

# Hypothesis Testing for NSF Office Stress Project - Full Sensor Set

Below are the test results for each of the Conditions that had  $n \geq 7$  subjects. Statistical testing can have three different possible outcomes: the data is already normal (t-test), the logarithm of the data is normal (t-test with log data), or the data is NOT normal (Wilcoxon test).

For notation, let:

**WB-RB** = Writing Baseline - Resting Baseline

**SC-RB** = Stress Condition - Resting Baseline

**SC-WB** = Stress Condition - Writing Baseline

**DT-RB** = Dual Task - Resting Baseline

**DT-WB** = Dual Task - Writing Baseline

**DT-SC** = Dual Task - Stress Condition

**P-RB** = Presentation - Resting Baseline

**P-WB** = Presentation - Writing Baseline

**P-SC** = Presentation - Stress Condition

**P-DT** = Presentation - Dual Task

For each of the graphs, let:

**\*** =  $0.01 < p \leq 0.05$

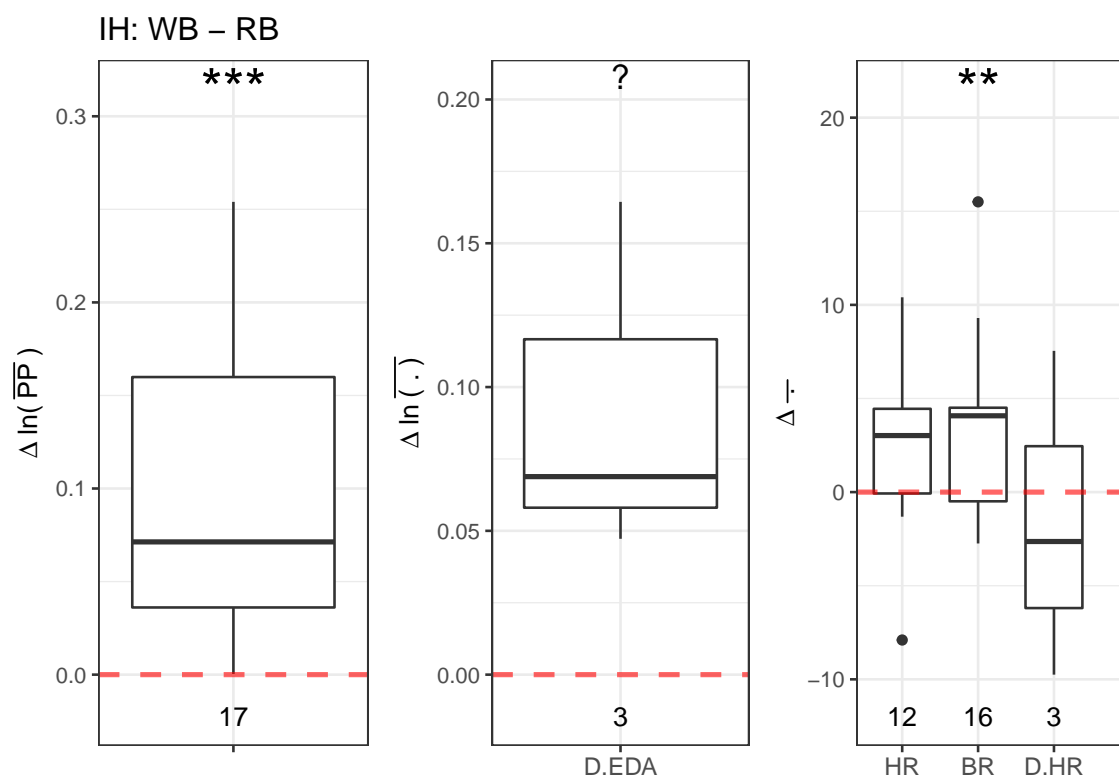
**\*\*** =  $0.001 < p \leq 0.01$

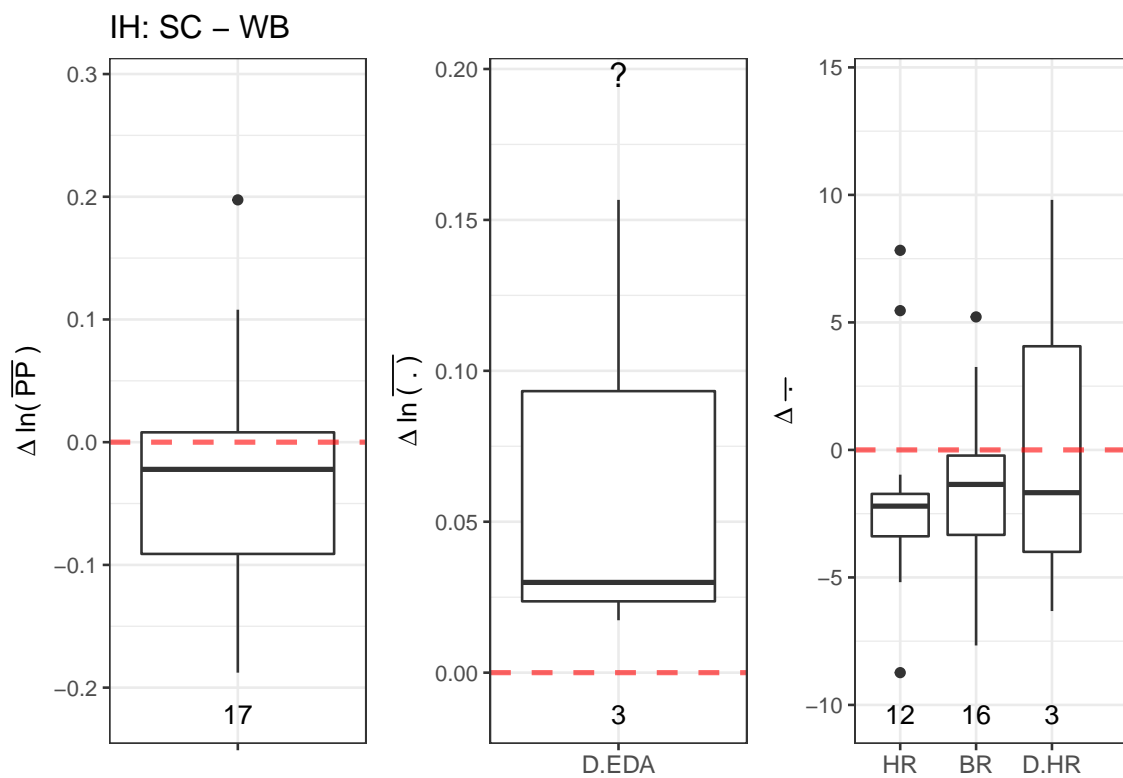
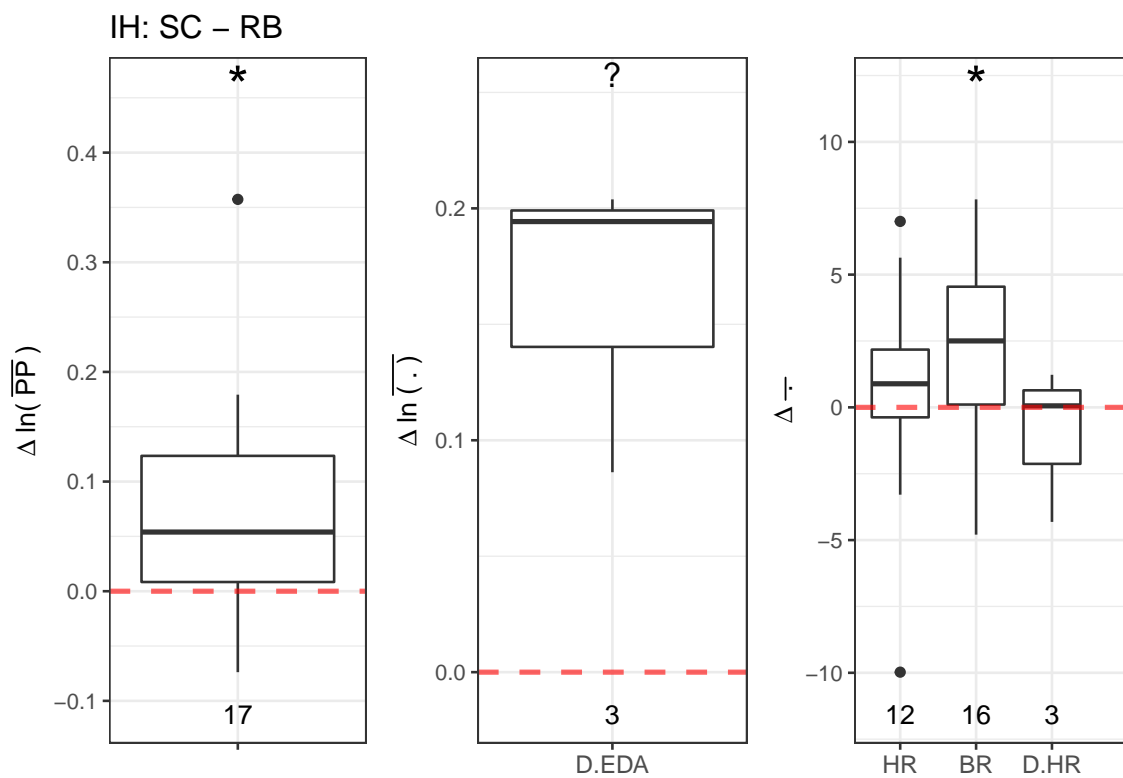
**\*\*\*** =  $p \leq 0.001$

**?** = Did not run statistical test ( $n < 7$ )

**Intermittent-High (IH)**

## Sensor Channels per Activity

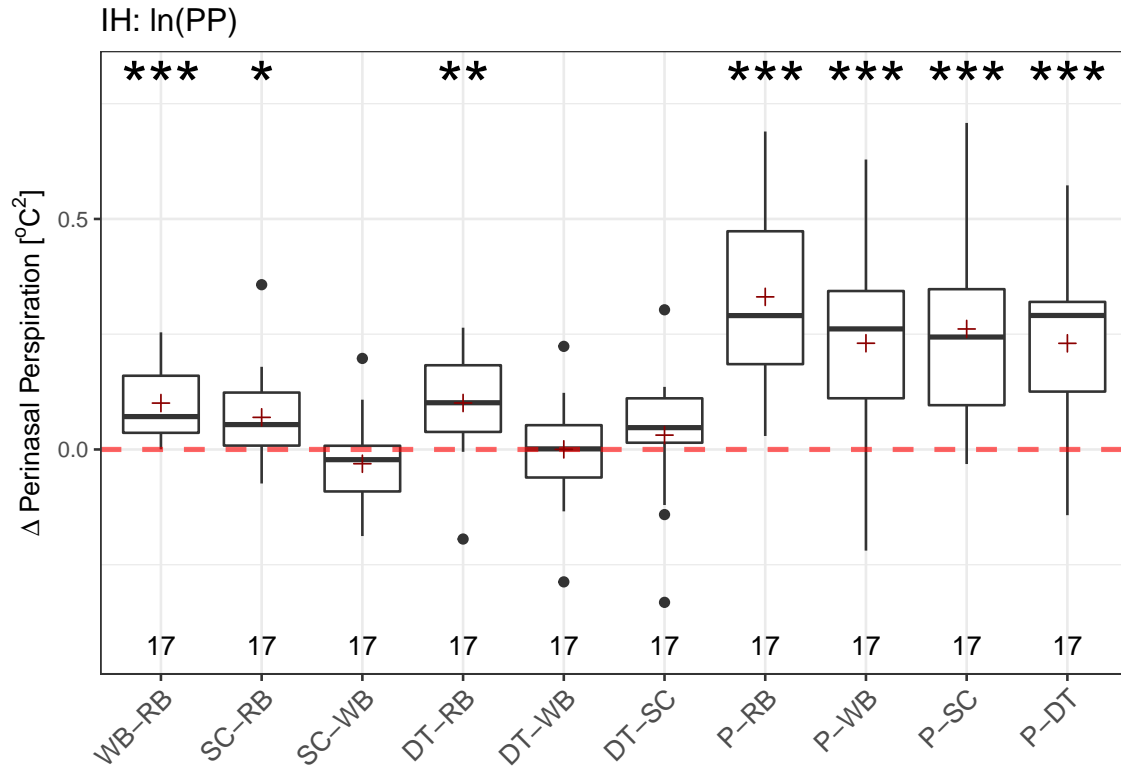








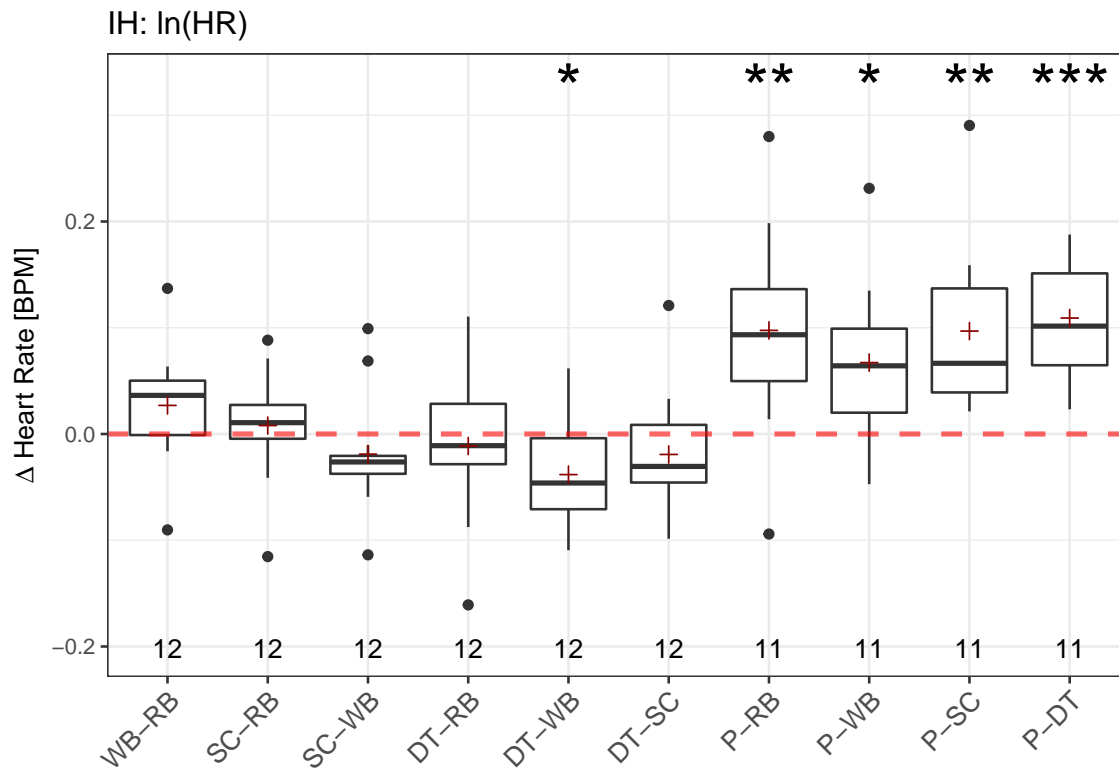
## Sensor Channel across Activities



```
## In the following tests, we applied ln(PP).
##
## Writing Baseline - Resting Baseline
## Transformed t-test p = 1e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0145 < 0.05 *
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.2084 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.0016 < 0.01 **
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.9946 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.3697 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0 < 0.001 ***
##
```

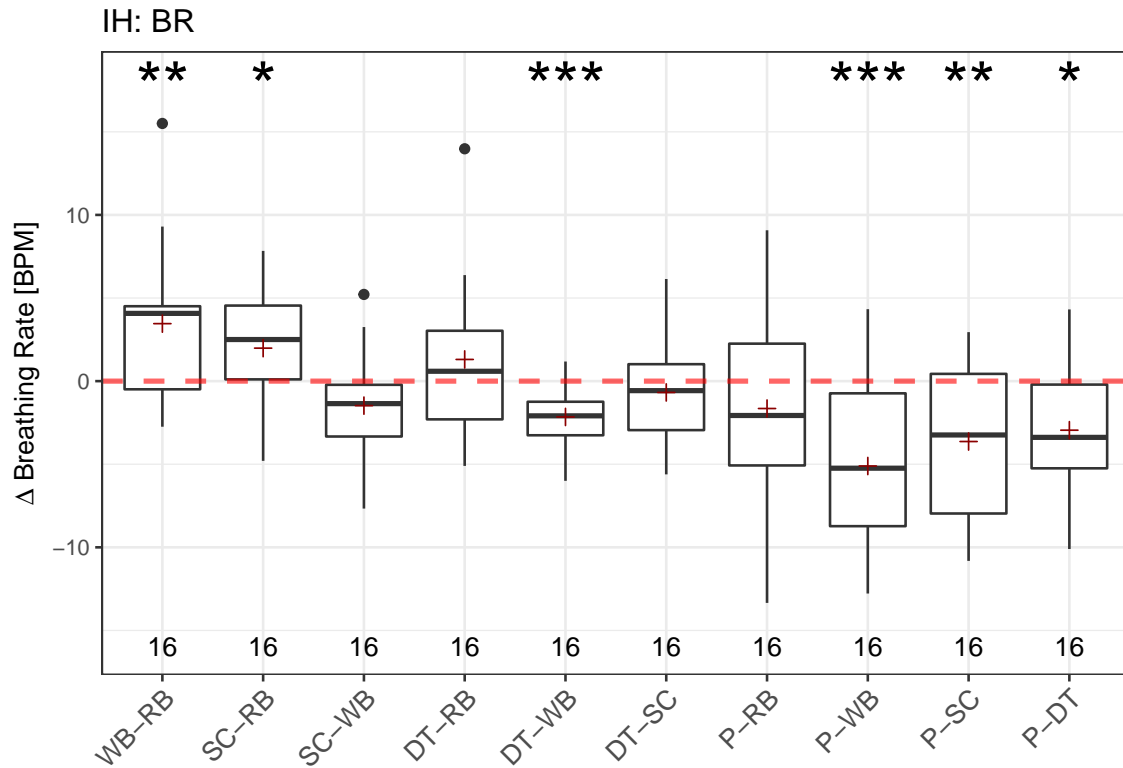
```
## Presentation - Writing Baseline
## Transformed t-test p = 2e-04 < 0.001 ***
##
## Presentation - Stress Condition
## Transformed t-test p = 1e-04 < 0.001 ***
##
## Presentation - Dual Task
## Transformed t-test p = 2e-04 < 0.001 ***
```





```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.1185 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.6095 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.2597 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.5735 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.0172 < 0.05  *
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.2853 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.0079 < 0.01  **
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.0153 < 0.05  *
##
## Presentation - Stress Condition
```

```
## Transformed t-test p = 0.0026 < 0.01  **  
##  
## Presentation - Dual Task  
## Transformed t-test p = 0 < 0.001  ***
```



