

# BCb Analysis- Early March

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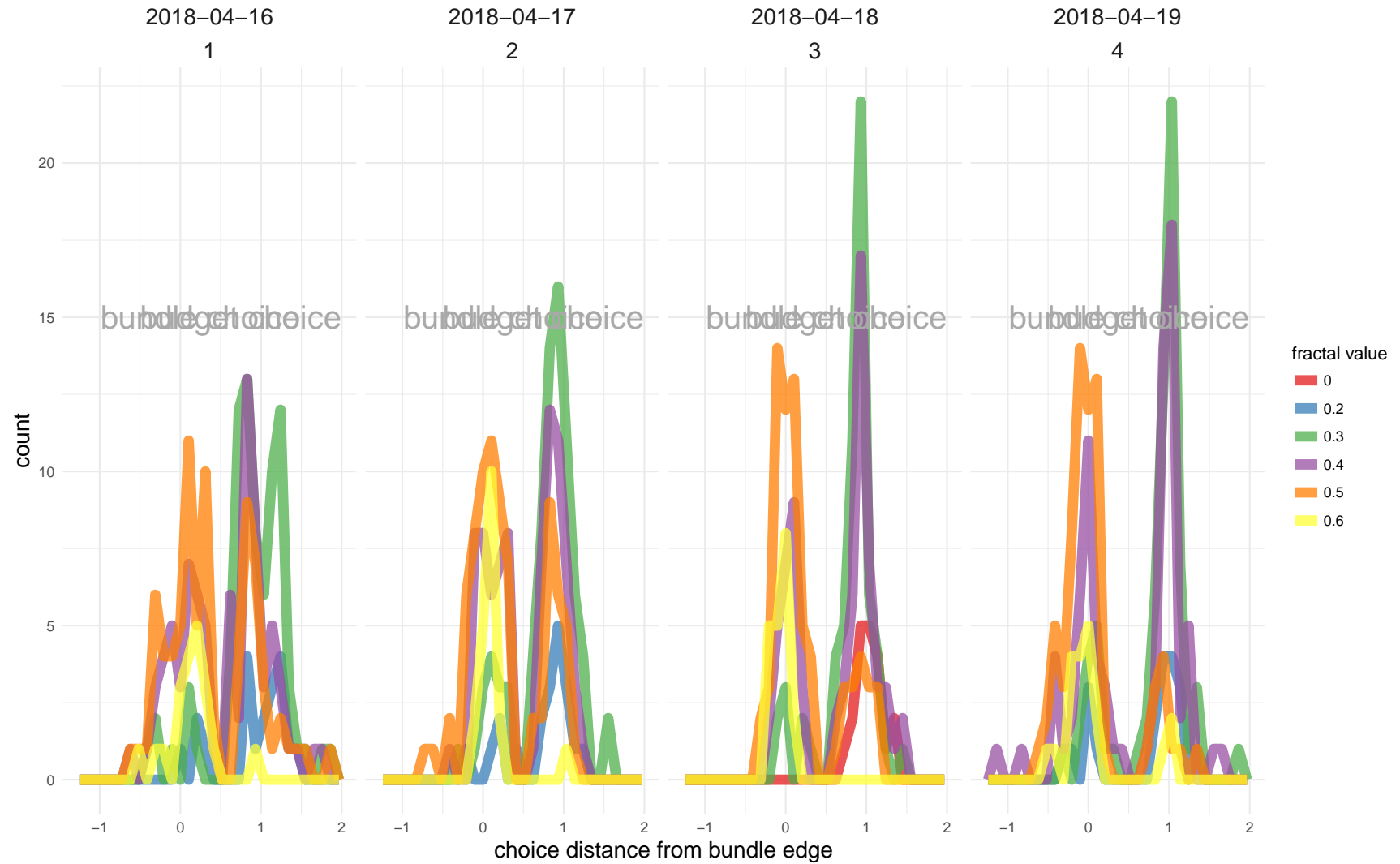
*05 April 2018*

```
monkey <- "Ulysses"  
today <- "19-Apr-2018"  
look_back <- "16-Apr-2018"  
  
start_trial <- 0  
stop_trial <- 160  
  
merge_days <- TRUE
```

