

Exp 3 - Control-Response Analysis

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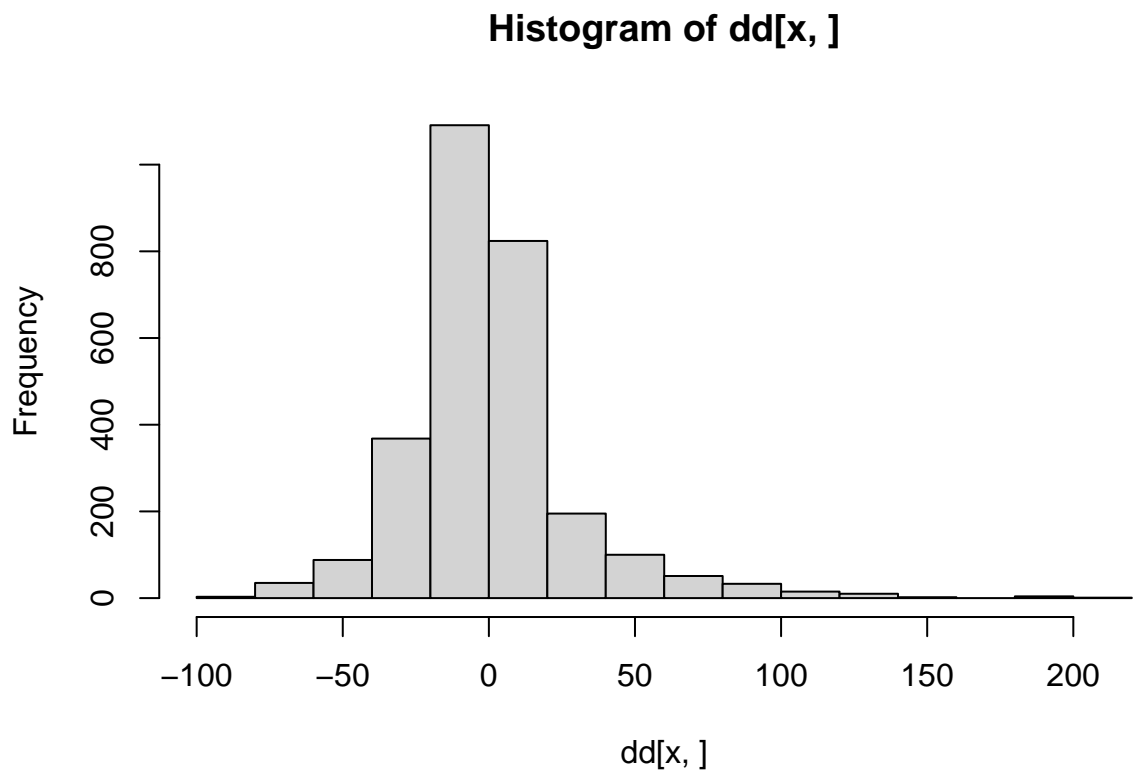
```
## Data: CC3Target
## Models:
## e3.ControlvTarget1: RespRate ~ Phase + ResponseType + (1 | ID)
## e3.ControlvTarget2: RespRate ~ Phase * ResponseType + (1 | ID)
##               npar   AIC   BIC logLik deviance Chisq Df Pr(>Chisq)
## e3.ControlvTarget1     6 39947 39985 -19968     39935
## e3.ControlvTarget2     8 39704 39755 -19844     39688 247.3  2 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Linear mixed model fit by maximum likelihood ['lmerMod']
## Formula: RespRate ~ Phase * ResponseType + (1 | ID)
## Data: CC3Target
##
##           AIC          BIC    logLik deviance df.resid
## 39704.0    39754.6 -19844.0   39688.0      4128
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.9063 -0.5037 -0.0833  0.3030  7.1379
##
## Random effects:
## Groups   Name                Variance Std.Dev.
## ID       (Intercept)    223.1      14.94
## Residual                    811.9      28.49
## Number of obs: 4136, groups: ID, 94
##
## Fixed effects:
##
##              Estimate Std. Error t value
## (Intercept)    14.9965    1.7174   8.732
## Phase2          1.1206    1.5177   0.738
## Phase3          0.9876    2.2124   0.446
## ResponseTypeTarget 35.5284    1.0732 33.106
## Phase2:ResponseTypeTarget -32.0603    2.1463 -14.937
## Phase3:ResponseTypeTarget -25.4220    3.1288  -8.125
##
## Correlation of Fixed Effects:
##              (Intr) Phase2 Phase3 RspnTT P2:RTT
## Phase2      -0.221
## Phase3      -0.152  0.171
## RspnsTypTrg -0.312  0.354  0.243
## Phs2:RspnTT  0.156 -0.707 -0.121 -0.500
## Phs3:RspnTT  0.107 -0.121 -0.707 -0.343  0.171
```

