

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:

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

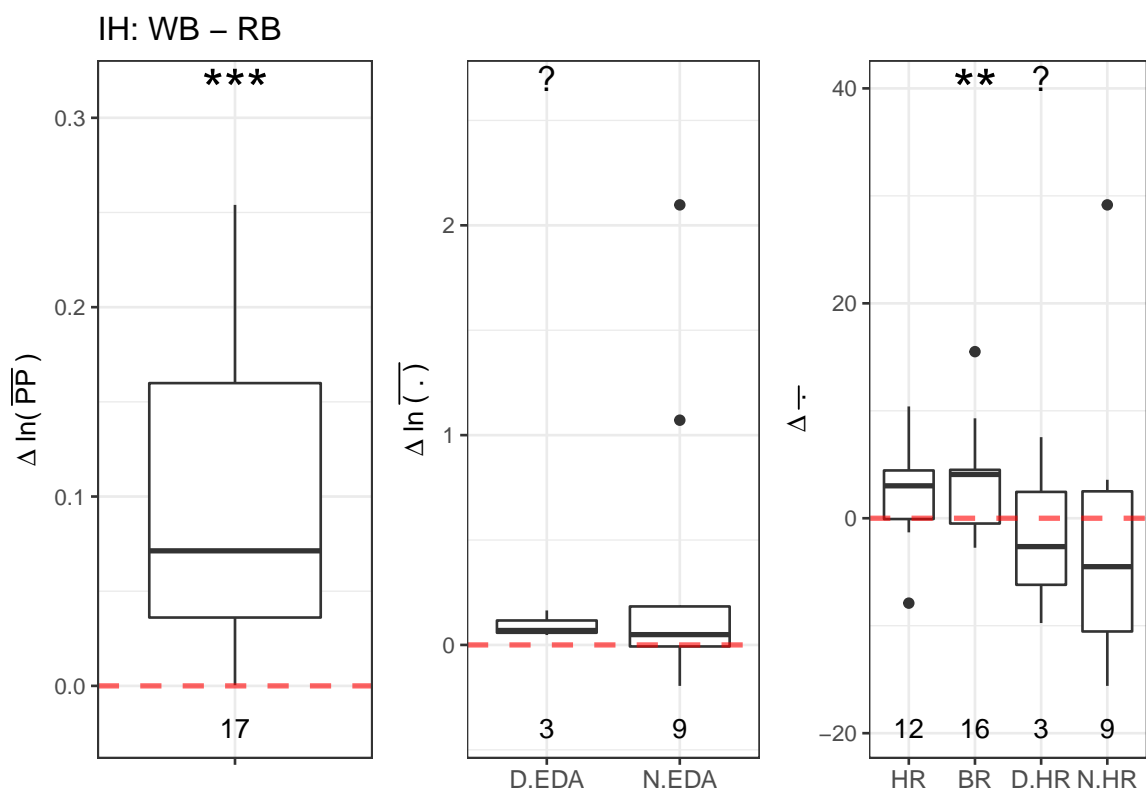
****** = $0.001 < p \leq 0.01$

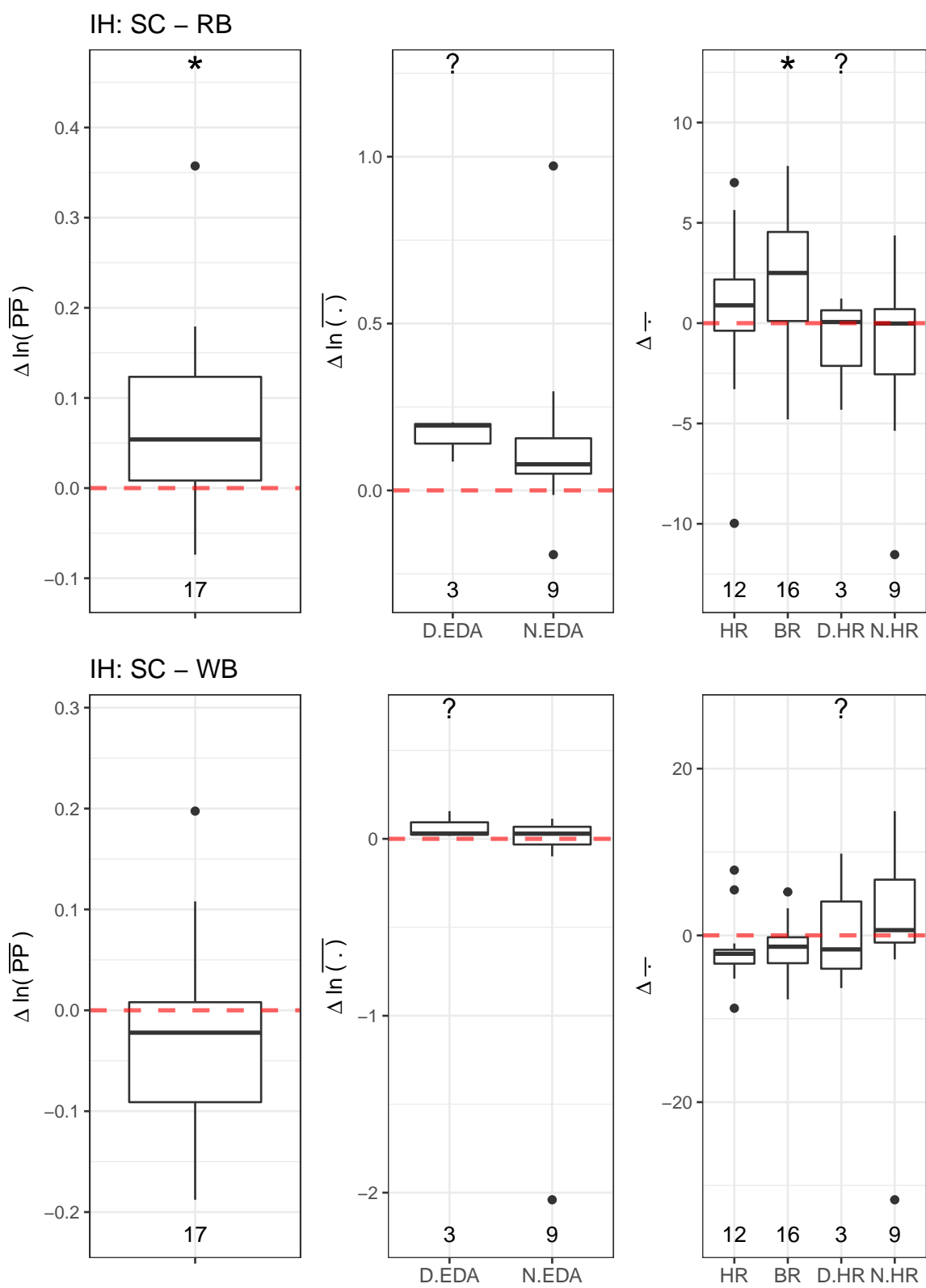
******* = $p \leq 0.001$

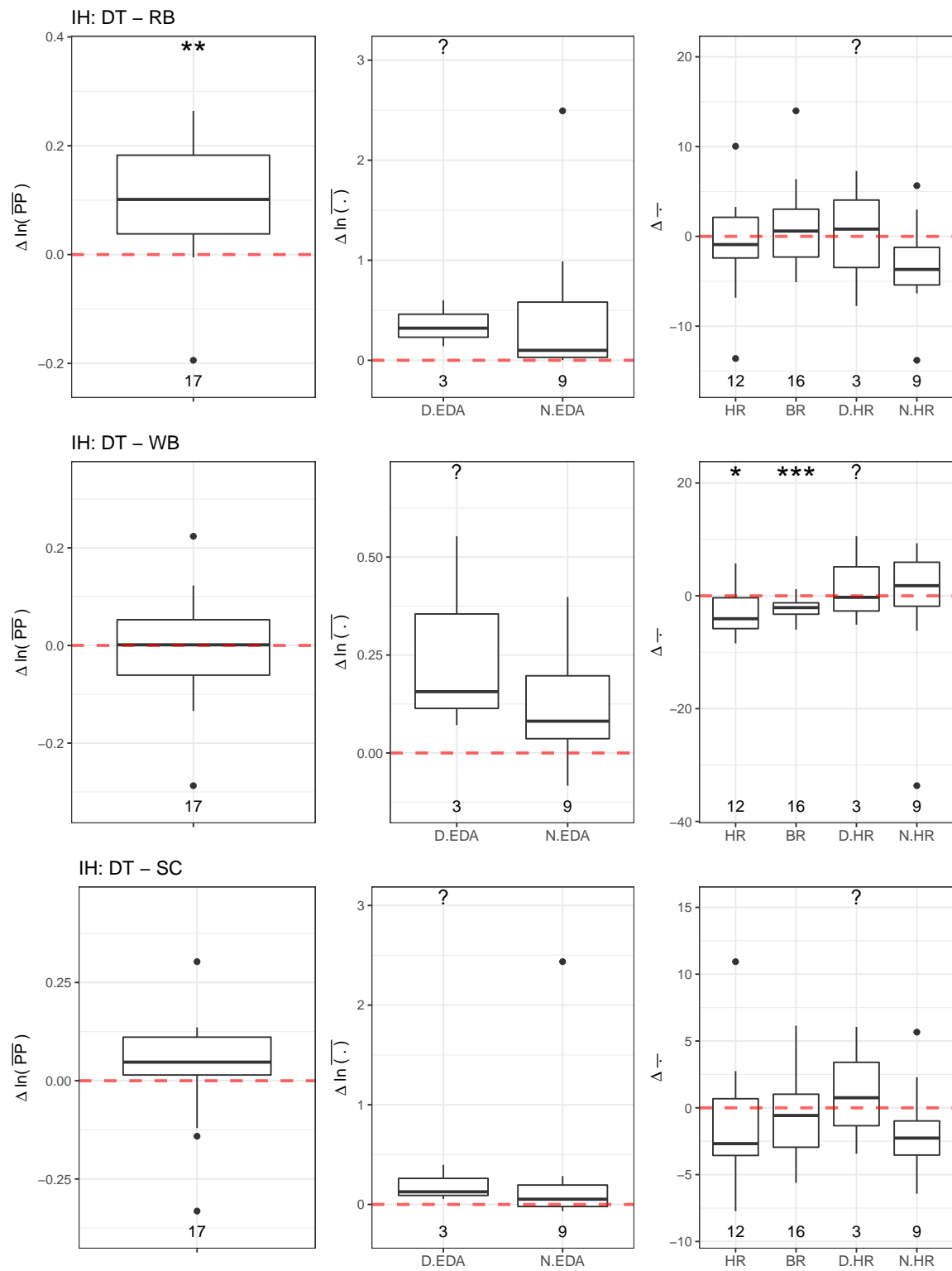
? = Did not run statistical test ($n < 7$)

