Binary Choice Analysis

Robert Hickman

Data shown for:
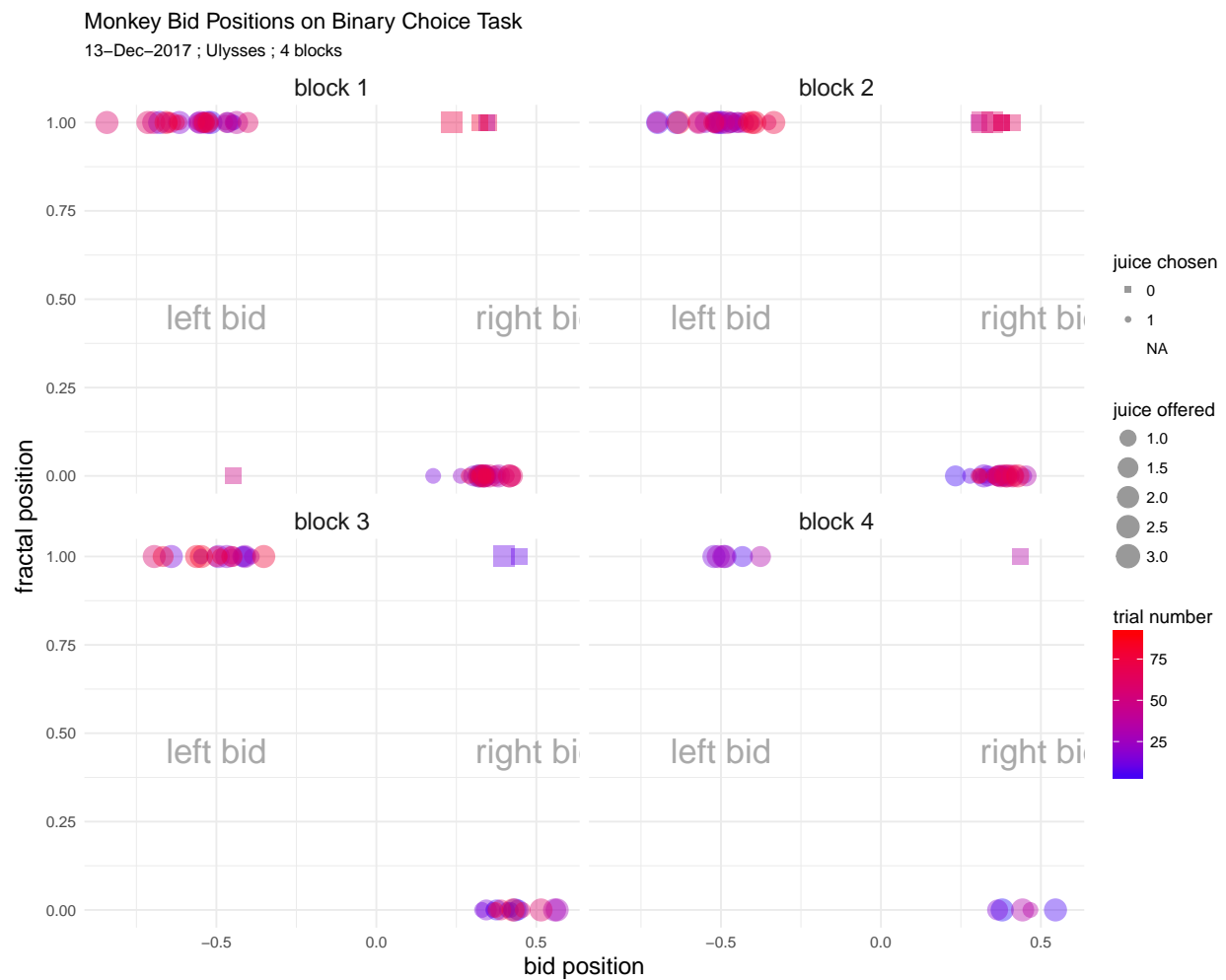
```
date
```

```
## [1] "13-Dec-2017"
```

```
monkey
```

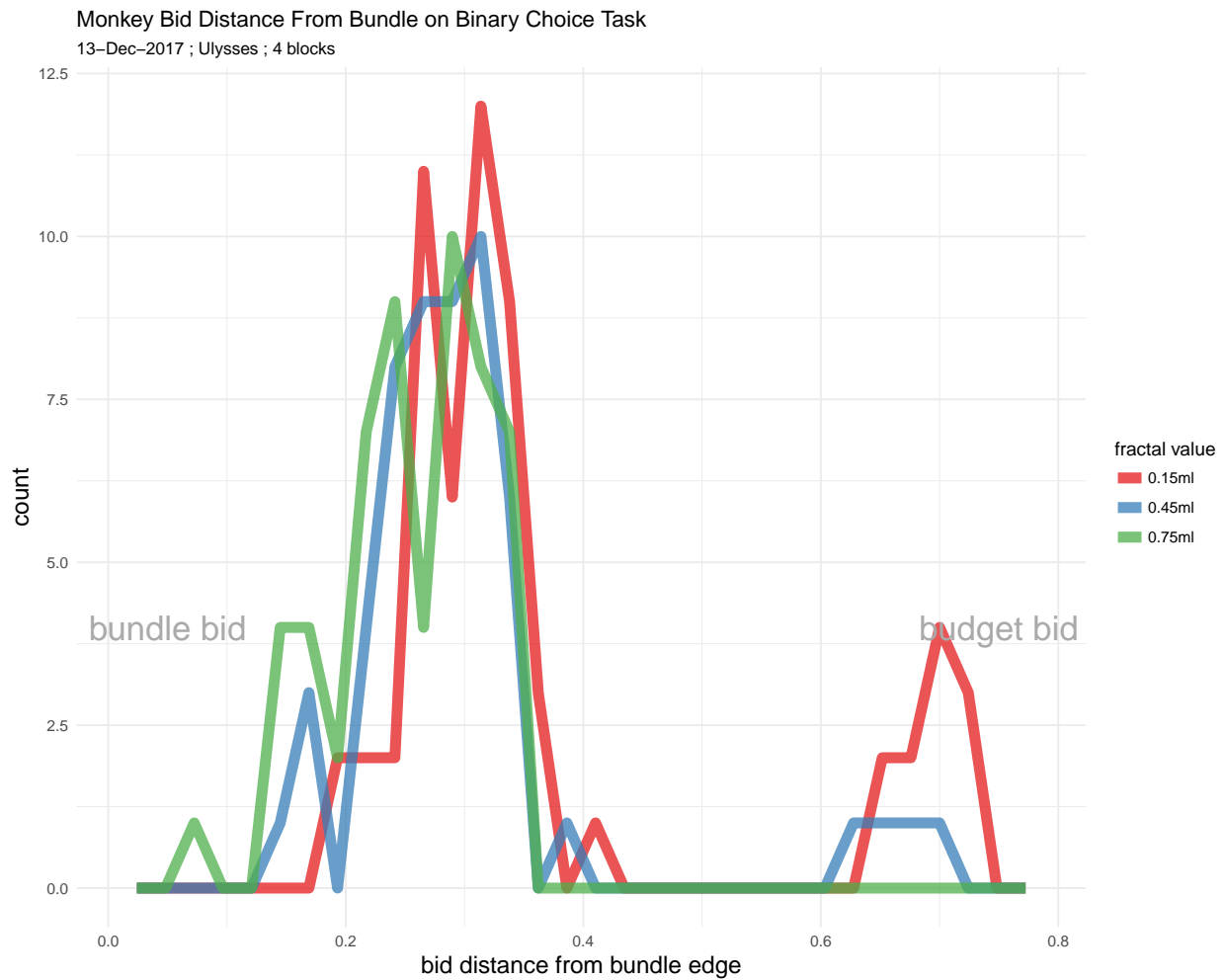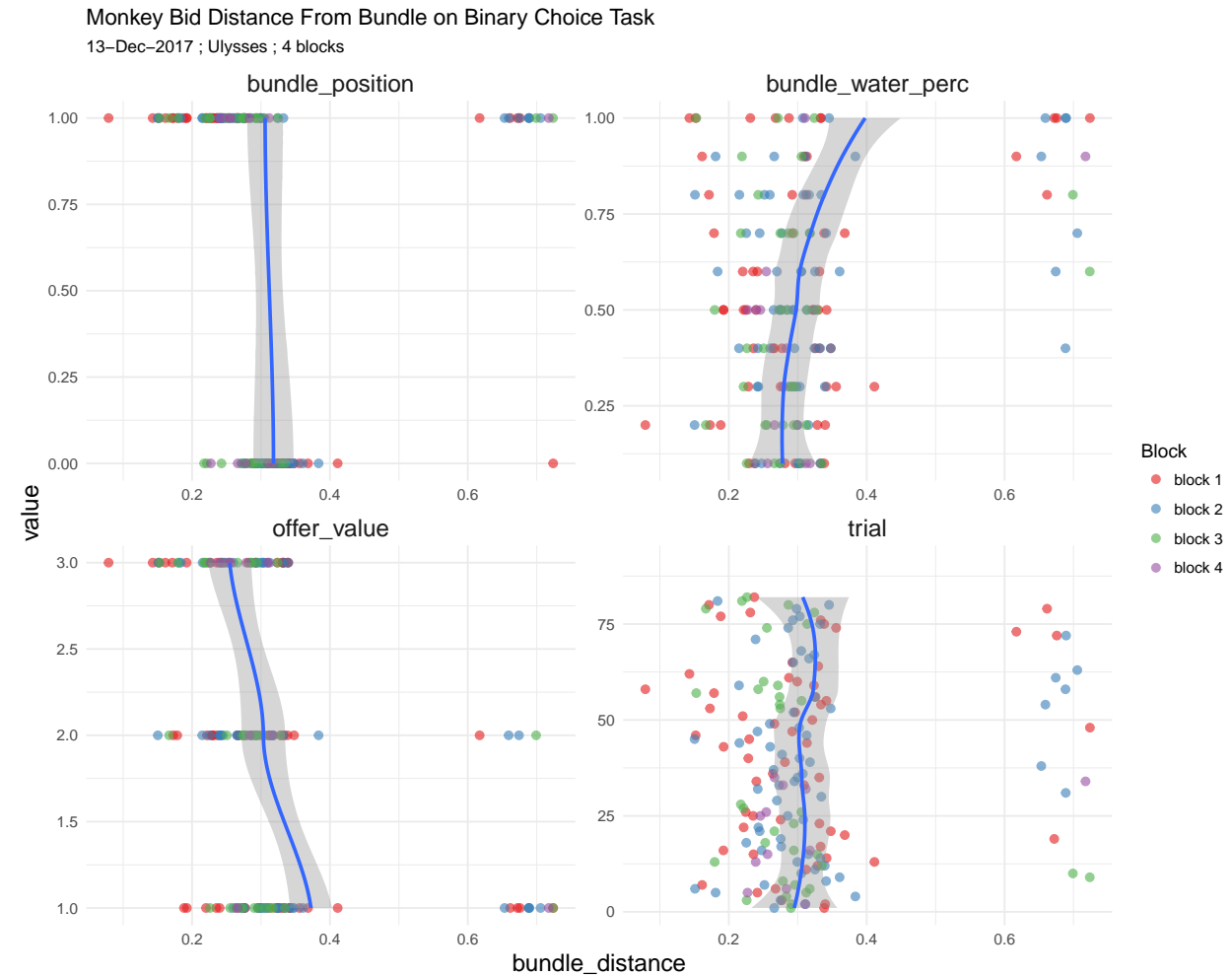```
[1] "Ulysses"
```

```r
#plot p1
p1
```


Graph of choices for each block. Circles indicate bid selecting the bundle, squares are bid selecting the budget. A fractal bid position of 1 means that the bundle is on the left hand side of the screen. Bids range from -1 (all the way to the left) to 1 (all the way to the right)

Monkey Bid Distance From Bundle on Binary Choice Task

13–Dec–2017 ; Ulysses ; 4 blocks

Graph showing all choices and how far away they are from the edge of the screen on the bundle side. 0 indicates full movement to the bundle side of the screen and 1 represent full movement away. Count is over all blocks for all values of the fractal (in ml of juice).

Monkey Bid Distance From Bundle on Binary Choice Task
13–Dec–2017 ; Ulysses ; 4 blocks

Graphs of various factors against the distance from the bundle side of the screen the monkey bids.

A bundle position of 1 indicates that the bundle is on the left hand side of the screen. A bundle water percentage of 1 indicates that the bundle contains no water [CHECK THIS- PRETTY SURE ITS CORRECT], whereas zero means it contains the full 1.2ml. Offer values of 1, 2, and 3 represent 0.15ml, 0.45ml, and 0.75mls of apple and mango juice (150ml in 950ml of water).

Fit lines use LOESS method.

