

# BCb Analysis- Early March

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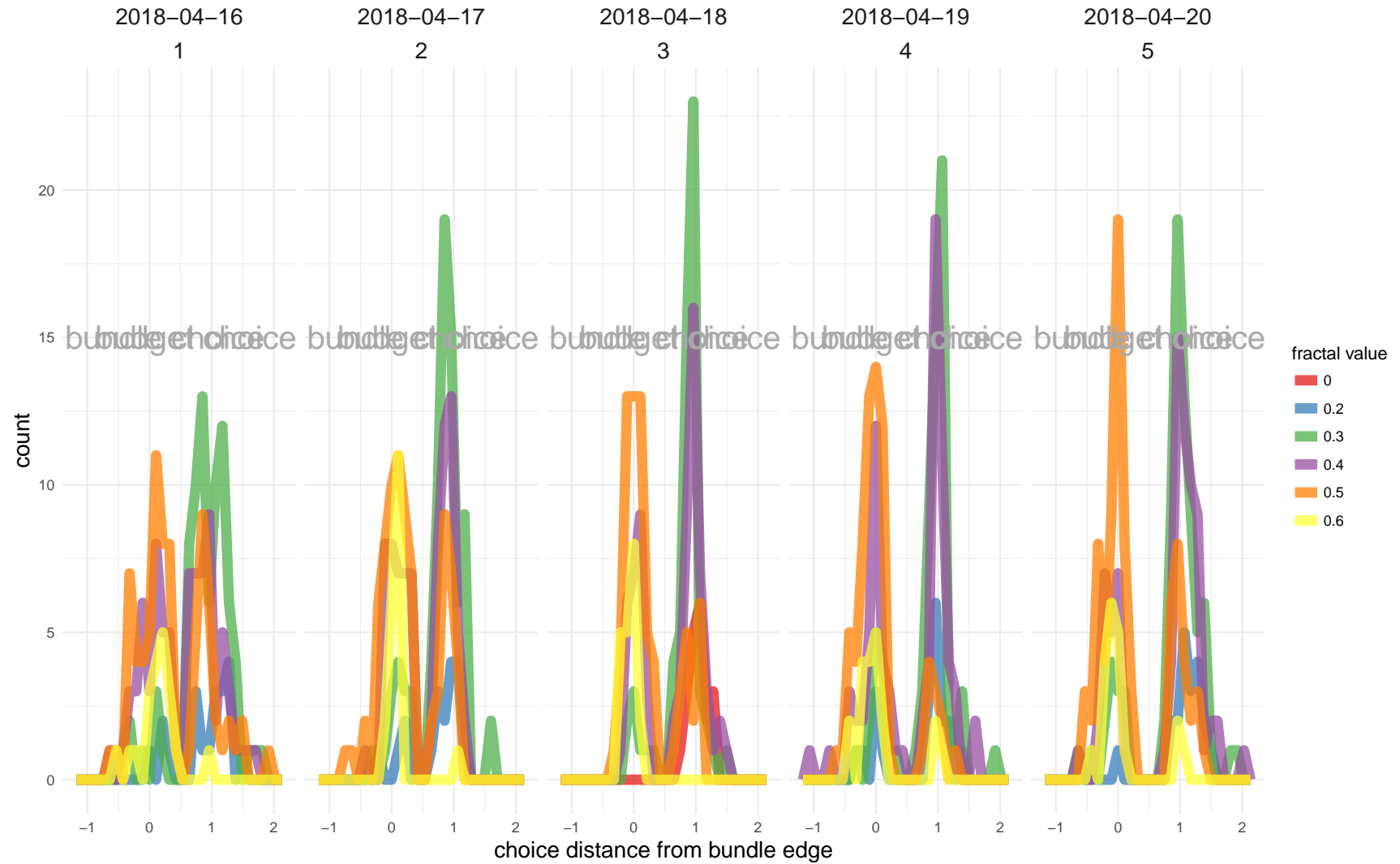
*05 April 2018*

```
monkey <- "Ulysses"  
today <- "20-Apr-2018"  
look_back <- "16-Apr-2018"  
  
start_trial <- 0  
stop_trial <- 140  
  
merge_days <- TRUE
```