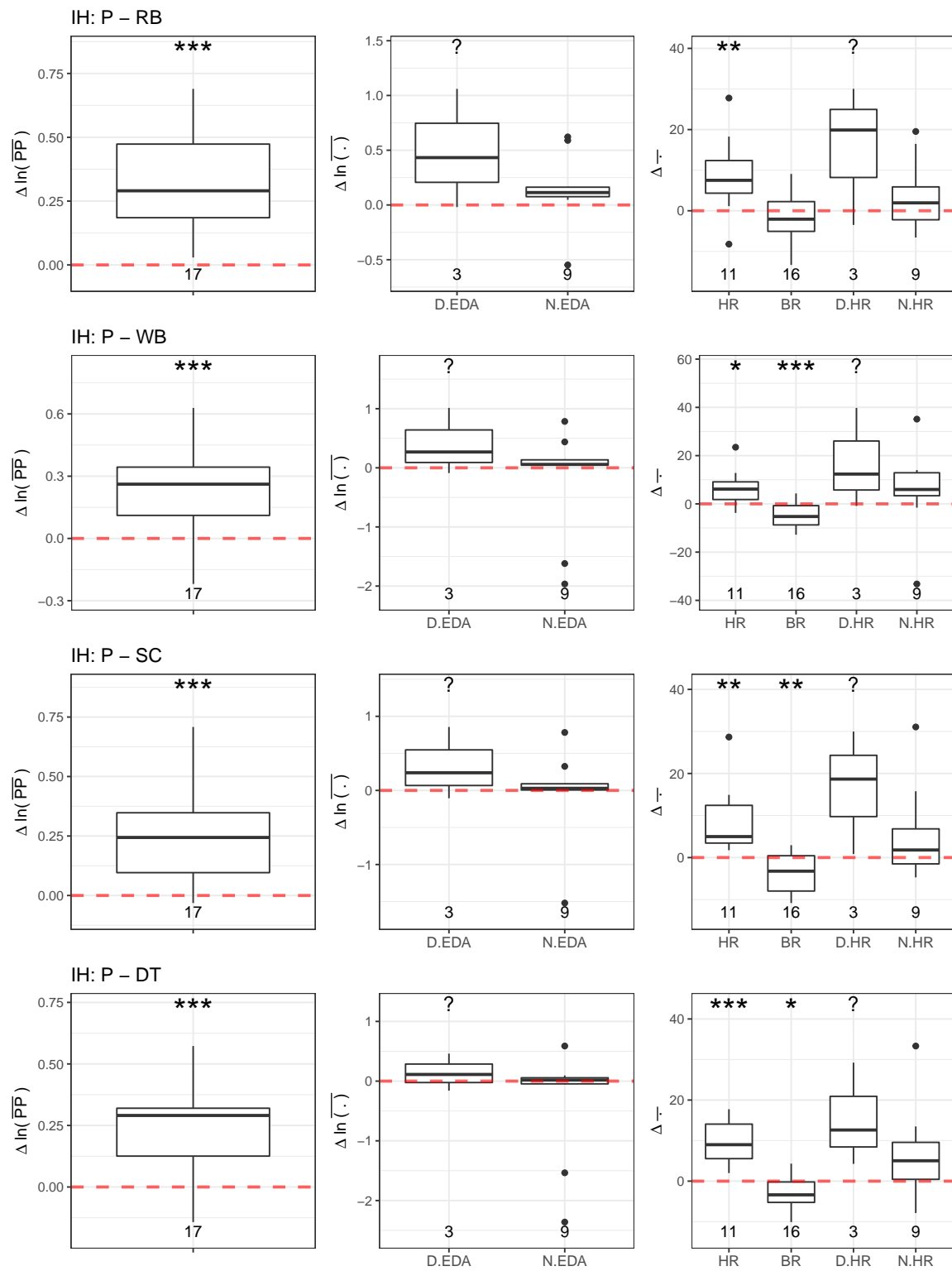
Intermittent-High (IH)

