Binary Choice Analysis

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Data shown for:

```
dates
```

```
## [1] "01-Feb-2018" "02-Feb-2018" "03-Feb-2018" "04-Feb-2018" "05-Feb-2018"
## [6] "06-Feb-2018" "07-Feb-2018" "08-Feb-2018"
```

```
monkey
```

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

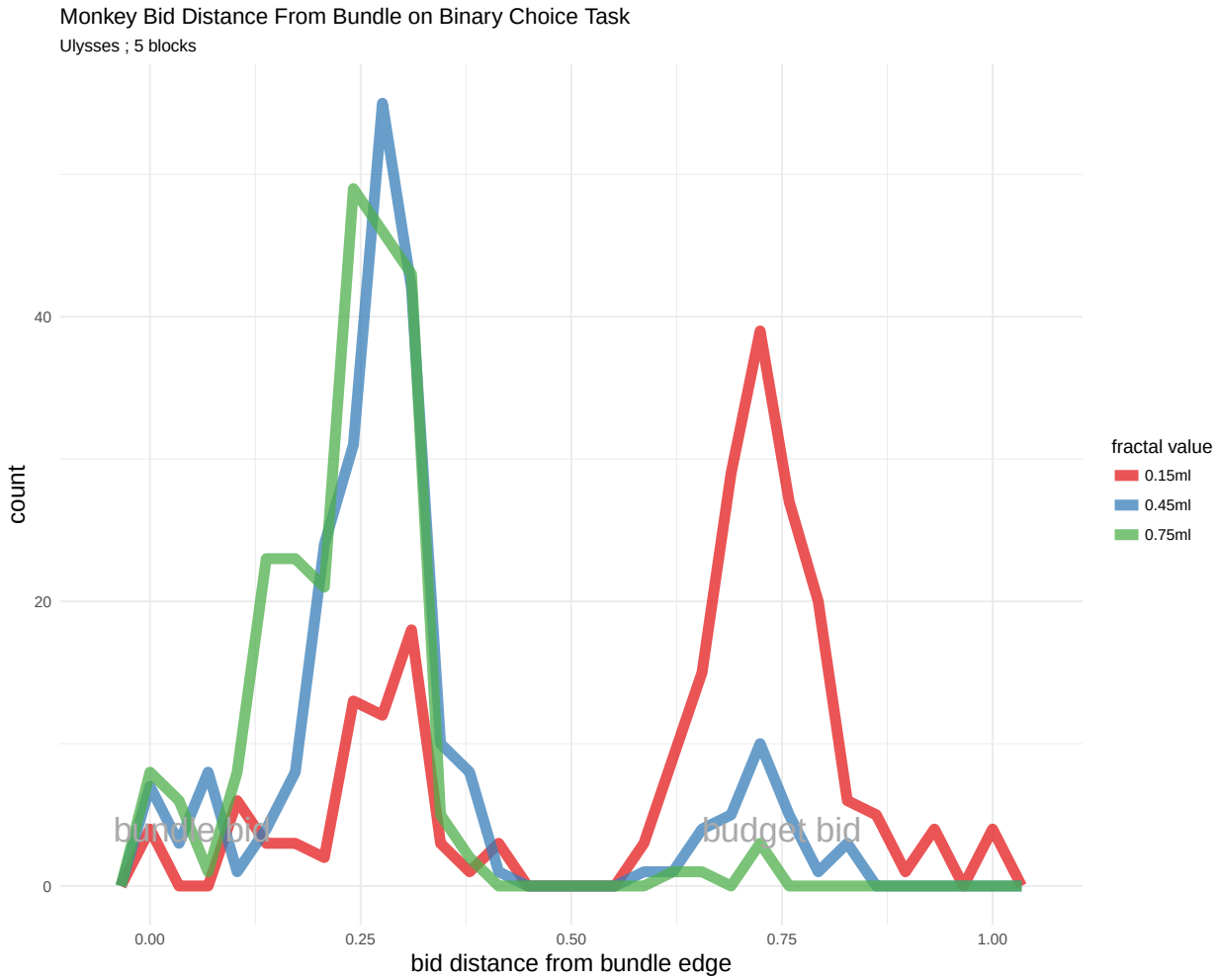
```
#for multiple files
precise_dates <- gsub("(.* )(.*)", "\\1", specific_files)
precise_dates
```

```
## [1] "01-Feb-2018 " "02-Feb-2018 " "05-Feb-2018 " "07-Feb-2018 "
## [5] "08-Feb-2018 "
```

```
#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)

```
#plot p2
p2
```



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).

