Binary Choice Analysis

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```r
monkey <- "Ulysses"
today <- "05-Mar-2018"
look_back <- "26-Feb-2018"
```
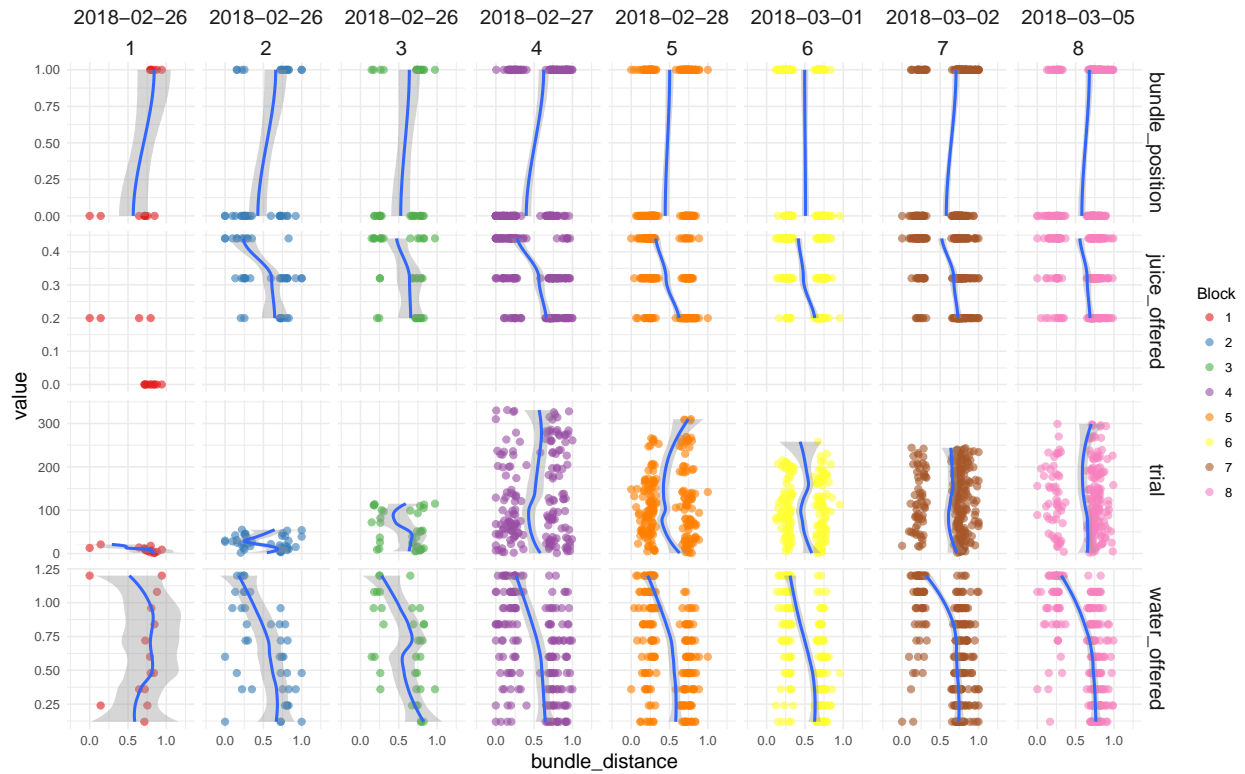
p1

Monkey Choice Distance From Bundle on Binary Choice Task
