Binary Choice Analysis

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Data shown for:

```
dates
```

```
## [1] "19-Feb-2018"
```

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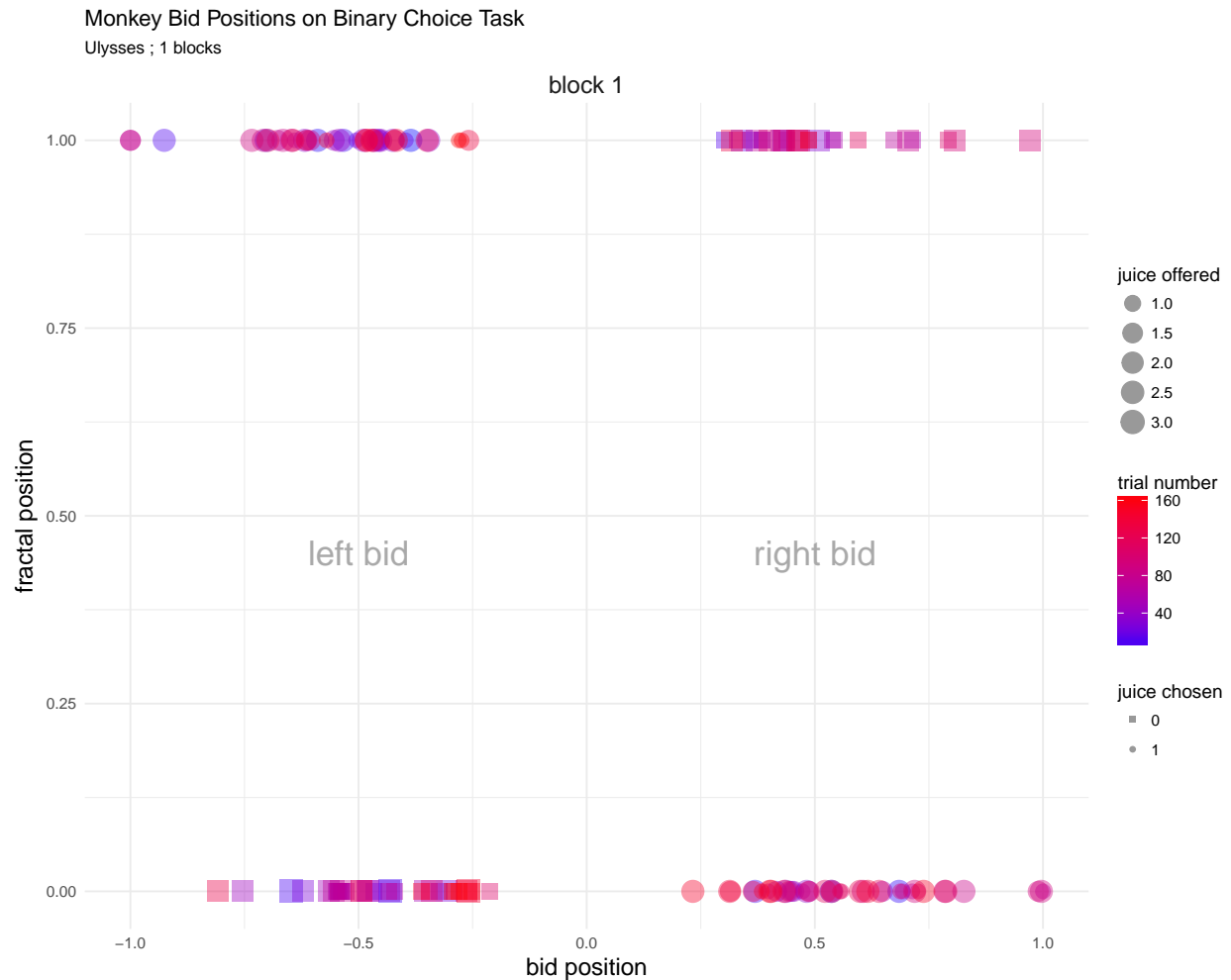
```
## [1] "Ulysses"
```

```
precise_dates
```

```
## [1] "19-Feb-2018 "
```

```
#plot p1
p1
```

**Monkey Bid Positions on Binary Choice Task**
Ulysses ; 1 blocks

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 +facet_wrap(~block)