```
#plot p3
p3
```

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).

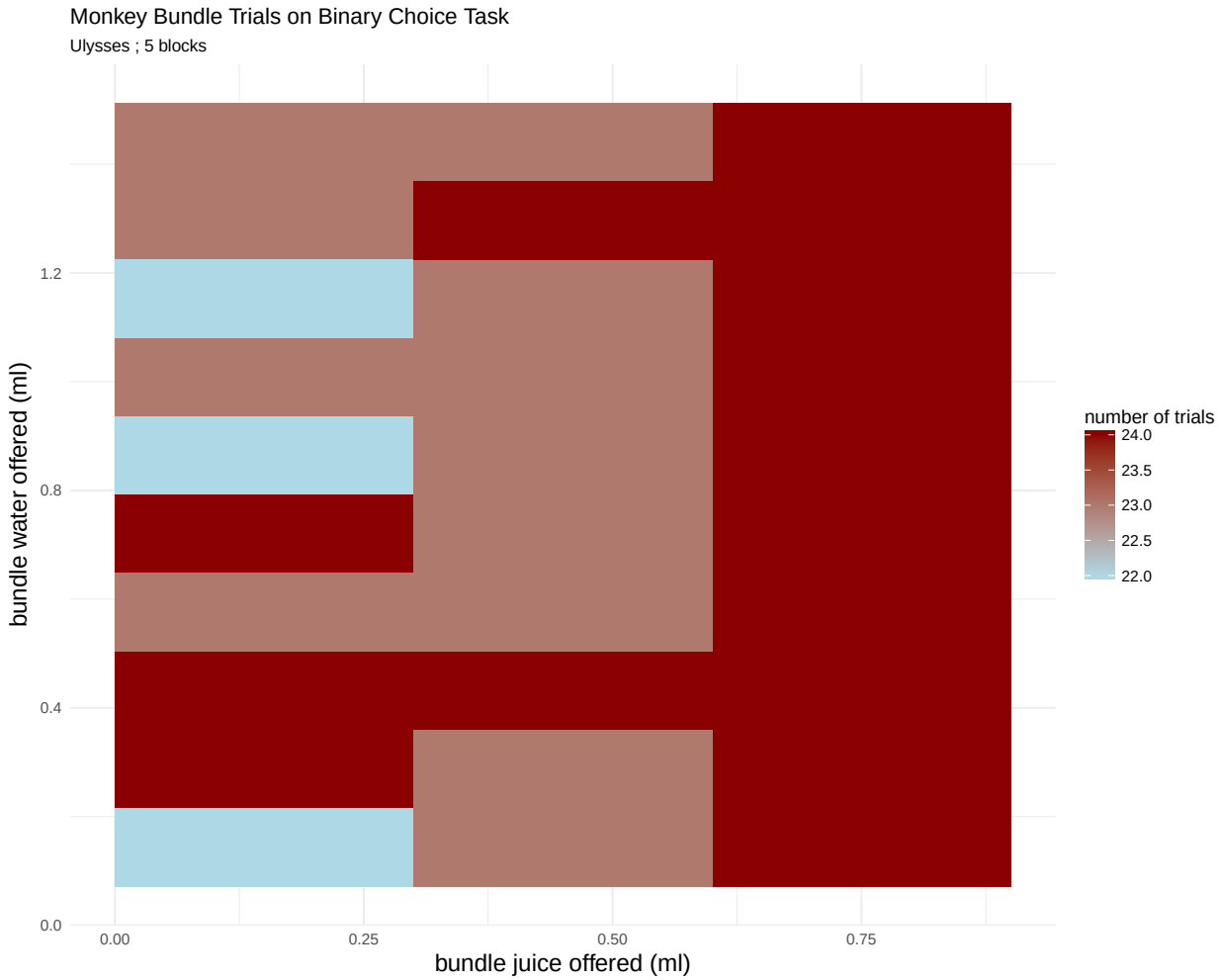
Fit lines use LOESS method.