p1

# Monkey Choice Distance From Bundle on Binary Choice Task

Ulysses : 16-Apr-2018 – 19-Apr-2018



# Monkey Choice Distance From Bundle on Binary Choice Task

Ulysses : 16-Apr-2018 – 19-Apr-2018



```

#generate a model of likelihood to choice for the fractal dependent on it's position,
#value and associated water
model <- glm(data = task_data,
             fractal_choice ~ bundle_position + water_offered + juice_offered + trial + date,
             family = "binomial")

#summarise the parameters
summary(model)

```

```

##
## Call:
## glm(formula = fractal_choice ~ bundle_position + water_offered +
##      juice_offered + trial + date, family = "binomial", data = task_data)
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.7792  -0.5385  -0.0830   0.5132   3.3395
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)  -4.562e+03  1.419e+03  -3.216  0.00130 **
## bundle_position  1.667e+00  1.949e-01   8.551  < 2e-16 ***
## water_offered   4.897e+00  3.526e-01  13.888  < 2e-16 ***
## juice_offered   1.811e+01  1.245e+00  14.544  < 2e-16 ***
## trial          4.071e-03  7.861e-04   5.179  2.23e-07 ***
## date           2.579e-01  8.042e-02   3.207  0.00134 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##      Null deviance: 1464.94  on 1061  degrees of freedom
## Residual deviance:  768.47  on 1056  degrees of freedom
##      (893 observations deleted due to missingness)
## AIC: 780.47
##
## Number of Fisher Scoring iterations: 6

```

```

#test for side bias with an exact binomial test
binom.test(c(nrow(task_data %>%
              .[c(bundle_position != fractal_choice)]),
            nrow(task_data %>%
              .[c(bundle_position == fractal_choice)])))

##
## Exact binomial test
##
## data:  c(nrow(task_data %>% .[c(bundle_position != fractal_choice)]),      nrow(task_data %>% .[c(bundle_position == fractal_choice)]))
## number of successes = 417, number of trials = 1062, p-value =
## 2.708e-12
## alternative hypothesis: true probability of success is not equal to 0.5
## 95 percent confidence interval:
##  0.3631464 0.4227610
## sample estimates:
## probability of success
##          0.3926554

```

```

#generate a model of likelihood to choice for the fractal dependent on it's position,
#value and associated water
model <- glm(data = dplyr::filter(task_data, block_no == max(block_no)),
             fractal_choice ~ bundle_position + water_offered + as.factor(juice_offered) + trial + date,
             family = "binomial")

#summarise the parameters
summary(model)

```

```

##
## Call:
## glm(formula = fractal_choice ~ bundle_position + water_offered +
##      as.factor(juice_offered) + trial + date, family = "binomial",
##      data = dplyr::filter(task_data, block_no == max(block_no)))
##
## Deviance Residuals:
##      Min       1Q   Median       3Q      Max
## -2.5554  -0.4148   0.0251   0.4318   2.3113
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -8.306484    1.205471  -6.891 5.55e-12 ***
## bundle_position     1.393375    0.414194   3.364 0.000768 ***
## water_offered      6.495529    0.915424   7.096 1.29e-12 ***
## as.factor(juice_offered)0.3 -0.112185    0.685245  -0.164 0.869956
## as.factor(juice_offered)0.4  1.938844    0.682198   2.842 0.004482 **
## as.factor(juice_offered)0.5  5.753356    0.922088   6.239 4.39e-10 ***
## as.factor(juice_offered)0.6  6.929117    1.171325   5.916 3.31e-09 ***
## trial            0.005211    0.001894   2.752 0.005929 **
## date              NA           NA       NA      NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##      Null deviance: 360.42  on 259  degrees of freedom
## Residual deviance: 171.29  on 252  degrees of freedom
## (143 observations deleted due to missingness)
## AIC: 187.29