```r
#generate a model of likelihood to bid for the fractal dependent on it's position,
#value and associated water
model <- glm(data = task_data,
             fractal_bid ~ bundle_position + bundle_water_perc + offer_value + trial,
             family = "binomial")

#summarise the parameters
summary(model)
```
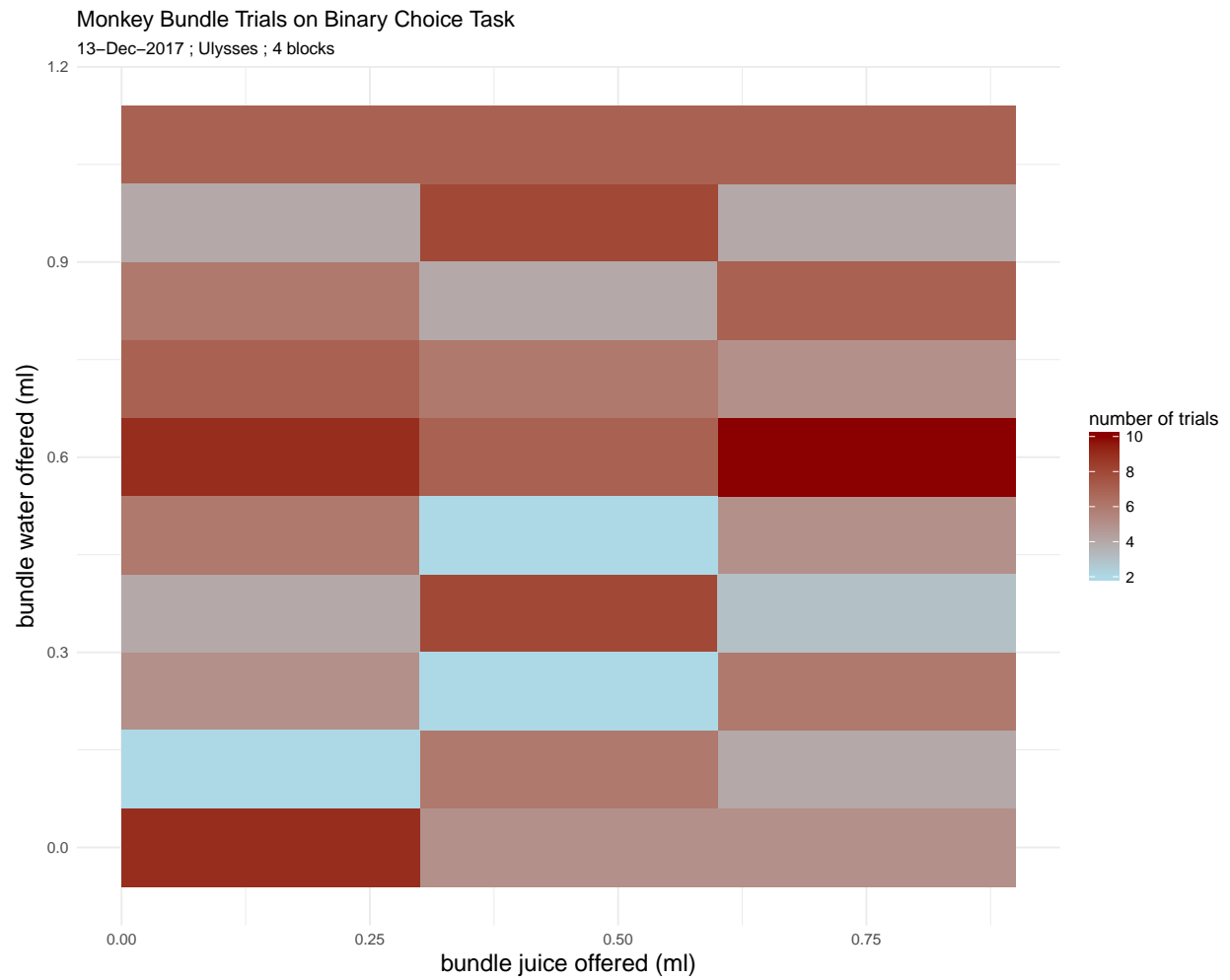
```
##
## Call:
## glm(formula = fractal_bid ~ bundle_position + bundle_water_perc +
##     offer_value + trial, family = "binomial", data = task_data)
##
## Deviance Residuals:
##      Min        1Q    Median        3Q       Max
## -2.44071   0.01021   0.04851   0.16349   1.73663
##
## Coefficients:
##                   Estimate Std. Error z value Pr(>|z|)
## (Intercept)        7.80970    2.28648   3.416 0.000636 ***
## bundle_position   -4.60480    1.40971  -3.266 0.001089 **
## bundle_water_perc -8.11548    2.31224  -3.510 