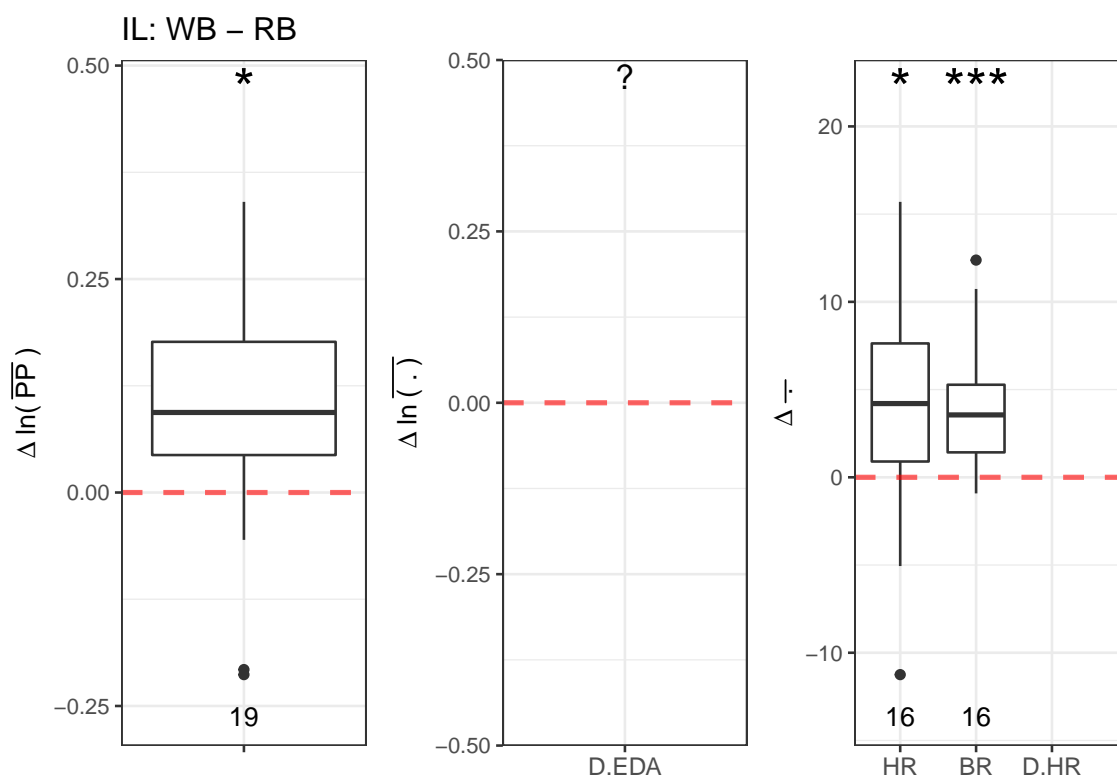
```
## Writing Baseline - Resting Baseline
## t-test p = 0.0086 < 0.01 **
##
## Stress Condition - Resting Baseline
## t-test p = 0.0455 < 0.05 *
##
## StressCondition - Writing Baseline
## t-test p = 0.0933 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.2969 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 5e-04 < 0.001 ***
##
## Dual Task - Stress Condition
## t-test p = 0.3543 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.2723 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 9e-04 < 0.001 ***
##
## Presentation - Stress Condition
```

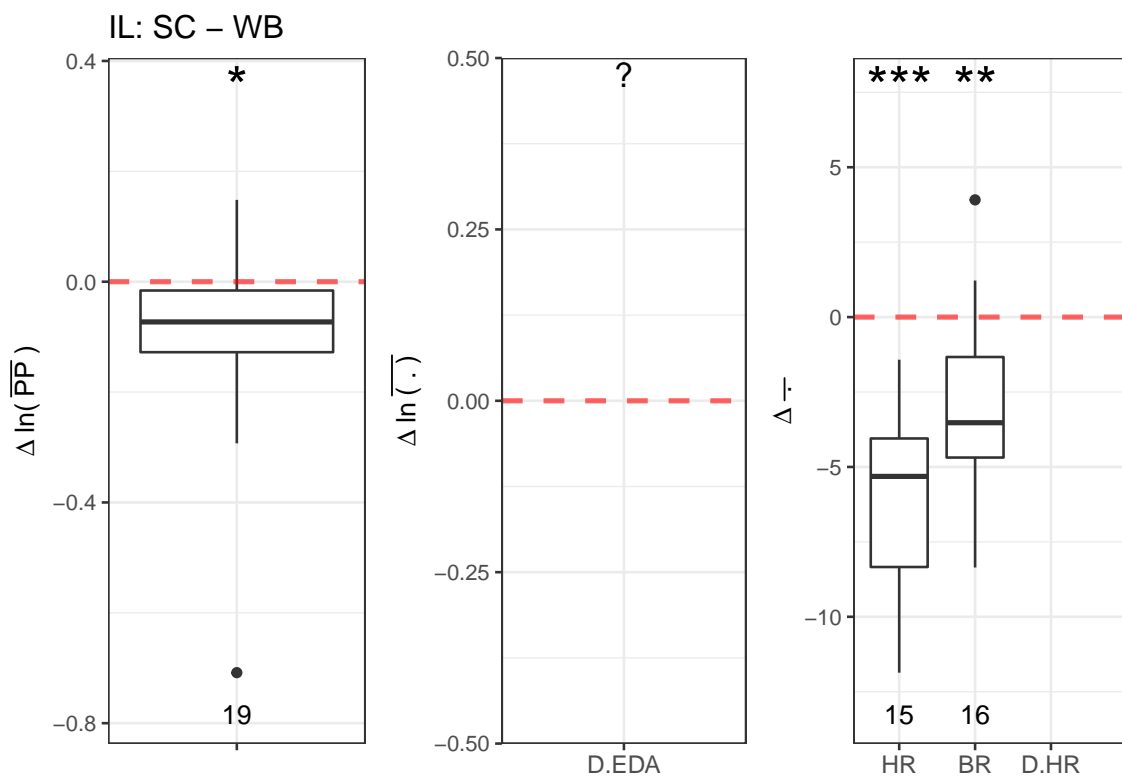
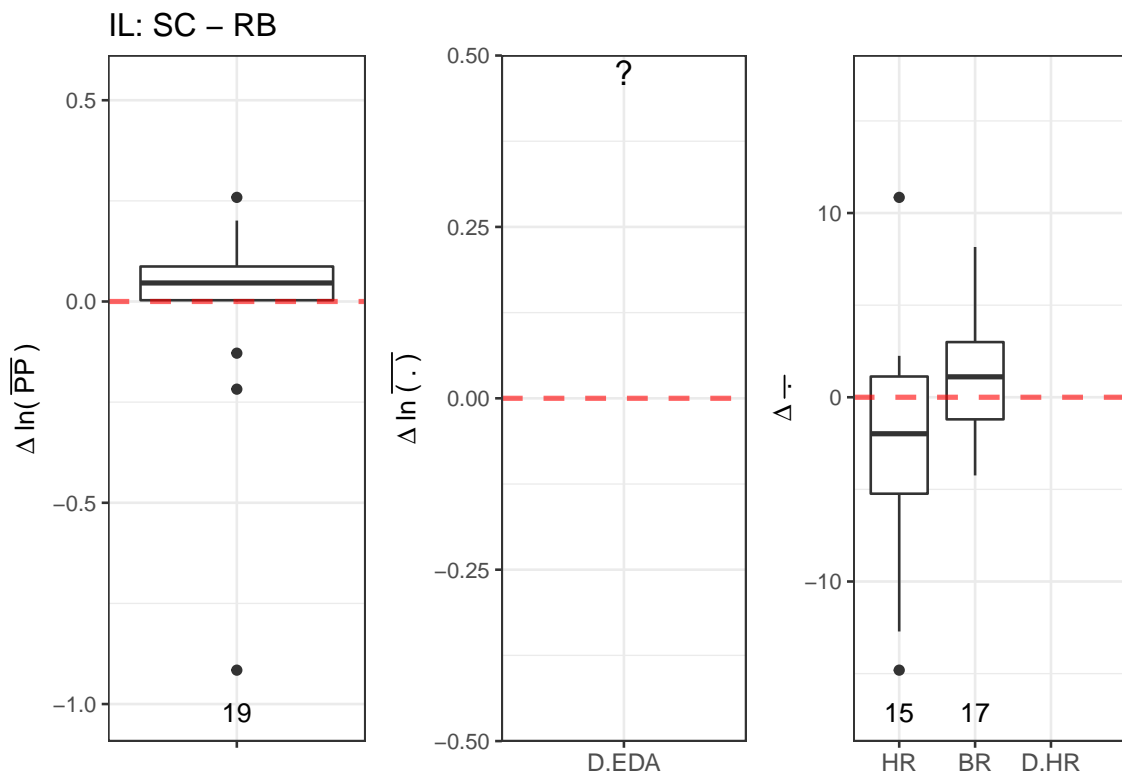
```
## t-test p = 0.0066 < 0.01  **
##
## Presentation - Dual Task
## t-test p = 0.0132 < 0.05  *
```

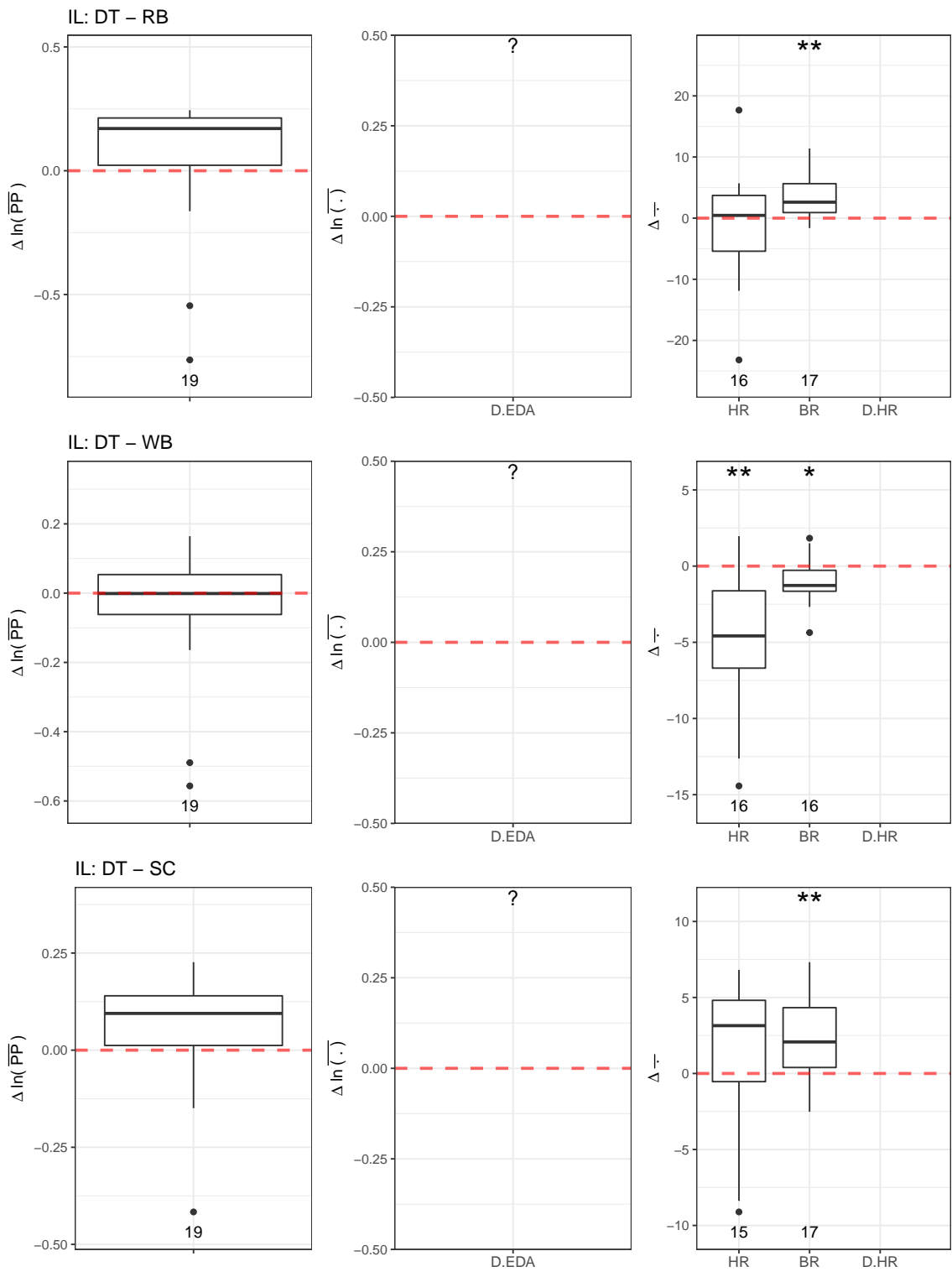
```
## IH has LESS than 7 subjects for D.EDA. Cannot continue with test.
## -----
## IH has LESS than 7 subjects for D.HR. Cannot continue with test.
## -----
```