```

```
##
```

```
## Number of Fisher Scoring iterations: 6
```

```
#test for side bias with an exact binomial test
```

```
binom.test(c(nrow(task_data %>%  
             .[c(bundle_position != fractal_choice & block_no == max(block_no))]),  
           nrow(task_data %>%  
             .[c(bundle_position == fractal_choice & block_no == max(block_no))])))
```

```
##
```

```
## Exact binomial test
```

```
##
```

```
## data: c(nrow(task_data %>% .[c(bundle_position != fractal_choice & block_no == max(block_no))]), nrow(task_data %>% .[c(bundle_pos
```

```
## number of successes = 111, number of trials = 260, p-value =
```

```
## 0.02157
```

```
## alternative hypothesis: true probability of success is not equal to 0.5
```

```
## 95 percent confidence interval:
```

```
## 0.3660164 0.4895150
```

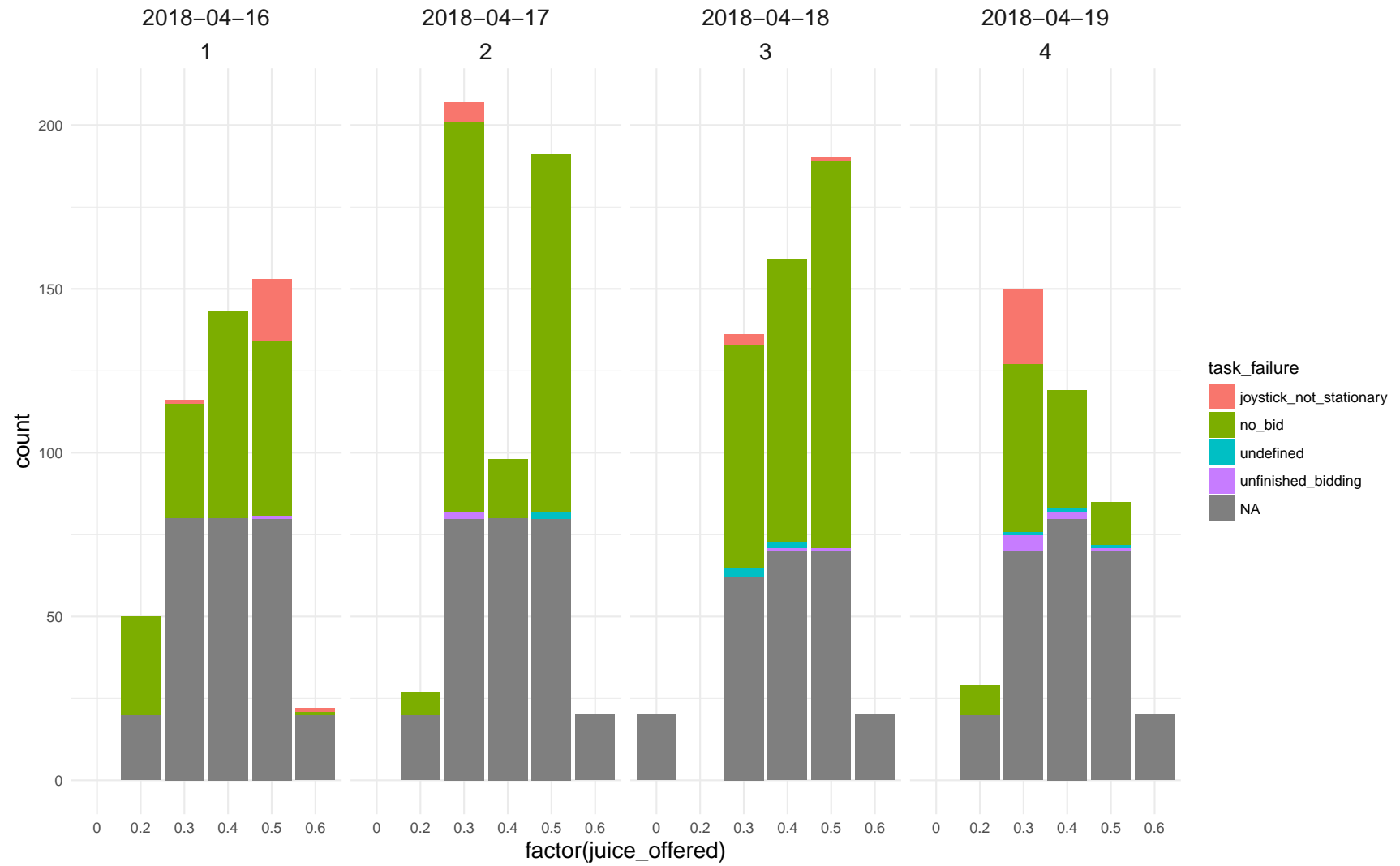
```
## sample estimates:
```

```
## probability of success
```

```
## 0.4269231
```