Sensor Channels per Activity

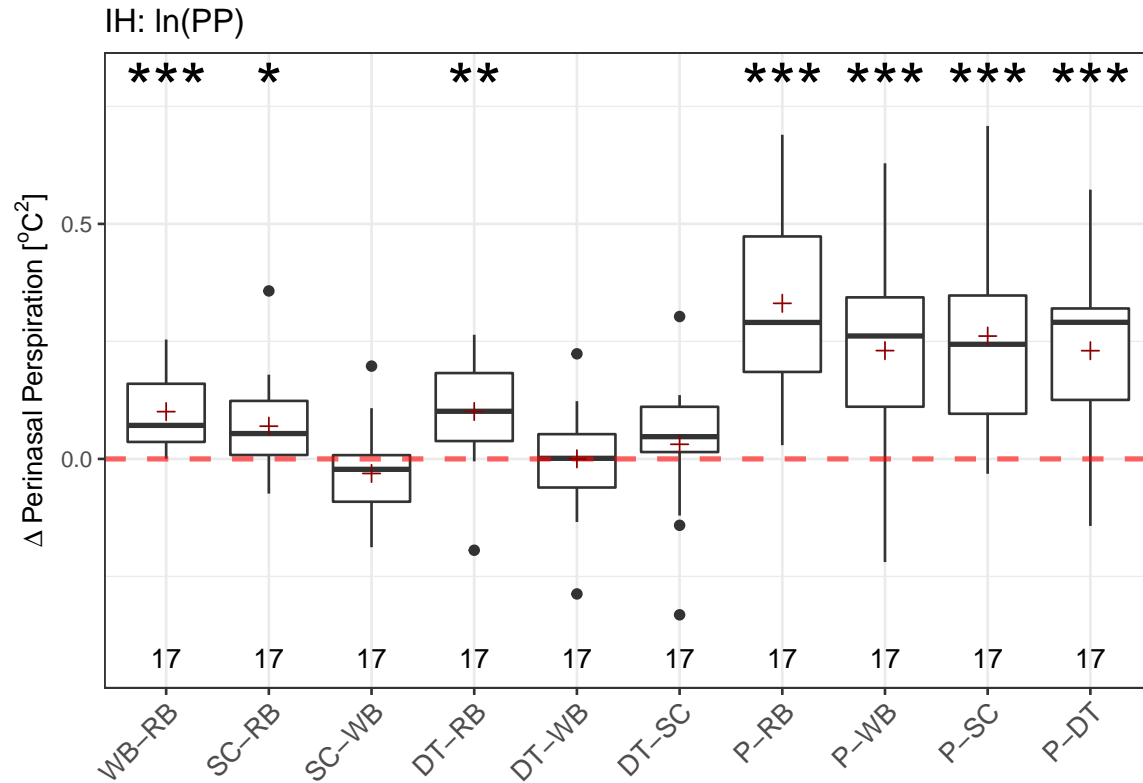






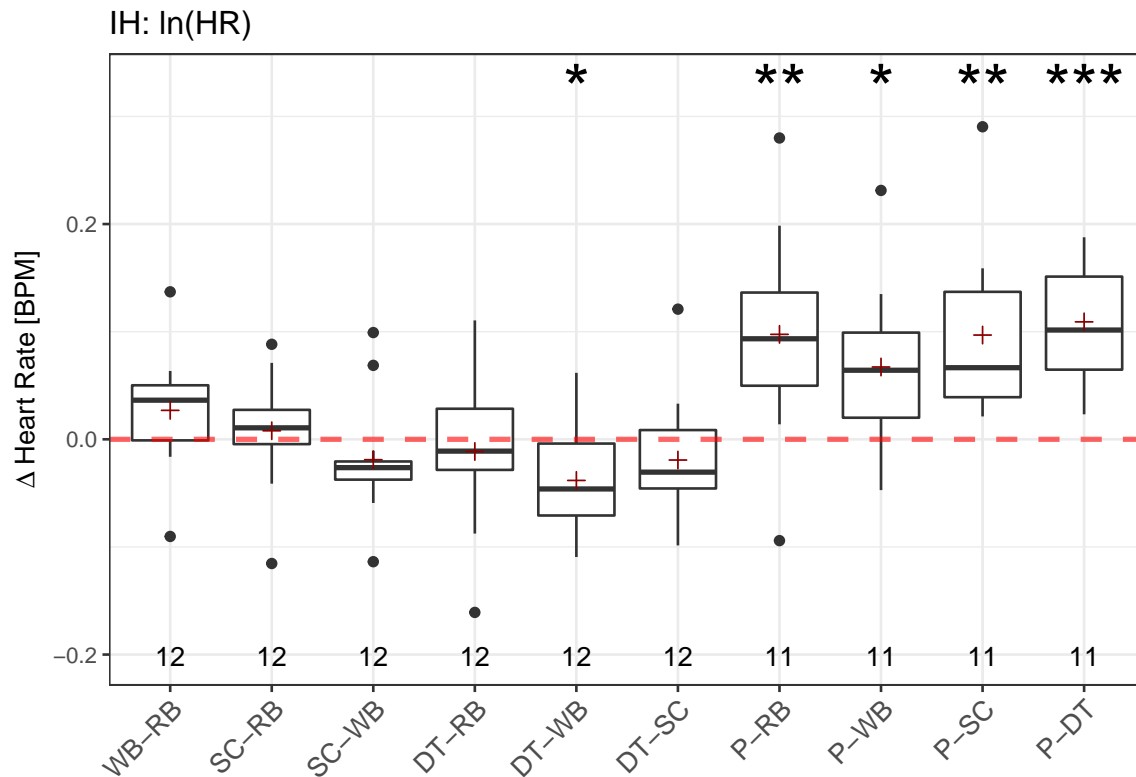


Sensor Channel across Activities



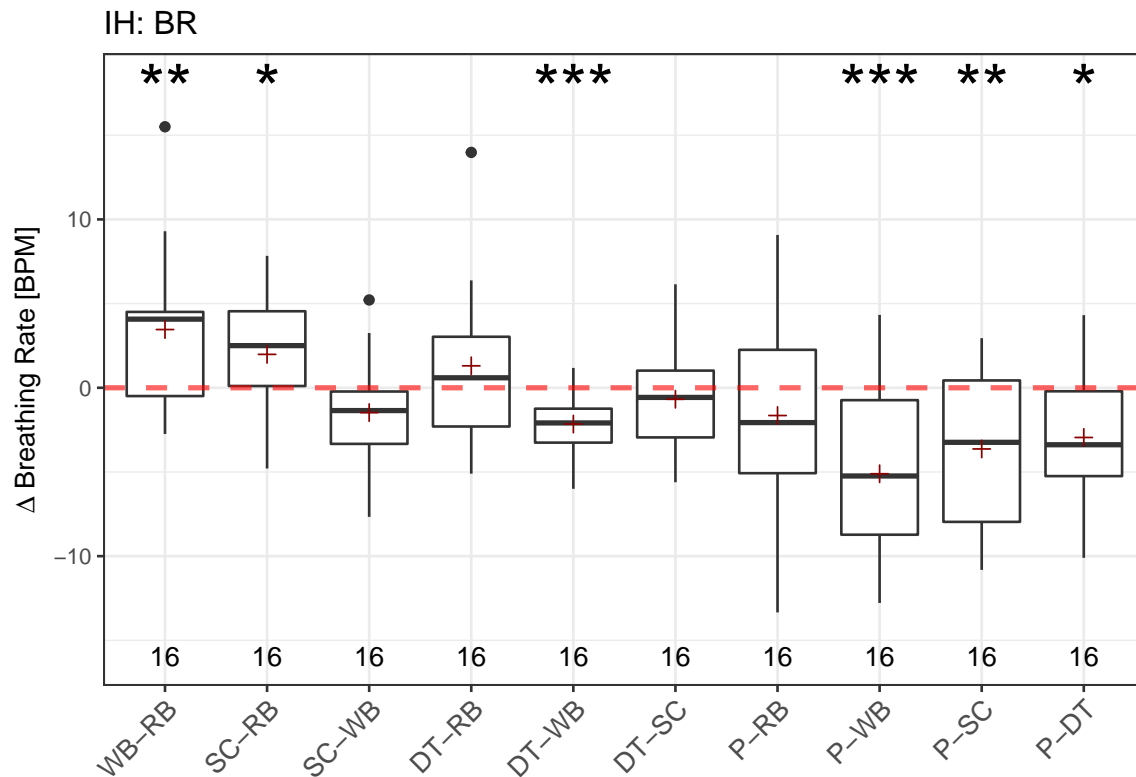
```
## In the following tests, we applied ln(PP).
##
## Writing Baseline - Resting Baseline
## Transformed t-test p = 1e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0145 < 0.05 *
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.2084 > 0.05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

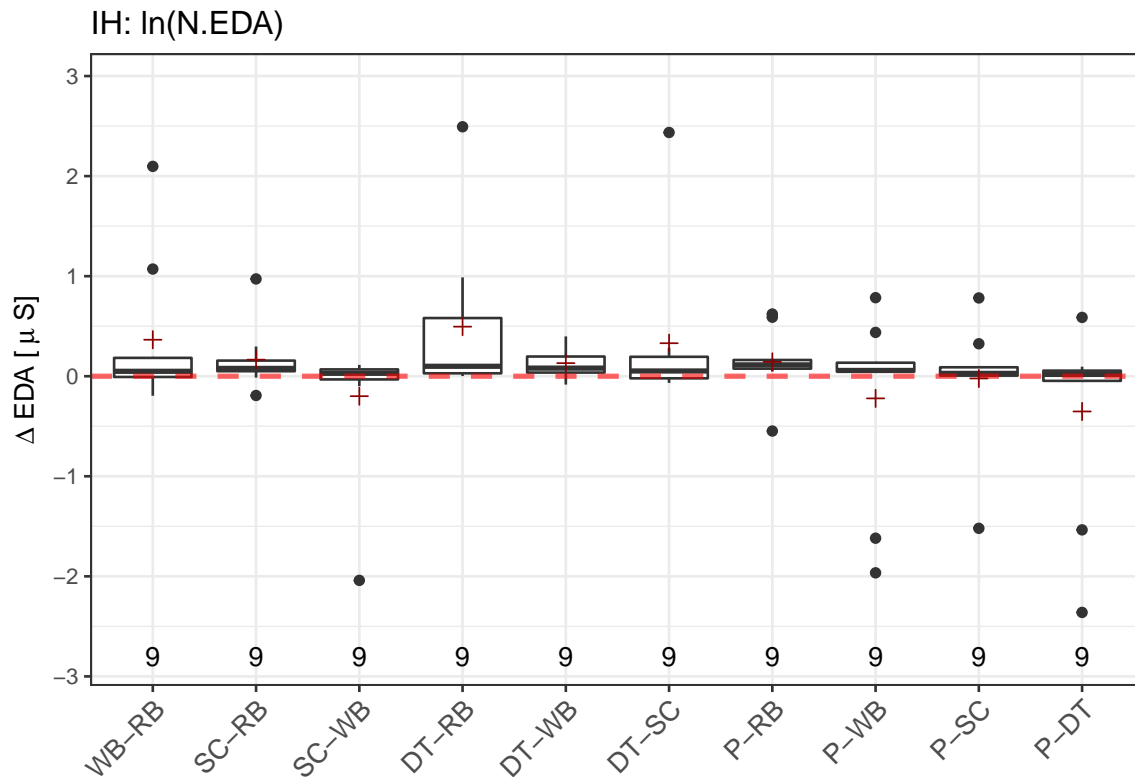
```
##  
## Presentation - Dual Task  
## Transformed t-test  $p = 0 < 0.001$  ***
```