**Intermittent-Low (IL)**

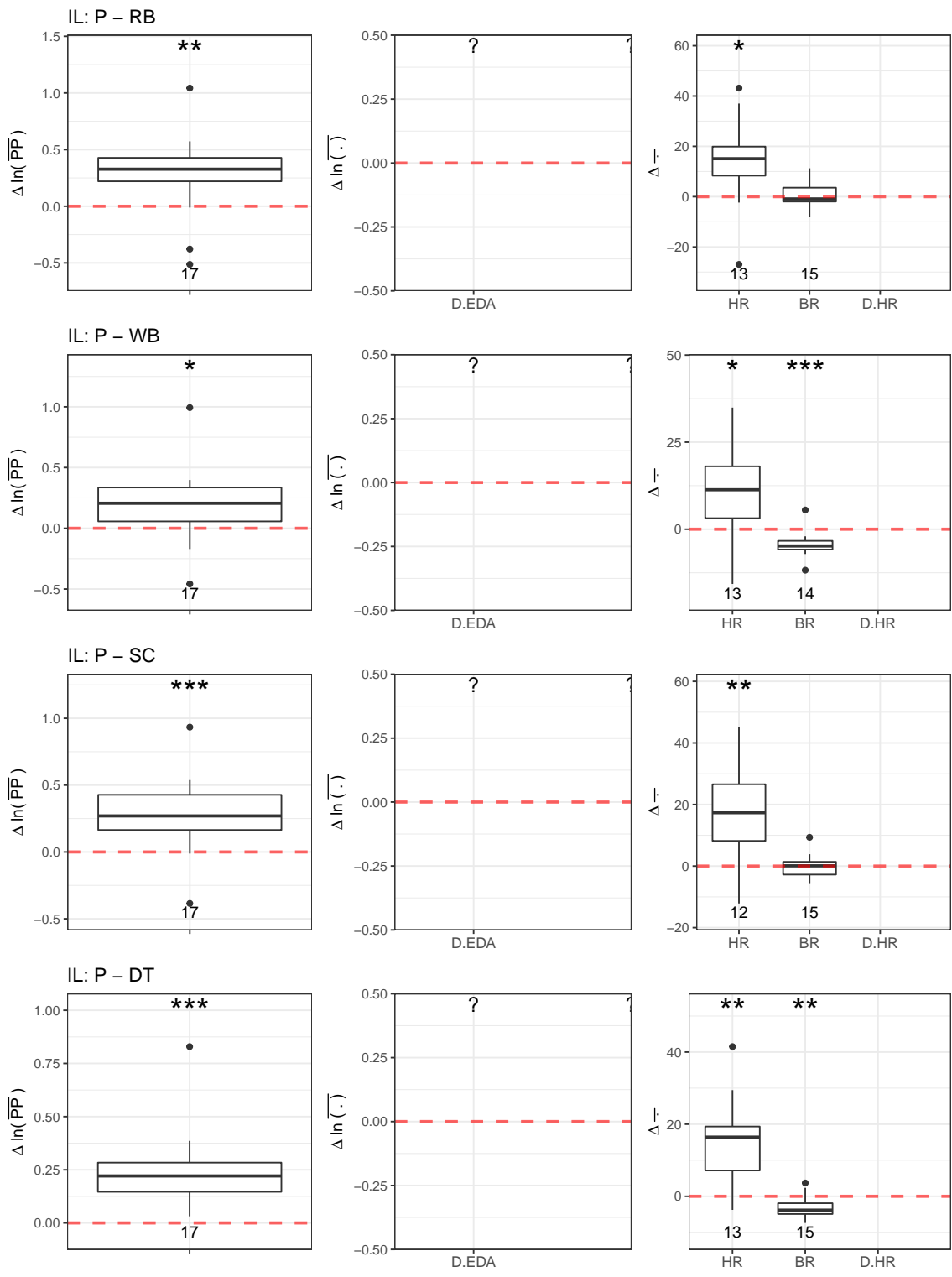
## Sensor Channels per Activity



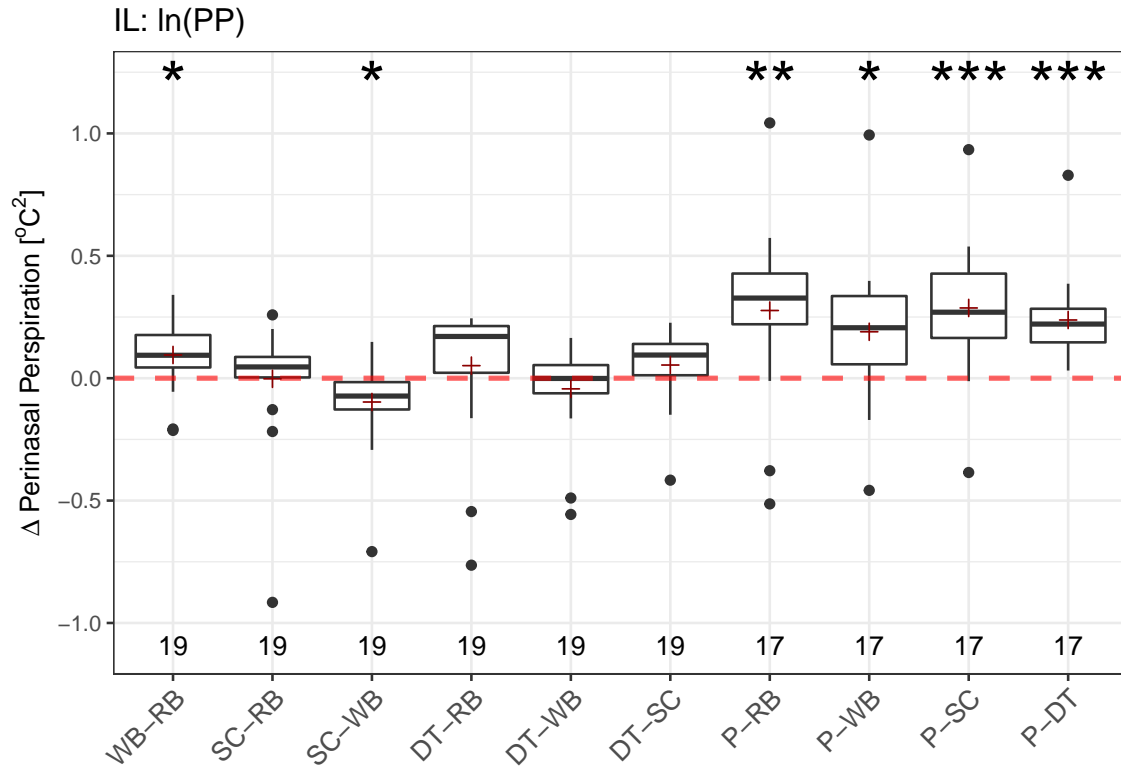






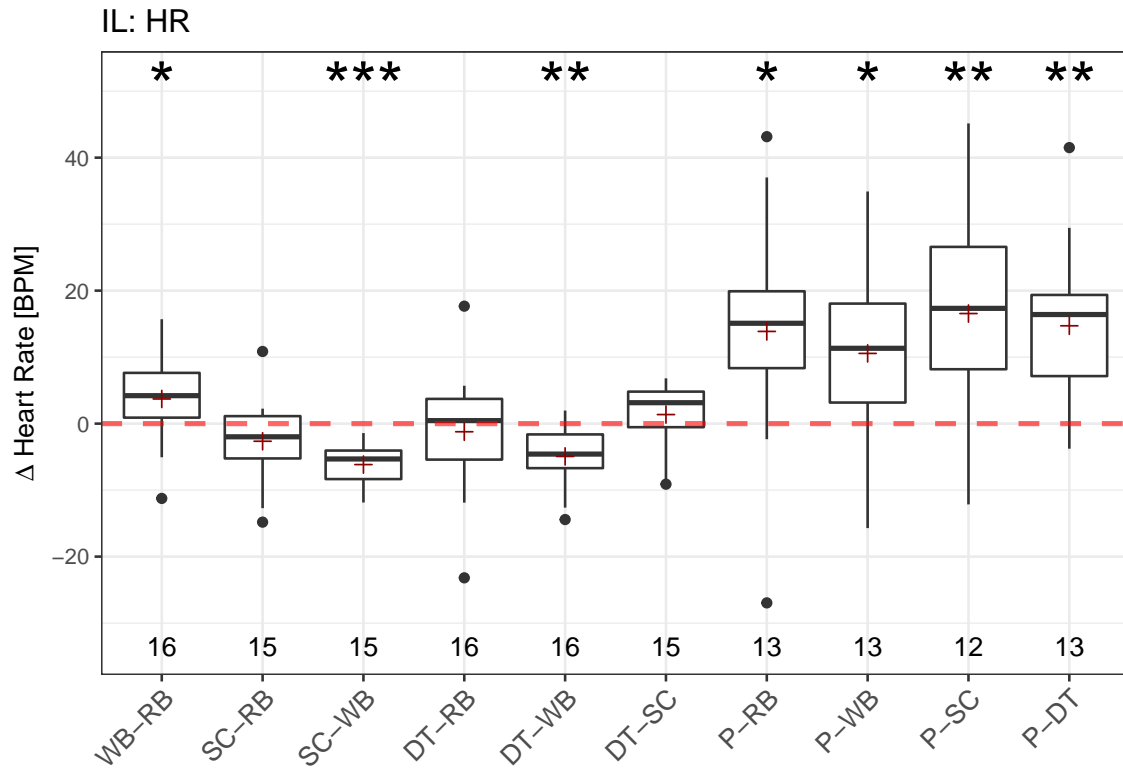


## Sensor Channel across Activities



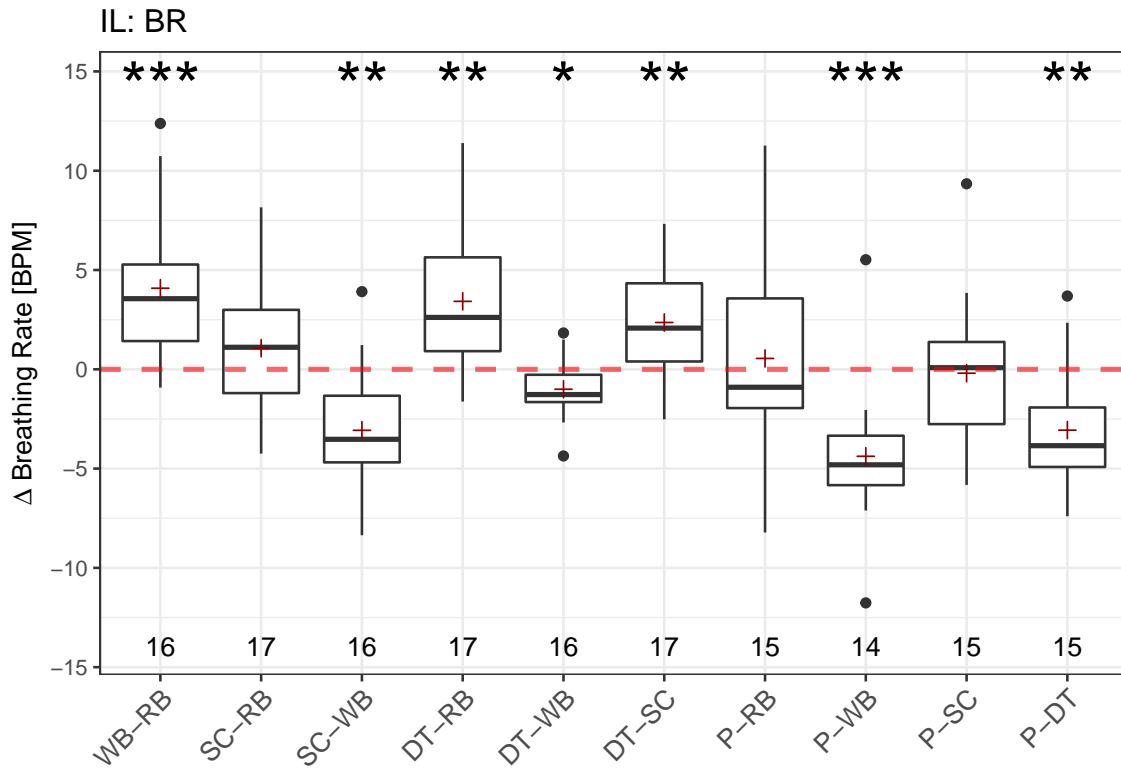
```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.0111 < 0.05  *
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.9654 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.0291 < 0.05  *
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.4248 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.33 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.1284 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.0059 < 0.01  **
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.0204 < 0.05  *
```

```
##  
## Presentation - Stress Condition  
## Transformed t-test p = 5e-04 < 0.001 ***  
##  
## Presentation - Dual Task  
## Transformed t-test p = 1e-04 < 0.001 ***
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.034 < 0.05  *
##
## Stress Condition - Resting Baseline
## t-test p = 0.1432 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0 < 0.001  ***
##
## Dual Task - Resting Baseline
## t-test p = 0.5956 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.0013 < 0.01  **
##
## Dual Task - Stress Condition
## t-test p = 0.2937 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0134 < 0.05  *
##
## Presentation - Writing Baseline
## t-test p = 0.0132 < 0.05  *
##
## Presentation - Stress Condition
```

```
## t-test p = 0.0032 < 0.01 **  
##  
## Presentation - Dual Task  
## t-test p = 0.0012 < 0.01 **
```



```
## Writing Baseline - Resting Baseline
## t-test p = 5e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## t-test p = 0.1932 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.0015 < 0.01 **
##
## Dual Task - Resting Baseline
## t-test p = 0.0031 < 0.01 **
##
## Dual Task - Writing Baseline
## t-test p = 0.0204 < 0.05 *
##
## Dual Task - Stress Condition
## t-test p = 0.0063 < 0.01 **
##
## Presentation - Resting Baseline
## t-test p = 0.6754 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 7e-04 < 0.001 ***
##
## Presentation - Stress Condition
```

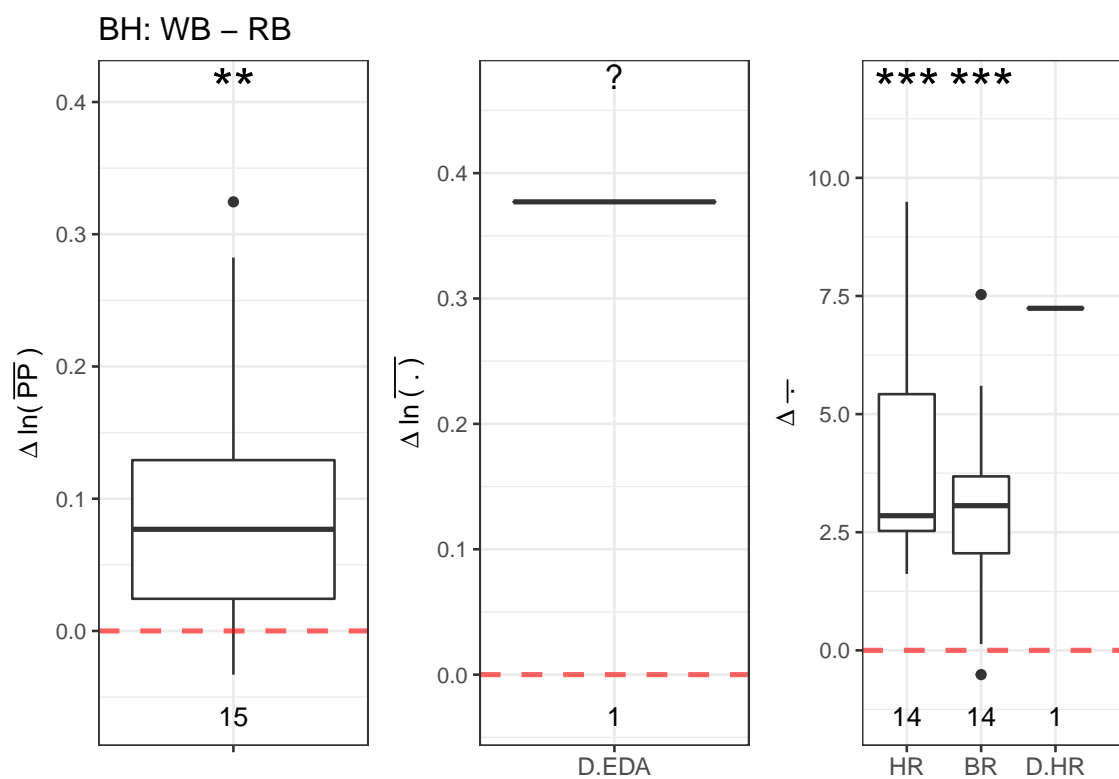
```
## t-test p = 0.8477 > 0.05
##
## Presentation - Dual Task
## t-test p = 0.0015 < 0.01 **
```

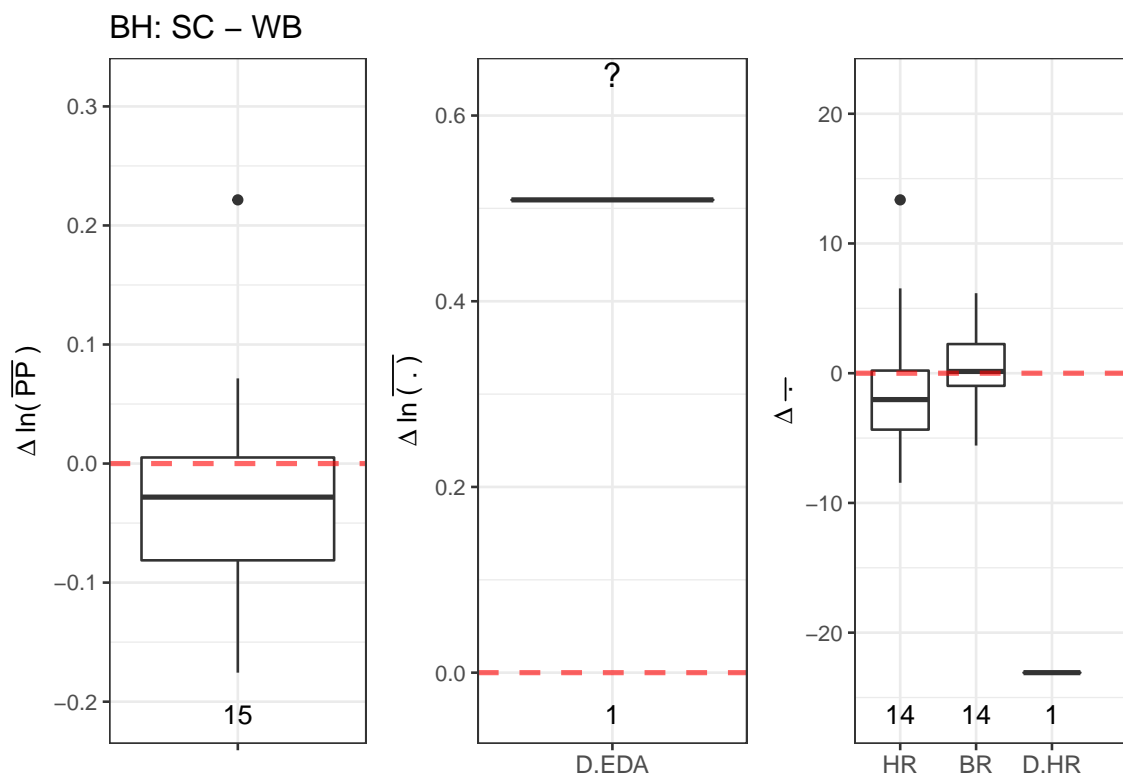
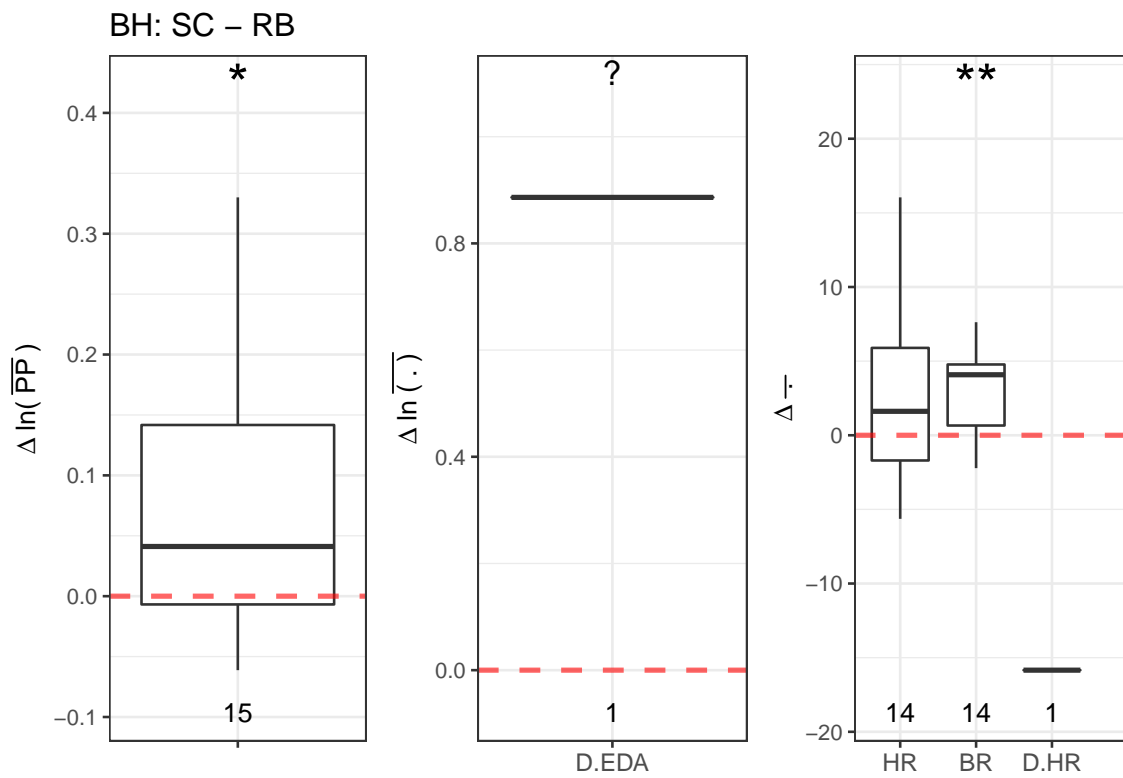
```
## IL has LESS than 7 subjects for D.EDA. Cannot continue with test.
## -----
## IL has LESS than 7 subjects for D.HR. Cannot continue with test.
## -----
```