Ulysses : 26–Feb–2018 – 05–Mar–2018
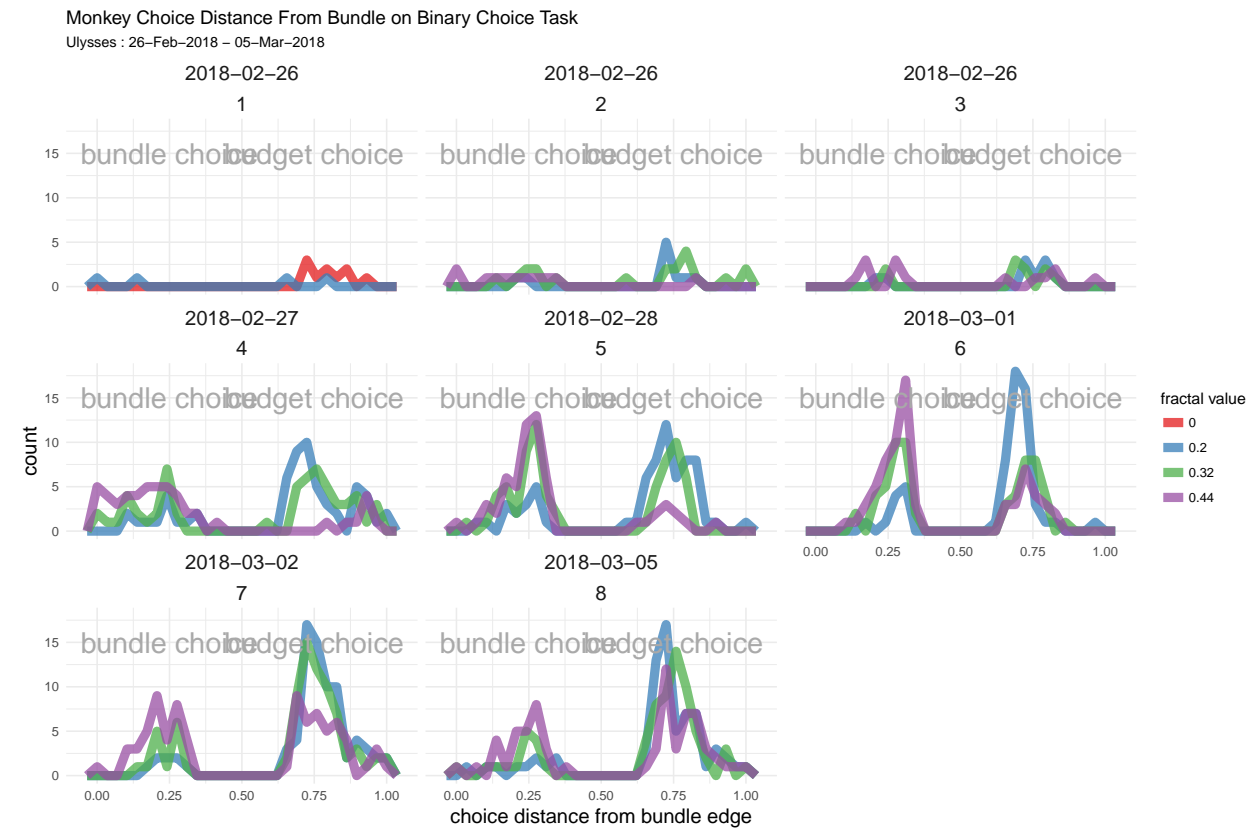
p2

Monkey Choice Distance From Bundle on Binary Choice Task
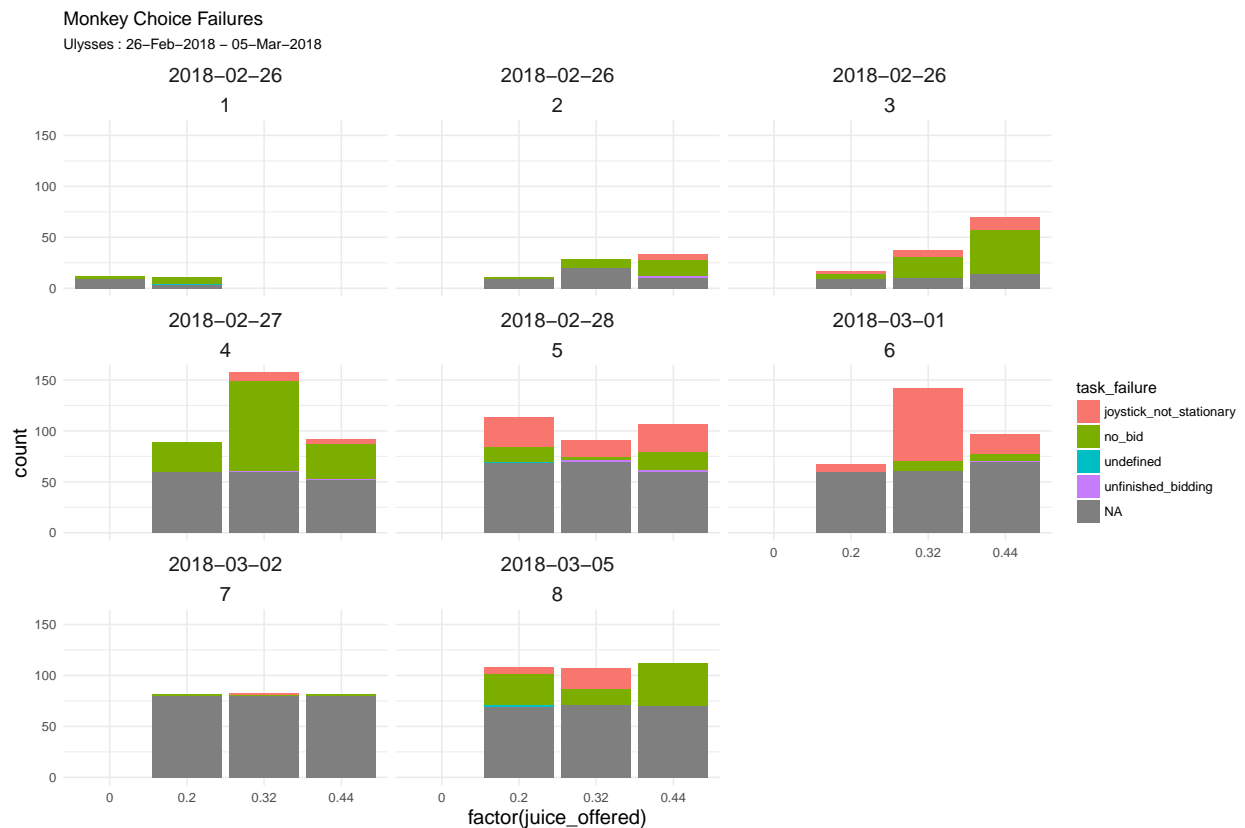Ulysses : 26–Feb–2018 – 05–Mar–2018