```
## 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.  
## -----
```



In the following tests, we applied $\ln(N.EDA)$.

##

Writing Baseline - Resting Baseline

Transformed t-test $p = 0.1796 > 0.05$

##

Stress Condition - Resting Baseline

Transformed t-test $p = 0.1701 > 0.05$

##

StressCondition - Writing Baseline

Transformed t-test $p = 0.4137 > 0.05$

##

Dual Task - Resting Baseline

Transformed t-test $p = 0.1074 > 0.05$

##

Dual Task - Writing Baseline

Transformed t-test $p = 0.0502 > 0.05$

##

Dual Task - Stress Condition

Transformed t-test $p = 0.25 > 0.05$

##

Presentation - Resting Baseline

Transformed t-test $p = 0.2412 > 0.05$

##

Presentation - Writing Baseline

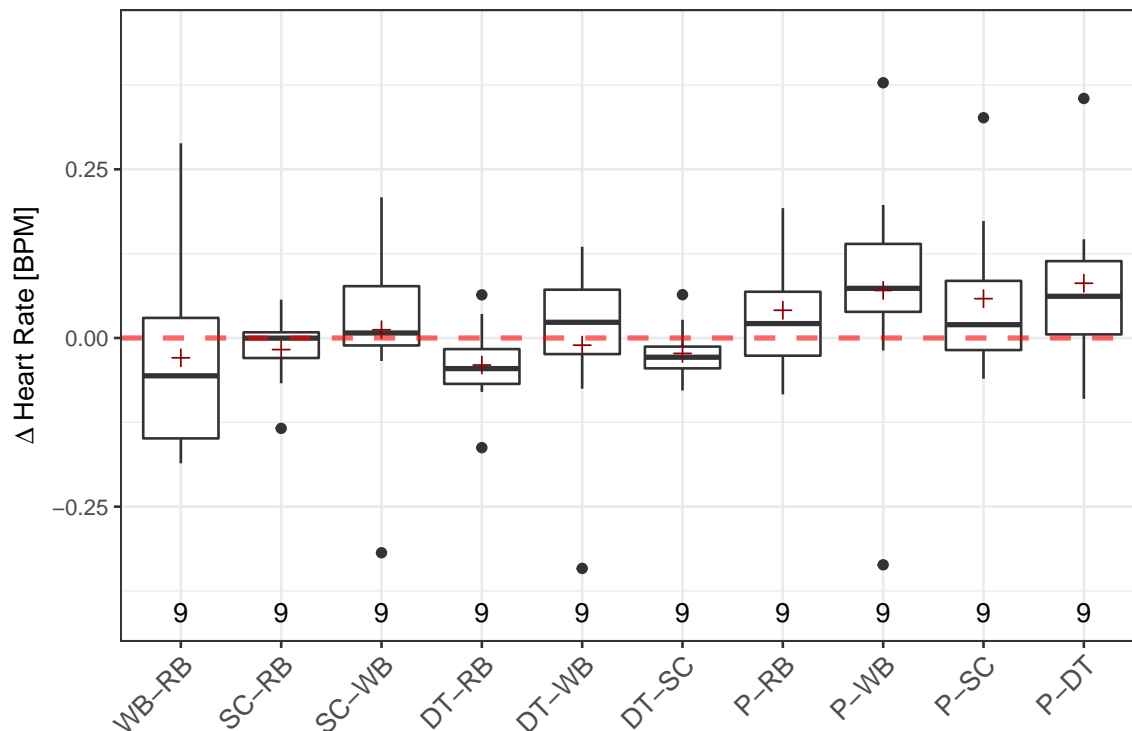
Transformed t-test $p = 0.494 > 0.05$

##