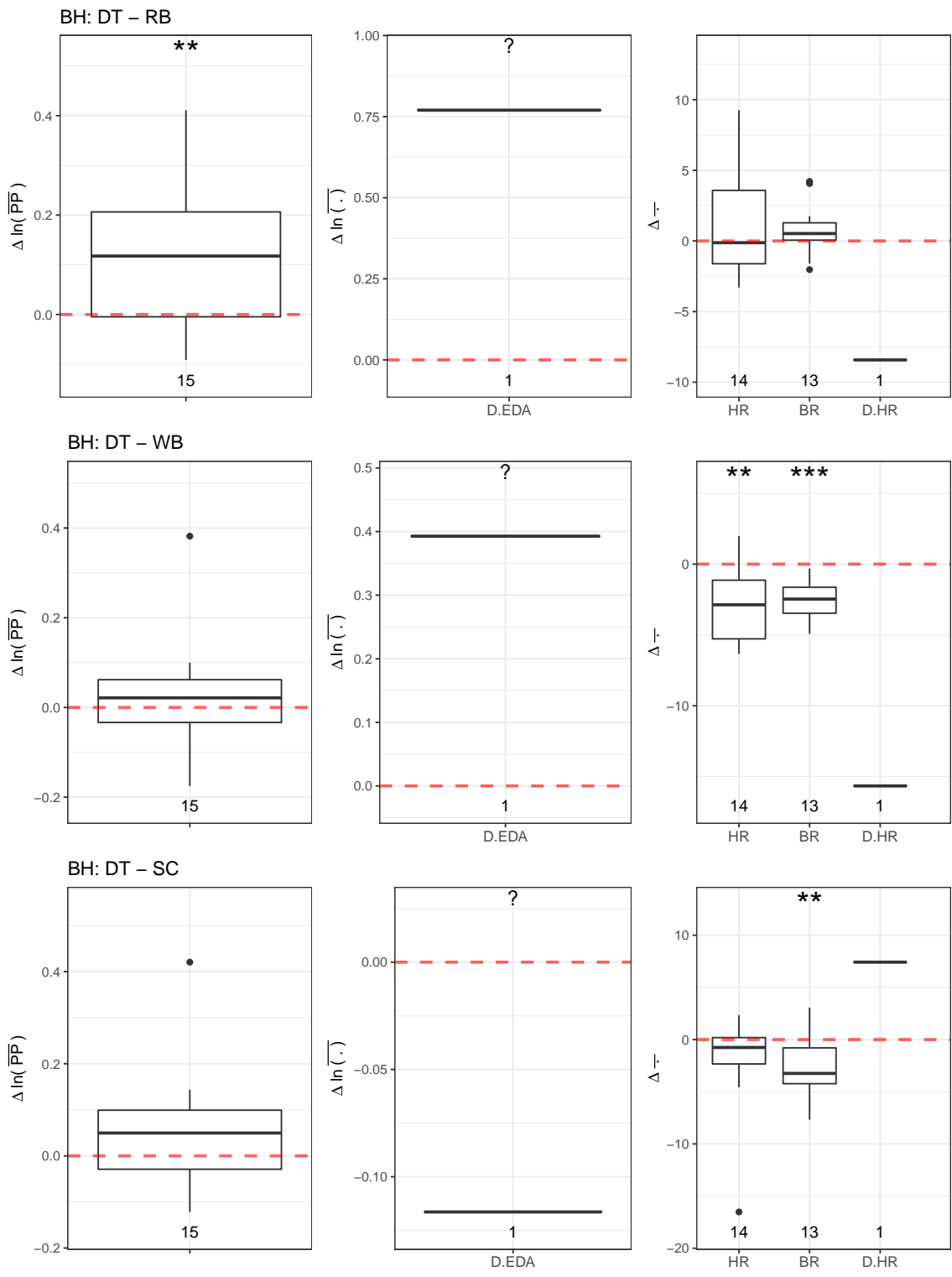
**Batch-High (BH)**

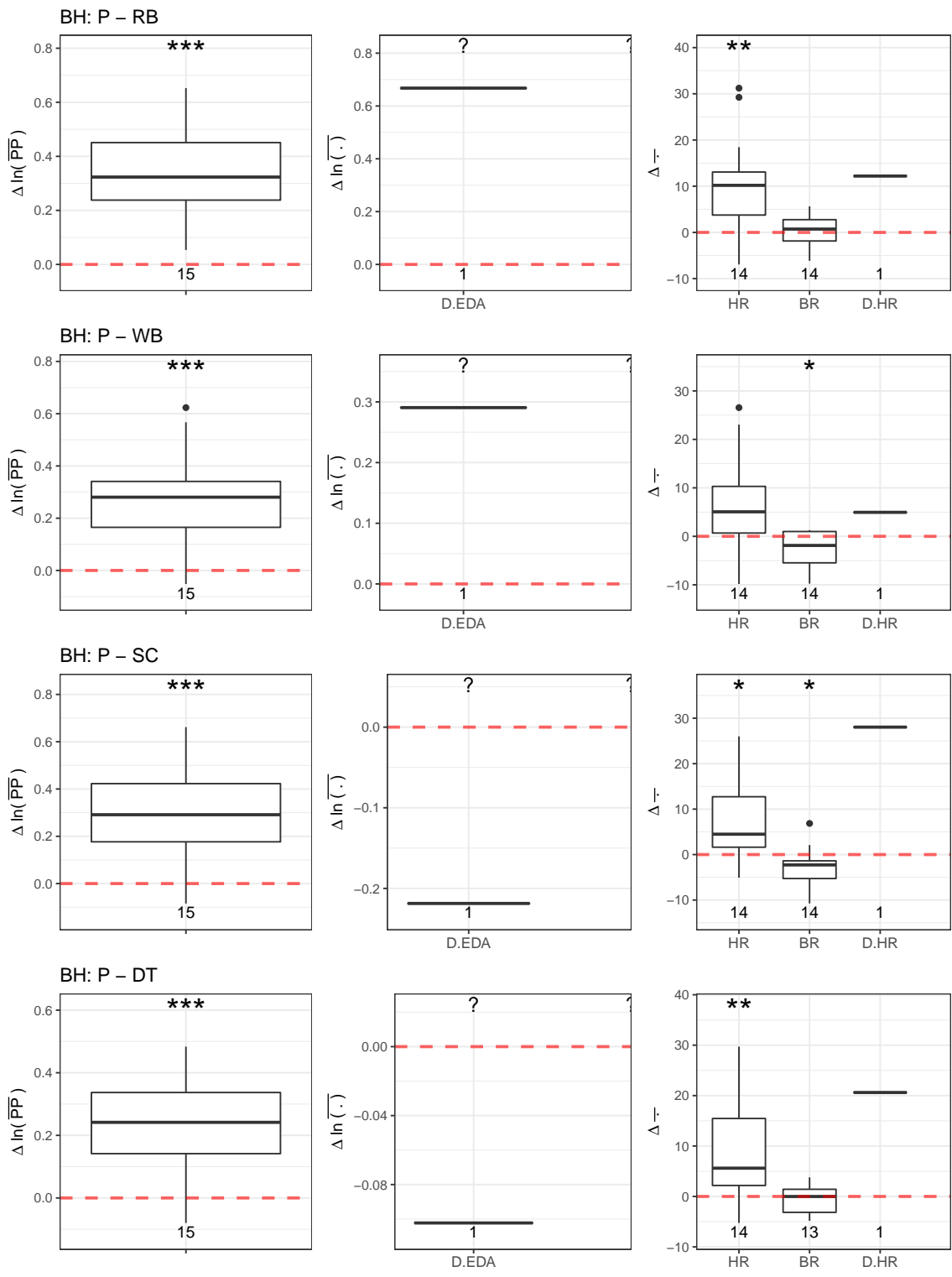


## Sensor Channels per Activity

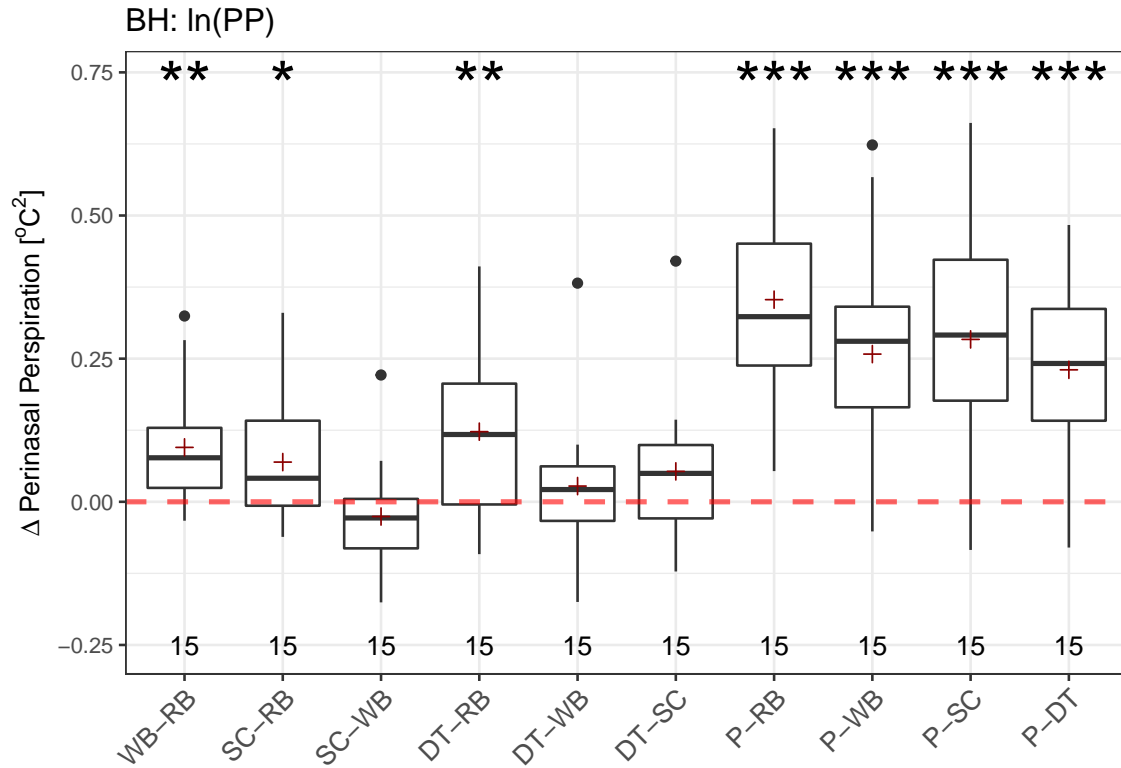






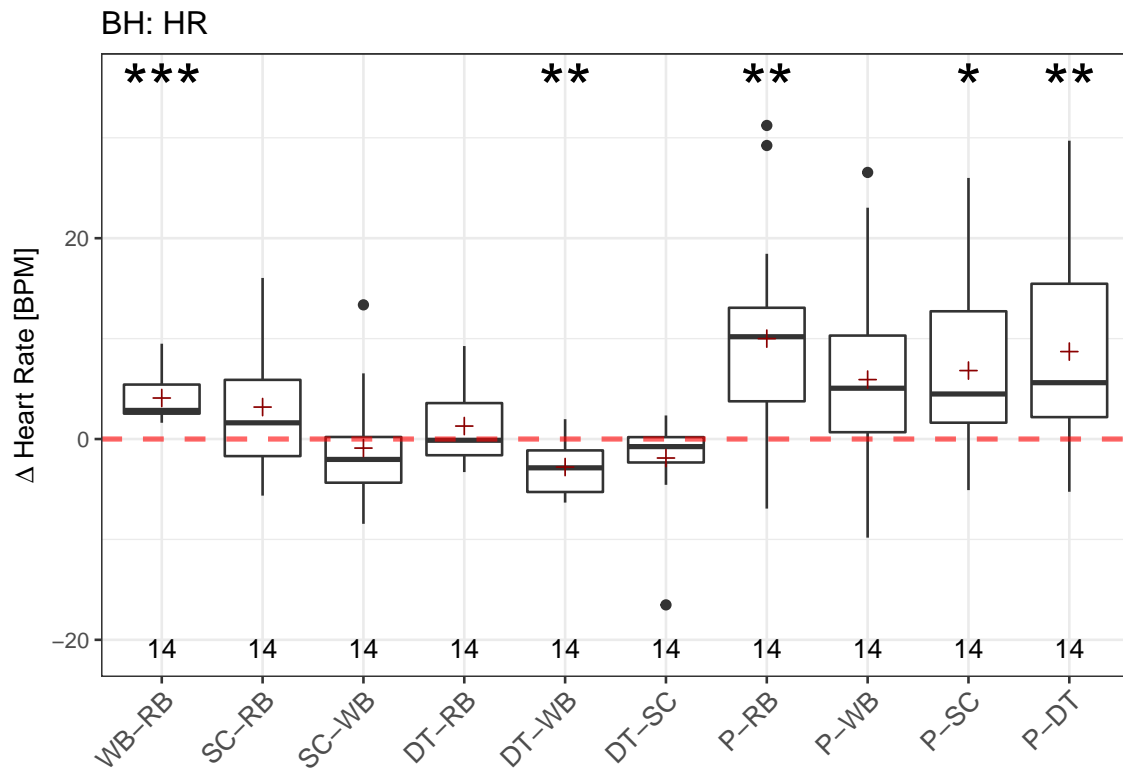


## Sensor Channel across Activities



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.0039 < 0.01  **
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0215 < 0.05  *
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.3011 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.0032 < 0.01  **
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.3915 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.1264 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0 < 0.001  ***
##
## Presentation - Writing Baseline
## Transformed t-test p = 1e-04 < 0.001  ***
```

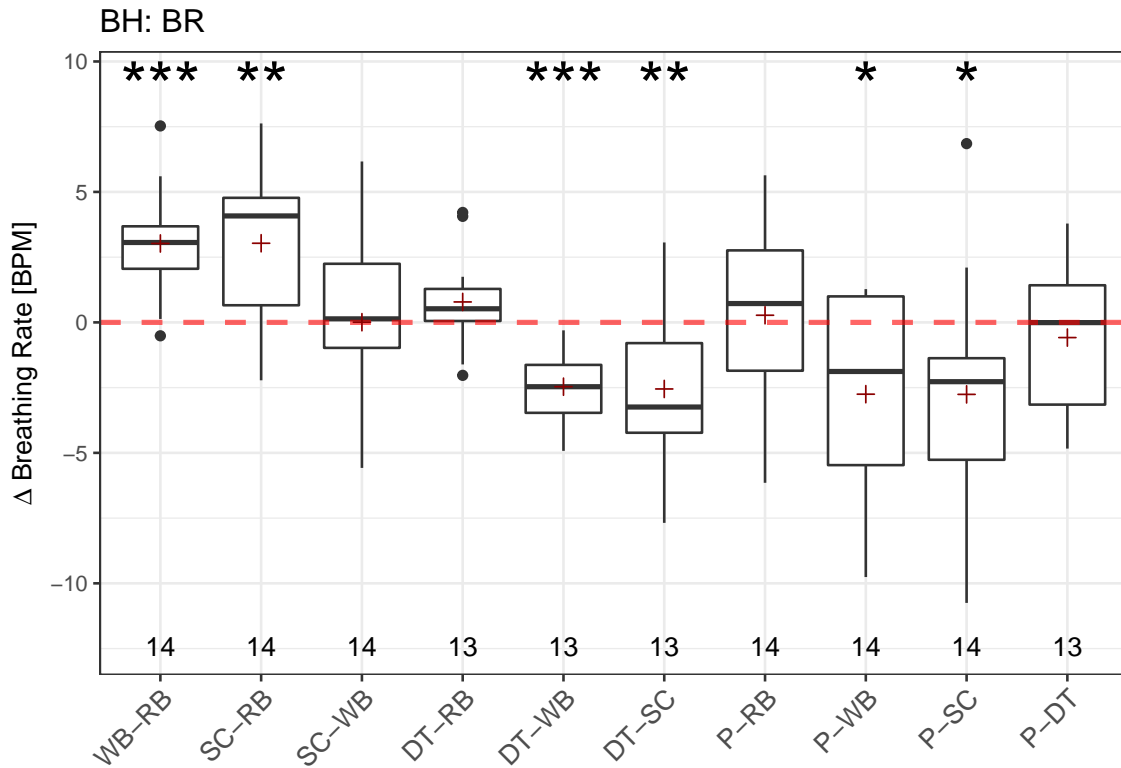
```
##  
## Presentation - Stress Condition  
## Transformed t-test p = 1e-04 < 0.001 ***  
##  
## Presentation - Dual Task  
## Transformed t-test p = 0 < 0.001 ***
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0 < 0.001 ***
##
## Stress Condition - Resting Baseline
## t-test p = 0.0805 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.559 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.2422 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.0017 < 0.01 **
##
## Dual Task - Stress Condition
## t-test p = 0.1489 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0051 < 0.01 **
##
## Presentation - Writing Baseline
## t-test p = 0.05 > 0.05
##
## Presentation - Stress Condition
```