0.000448 ***
## offer_value        2.73326    0.78550   3.480 0.000502 ***
## trial             -0.01436    0.01778  -0.807 0.419401
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 101.468  on 169  degrees of freedom
## Residual deviance:  41.799  on 165  degrees of freedom
##   (135 observations deleted due to missingness)
## AIC: 51.799
##
## Number of Fisher Scoring iterations: 8
```
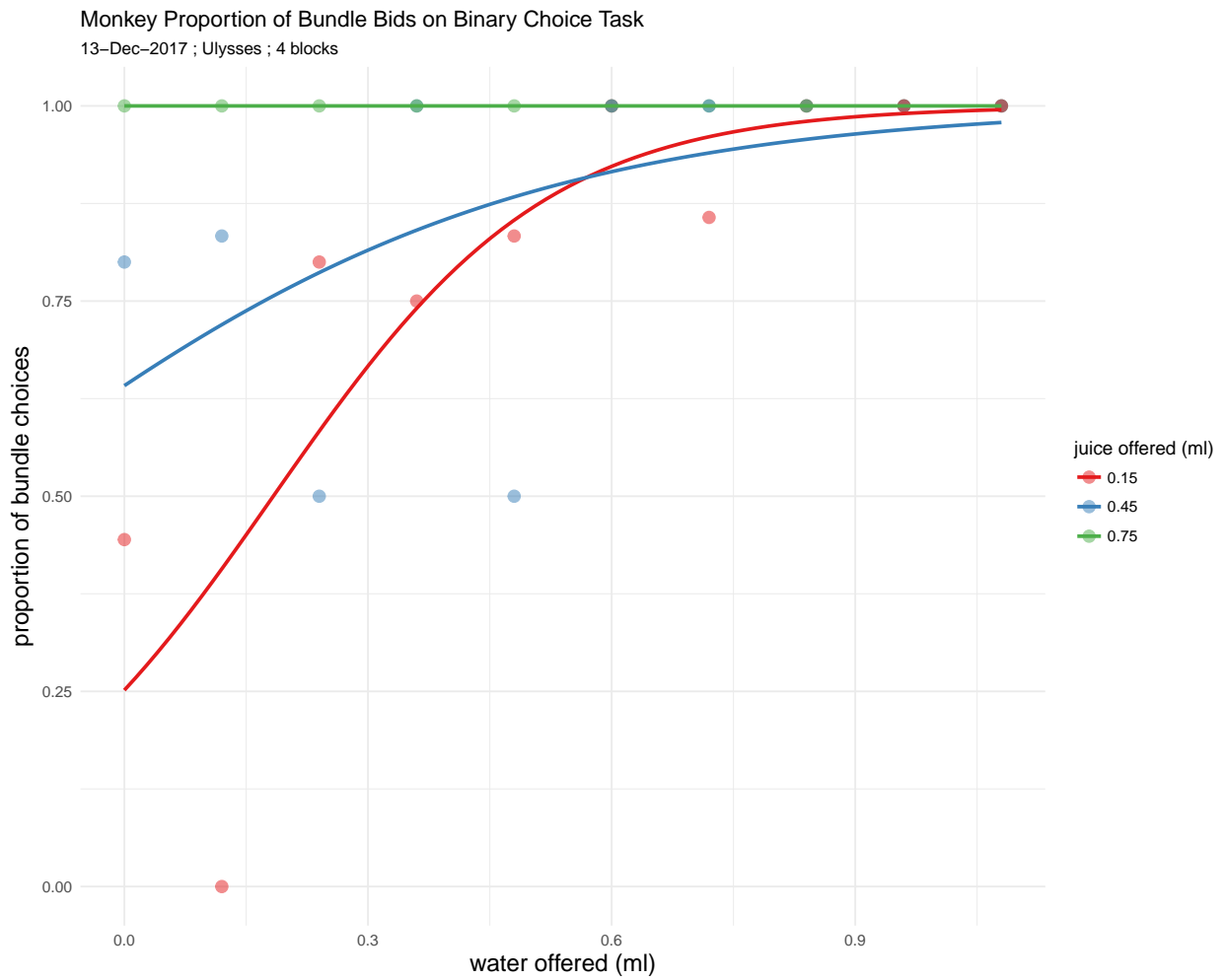
Monkey Bundle Trials on Binary Choice Task

13–Dec–2017 ; Ulysses ; 4 blocks

Graph showing the number of trials the monkey carried out for each bundle combination. Does not include failed trials.

Monkey Proportion of Bundle Bids on Binary Choice Task

13–Dec–2017 ; Ulysses ; 4 blocks

Graph showing the proportion of bids for the bundle that a monkey makes, separated by the values of the juice offered in the bundles. Fits using a binomial glm model.