```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)
```

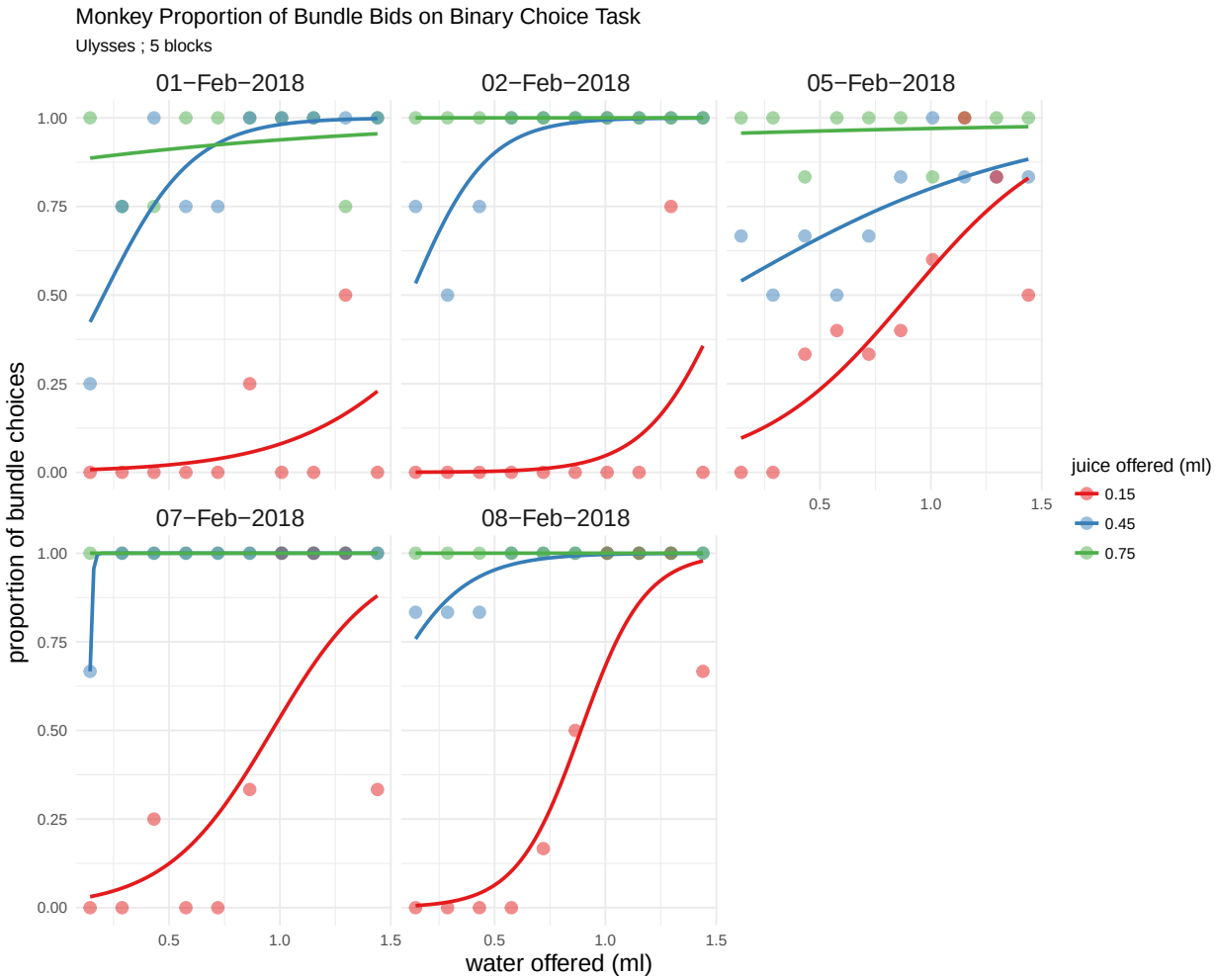
```
##
## Call:
## glm(formula = fractal_bid ~ bundle_position + bundle_water_perc +
##     offer_value + trial, family = "binomial", data = task_data)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -3.6504  -0.3508   0.1301   0.4034   1.9956
##
## Coefficients:
##                    Estimate Std. Error z value Pr(>|z|)
## (Intercept)       -3.219390   0.437148  -7.365 1.78e-13 ***
## bundle_position    0.318173   0.247810   1.284  0.19916
## bundle_water_perc -3.973873   0.506026  -7.853 4.06e-15 ***
## offer_value        3.199194   0.259882  12.310  < 2e-16 ***
## trial              0.007848   0.002495   3.146  0.00166 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 833.34  on 701  degrees of freedom
## Residual deviance: 417.88  on 697  degrees of freedom
##   (124 observations deleted due to missingness)
## AIC: 427.88
##
## Number of Fisher Scoring iterations: 6
```