```
## t-test p = 0.0136 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.0074 < 0.01  **
```





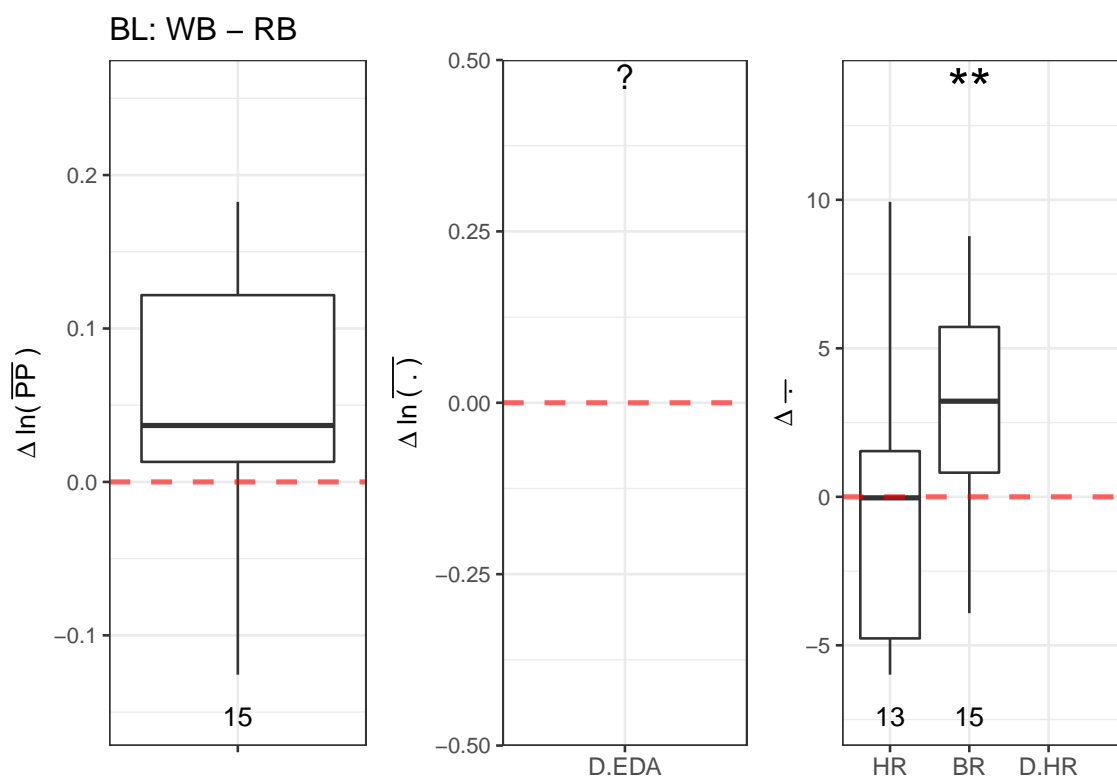
```
## Writing Baseline - Resting Baseline
## t-test p = 1e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## t-test p = 0.0026 < 0.01 **
##
## StressCondition - Writing Baseline
## t-test p = 0.993 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.1451 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0 < 0.001 ***
##
## Dual Task - Stress Condition
## t-test p = 0.0096 < 0.01 **
##
## Presentation - Resting Baseline
## t-test p = 0.774 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.0211 < 0.05 *
##
## Presentation - Stress Condition
```

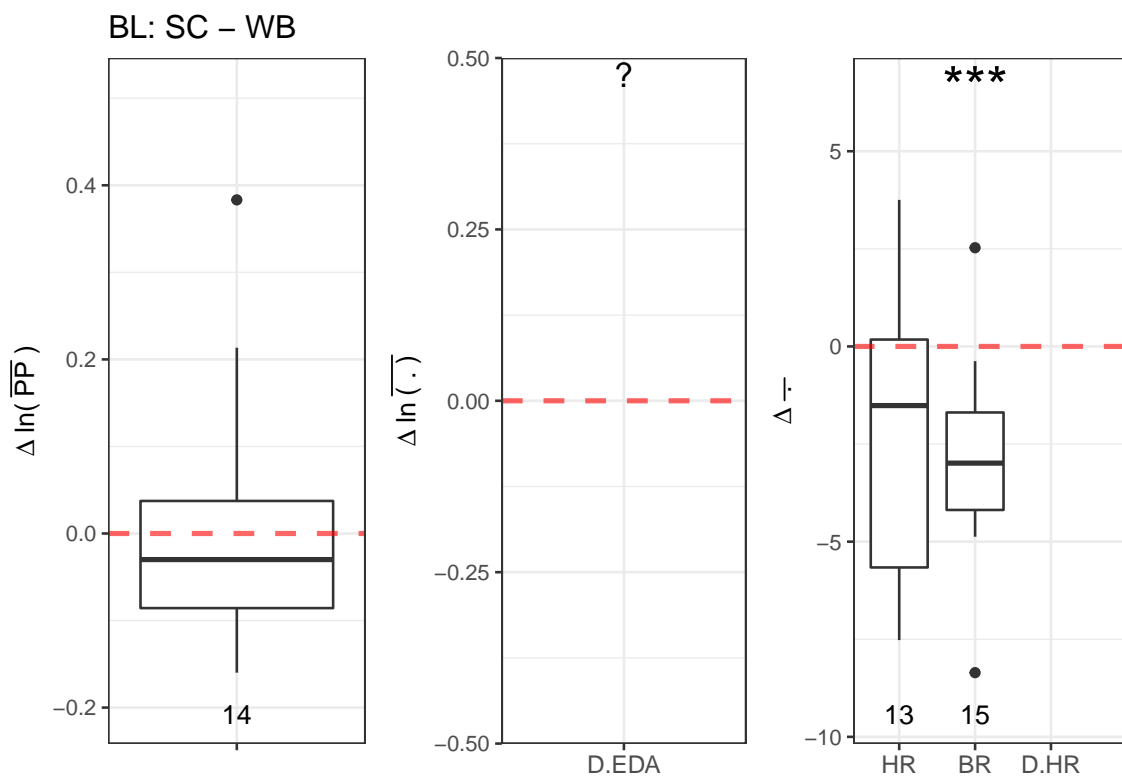
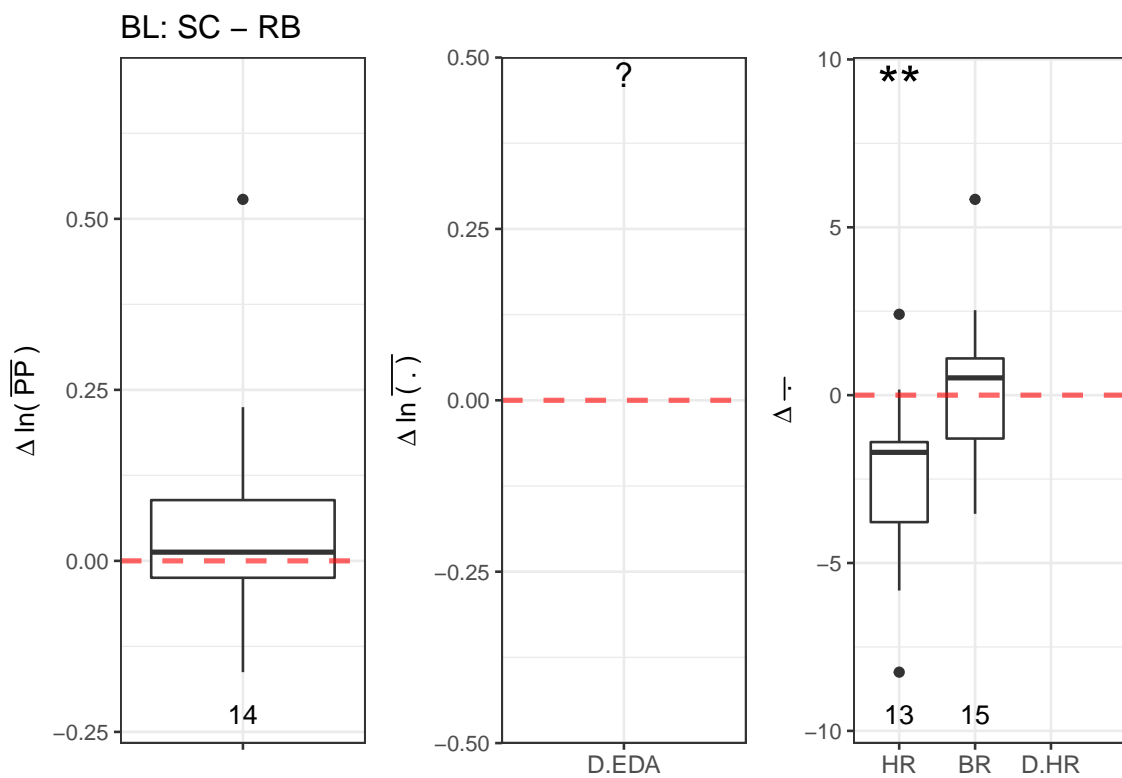
```
## t-test p = 0.0402 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.4905 > 0.05
```

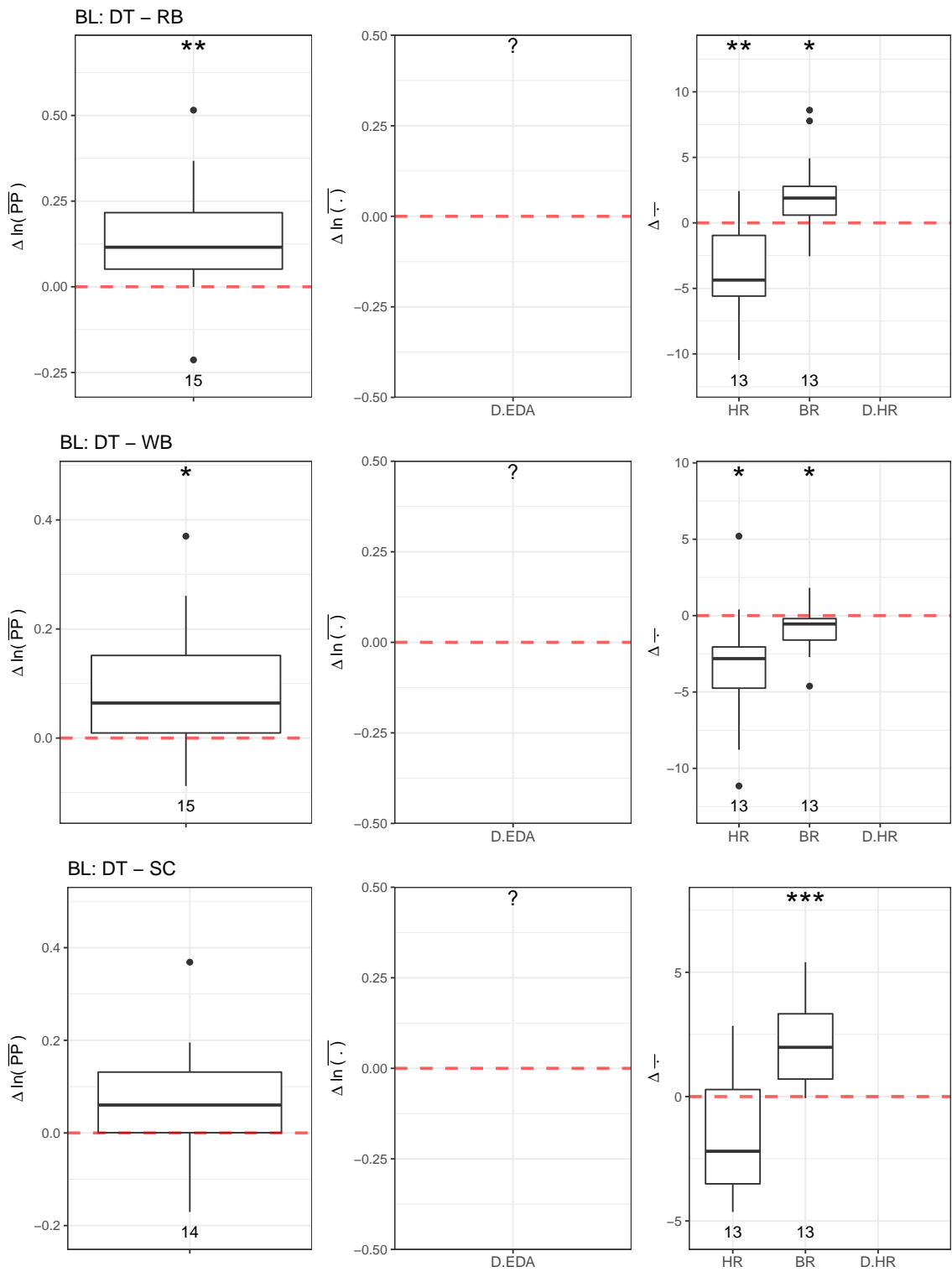
```
## BH has LESS than 7 subjects for D.EDA. Cannot continue with test.  
## -----  
## BH has LESS than 7 subjects for D.HR. Cannot continue with test.  
## -----
```

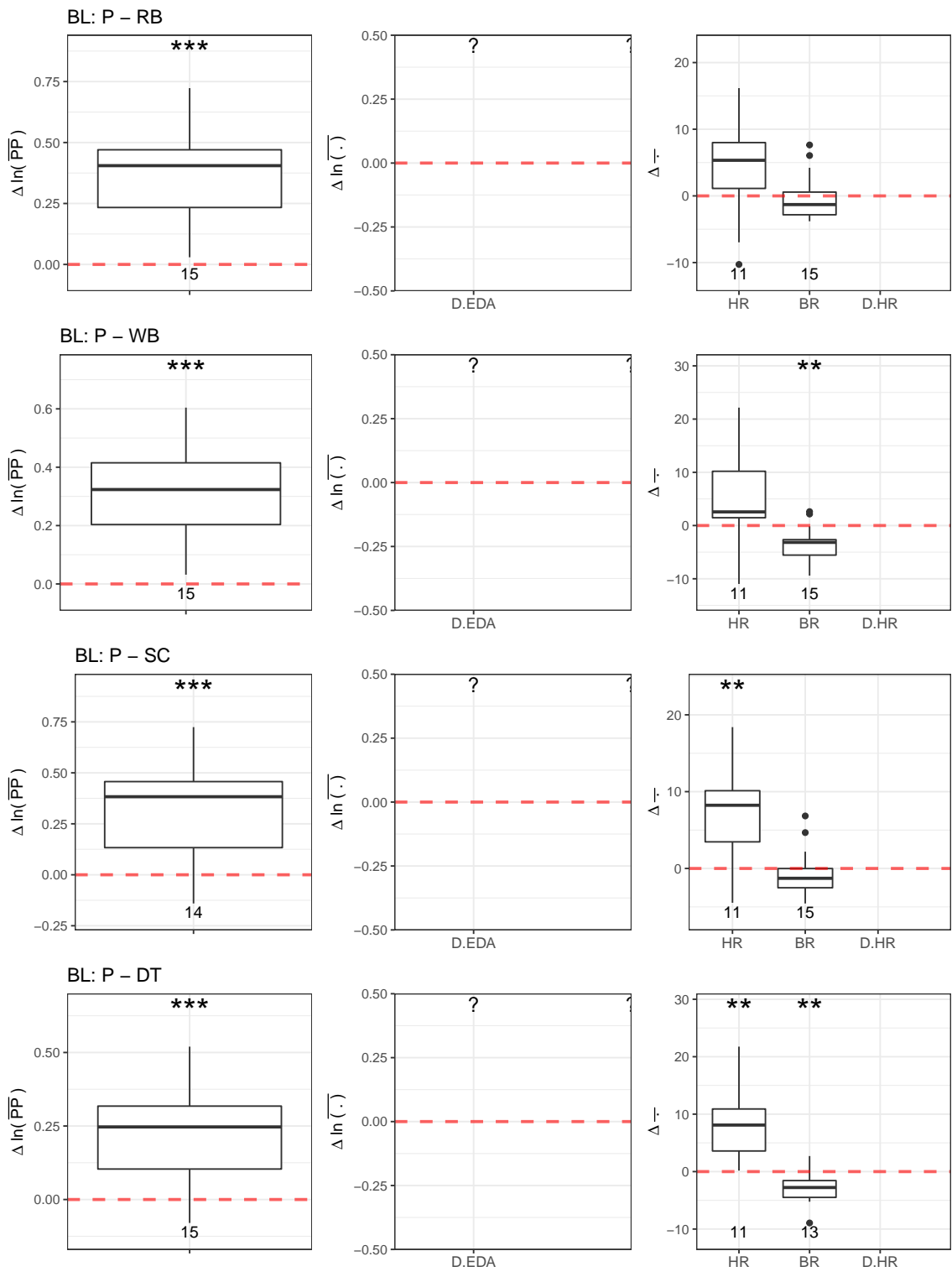
**Batch-Low (BL)**

## Sensor Channels per Activity

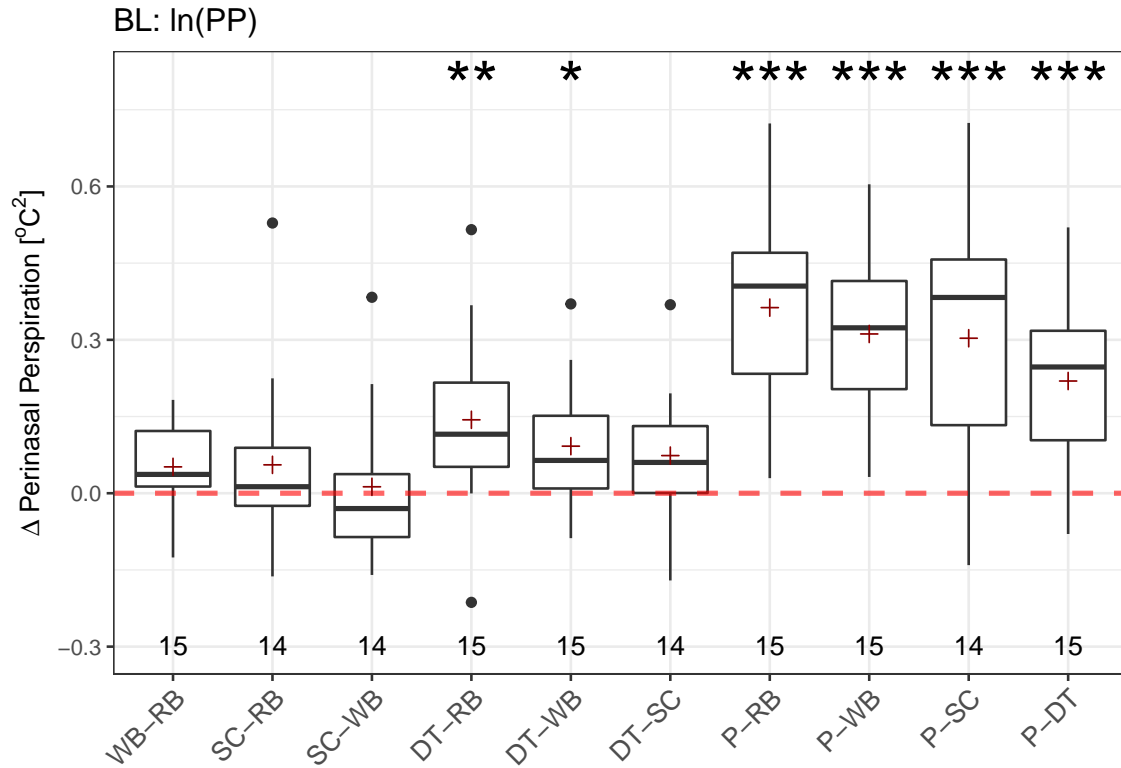








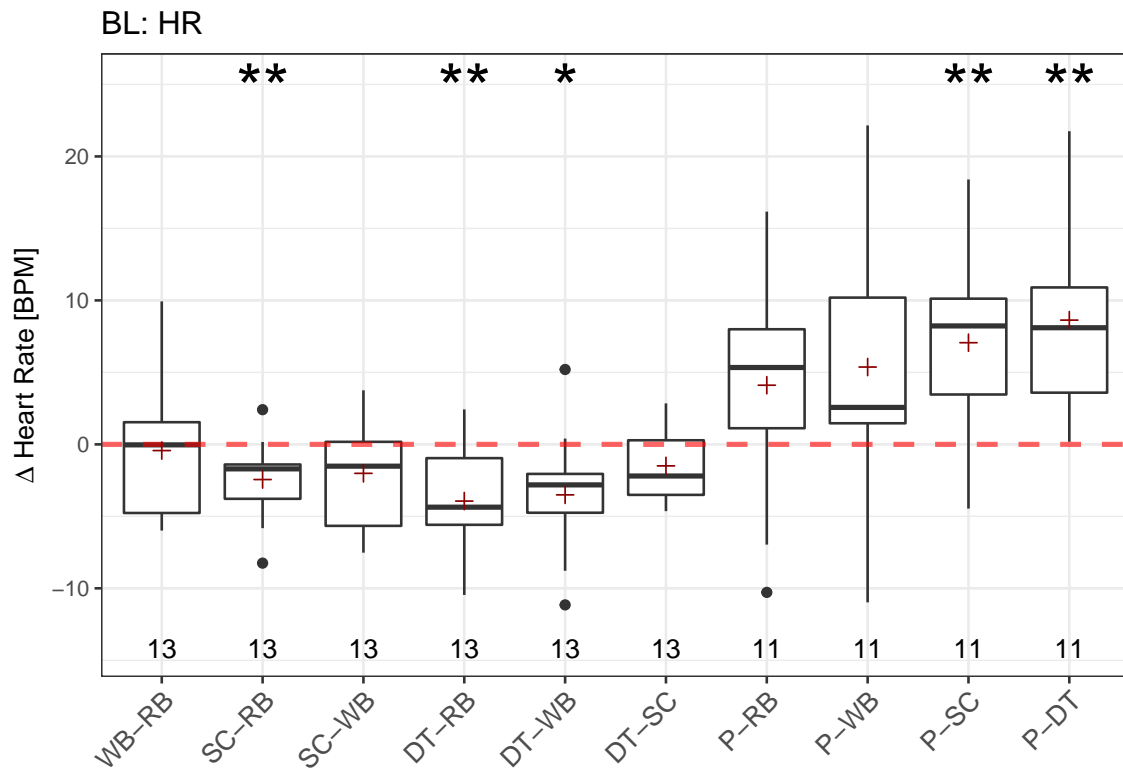
## Sensor Channel across Activities



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.0524 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.2437 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.7578 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.0068 < 0.01  **
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.0137 < 0.05  *
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.0617 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0 < 0.001  ***
##
## Presentation - Writing Baseline
## Transformed t-test p = 0 < 0.001  ***
```