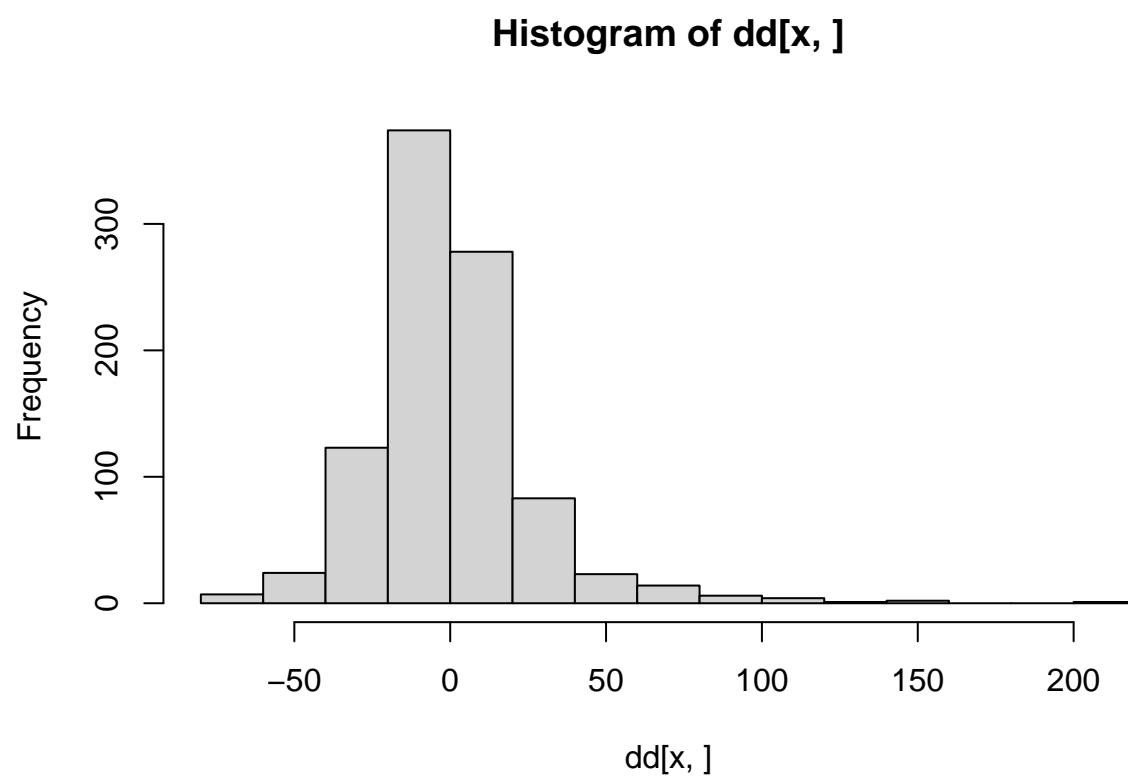
Fixed effects

```
## Registered S3 methods overwritten by 'car':
##   method                                from
##   influence.merMod                      lme4
##   cooks.distance.influence.merMod      lme4
##   dfbeta.influence.merMod              lme4
##   dfbetas.influence.merMod             lme4

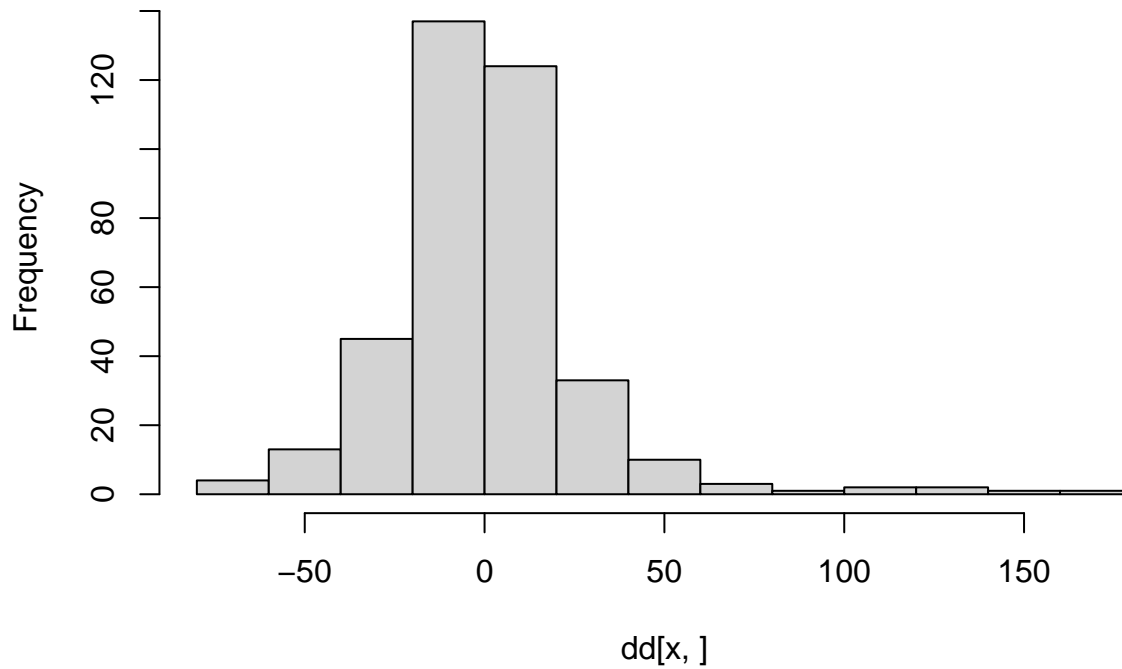