```

Monkey Bid Distance From Bundle on Binary Choice Task

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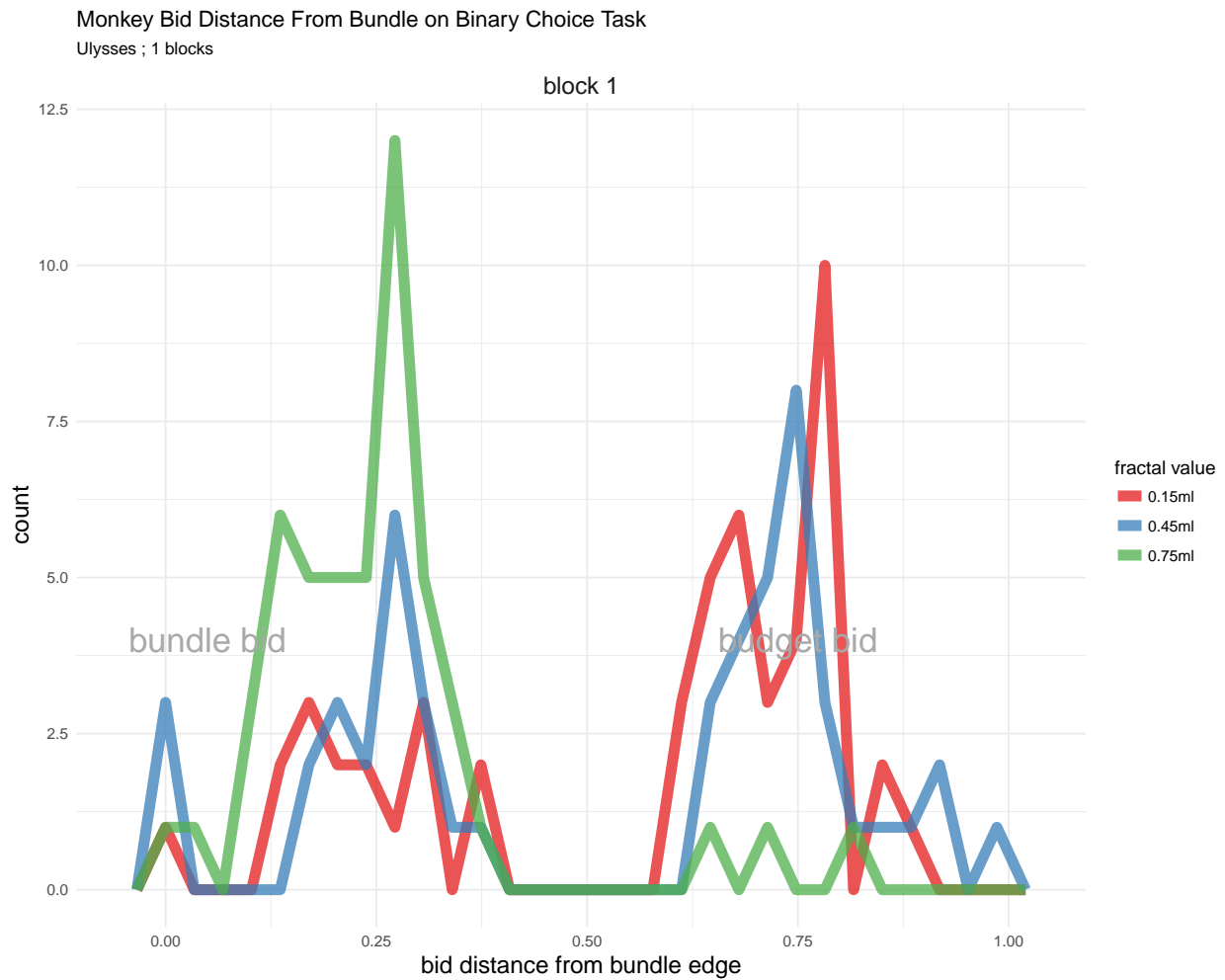
Graph showing all choices and how far away they are from the edge of the screen on the bundle side. 0 indicates full movement to the bundle side of the screen and 1 represent full movement away. Count is over all blocks for all values of the fractal (in ml of juice).