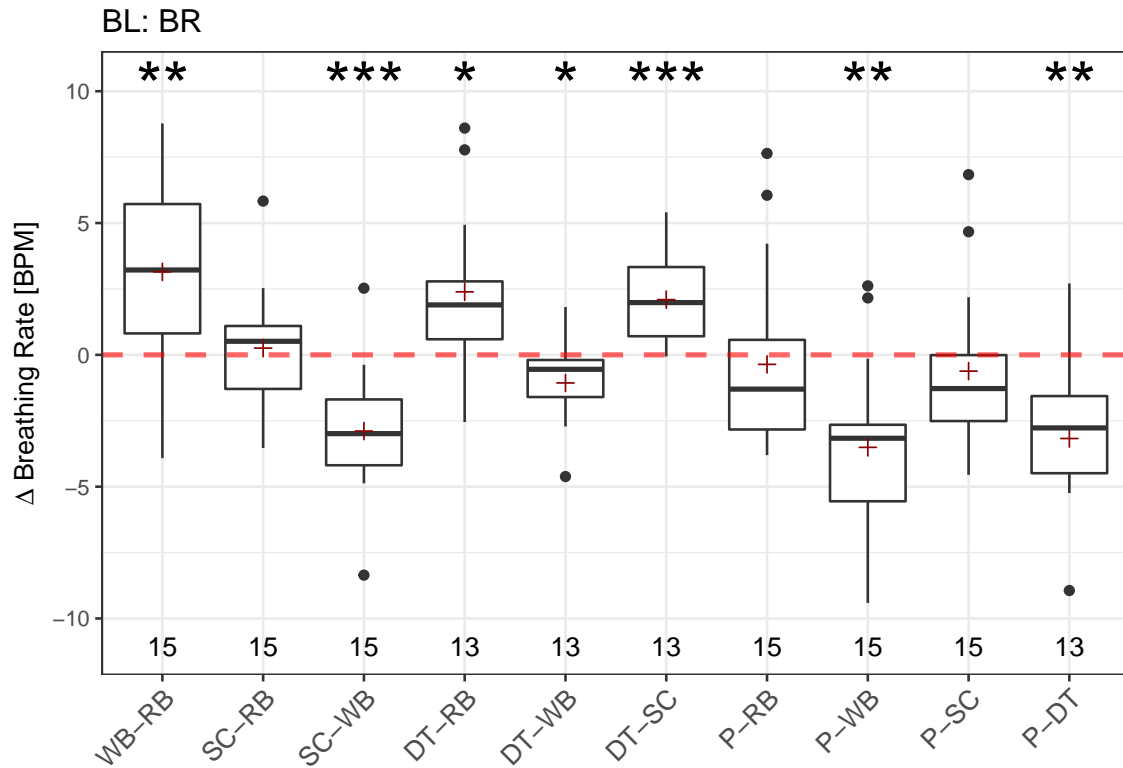


```
##  
## Presentation - Stress Condition  
## Transformed t-test p = 3e-04 < 0.001 ***  
##  
## Presentation - Dual Task  
## Transformed t-test p = 2e-04 < 0.001 ***
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.7394 > 0.05
##
## Stress Condition - Resting Baseline
## t-test p = 0.0068 < 0.01 **
##
## StressCondition - Writing Baseline
## t-test p = 0.081 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.0028 < 0.01 **
##
## Dual Task - Writing Baseline
## t-test p = 0.0103 < 0.05 *
##
## Dual Task - Stress Condition
## t-test p = 0.0577 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.1093 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.0833 > 0.05
##
## Presentation - Stress Condition
```

```
## t-test p = 0.0069 < 0.01 **  
##  
## Presentation - Dual Task  
## t-test p = 0.0019 < 0.01 **
```

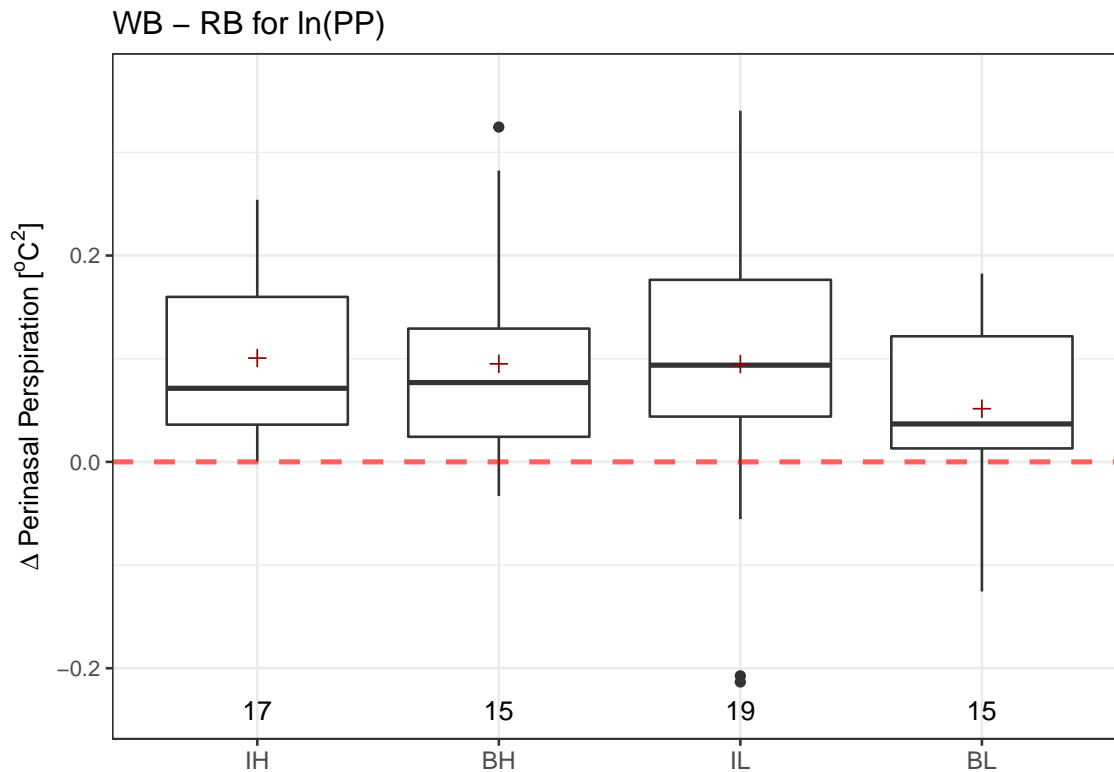


```
## Writing Baseline - Resting Baseline
## t-test p = 0.0022 < 0.01 **
##
## Stress Condition - Resting Baseline
## t-test p = 0.6729 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 5e-04 < 0.001 ***
##
## Dual Task - Resting Baseline
## t-test p = 0.0179 < 0.05 *
##
## Dual Task - Writing Baseline
## t-test p = 0.0295 < 0.05 *
##
## Dual Task - Stress Condition
## t-test p = 8e-04 < 0.001 ***
##
## Presentation - Resting Baseline
## t-test p = 0.7061 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.001 < 0.01 **
##
## Presentation - Stress Condition
```

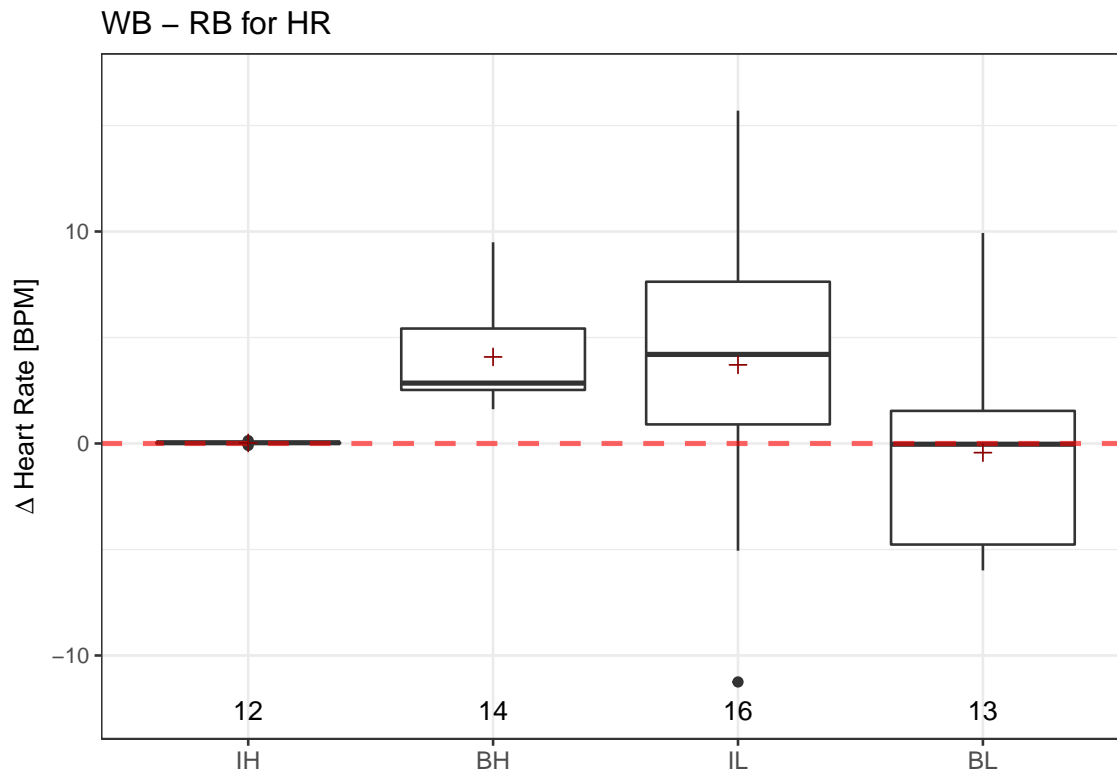
```
## t-test p = 0.4545 > 0.05
##
## Presentation - Dual Task
## t-test p = 0.0014 < 0.01 **
```

```
## BL has LESS than 7 subjects for D.EDA. Cannot continue with test.
## -----
## BL has LESS than 7 subjects for D.HR. Cannot continue with test.
## -----
```

## Across Activities

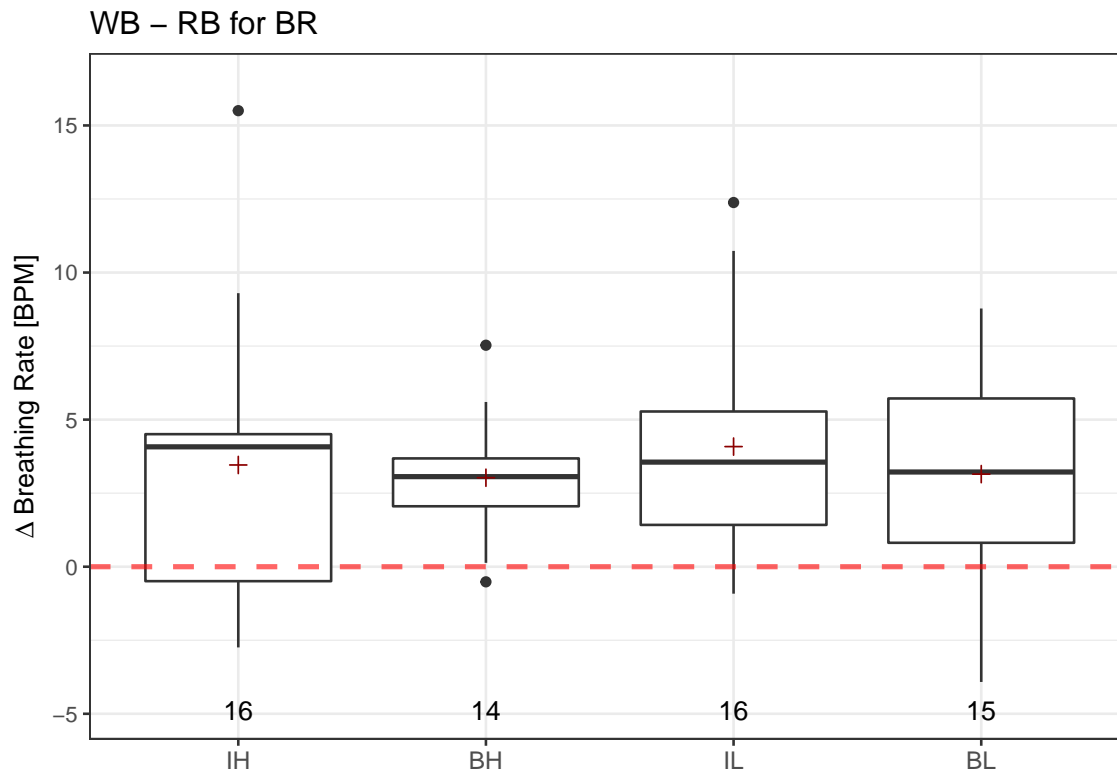


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0241  0.008043   0.647  0.588
## Residuals  62  0.7710  0.012435
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr          upr        p adj
## BL-BH -0.0435223394 -0.15102371  0.06397904  0.7096171
## IH-BH  0.0055453387 -0.09874631  0.10983699  0.9990022
## IL-BH -0.0002495864 -0.10193571  0.10143653  0.9999999
## IH-BL  0.0490676781 -0.05522397  0.15335933  0.6027724
## IL-BL  0.0432727530 -0.05841337  0.14495887  0.6765392
## IL-IH -0.0057949251 -0.10408160  0.09249175  0.9986420
```

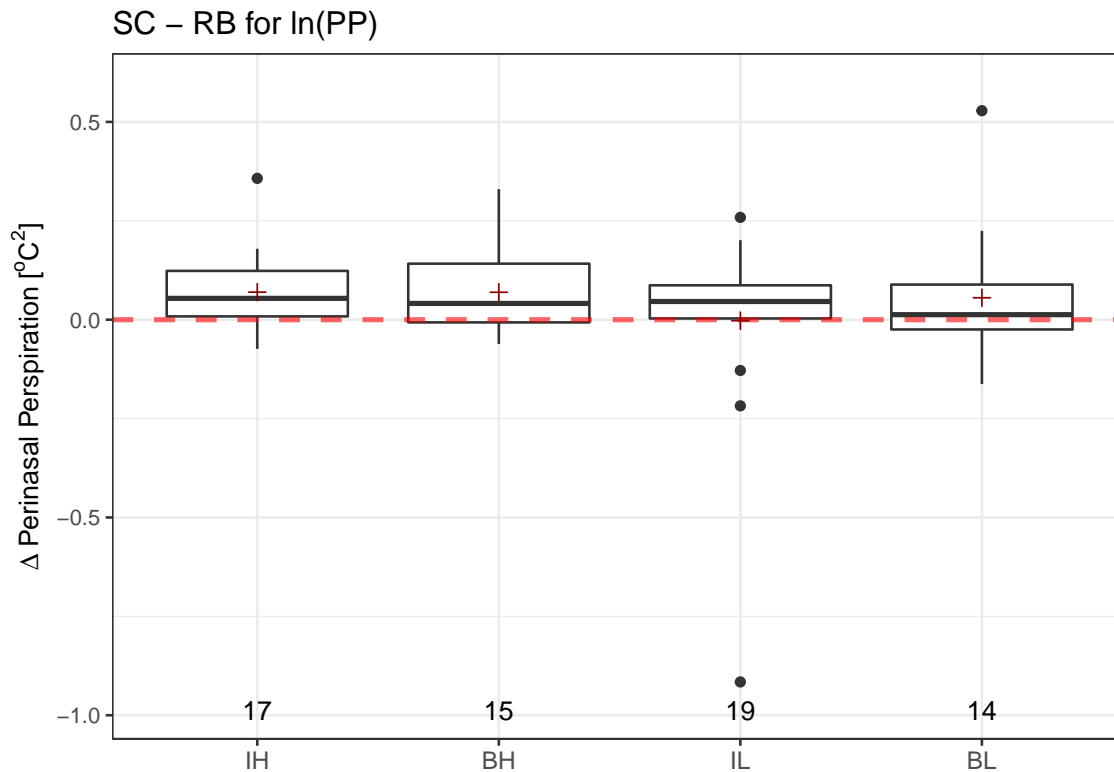


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  231.1    77.03   4.167 0.0103 *
## Residuals  51  942.8    18.49
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -4.5150752 -8.9130882 -0.1170621 0.0421420
## IH-BH -4.0565778 -8.5486049  0.4354492 0.0902238
## IL-BH -0.3737810 -4.5525364  3.8049743 0.9952224
## IH-BL  0.4584973 -4.1125744  5.0295690 0.9933017
## IL-BL  4.1412941 -0.1223177  8.4049059 0.0598664
## IL-IH  3.6827968 -0.6777277  8.0433213 0.1254894
```