p1

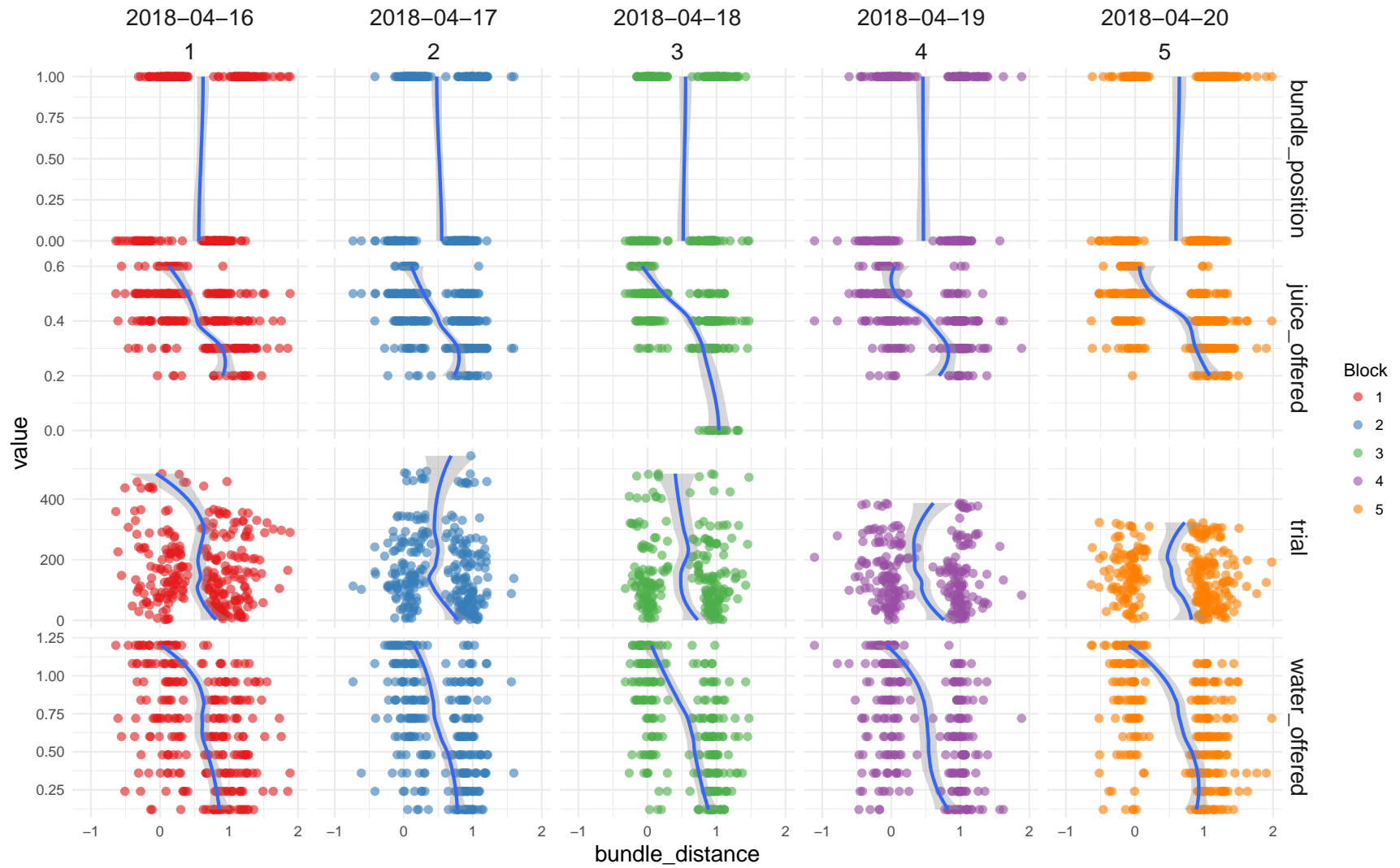
## Monkey Choice Distance From Bundle on Binary Choice Task