Monkey Bid Distance From Bundle on Binary Choice Task

Ulysses ; 1 blocks
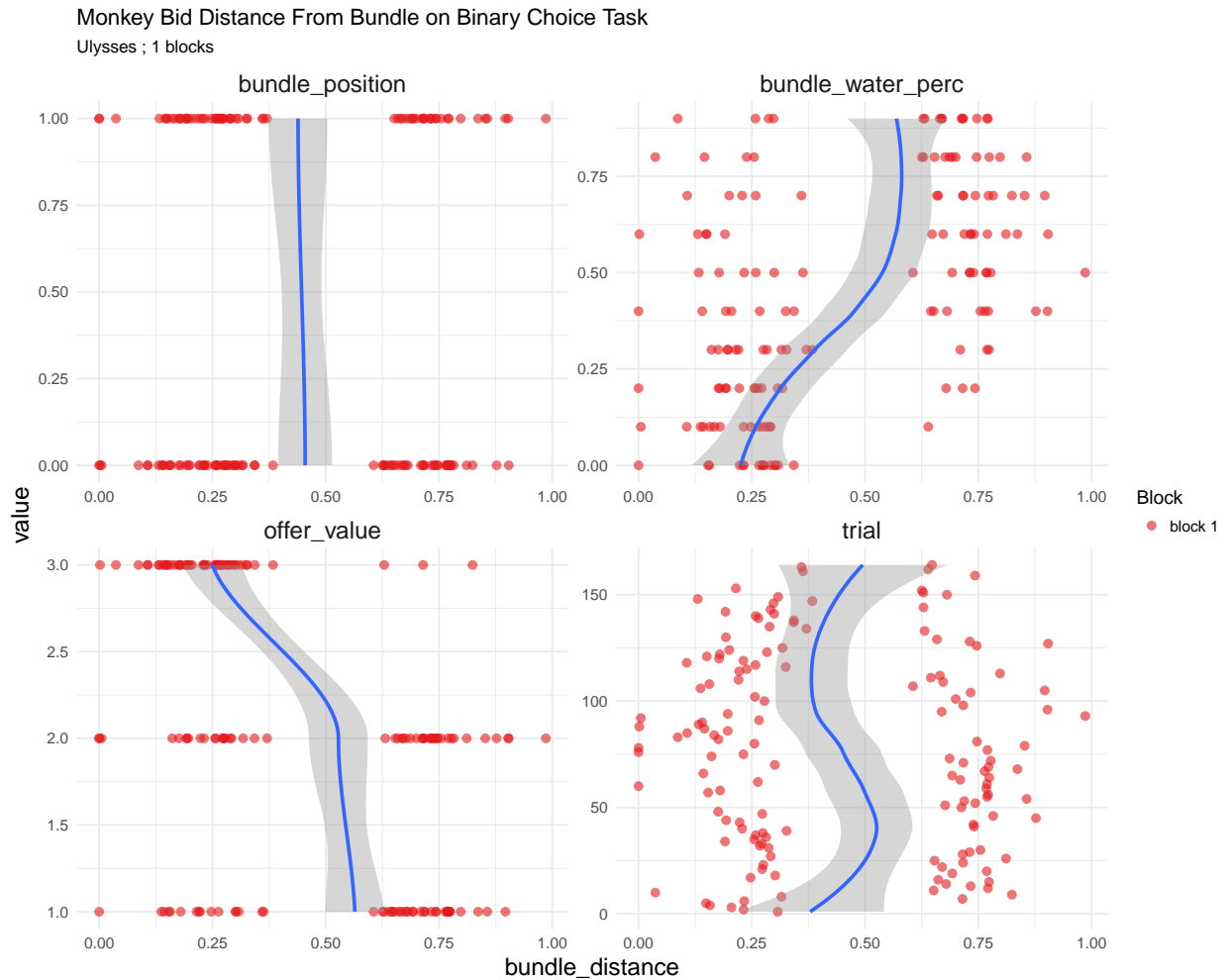
Graphs of various factors against the distance from the bundle side of the screen the monkey bids.

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.