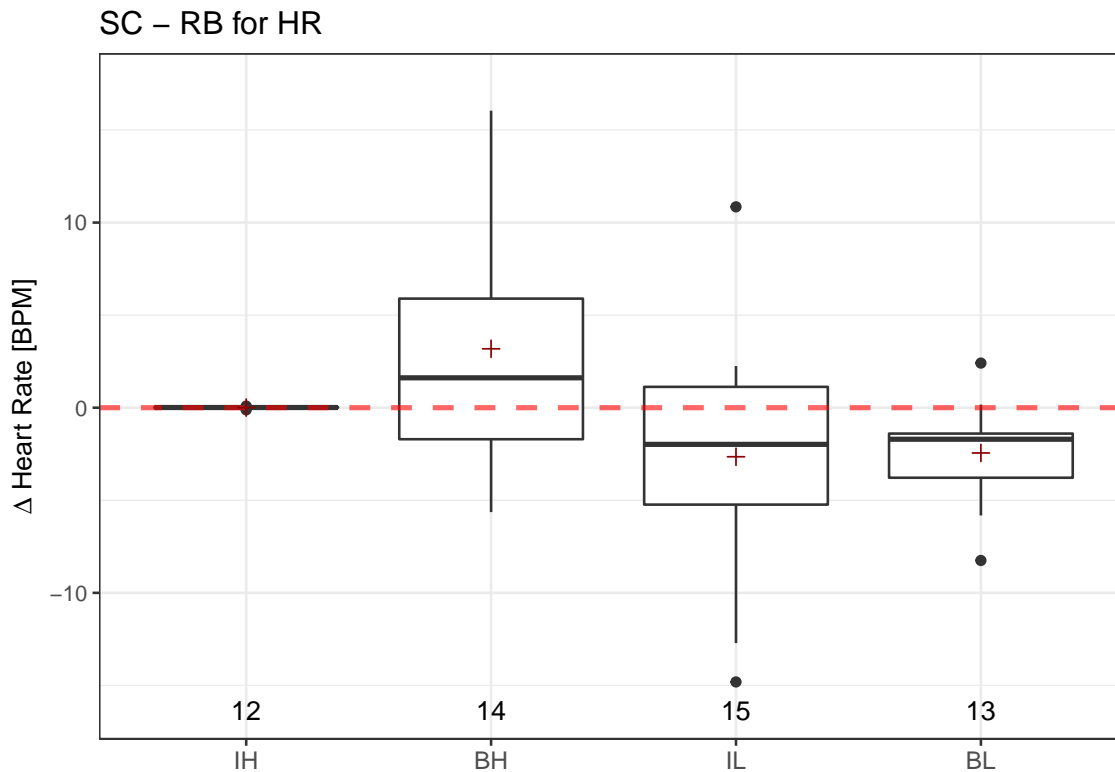




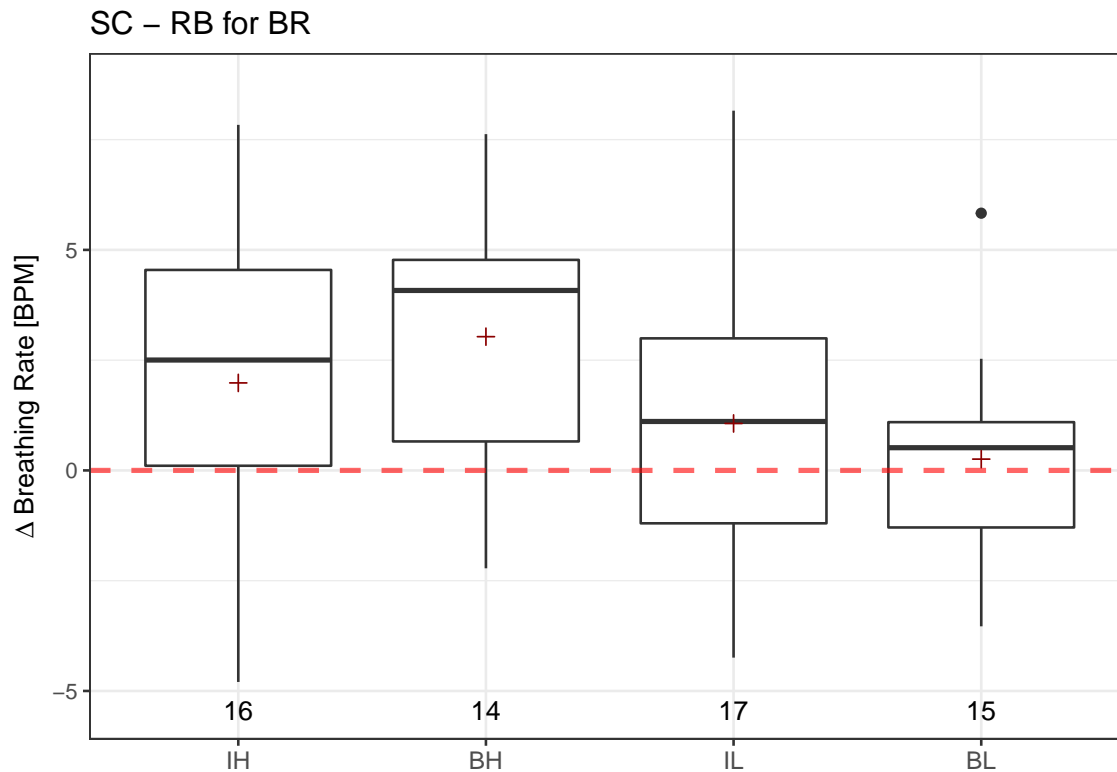
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   10.3    3.443   0.271  0.846
## Residuals  57  723.4   12.692
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff          lwr          upr          p adj
## BL-BH 0.1222067 -3.381434  3.625847  0.9997148
## IH-BH 0.4337466 -3.016633  3.884126  0.9871709
## IL-BH 1.0586452 -2.391734  4.509024  0.8485480
## IH-BL 0.3115399 -3.076944  3.700024  0.9948789
## IL-BL 0.9364385 -2.452045  4.324922  0.8840908
## IL-IH 0.6248986 -2.708484  3.958282  0.9596305
```



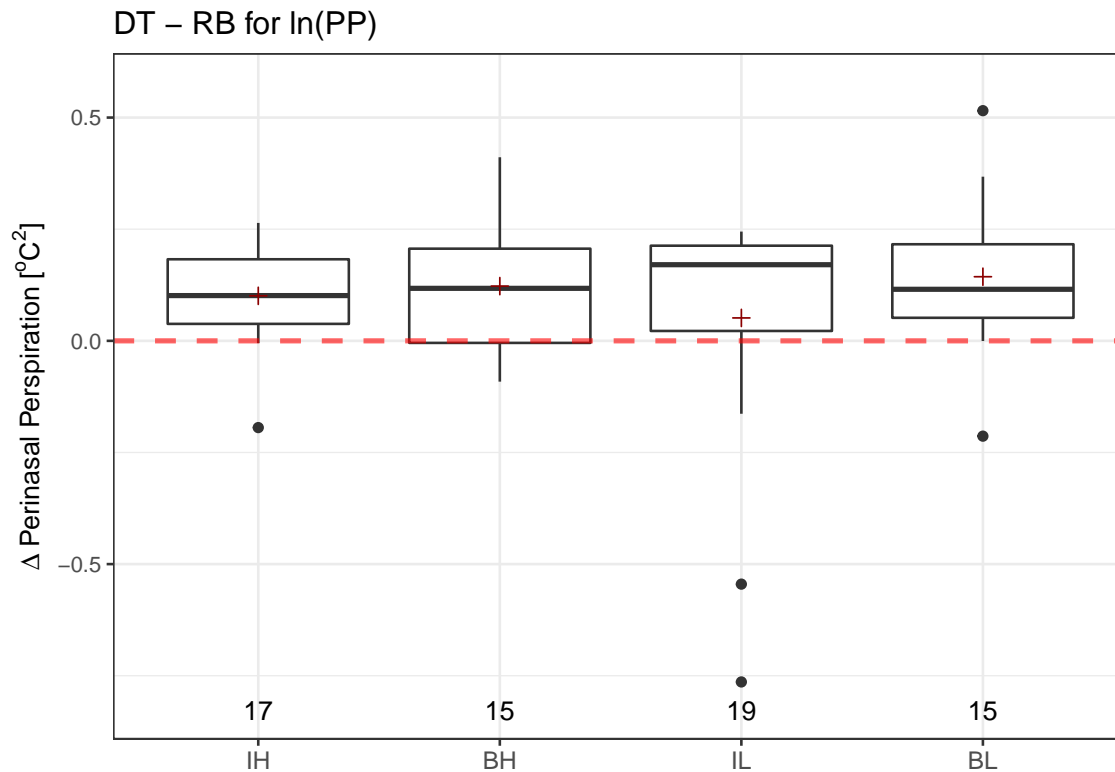
```
## [1] "Removed 0 subjects who had Stroop scores less than 0."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0636  0.02119   0.729  0.538
## Residuals  61  1.7720  0.02905
##
## ---
##
## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -0.0138865234 -0.1811753  0.15340225  0.9962397
## IH-BH  0.0002650717 -0.1592062  0.15973630  1.0000000
## IL-BH -0.0718404652 -0.2273276  0.08364667  0.6164622
## IH-BL  0.0141515951 -0.1483171  0.17662033  0.9956637
## IL-BL -0.0579539418 -0.2165139  0.10060604  0.7694924
## IL-IH -0.0721055369 -0.2223946  0.07818354  0.5870544
```



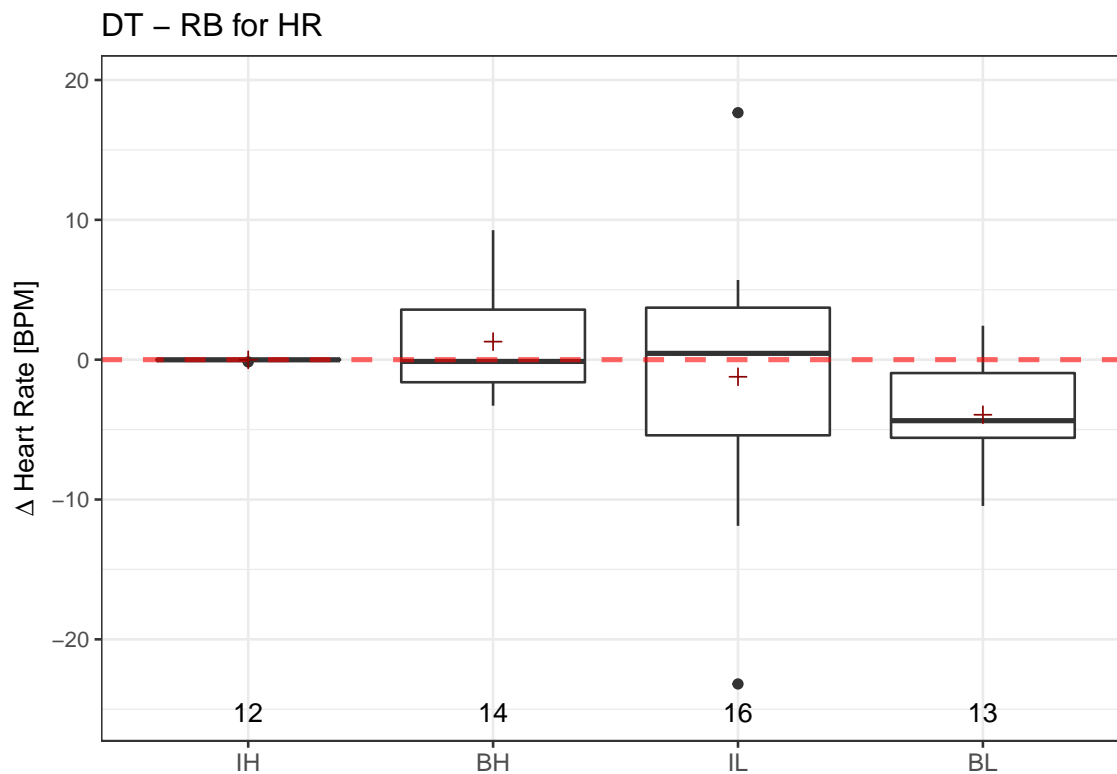
```
## [1] "Removed 0 subjects who had Stroop scores less than 0."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  311.3   103.78    4.277 0.00917 **
## Residuals  50 1213.3    24.27
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr      p adj
## BL-BH -5.6268272 -10.669112 -0.5845423 0.0231659
## IH-BH -3.1742515  -8.324323  1.9758196 0.3671271
## IL-BH -5.8309016 -10.695764 -0.9660394 0.0128837
## IH-BL  2.4525757  -2.788119  7.6932708 0.6024467
## IL-BL -0.2040744  -5.164774  4.7566249 0.9995259
## IL-IH -2.6566501  -7.726870  2.4135701 0.5098958
```



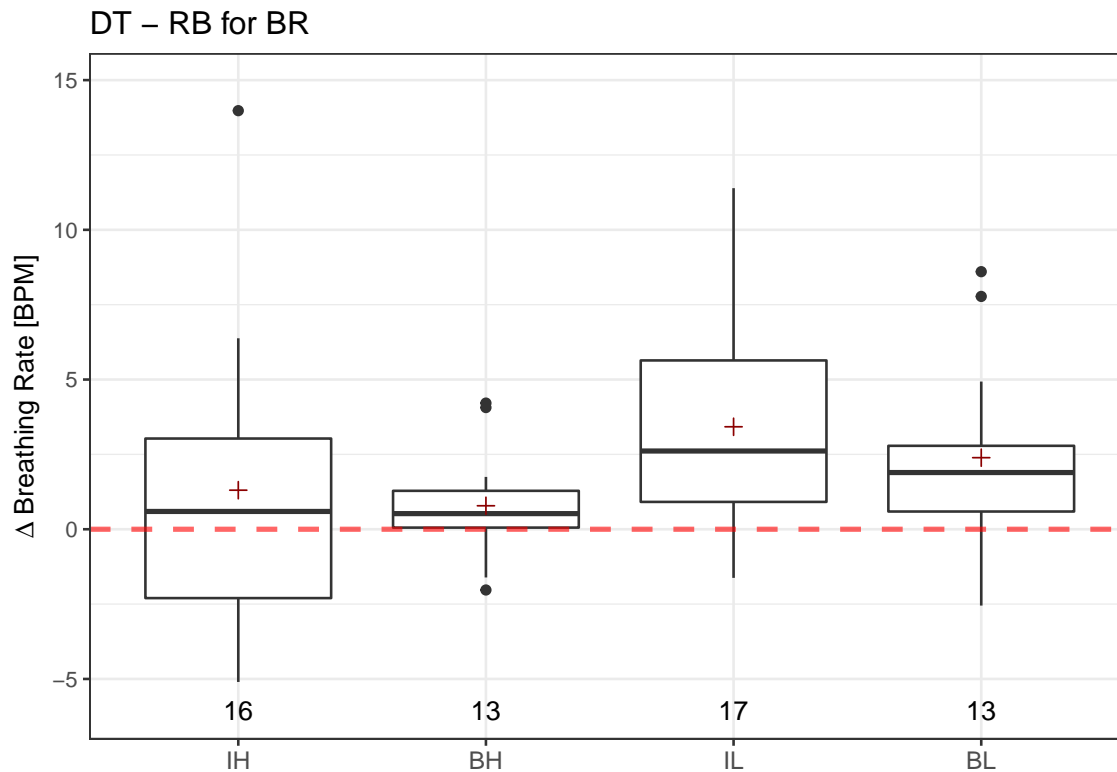
```
## [1] "Removed 0 subjects who had Stroop scores less than 0."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   62.9   20.966    2.165  0.102
## Residuals  58  561.7    9.684
##
## ---
##
## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -2.7764090 -5.835248  0.2824304  0.0881857
## IH-BH -1.0483755 -4.060715  1.9639642  0.7939702
## IL-BH -1.9675514 -4.938258  1.0031548  0.3068896
## IH-BL  1.7280336 -1.230269  4.6863359  0.4177864
## IL-BL  0.8088577 -2.107040  3.7247550  0.8831214
## IL-IH -0.9191759 -3.786256  1.9479043  0.8312418
```



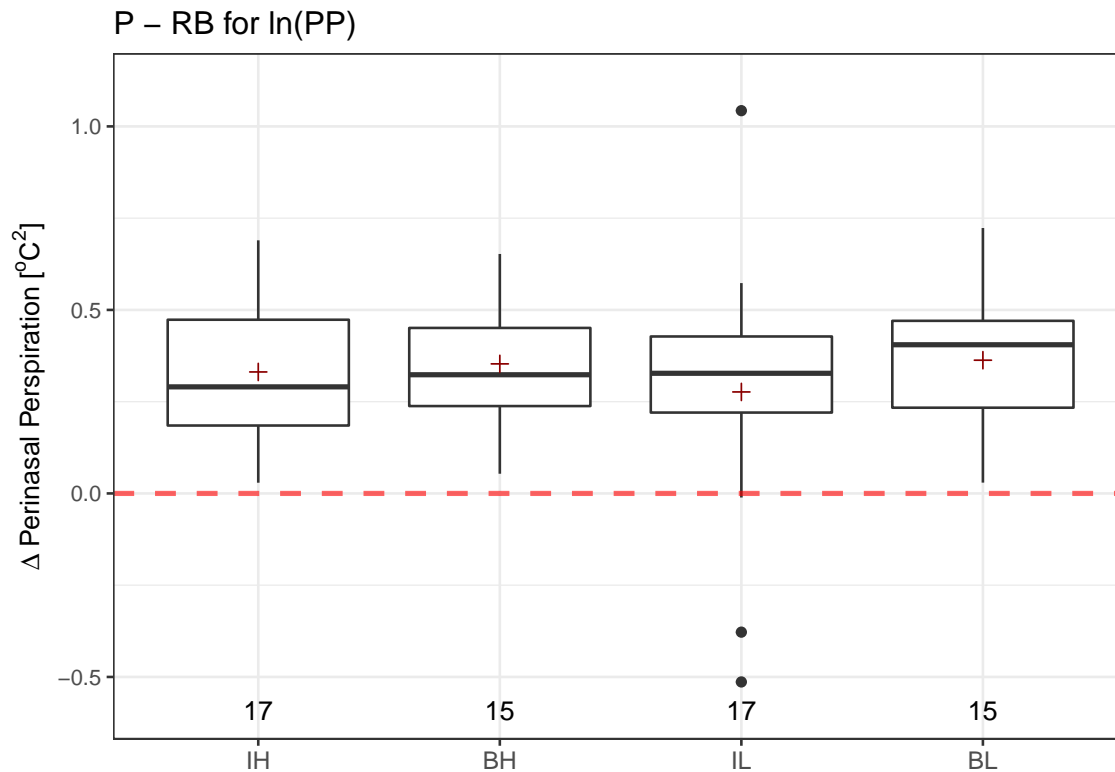
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.081  0.02701   0.754  0.524
## Residuals  62  2.222  0.03584
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr      p adj
## BL-BH  0.02105726 -0.1614514  0.20356593  0.9900928
## IH-BH -0.02173941 -0.1987988  0.15532002  0.9881176
## IL-BH -0.07120430 -0.2438402  0.10143163  0.6975664
## IH-BL -0.04279667 -0.2198561  0.13426276  0.9192577
## IL-BL -0.09226156 -0.2648975  0.08037437  0.4974272
## IL-IH -0.04946489 -0.2163295  0.11739968  0.8620509
```



```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  198.2    66.07    2.109  0.111
## Residuals  51 1597.5    31.32
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr          upr      p adj
## BL-BH -5.229941 -10.954909  0.495027  0.0848672
## IH-BH -1.302302  -7.149650  4.545046  0.9342030
## IL-BH -2.514618  -7.954175  2.924938  0.6123653
## IH-BL  3.927639  -2.022602  9.877881  0.3076656
## IL-BL  2.715323  -2.834693  8.265339  0.5675874
## IL-IH -1.212316  -6.888485  4.463852  0.9413440
```