```
## Presentation - Stress Condition
## Transformed t-test p = 0.9167 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.2971 > 0.05
```

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

IH: N.HR

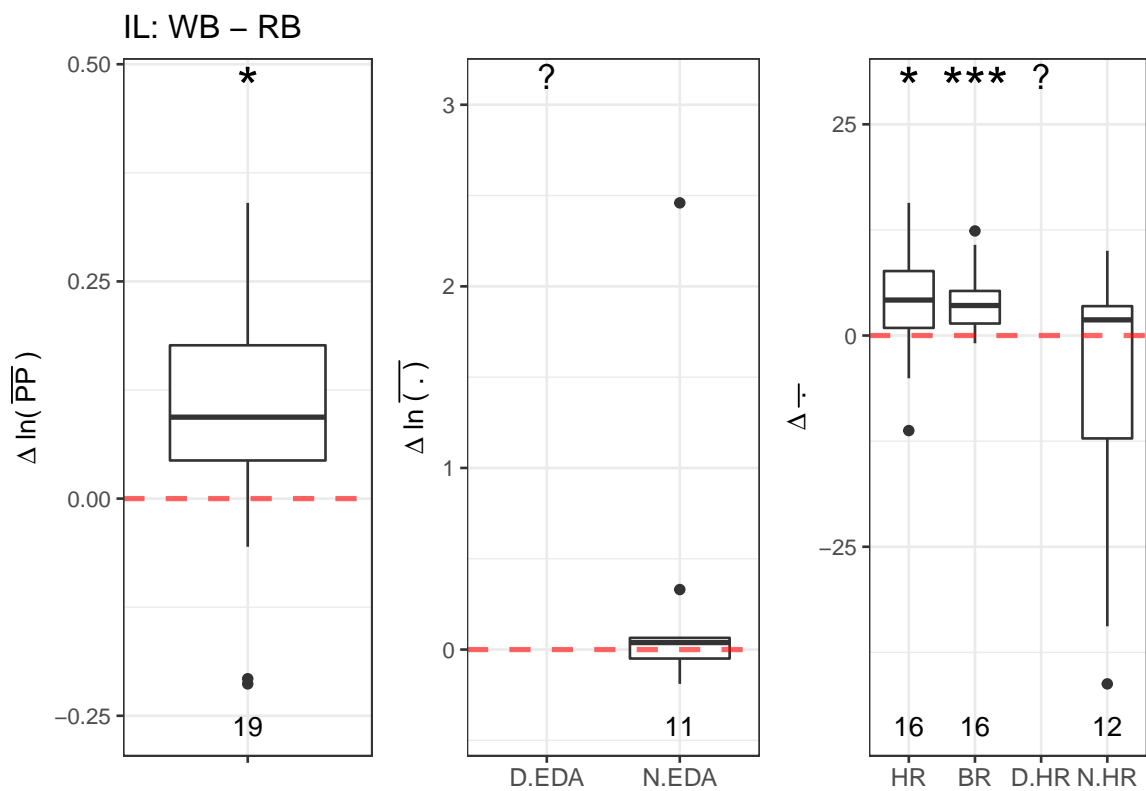


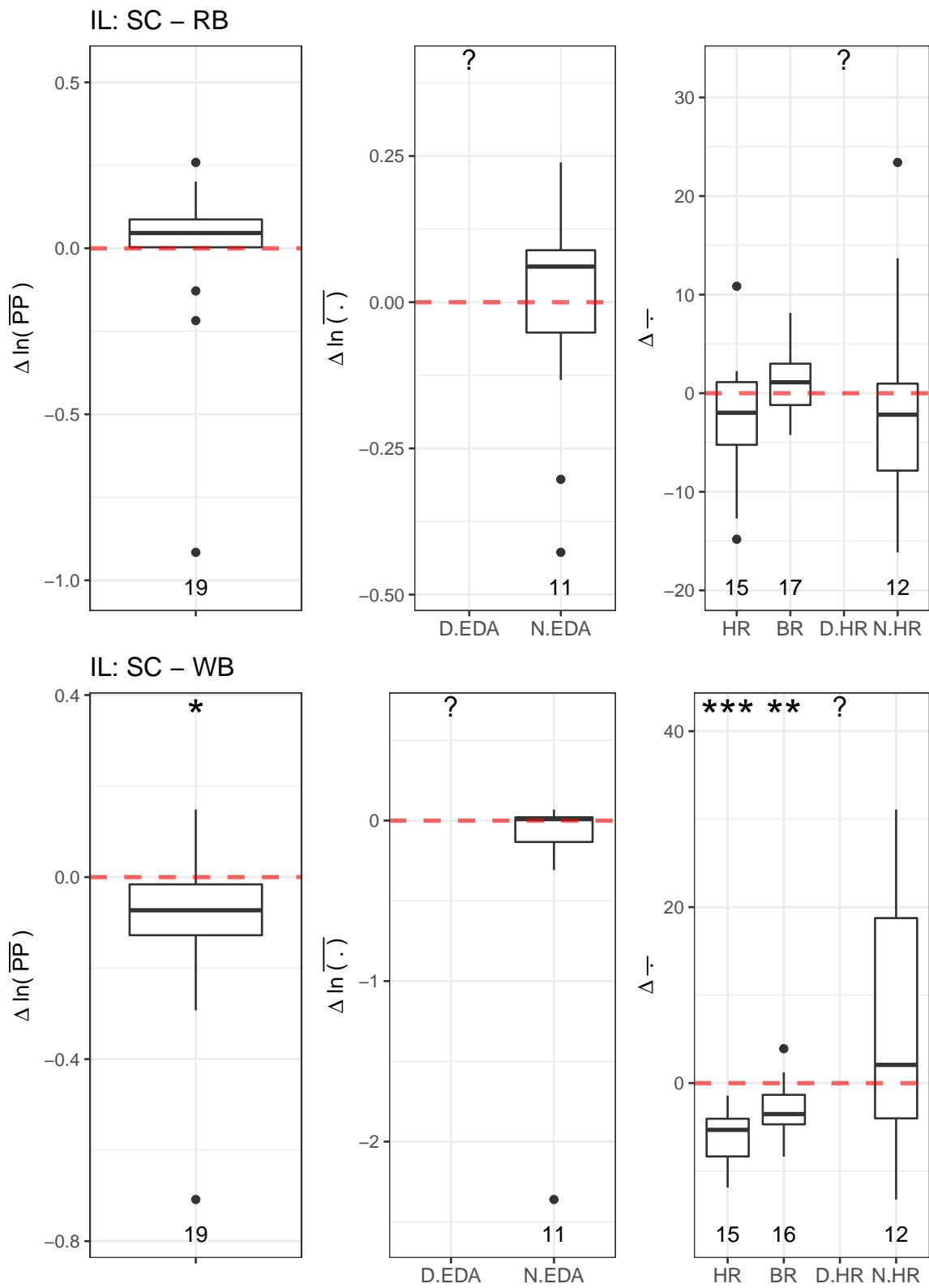
```
## In the following tests, we applied ln(N.HR).
##
## Writing Baseline - Resting Baseline
## Wilcoxon p = 0.3594 > 0.05
##
## Stress Condition - Resting Baseline
## Wilcoxon p = 0.6523 > 0.05
##
## StressCondition - Writing Baseline
## Wilcoxon p = 0.4961 > 0.05
##
## Dual Task - Resting Baseline
## Wilcoxon p = 0.1289 > 0.05
##
## Dual Task - Writing Baseline
## Wilcoxon p = 0.7344 > 0.05
##
## Dual Task - Stress Condition
## Wilcoxon p = 0.1641 > 0.05
##
## Presentation - Resting Baseline
## Wilcoxon p = 0.4258 > 0.05
##
## Presentation - Writing Baseline
## Wilcoxon p = 0.1289 > 0.05
##
```

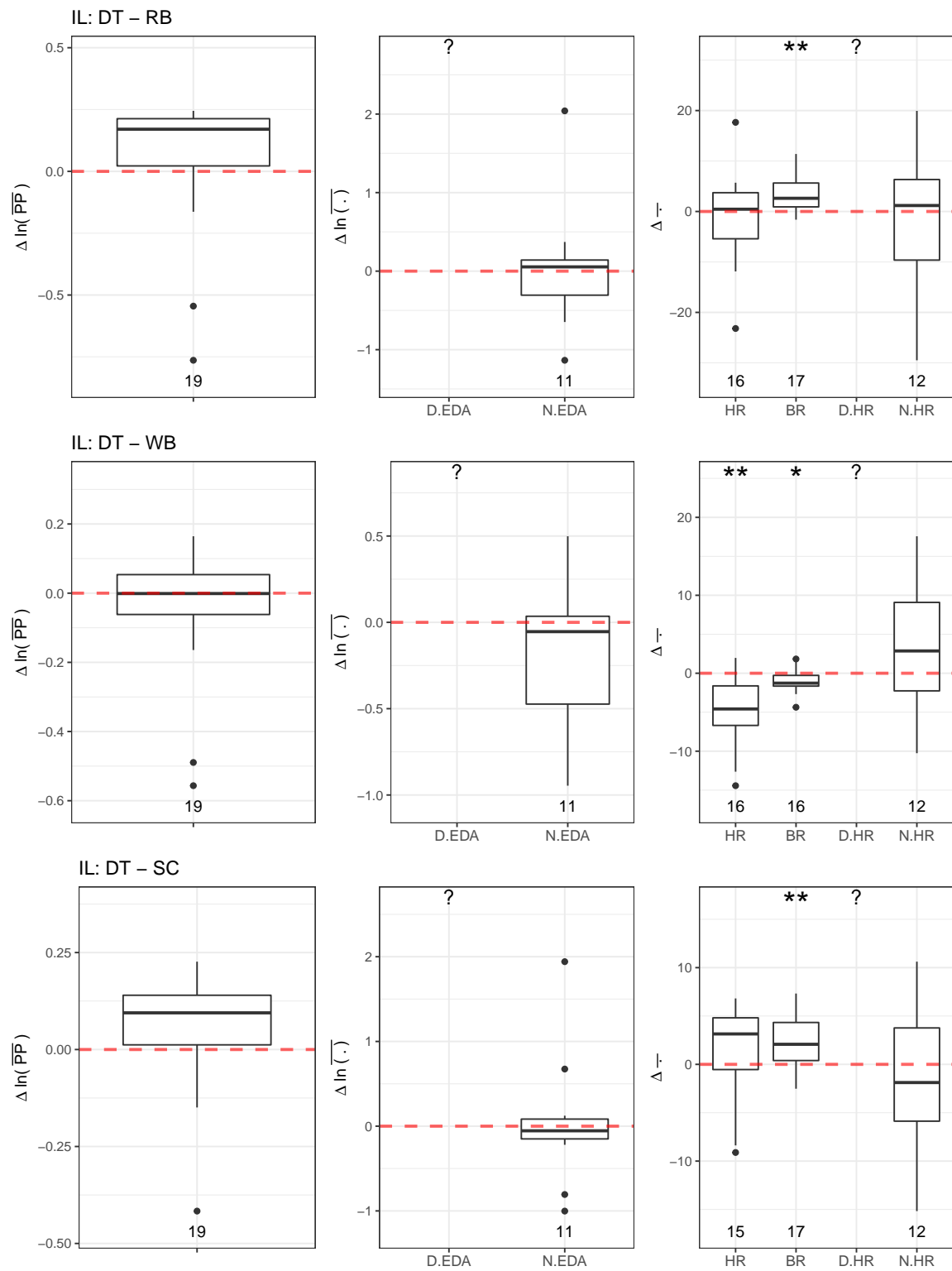
```
## Presentation - Stress Condition
## Wilcoxon p = 0.3008 > 0.05
##
## Presentation - Dual Task
## Wilcoxon p = 0.0742 > 0.05
```

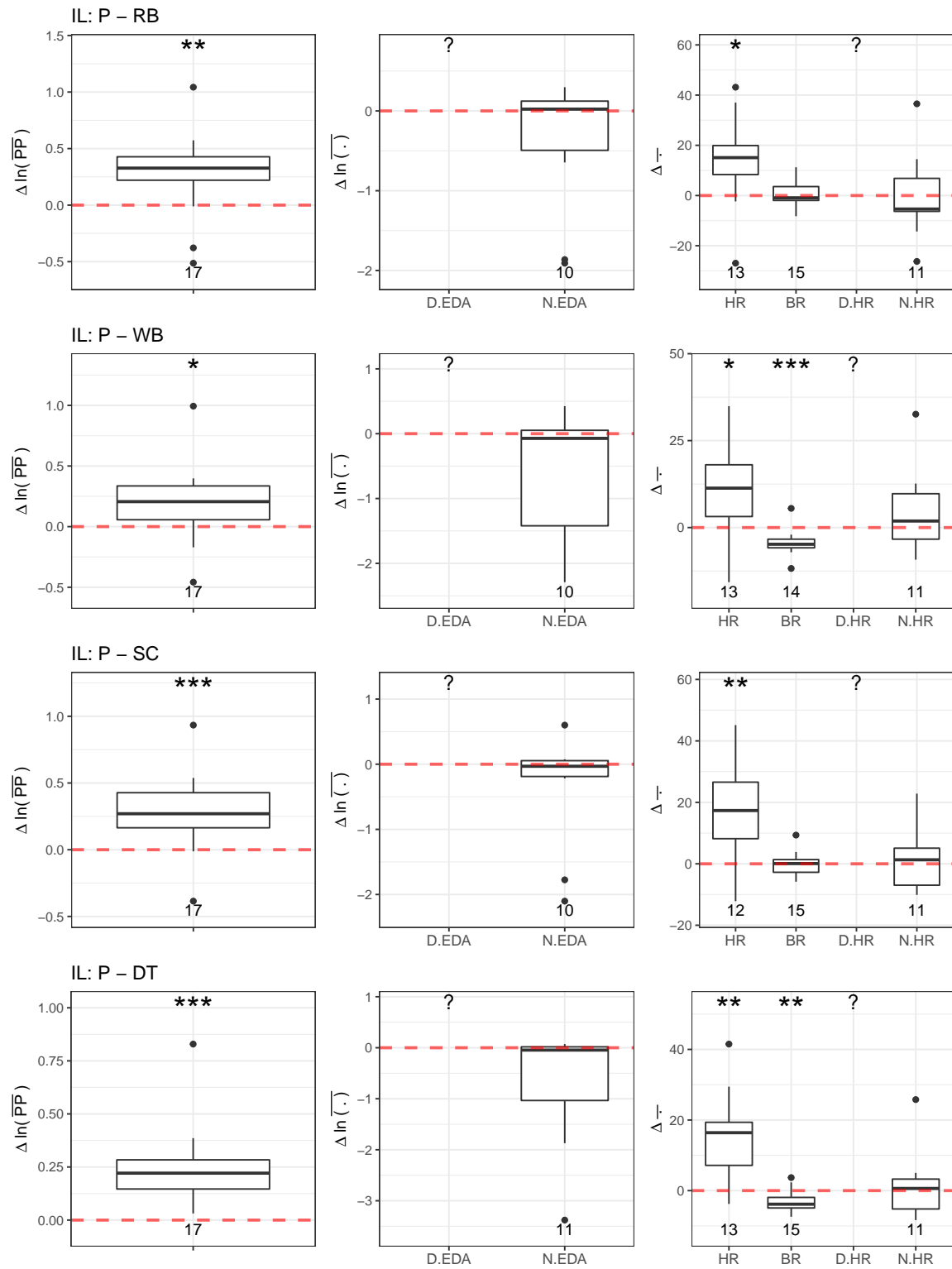

Intermittent-Low (IL)

Sensor Channels per Activity

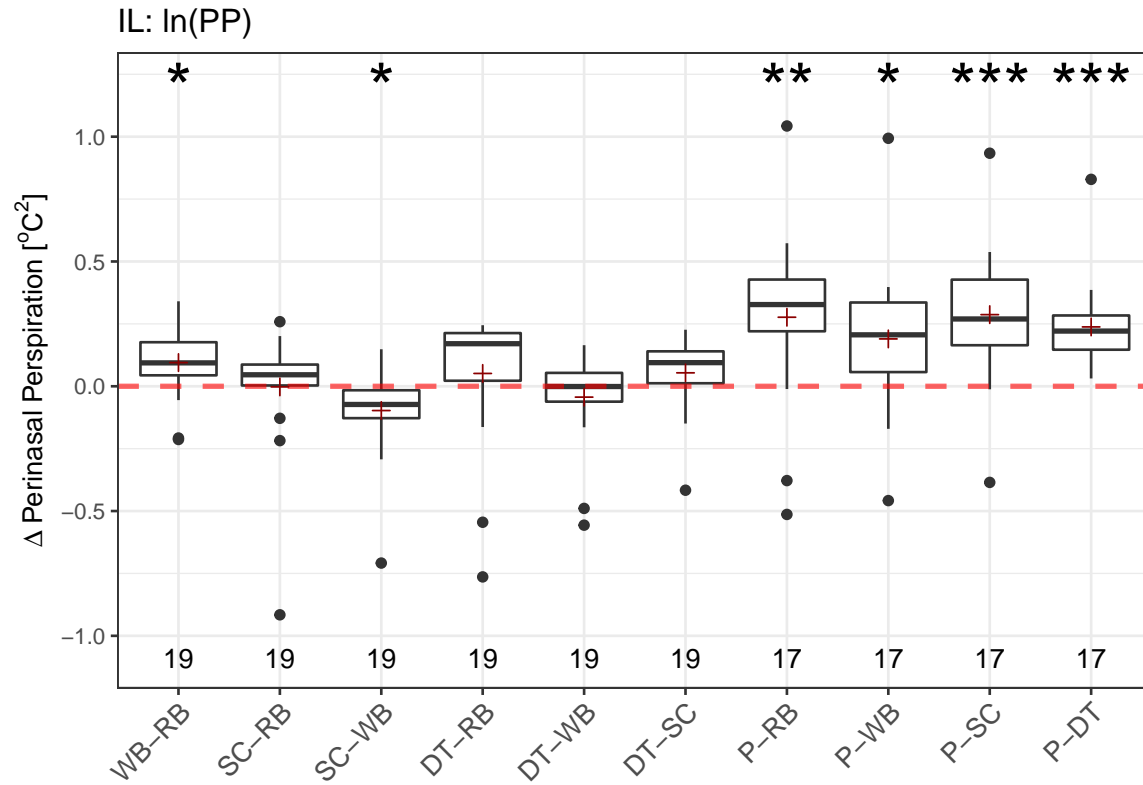






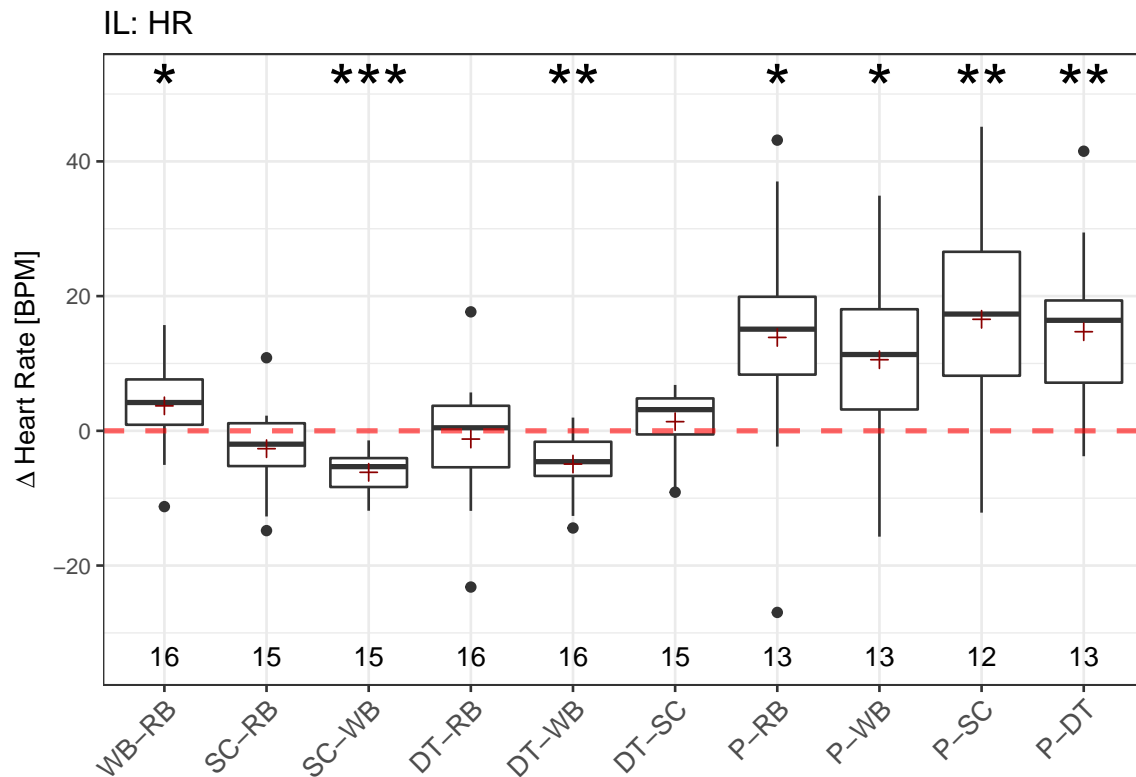


Sensor Channel across Activities