Ulysses : 16-Apr-2018 – 20-Apr-2018



## Monkey Choice Distance From Bundle on Binary Choice Task

Ulysses : 16-Apr-2018 – 20-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
## -2.8283  -0.5272  -0.1078   0.5074   3.3636
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)   -7.947e+02  9.866e+02  -0.805    0.421
## bundle_position  1.550e+00  1.716e-01   9.033 < 2e-16 ***
## water_offered   4.953e+00  3.130e-01  15.822 < 2e-16 ***
## juice_offered   1.812e+01  1.111e+00  16.318 < 2e-16 ***
## trial           4.280e-03  7.324e-04   5.843 5.13e-09 ***
## date            4.435e-02  5.593e-02   0.793    0.428
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##      Null deviance: 1844.49  on 1341  degrees of freedom
## Residual deviance:  971.16  on 1336  degrees of freedom
## (936 observations deleted due to missingness)
## AIC: 983.16
##
## 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 = 538, number of trials = 1342, p-value =
## 3.951e-13
## alternative hypothesis: true probability of success is not equal to 0.5
## 95 percent confidence interval:
##  0.3745427 0.4276807
## sample estimates:
## probability of success
##          0.4008942

```

```

#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
## -2.5624  -0.4286  -0.1099   0.3050   2.7162
##
## Coefficients: (1 not defined because of singularities)
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -9.706232    1.565947  -6.198 5.71e-10 ***
## bundle_position     1.401659    0.417420   3.358 0.000785 ***
## water_offered      6.358429    0.867770   7.327 2.35e-13 ***
## as.factor(juice_offered)0.3  1.007568    1.189428   0.847 0.396938
## as.factor(juice_offered)0.4  2.031525    1.178455   1.724 0.084728 .
## as.factor(juice_offered)0.5  5.516698    1.260932   4.375 1.21e-05 ***
## as.factor(juice_offered)0.6  6.582925    1.462312   4.502 6.74e-06 ***
## trial            0.006687    0.002233   2.994 0.002749 **
## 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: 376.06  on 279  degrees of freedom
## Residual deviance: 174.67  on 272  degrees of freedom
## (43 observations deleted due to missingness)
## AIC: 190.67

```

```
##
```

```
## 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 = 121, number of trials = 280, p-value =
```

```
## 0.02685
```

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

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