## Analysis of Deviance Table (Type II Wald chisquare tests)
##
## Response: RespRate
##               Chisq Df Pr(>Chisq)
## Phase          219.94  2 < 2.2e-16 ***
## ResponseType    856.33  1 < 2.2e-16 ***
## Phase:ResponseType 255.02  2 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```



Checking residuals



Histogram of dd[x,]

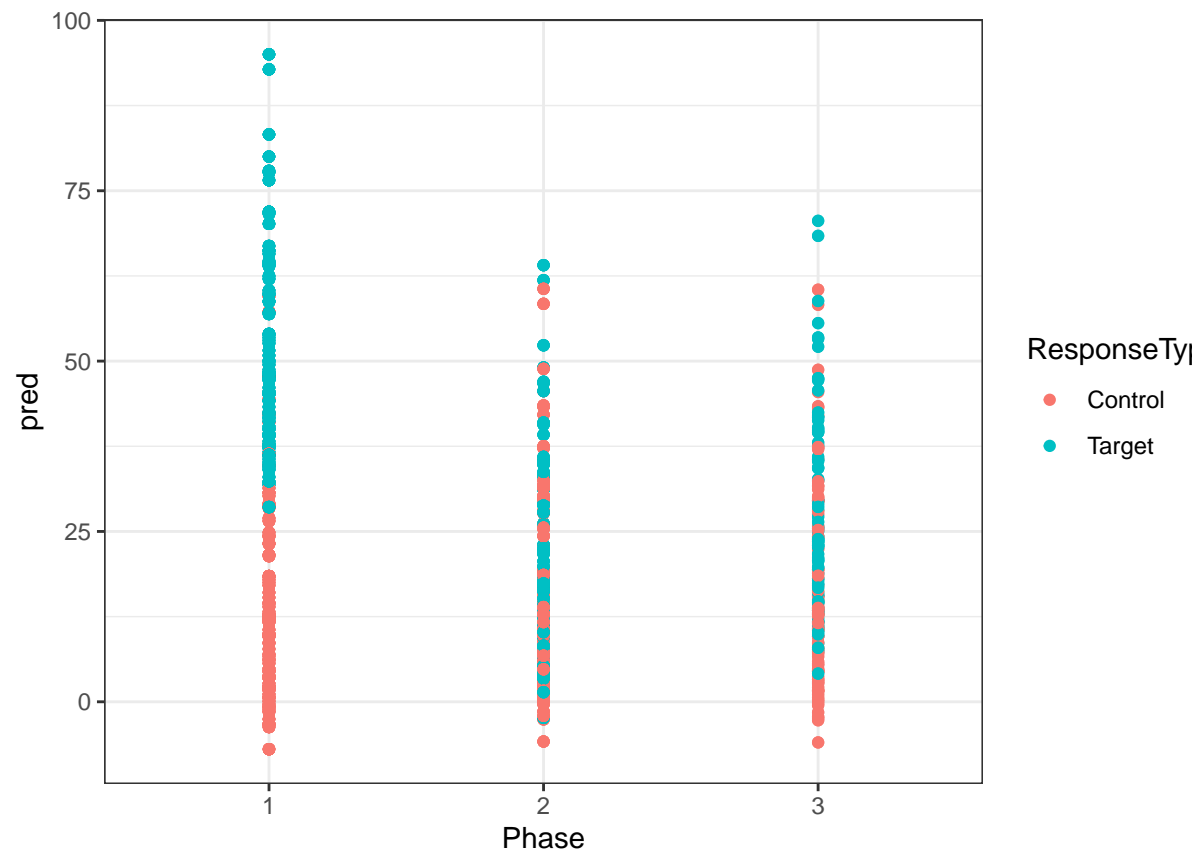