```
#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
## -2.27180  -0.32768   0.04882   0.38021   2.63596
##
## Coefficients:
##                    Estimate Std. Error z value Pr(>|z|)
## (Intercept)       -2.771740   0.977642  -2.835  0.00458 **
## bundle_position    0.389200   0.552946   0.704  0.48152
## bundle_water_perc -9.440075   1.701893  -5.547 2.91e-08 ***
## offer_value        3.183053   0.581493   5.474 4.40e-08 ***
## trial              0.014509   0.006435   2.255  0.02415 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 205.779  on 149  degrees of freedom
## Residual deviance:  85.546  on 145  degrees of freedom
## AIC: 95.546
##
## Number of Fisher Scoring iterations: 6
```
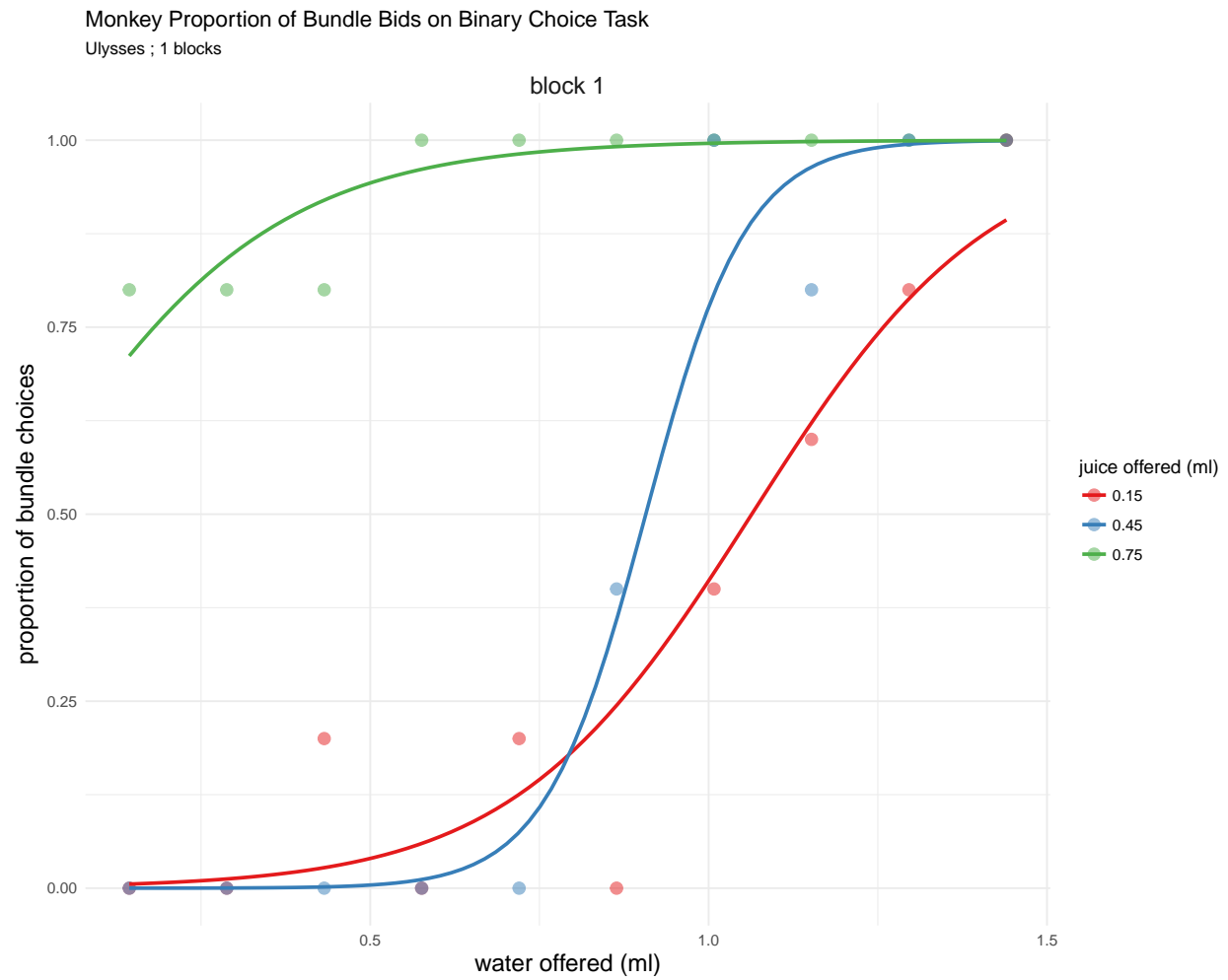
```
#plot p4
p4
```

Monkey Bundle Trials on Binary Choice Task
Ulysses ; 1 blocks
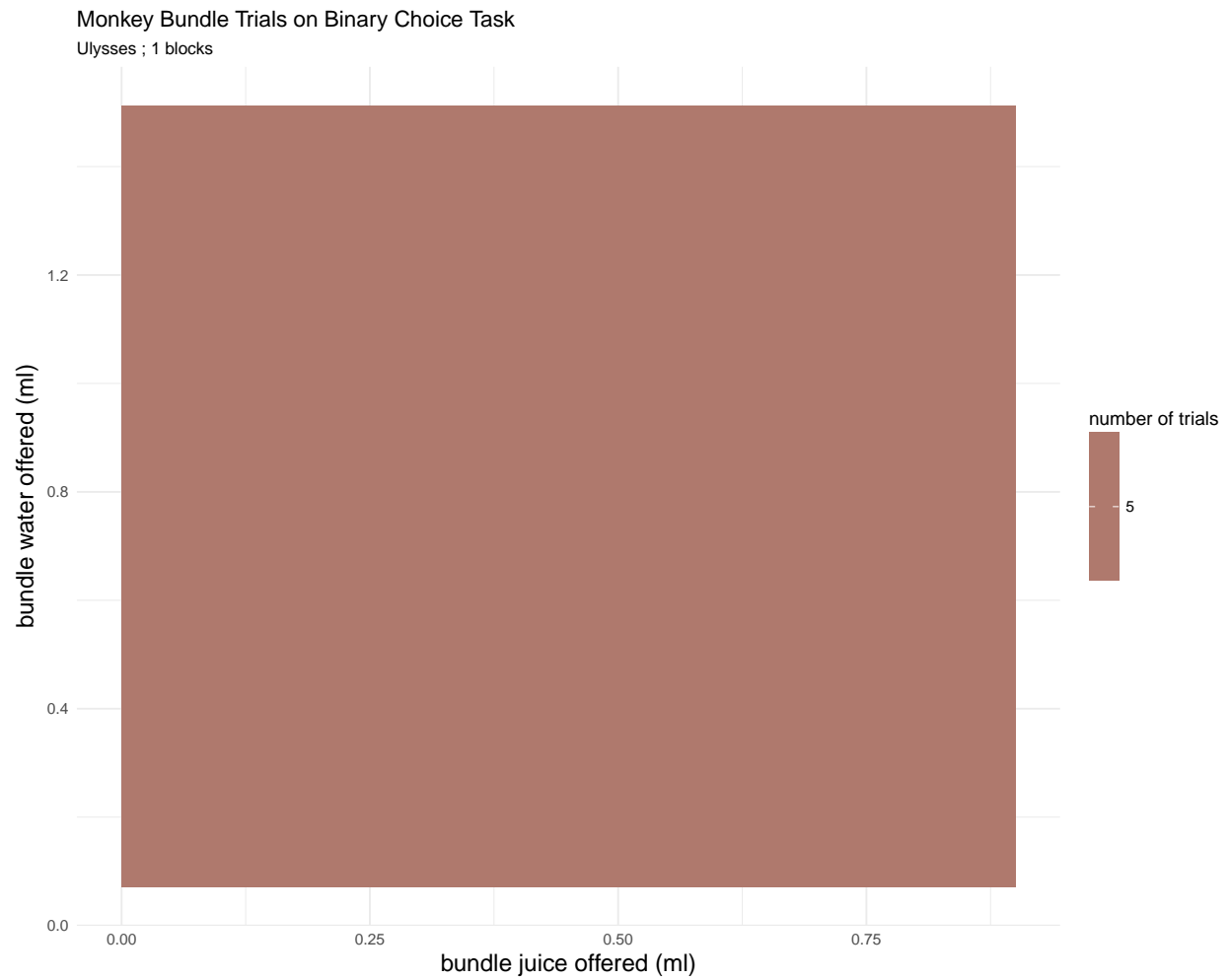
Graph showing the number of trials the monkey carried out for each bundle combination. Does not include failed trials.