## Monkey Choice Failures

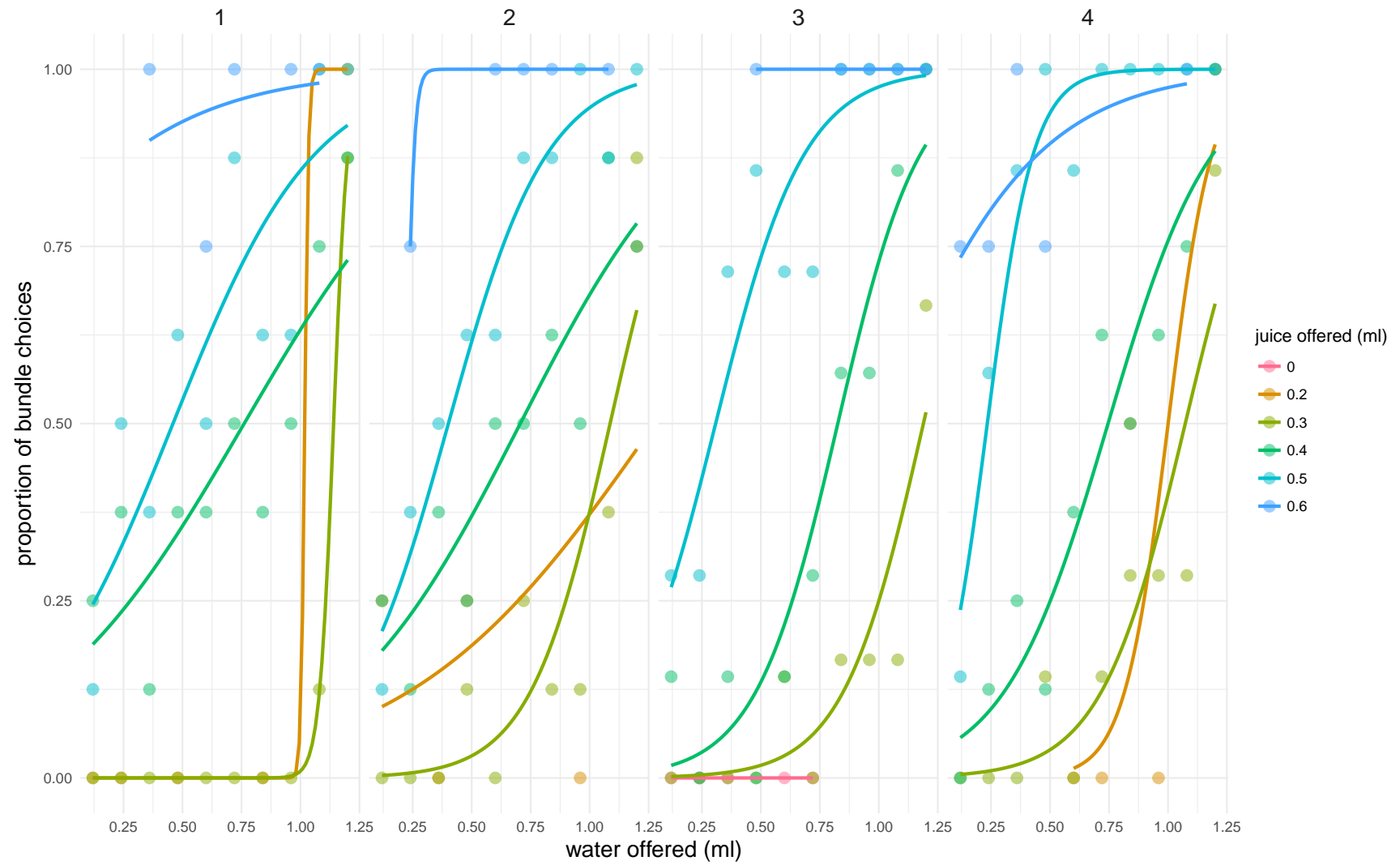
Ulysses : 16-Apr-2018 – 19-Apr-2018