```
## 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  *
```

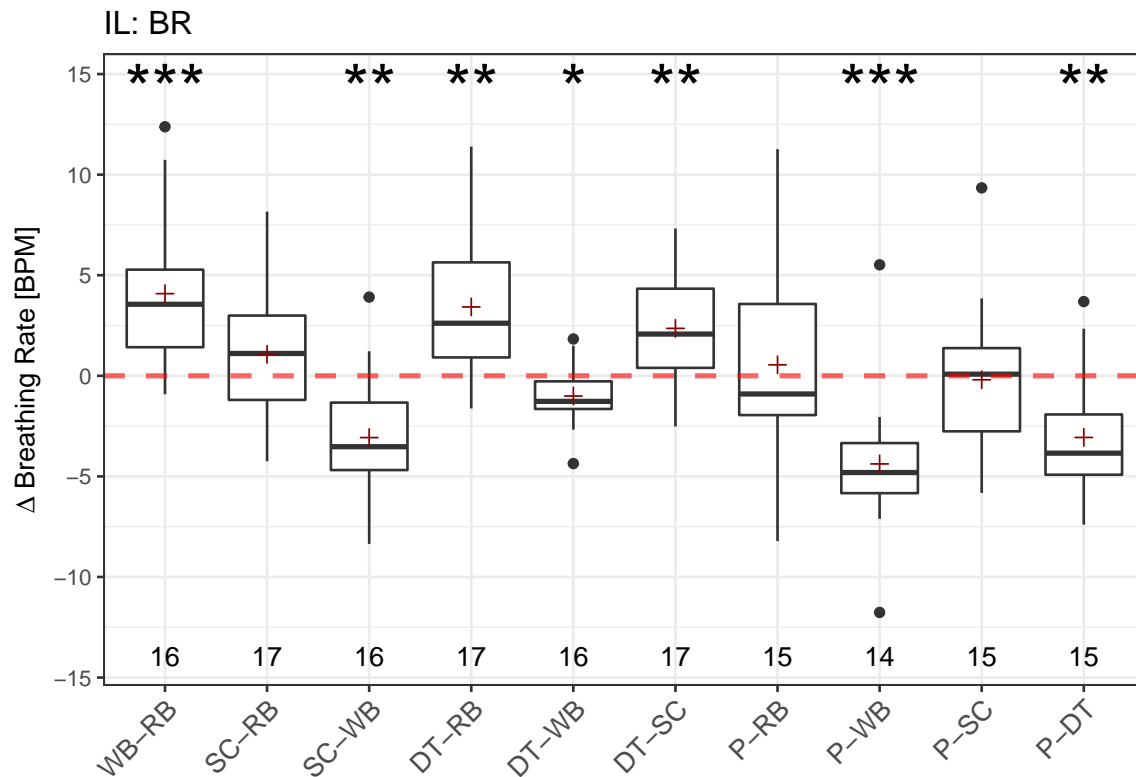
```
##  
## Presentation - Stress Condition  
## Transformed t-test p = 5e-04 < 0.001 ***  
##  
## Presentation - Dual Task  
## Transformed t-test p = 1e-04 < 0.001 ***
```