```
## CC3Target$Phase: 1
## $breaks
## [1] -100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180
## [16] 200 220
##
## $counts
## [1] 3 35 88 368 1091 824 195 100 51 33 15 10 2 0 4
## [16] 1
##
## $density
## [1] 5.319149e-05 6.205674e-04 1.560284e-03 6.524823e-03 1.934397e-02
## [6] 1.460993e-02 3.457447e-03 1.773050e-03 9.042553e-04 5.851064e-04
## [11] 2.659574e-04 1.773050e-04 3.546099e-05 0.000000e+00 7.092199e-05
## [16] 1.773050e-05
##
## $mids
## [1] -90 -70 -50 -30 -10 10 30 50 70 90 110 130 150 170 190 210
##
## $xname
## [1] "dd[x, ]"
##
## $equidist
## [1] TRUE
##
## attr(,"class")
## [1] "histogram"
```

```

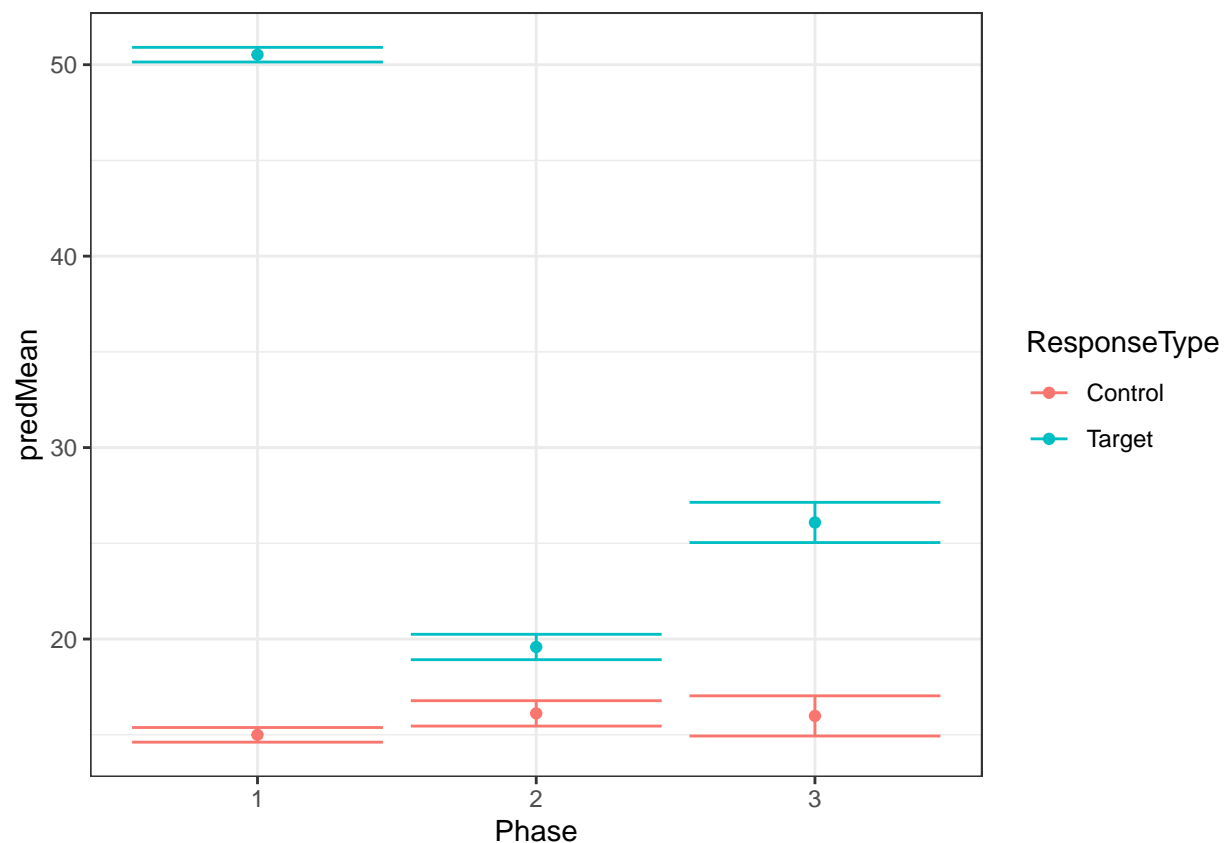
## -----
## CC3Target$Phase: 2
## $breaks
## [1] -80 -60 -40 -20  0  20  40  60  80 100 120 140 160 180 200 220
##
## $counts
## [1]  7  24 123 374 278  83  23  14  6  4  1  2  0  0  1
##
## $density
## [1] 3.723404e-04 1.276596e-03 6.542553e-03 1.989362e-02 1.478723e-02
## [6] 4.414894e-03 1.223404e-03 7.446809e-04 3.191489e-04 2.127660e-04
## [11] 5.319149e-05 1.063830e-04 0.000000e+00 0.000000e+00 5.319149e-05
##
## $mids
## [1] -70 -50 -30 -10  10  30  50  70  90 110 130 150 170 190 210
##
## $xname
## [1] "dd[x, ]"
##
## $equidist
## [1] TRUE
##
## attr("class")
## [1] "histogram"
## -----
## CC3Target$Phase: 3
## $breaks
## [1] -80 -60 -40 -20  0  20  40  60  80 100 120 140 160 180
##
## $counts
## [1]  4  13  45 137 124  33  10  3  1  2  2  1  1
##
## $density
## [1] 0.0005319149 0.0017287234 0.0059840426 0.0182180851 0.0164893617
## [6] 0.0043882979 0.0013297872 0.0003989362 0.0001329787 0.0002659574
## [11] 0.0002659574 0.0001329787 0.0001329787
##
## $mids
## [1] -70 -50 -30 -10  10  30  50  70  90 110 130 150 170
##
## $xname
## [1] "dd[x, ]"
##
## $equidist
## [1] TRUE
##
## attr("class")
## [1] "histogram"

```



looking @ predictions

'summarise()' has grouped output by 'Phase'. You can override using the '.groups' argument.



specific comparisons