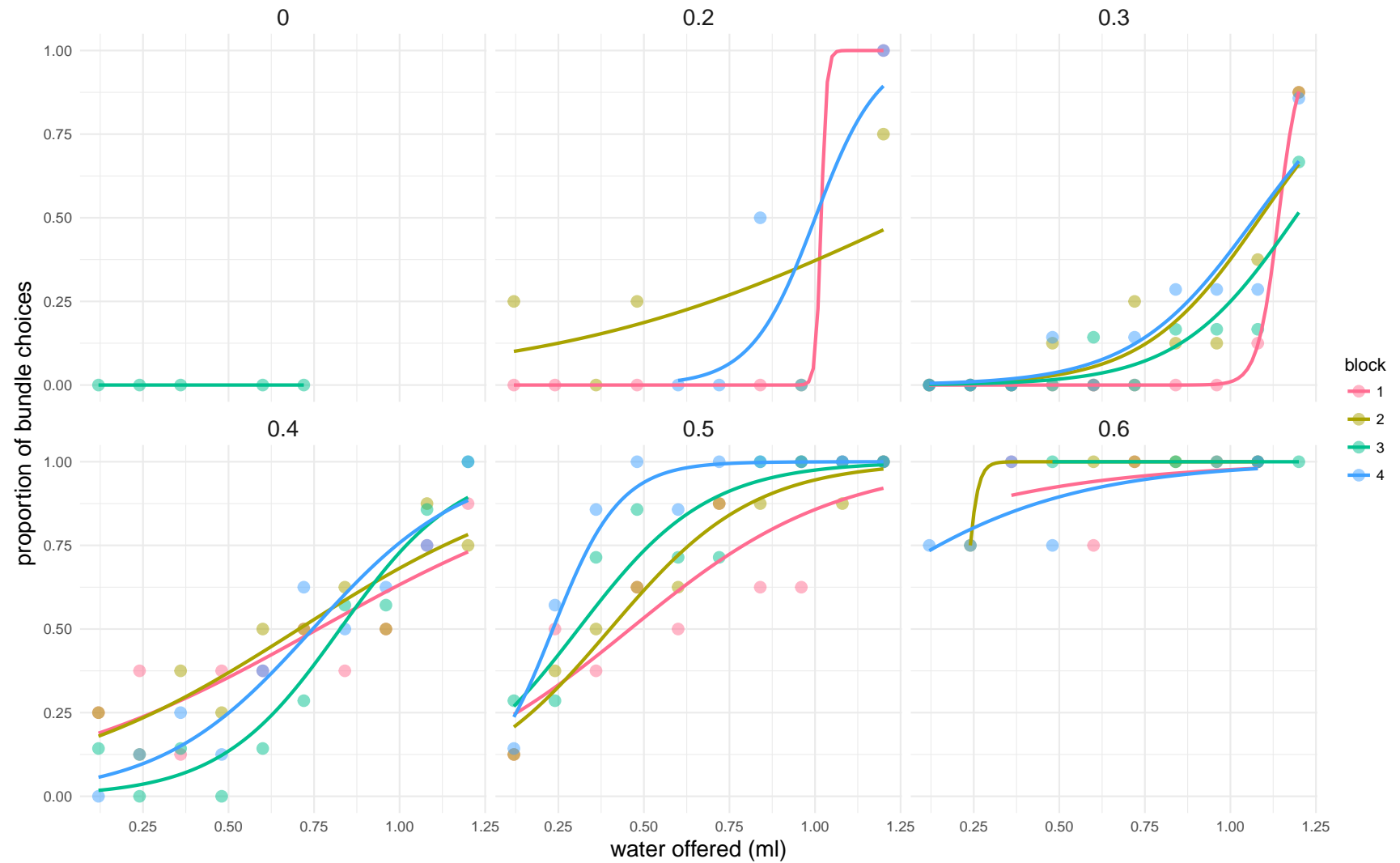
## Monkey Bundle Choice Binoimial Curves