```
## 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  **
```



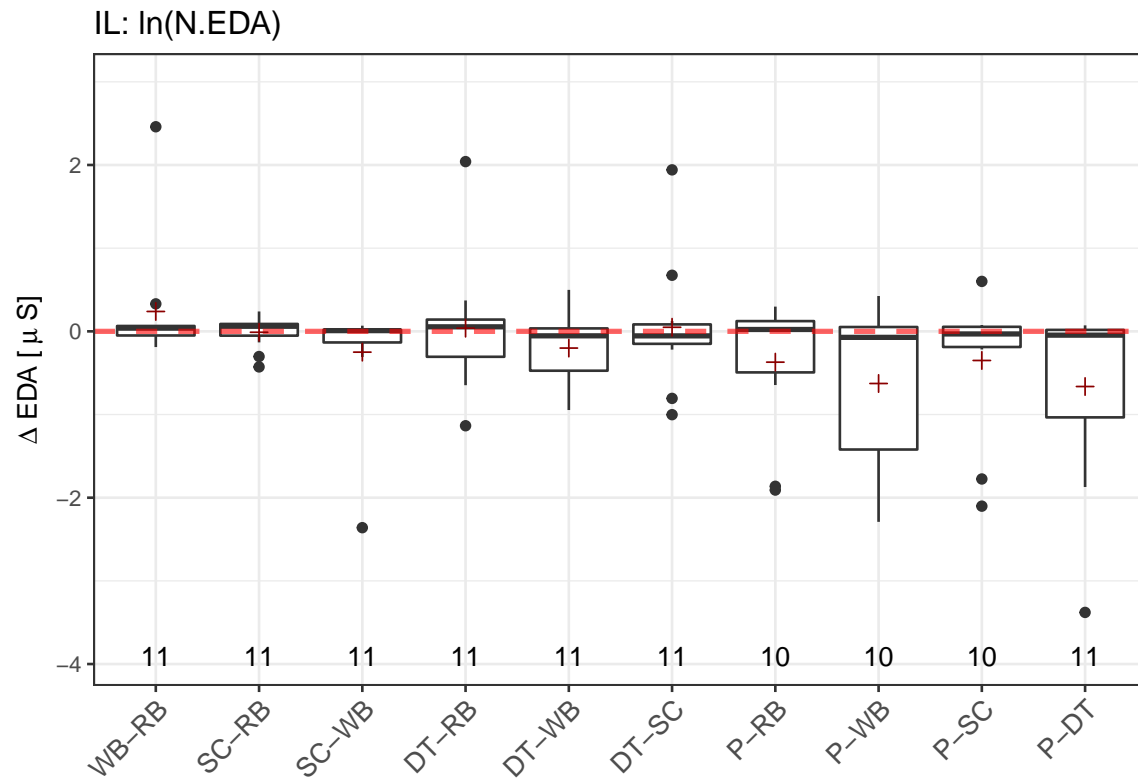
```
##  
## Presentation - Dual Task  
## t-test  $p = 0.0012 < 0.01$  **
```



```
## 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  $p = 0.0015 < 0.01$  **
```

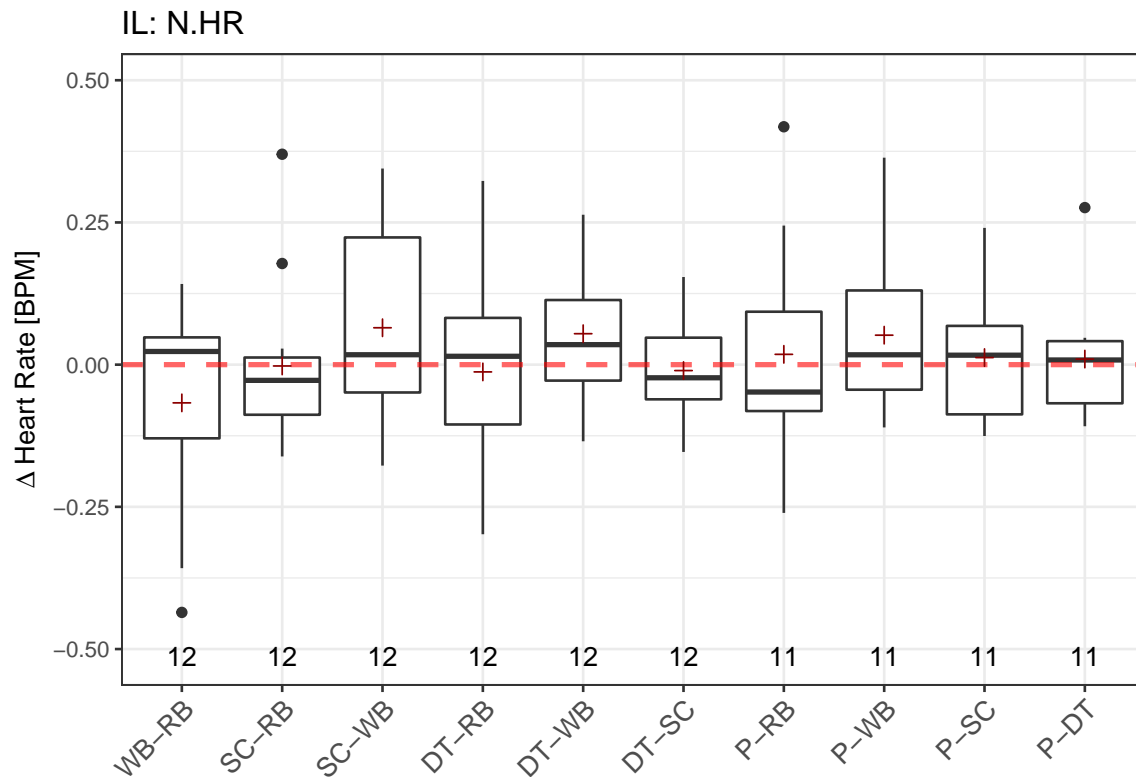
```
## IL has LESS than 7 subjects for D.EDA. Cannot continue with test.  
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.315 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.8558 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.2692 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.878 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.1658 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.837 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.1953 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.0865 > 0.05
##
## Presentation - Stress Condition
## Transformed t-test p = 0.2336 > 0.05
```