```
## 0.3733256 0.4924117
```

```
## sample estimates:
```

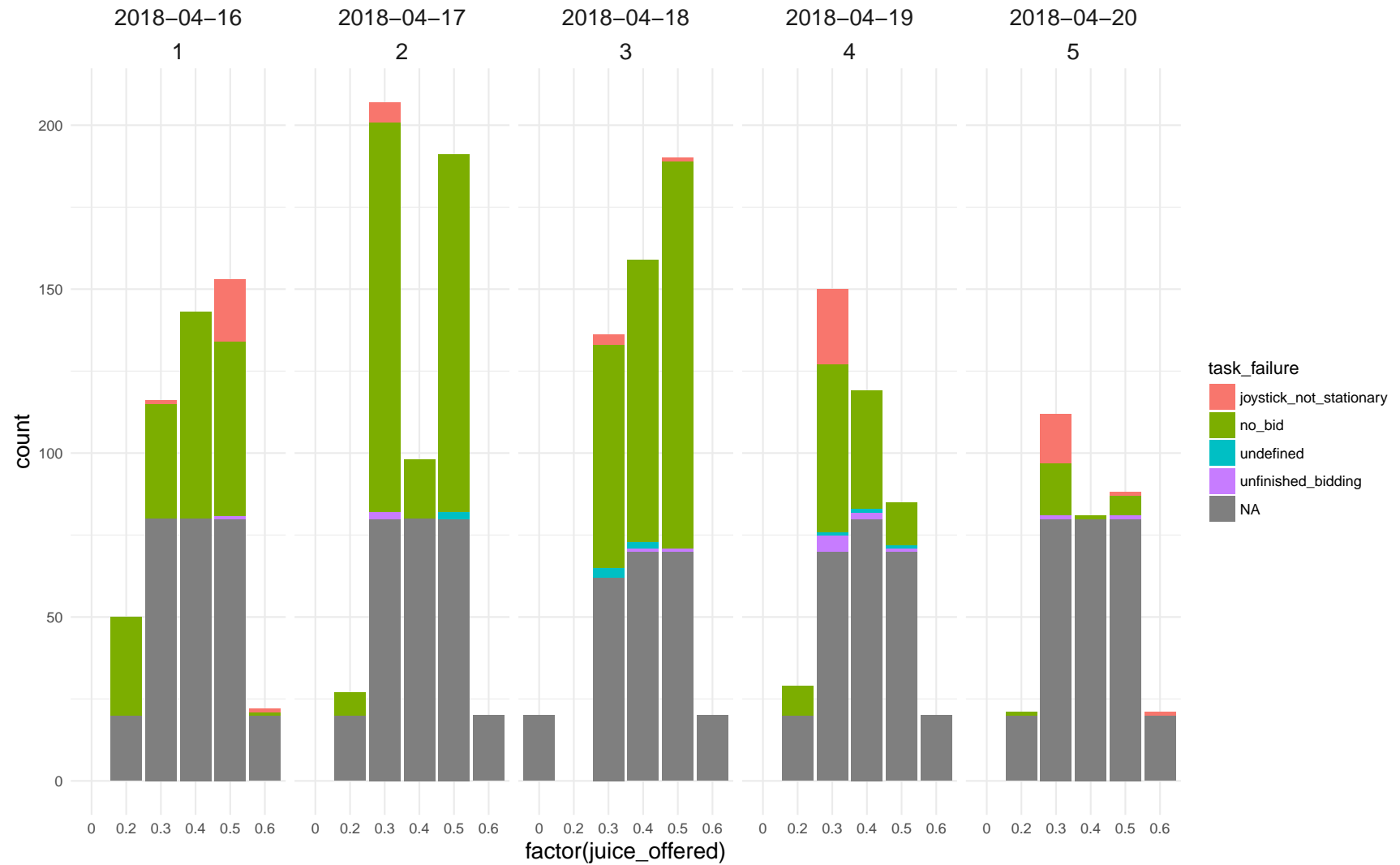
```
## probability of success
```