```
## $emmeans
## ResponseType = Control:
## Phase emmean SE df lower.CL upper.CL
## 1 15.0 1.73 125 11.6 18.4
## 2 16.1 2.03 240 12.1 20.1
## 3 16.0 2.59 608 10.9 21.1
##
## ResponseType = Target:
## Phase emmean SE df lower.CL upper.CL
## 1 50.5 1.73 125 47.1 53.9
## 2 19.6 2.03 240 15.6 23.6
## 3 26.1 2.59 608 21.0 31.2
##
## Degrees-of-freedom method: kenward-roger
## Confidence level used: 0.95
##
## $contrasts
## ResponseType = Control:
## contrast estimate SE df t.ratio p.value
## 1 - 2 -1.121 1.52 4047 -0.738 0.4606
## 1 - 3 -0.988 2.21 4047 -0.446 0.6555
## 2 - 3 0.133 2.46 4047 0.054 0.9569
##
## ResponseType = Target:
## contrast estimate SE df t.ratio p.value
```

```

## 1 - 2      30.940 1.52 4047 20.374 <.0001
## 1 - 3      24.434 2.21 4047 11.038 <.0001
## 2 - 3      -6.505 2.46 4047 -2.644 0.0082
##
## Degrees-of-freedom method: kenward-roger

## $emmeans
## Phase = 1:
## ResponseType emmean SE df lower.CL upper.CL
## Control      15.0 1.73 125 11.6 18.4
## Target       50.5 1.73 125 47.1 53.9
##
## Phase = 2:
## ResponseType emmean SE df lower.CL upper.CL
## Control      16.1 2.03 240 12.1 20.1
## Target       19.6 2.03 240 15.6 23.6
##
## Phase = 3:
## ResponseType emmean SE df lower.CL upper.CL
## Control      16.0 2.59 608 10.9 21.1
## Target       26.1 2.59 608 21.0 31.2
##
## Degrees-of-freedom method: kenward-roger
## Confidence level used: 0.95
##
## $contrasts
## Phase = 1:
## contrast      estimate SE df t.ratio p.value
## Control - Target -35.53 1.07 4047 -33.086 <.0001
##
## Phase = 2:
## contrast      estimate SE df t.ratio p.value
## Control - Target -3.47 1.86 4047 -1.865 0.0623
##
## Phase = 3:
## contrast      estimate SE df t.ratio p.value
## Control - Target -10.11 2.94 4047 -3.437 0.0006
##
## Degrees-of-freedom method: kenward-roger

```

Conclusion: No statistically significant increases in control responses from Phase 2 to Phase 3. Control responses remained low throughout the experiment.