Ulysses : 16-Apr-2018 – 19-Apr-2018



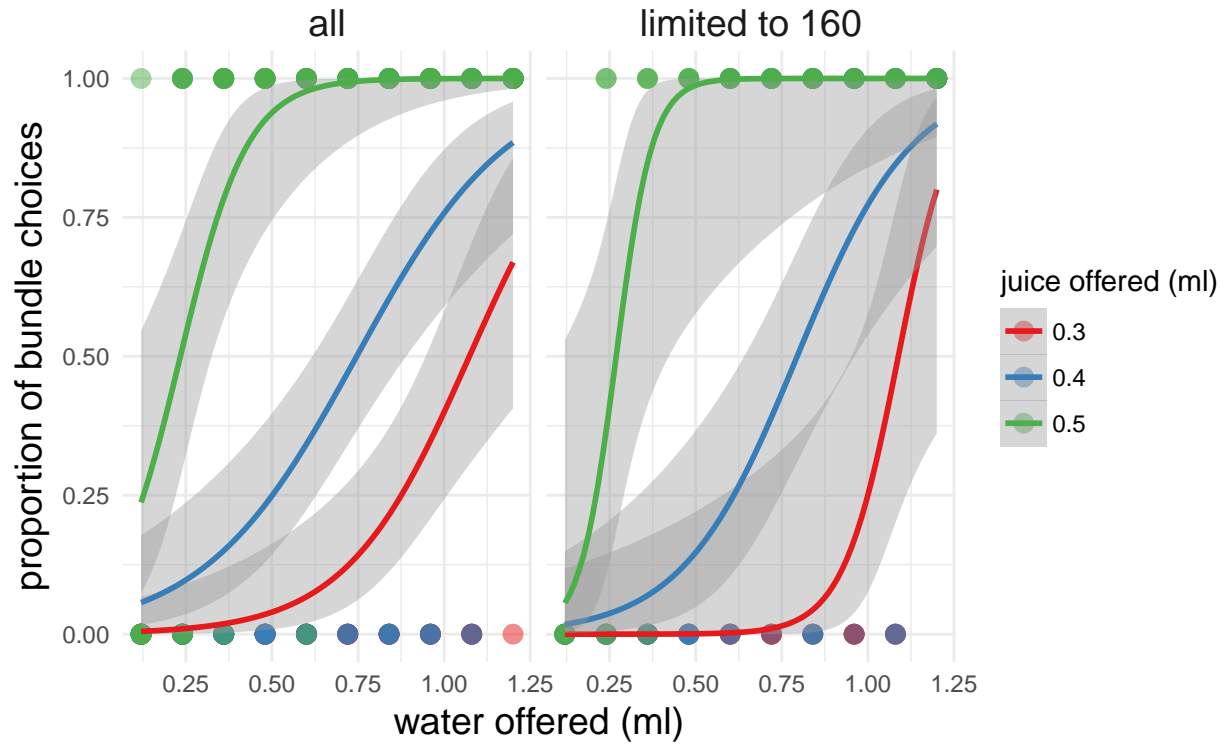
## Monkey Bundle Choice Binoimial Curves