```
## 0.4321429
```

p3

## Monkey Choice Failures

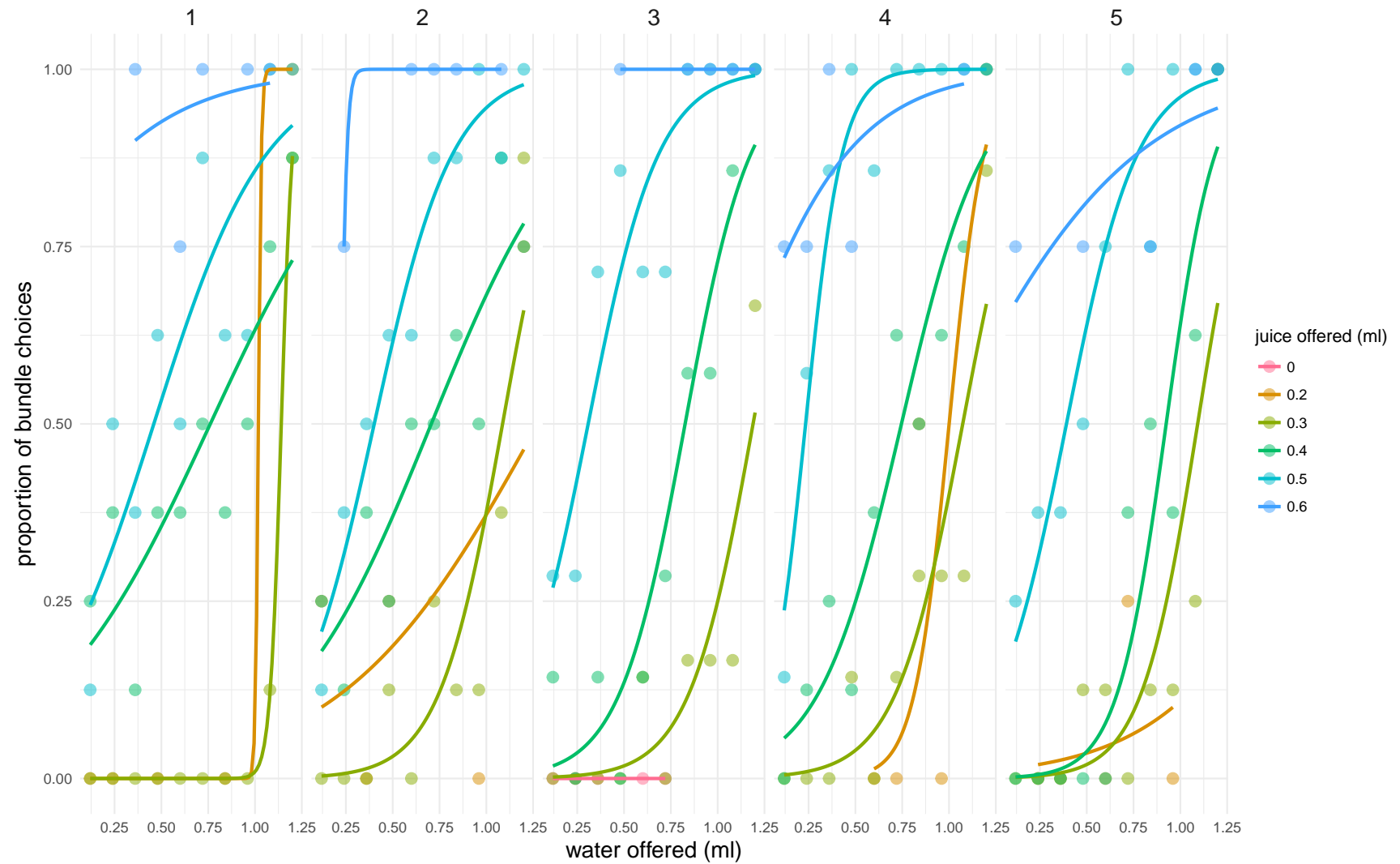
Ulysses : 16-Apr-2018 – 20-Apr-2018





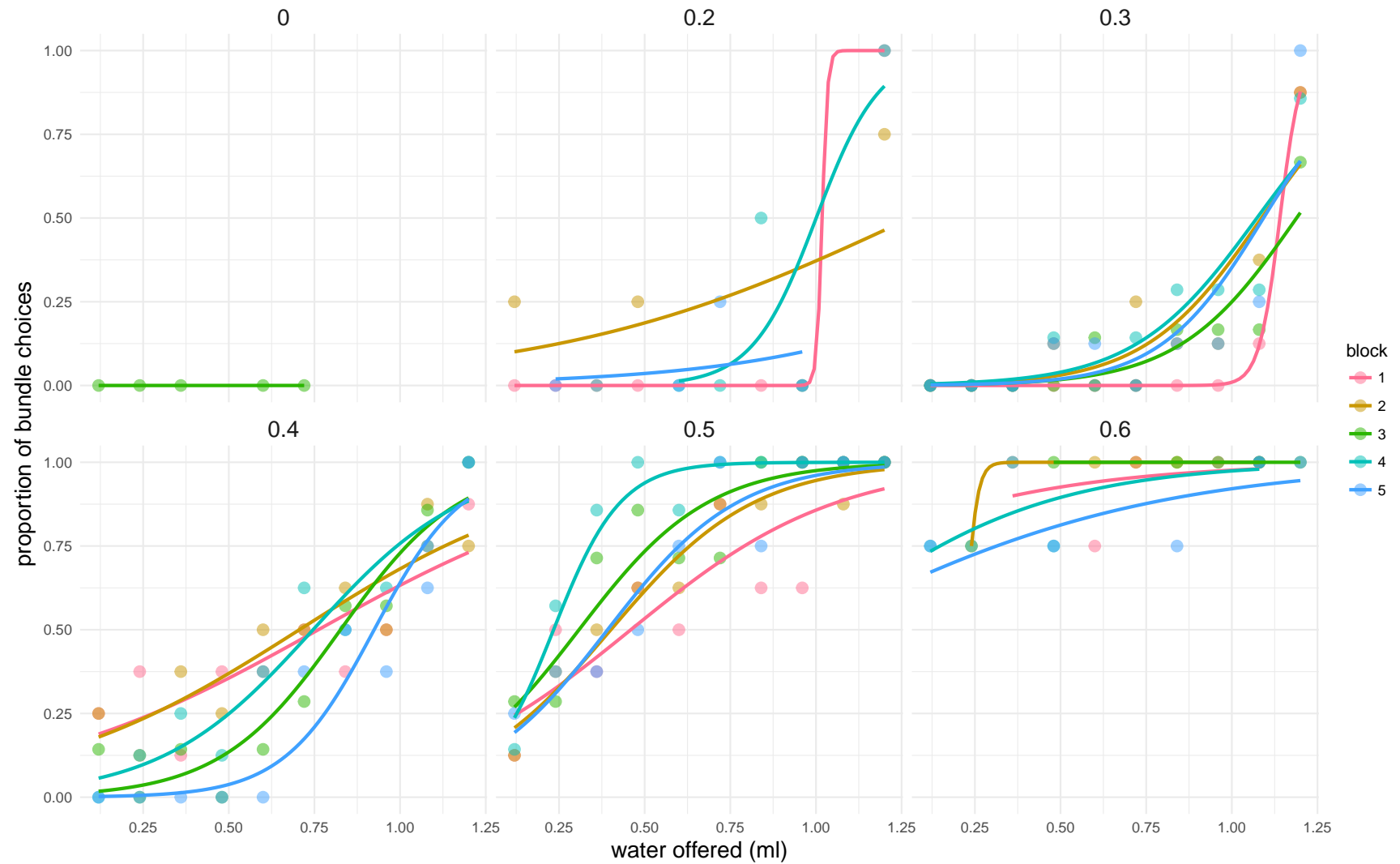
## Monkey Bundle Choice Binoimial Curves

Ulysses : 16-Apr-2018 – 20-Apr-2018