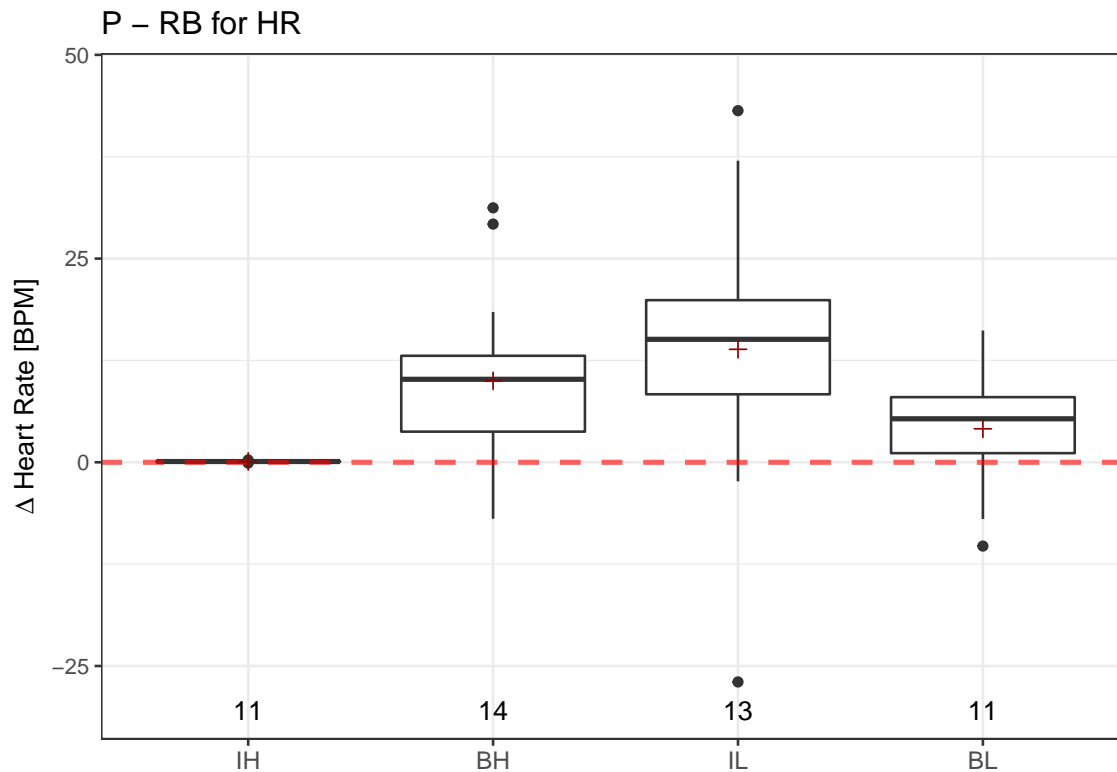


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   63.3    21.09   1.505  0.223
## Residuals  55  770.5    14.01
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr          upr          p adj
## BL-BH  1.6064369 -2.282969  5.495843  0.6945016
## IH-BH  0.5202144 -3.182390  4.222819  0.9822184
## IL-BH  2.6386138 -1.014847  6.292075  0.2343805
## IH-BL -1.0862225 -4.788827  2.616382  0.8644195
## IL-BL  1.0321770 -2.621284  4.685638  0.8769147
## IL-IH  2.1183995 -1.335522  5.572321  0.3733521
```

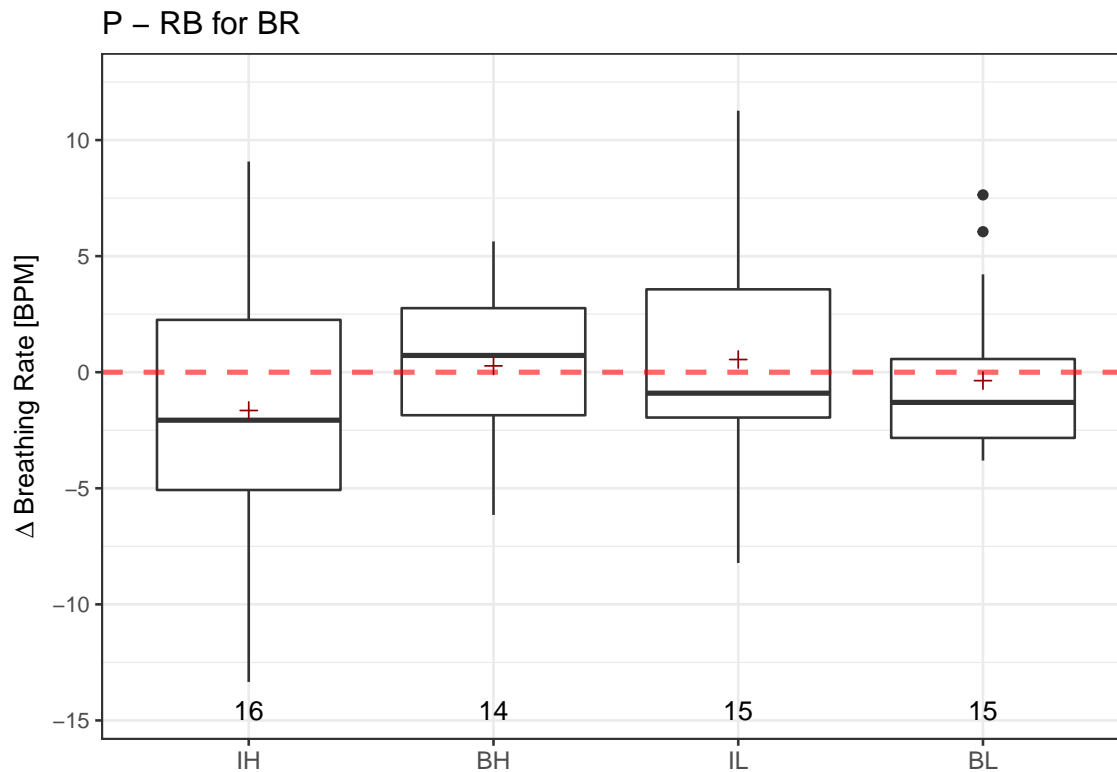


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.073  0.02428    0.38  0.768
## Residuals  60  3.830  0.06384
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr         p adj
## BL-BH  0.009966155 -0.2338316  0.2537639  0.9995437
## IH-BH -0.022049201 -0.2585678  0.2144694  0.9946916
## IL-BH -0.076479049 -0.3129976  0.1600395  0.8280576
## IH-BL -0.032015356 -0.2685339  0.2045032  0.9841704
## IL-BL -0.086445204 -0.3229638  0.1500734  0.7692651
## IL-IH -0.054429848 -0.2834380  0.1745783  0.9226342
```





```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   1343    447.8   3.483 0.0233 *
## Residuals  45   5785    128.6
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr      p adj
## BL-BH -5.891227 -18.078140   6.295686 0.5742262
## IH-BH -9.902191 -22.089104   2.284722 0.1480013
## IL-BH  3.865329  -7.784787  15.515445 0.8125616
## IH-BL -4.010964 -16.908380   8.886452 0.8401169
## IL-BL  9.756556  -2.634881  22.147992 0.1685518
## IL-IH 13.767520   1.376083  26.158957 0.0241252
```



```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   44.4    14.82   0.697  0.558
## Residuals  56 1189.8     21.25
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -0.6359833 -5.171547  3.899580  0.9823516
## IH-BH -1.9220536 -6.388669  2.544561  0.6669421
## IL-BH  0.2727362 -4.262827  4.808300  0.9985454
## IH-BL -1.2860703 -5.672560  3.100419  0.8648273
## IL-BL  0.9087195 -3.547959  5.365398  0.9488644
## IL-IH  2.1947898 -2.191700  6.581280  0.5512450
```

## Summary

Condition	Difference	Measure	p	Test	n	Significance
BH	WB - RB	PP	0.0038869	Transformed t-test	15	**
BH	WB - RB	HR	0.0000470	t-test	14	***
BH	WB - RB	BR	0.0000993	t-test	14	***
BH	SC - RB	PP	0.0215038	Transformed t-test	15	*
BH	SC - RB	HR	0.0805282	t-test	14	
BH	SC - RB	BR	0.0026189	t-test	14	**
BH	SC - WB	PP	0.3011111	Transformed t-test	15	
BH	SC - WB	HR	0.5589881	t-test	14	
BH	SC - WB	BR	0.9929885	t-test	14	
BH	DT - RB	PP	0.0031738	Transformed t-test	15	**
BH	DT - RB	HR	0.2421935	t-test	14	
BH	DT - RB	BR	0.1450731	t-test	13	
BH	DT - WB	PP	0.3915045	Transformed t-test	15	
BH	DT - WB	HR	0.0017455	t-test	14	**
BH	DT - WB	BR	0.0000109	t-test	13	***
BH	DT - SC	PP	0.1264163	Transformed t-test	15	
BH	DT - SC	HR	0.1489480	t-test	14	
BH	DT - SC	BR	0.0095733	t-test	13	**
BH	P - RB	PP	0.0000019	Transformed t-test	15	***
BH	P - RB	HR	0.0051343	t-test	14	**
BH	P - RB	BR	0.7739637	t-test	14	
BH	P - WB	PP	0.0001211	Transformed t-test	15	***
BH	P - WB	HR	0.0500403	t-test	14	
BH	P - WB	BR	0.0210557	t-test	14	*
BH	P - SC	PP	0.0001008	Transformed t-test	15	***
BH	P - SC	HR	0.0135531	t-test	14	*
BH	P - SC	BR	0.0401917	t-test	14	*
BH	P - DT	PP	0.0000374	Transformed t-test	15	***
BH	P - DT	HR	0.0073807	t-test	14	**
BH	P - DT	BR	0.4905062	t-test	13	
BL	WB - RB	PP	0.0524247	Transformed t-test	15	
BL	WB - RB	HR	0.7393780	t-test	13	
BL	WB - RB	BR	0.0021717	t-test	15	**
BL	SC - RB	PP	0.2437167	Transformed t-test	14	
BL	SC - RB	HR	0.0068419	t-test	13	**
BL	SC - RB	BR	0.6729485	t-test	15	
BL	SC - WB	PP	0.7577805	Transformed t-test	14	
BL	SC - WB	HR	0.0810305	t-test	13	
BL	SC - WB	BR	0.0004782	t-test	15	***
BL	DT - RB	PP	0.0067535	Transformed t-test	15	**
BL	DT - RB	HR	0.0028318	t-test	13	**
BL	DT - RB	BR	0.0179329	t-test	13	*
BL	DT - WB	PP	0.0137203	Transformed t-test	15	*
BL	DT - WB	HR	0.0103391	t-test	13	*
BL	DT - WB	BR	0.0295293	t-test	13	*

(continued)

Condition	Difference	Measure	p	Test	n	Significance
BL	DT - SC	PP	0.0617118	Transformed t-test	14	
BL	DT - SC	HR	0.0577026	t-test	13	
BL	DT - SC	BR	0.0008051	t-test	13	***
BL	P - RB	PP	0.0000098	Transformed t-test	15	***
BL	P - RB	HR	0.1092566	t-test	11	
BL	P - RB	BR	0.7060864	t-test	15	
BL	P - WB	PP	0.0000054	Transformed t-test	15	***
BL	P - WB	HR	0.0833217	t-test	11	
BL	P - WB	BR	0.0010110	t-test	15	**
BL	P - SC	PP	0.0003035	Transformed t-test	14	***
BL	P - SC	HR	0.0068502	t-test	11	**
BL	P - SC	BR	0.4544982	t-test	15	
BL	P - DT	PP	0.0001644	Transformed t-test	15	***
BL	P - DT	HR	0.0019303	t-test	11	**
BL	P - DT	BR	0.0013562	t-test	13	**
IH	WB - RB	PP	0.0000999	Transformed t-test	17	***
IH	WB - RB	HR	0.1185091	Transformed t-test	12	
IH	WB - RB	BR	0.0086109	t-test	16	**
IH	SC - RB	PP	0.0145060	Transformed t-test	17	*
IH	SC - RB	HR	0.6094900	Transformed t-test	12	
IH	SC - RB	BR	0.0454605	t-test	16	*
IH	SC - WB	PP	0.2084476	Transformed t-test	17	
IH	SC - WB	HR	0.2597084	Transformed t-test	12	
IH	SC - WB	BR	0.0933387	t-test	16	
IH	DT - RB	PP	0.0016239	Transformed t-test	17	**
IH	DT - RB	HR	0.5734584	Transformed t-test	12	
IH	DT - RB	BR	0.2969312	t-test	16	
IH	DT - WB	PP	0.9946474	Transformed t-test	17	
IH	DT - WB	HR	0.0171595	Transformed t-test	12	*
IH	DT - WB	BR	0.0005234	t-test	16	***
IH	DT - SC	PP	0.3697148	Transformed t-test	17	
IH	DT - SC	HR	0.2853287	Transformed t-test	12	
IH	DT - SC	BR	0.3543299	t-test	16	
IH	P - RB	PP	0.0000079	Transformed t-test	17	***
IH	P - RB	HR	0.0079289	Transformed t-test	11	**
IH	P - RB	BR	0.2723250	t-test	16	
IH	P - WB	PP	0.0002411	Transformed t-test	17	***
IH	P - WB	HR	0.0152592	Transformed t-test	11	*
IH	P - WB	BR	0.0008811	t-test	16	***
IH	P - SC	PP	0.0000697	Transformed t-test	17	***
IH	P - SC	HR	0.0026035	Transformed t-test	11	**
IH	P - SC	BR	0.0065963	t-test	16	**
IH	P - DT	PP	0.0001591	Transformed t-test	17	***
IH	P - DT	HR	0.0000458	Transformed t-test	11	***
IH	P - DT	BR	0.0131870	t-test	16	*
IL	WB - RB	PP	0.0110517	Transformed t-test	19	*
IL	WB - RB	HR	0.0339757	t-test	16	*

(continued)

Condition	Difference	Measure	p	Test	n	Significance
IL	WB - RB	BR	0.0005059	t-test	16	***
IL	SC - RB	PP	0.9653604	Transformed t-test	19	
IL	SC - RB	HR	0.1431695	t-test	15	
IL	SC - RB	BR	0.1931501	t-test	17	
IL	SC - WB	PP	0.0291272	Transformed t-test	19	*
IL	SC - WB	HR	0.0000012	t-test	15	***
IL	SC - WB	BR	0.0015261	t-test	16	**
IL	DT - RB	PP	0.4247691	Transformed t-test	19	
IL	DT - RB	HR	0.5956168	t-test	16	
IL	DT - RB	BR	0.0030795	t-test	17	**
IL	DT - WB	PP	0.3300145	Transformed t-test	19	
IL	DT - WB	HR	0.0013141	t-test	16	**
IL	DT - WB	BR	0.0203968	t-test	16	*
IL	DT - SC	PP	0.1283543	Transformed t-test	19	
IL	DT - SC	HR	0.2937107	t-test	15	
IL	DT - SC	BR	0.0062921	t-test	17	**
IL	P - RB	PP	0.0059327	Transformed t-test	17	**
IL	P - RB	HR	0.0133767	t-test	13	*
IL	P - RB	BR	0.6753936	t-test	15	
IL	P - WB	PP	0.0203817	Transformed t-test	17	*
IL	P - WB	HR	0.0132198	t-test	13	*
IL	P - WB	BR	0.0006932	t-test	14	***
IL	P - SC	PP	0.0005328	Transformed t-test	17	***
IL	P - SC	HR	0.0032216	t-test	12	**
IL	P - SC	BR	0.8476607	t-test	15	
IL	P - DT	PP	0.0000890	Transformed t-test	17	***
IL	P - DT	HR	0.0012193	t-test	13	**
IL	P - DT	BR	0.0015221	t-test	15	**