Ulysses : 16-Apr-2018 – 19-Apr-2018



## Today's Monkey Bundle Choice Binoimial Curves

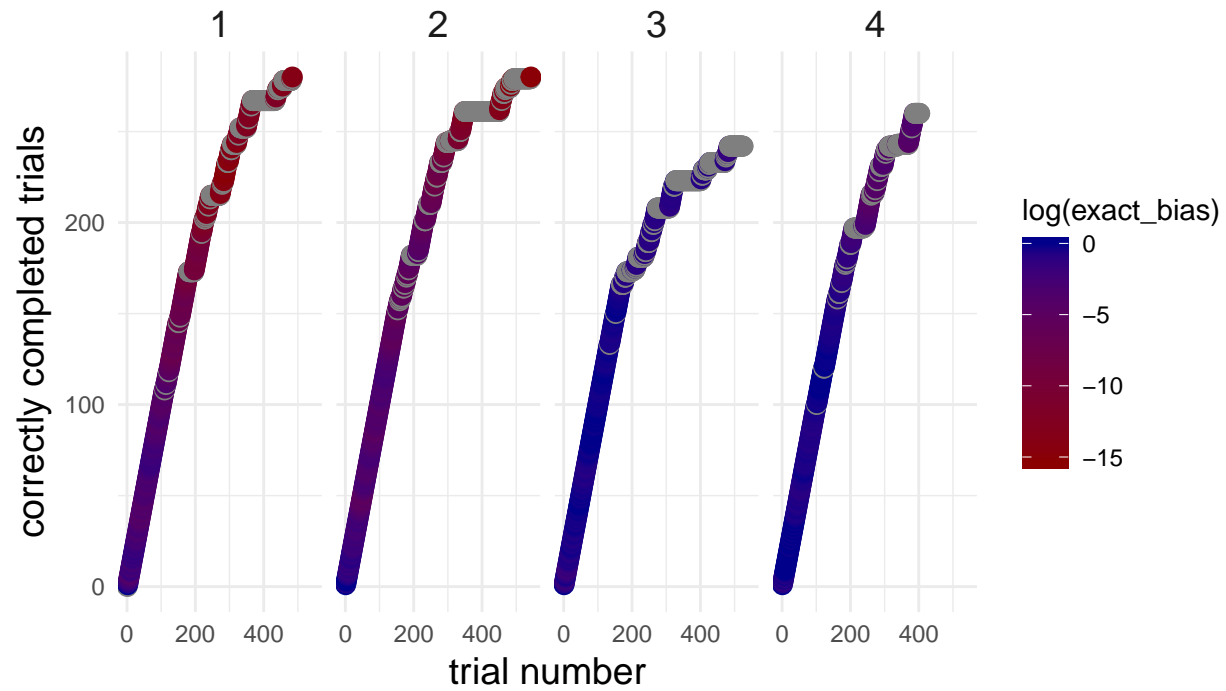
Ulysses : 19-Apr-2018



## Monkey Trial Progression and Bias

Ulysses : 16-Apr-2018 – 19-Apr-2018

2018-04-16 2018-04-17 2018-04-18 2018-04-19



## Monkey Trial Progression and Bias

Ulysses : 16-Apr-2018 – 19-Apr-2018

