, "/", condition))  # useful for plotting
head(Chimps)
```

```
##   actor condition block trial prosoc_left chose_prosoc pulled_left combo
## 1     1         0     1     2           0            1           0   0/0
## 2     1         0     1     4           0            0           1   0/0
## 3     1         0     1     6           1            0           0   1/0
## 4     1         0     1     8           0            1           0   0/0
## 5     1         0     1    10           1            1           1   1/0
## 6     1         0     1    12           1            1           1   1/0
```

### Five models

#### m10.1

```
m10.1 <-
  map(
    alist(pulled_left ~ dbinom(1, p),
          logit(p) <- a,
          a ~ dnorm(0, 10)),
    data = Chimps)
```

#### m10.2

```
m10.2 <-
  map(
    alist(
      pulled_left ~ dbinom(1, p),
      logit(p) <- a + bp * prosoc_left,
      a ~ dnorm(0, 10),
      bp ~ dnorm(0, 10)
    ),
    data = Chimps)
```

#### m10.3

```
m10.3 <-
  map(
    alist(
```

```
    pulled_left ~ dbinom(1, p),
    logit(p) <- a + (bp + bpC * condition) * prosoc_left,
    a ~ dnorm(0, 10),
    bp ~ dnorm(0, 10),
    bpC ~ dnorm(0, 10)
  ),
  data = Chimps)
```

**m10.4**

```
m10.4 <- map2stan(
  alist(
    pulled_left ~ dbinom(1, p),
    logit(p) <- a[actor] + (bp + bpC * condition) * prosoc_left,
    a[actor] ~ dnorm(0, 10),
    bp ~ dnorm(0, 10),
    bpC ~ dnorm(0, 10)
  ),
  data = Chimps,
  chains = 2, iter = 2500, warmup = 500, refresh = 0
)
```

**m12.4**

```
m12.4 <- map2stan(
  alist(
    pulled_left ~ dbinom(1, p),
    logit(p) <-
      a + a_actor[actor] + (bp + bpC * condition) * prosoc_left,
    a_actor[actor] ~ dnorm(0, sigma_actor),
    a ~ dnorm(0, 10),
    bp ~ dnorm(0, 10),
    bpC ~ dnorm(0, 10),
    sigma_actor ~ dcauchy(0, 1)
  ),
  data = Chimps,
  warmup = 1000, iter = 5000,
  chains = 4, cores = 3, refresh = 0
)
```