```
#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
## -3.1711  -0.5933  -0.2038   0.5606   2.7988
##
## Coefficients:
##                  Estimate Std. Error z value Pr(>|z|)
## (Intercept)     5.584e+03  7.567e+02   7.380 1.58e-13 ***
## bundle_position -1.016e+00  1.750e-01  -5.804 6.47e-09 ***
## water_offered    4.848e+00  3.257e-01  14.885  < 2e-16 ***
## juice_offered    1.428e+01  1.067e+00  13.389  < 2e-16 ***
## trial           -6.443e-05  1.086e-03  -0.059    0.953
## date            -3.179e-01  4.302e-02  -7.389 1.48e-13 ***
## ---
```

2

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1467.68  on 1101  degrees of freedom
## Residual deviance:  869.38  on 1096  degrees of freedom
##   (642 observations deleted due to missingness)
## AIC: 881.38
##
## Number of Fisher Scoring iterations: 5
```

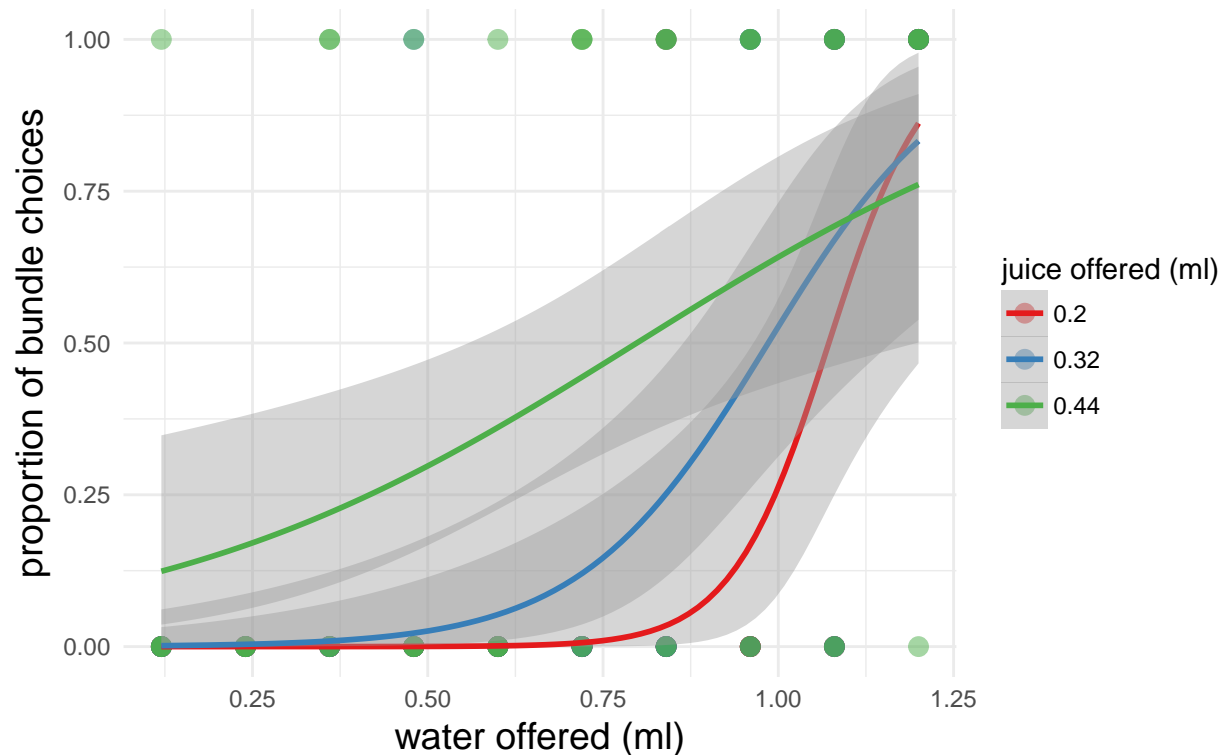p3

Monkey Choice Failures
Ulysses : 26–Feb–2018 – 05–Mar–2018

p4

Monkey Bundle Choice Binoimial Curves

Ulysses : 26–Feb–2018 – 05–Mar–2018
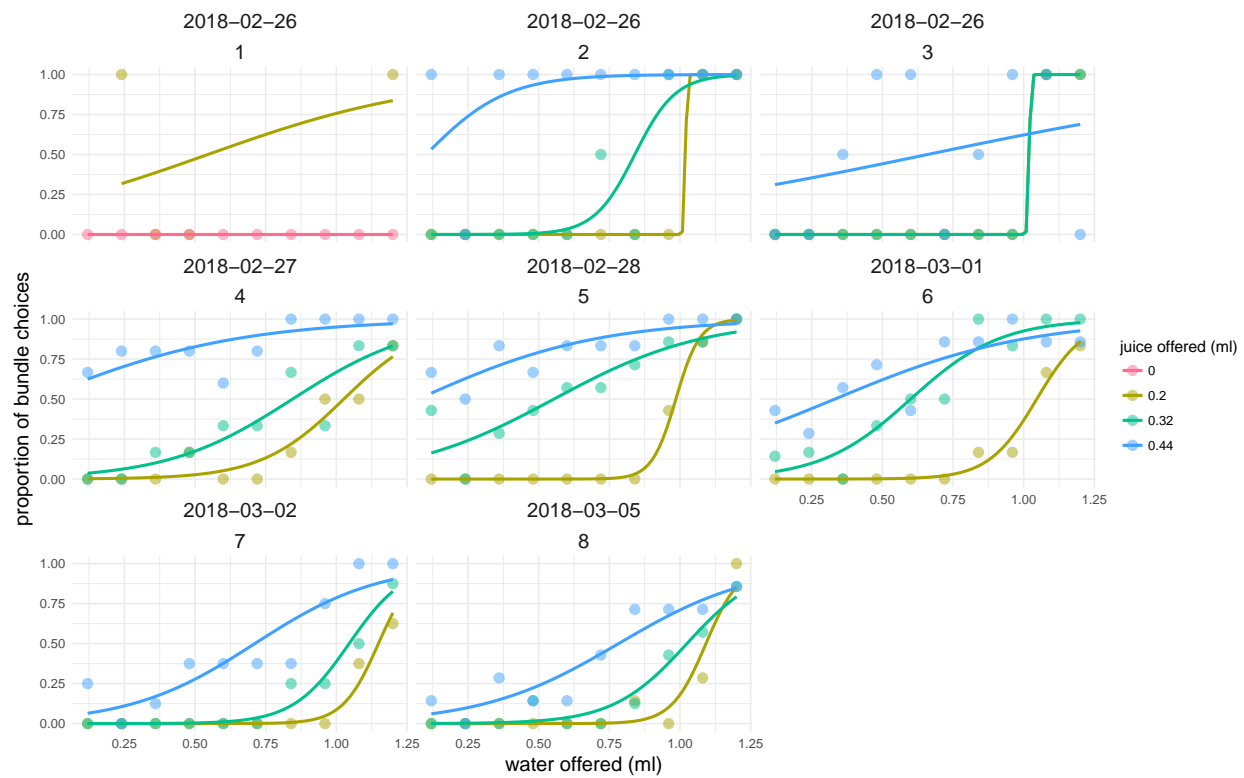
p5