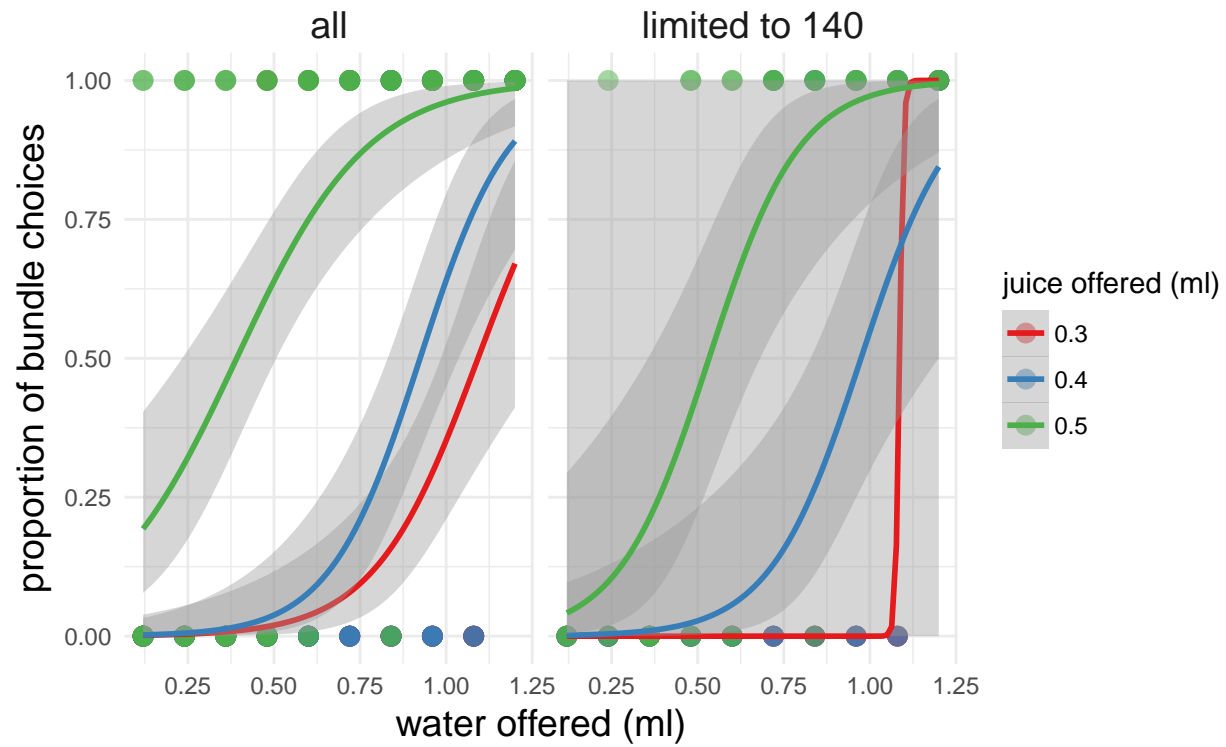
## Monkey Bundle Choice Binoimial Curves

Ulysses : 16-Apr-2018 – 20-Apr-2018



## Today's Monkey Bundle Choice Binoimial Curves

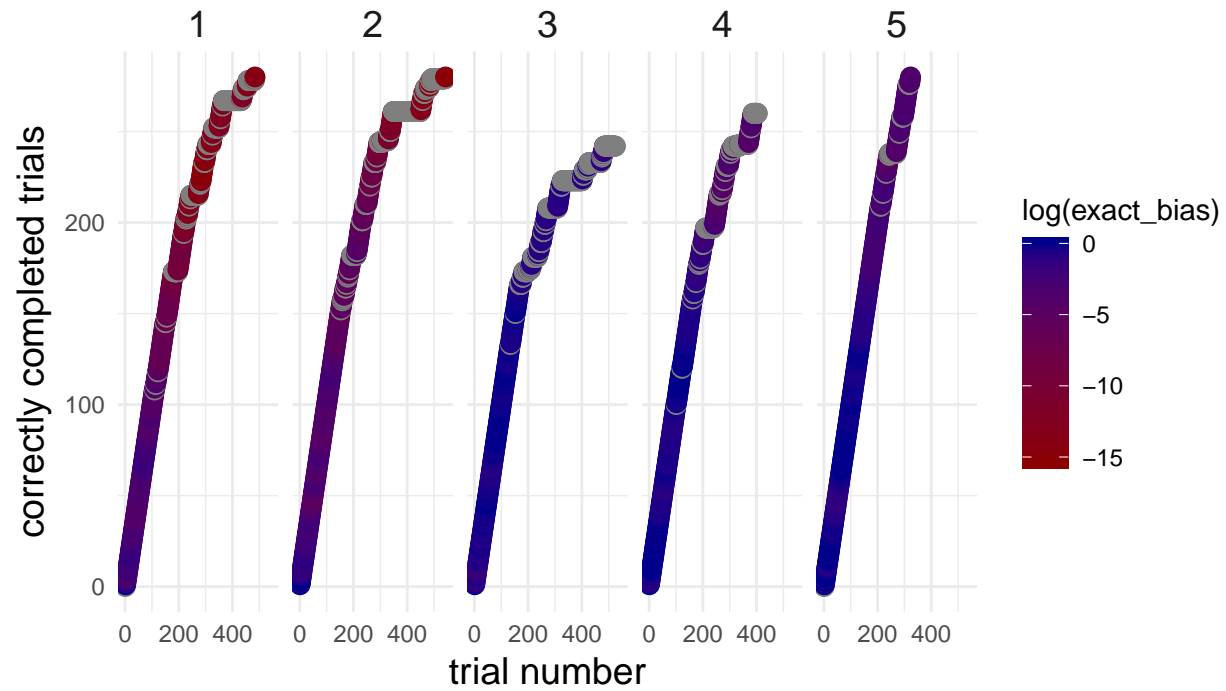
Ulysses : 20-Apr-2018



## Monkey Trial Progression and Bias

Ulysses : 16-Apr-2018 – 20-Apr-2018

018-04-1 018-04-1 018-04-1 018-04-1 018-04-2



## Monkey Trial Progression and Bias

Ulysses : 16-Apr-2018 – 20-Apr-2018