Monkey Proportion of Bundle Bids on Binary Choice Task

Ulysses ; 1 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.

Monkey Proportion of Bundle Bids on Binary Choice Task (CI = 0.95?)

Ulysses ; 1 blocks
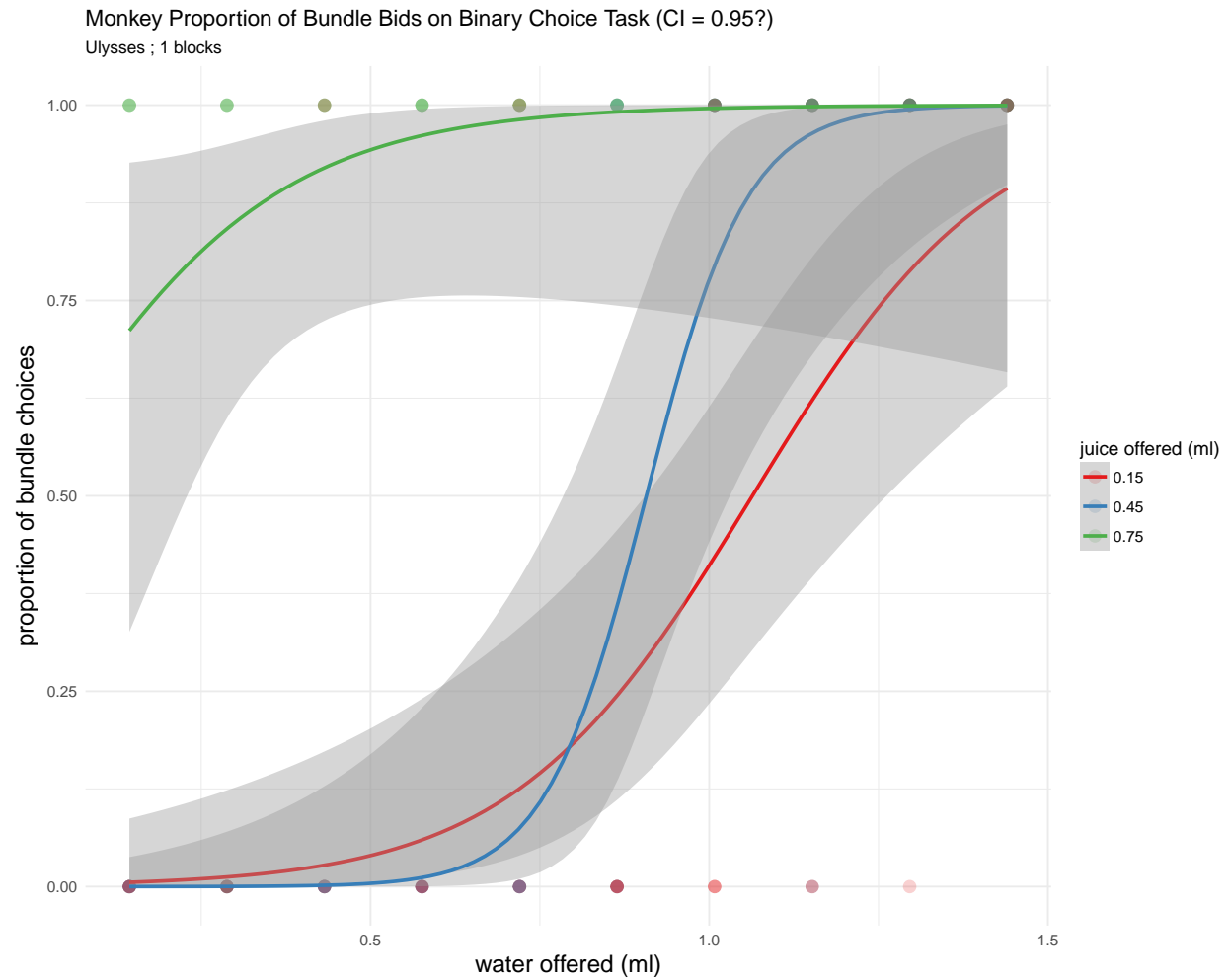
Same graph as above but with 95% confidence intervals. Uses the default method of calculating this for the tidyverse libraries in R which I'm not convinced are the best way. Looking into calculating and plotting it myself.