```
#plot p4
p4
```



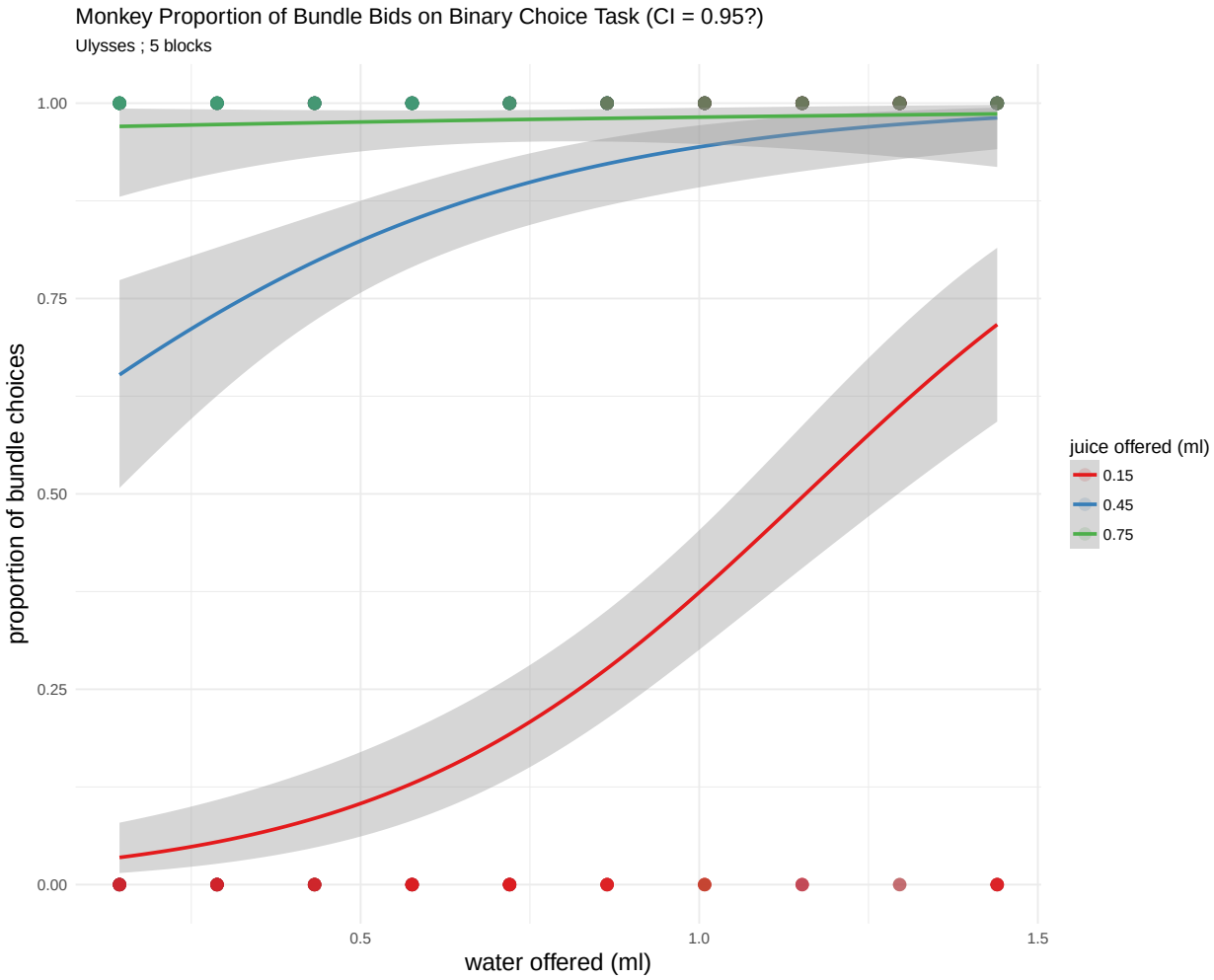
Graph showing the number of trials the monkey carried out for each bundle combination. Does not include failed trials.

```
#plot p5
p5
```



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.

```
p6
```



Same graph as above but with 95% confidence intervals. Uses the default method of calculating this for the tidyverse libraries in R which I'm not convinced are the best way. Looking into calculating and plotting it myself.