Today's Monkey Bundle Choice Binoimial Curves
Ulysses : 05–Mar–2018


```
p6 <- task_data %>%
  .[order(block_no, trial)] %>%
  .[,correct := cumsum(is.na(task_failure)), by = block_no] %>%
  .[bundle_position == fractal_choice, left_bid := 1] %>%
  .[bundle_position != fractal_choice, left_bid := -1] %>%
  .[!is.na(left_bid), leftward_bias := cumsum(left_bid) / trial, by = block_no] %>%
  #.[, res := rollapplyr(progression, 1:.N, mean), by = block_no]
  ggplot(., aes(x = trial, y = correct)) +
  geom_point(size = 3, aes(colour = leftward_bias)) +
  scale_colour_gradient2(low = "darkred", high = "darkblue", midpoint = 0, mid = "purple") +
  xlab("trial number") +
  ylab("correctly completed trials") +
  ggtitle("Monkey Trial Progression and Bias",
          subtitle = paste(monkey, ":", look_back, "-", today)) +
  theme_minimal() +
  theme(strip.text.x = element_text(size = 14)) +
  theme(axis.title.x = element_text(size = 14)) +
  theme(axis.title.y = element_text(size = 14)) +
  facet_wrap(~date + block_no)

p6
```

Monkey Trial Progression and Bias

Ulysses : 26–Feb–2018 – 05–Mar–2018