```
##  
## Presentation - Dual Task  
## Transformed t-test  $p = 0.0761 > 0.05$ 
```

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

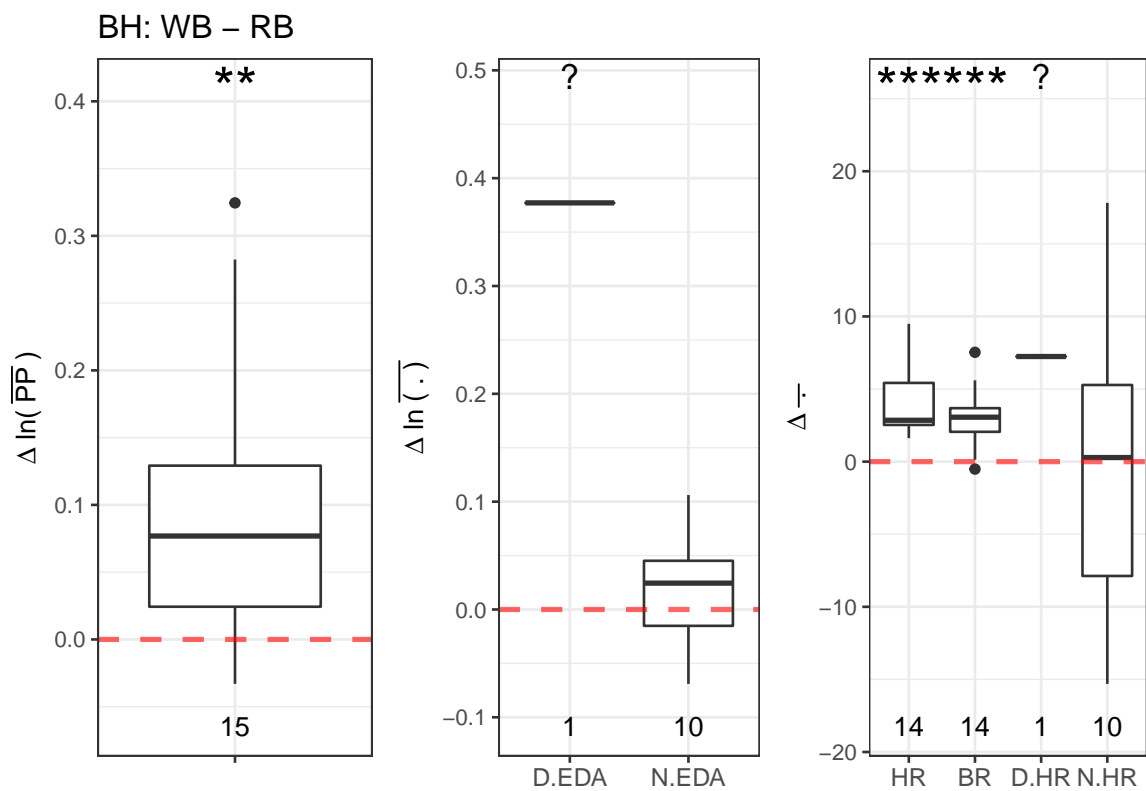


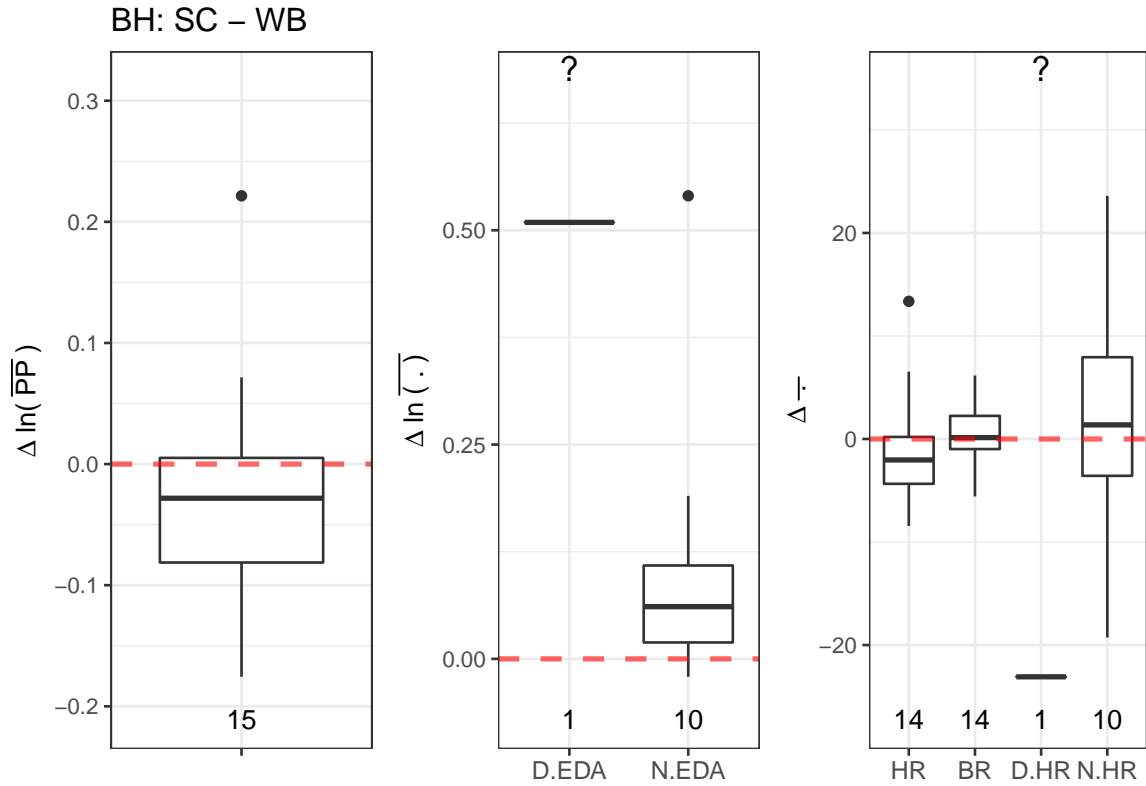
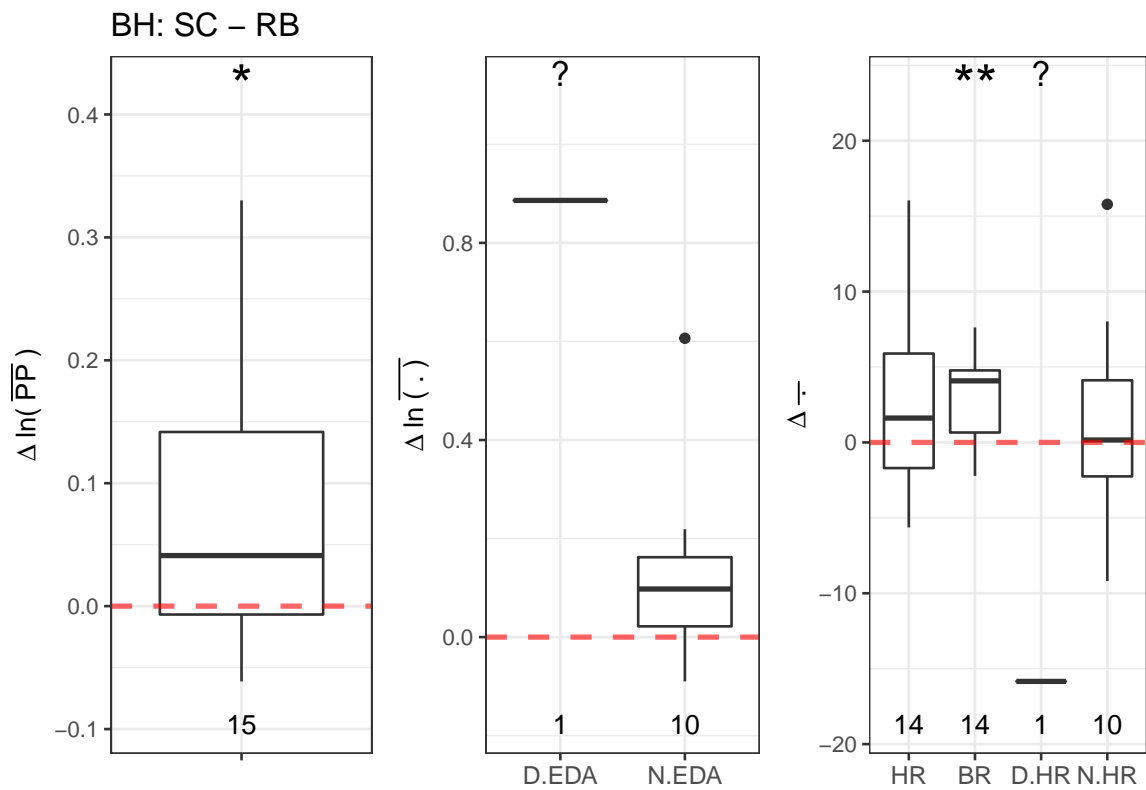
```
## Writing Baseline - Resting Baseline
## Wilcoxon p = 0.8501 > 0.05
##
## Stress Condition - Resting Baseline
## Wilcoxon p = 0.4238 > 0.05
##
## StressCondition - Writing Baseline
## Wilcoxon p = 0.3804 > 0.05
##
## Dual Task - Resting Baseline
## Wilcoxon p = 1 > 0.05
##
## Dual Task - Writing Baseline
## Wilcoxon p = 0.1294 > 0.05
##
## Dual Task - Stress Condition
## Wilcoxon p = 0.791 > 0.05
##
## Presentation - Resting Baseline
## Wilcoxon p = 0.9658 > 0.05
##
## Presentation - Writing Baseline
## Wilcoxon p = 0.3203 > 0.05
##
## Presentation - Stress Condition
## Wilcoxon p = 0.9658 > 0.05
```

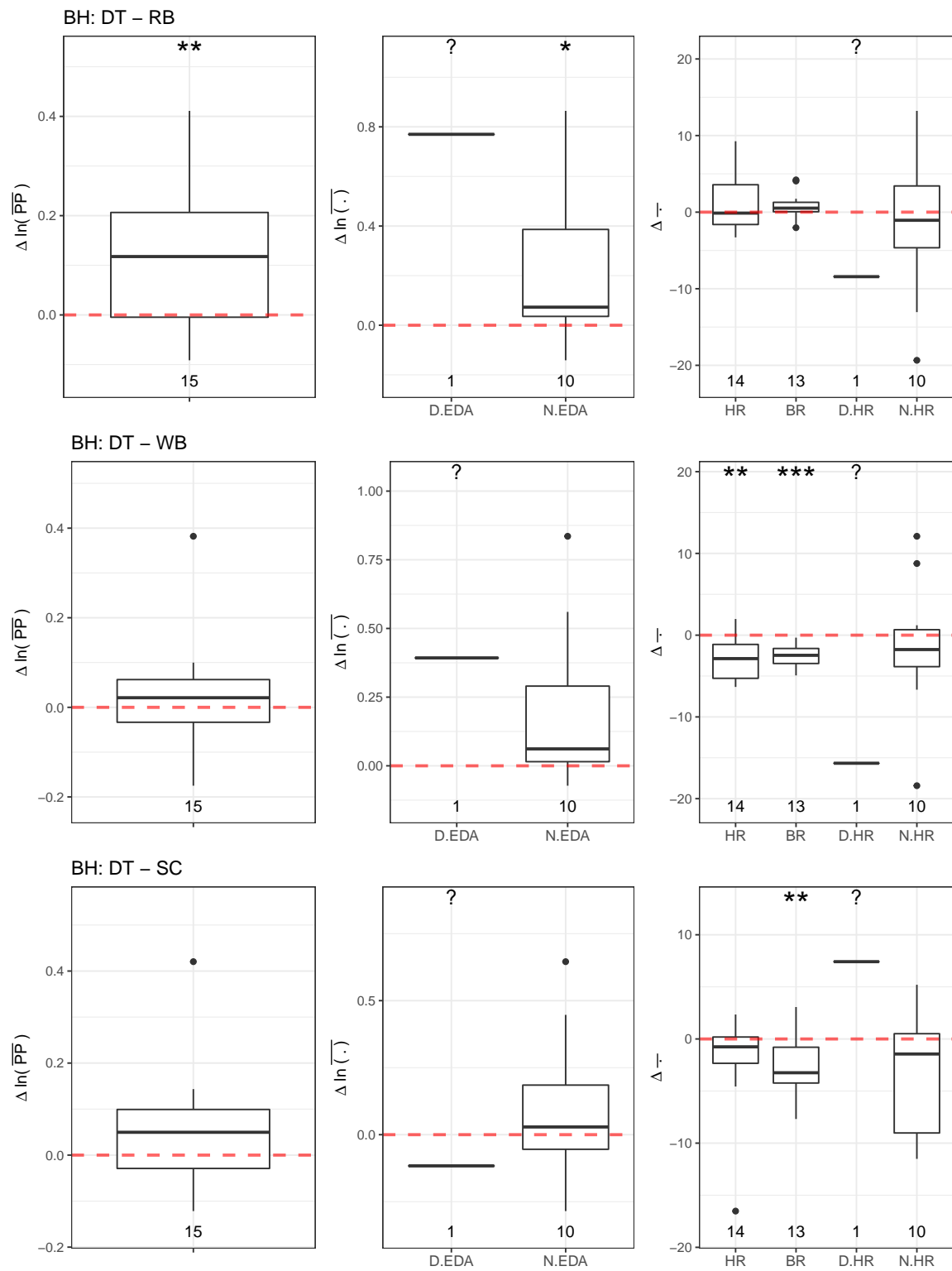
```
##  
## Presentation - Dual Task  
## Wilcoxon p = 0.8311 > 0.05
```

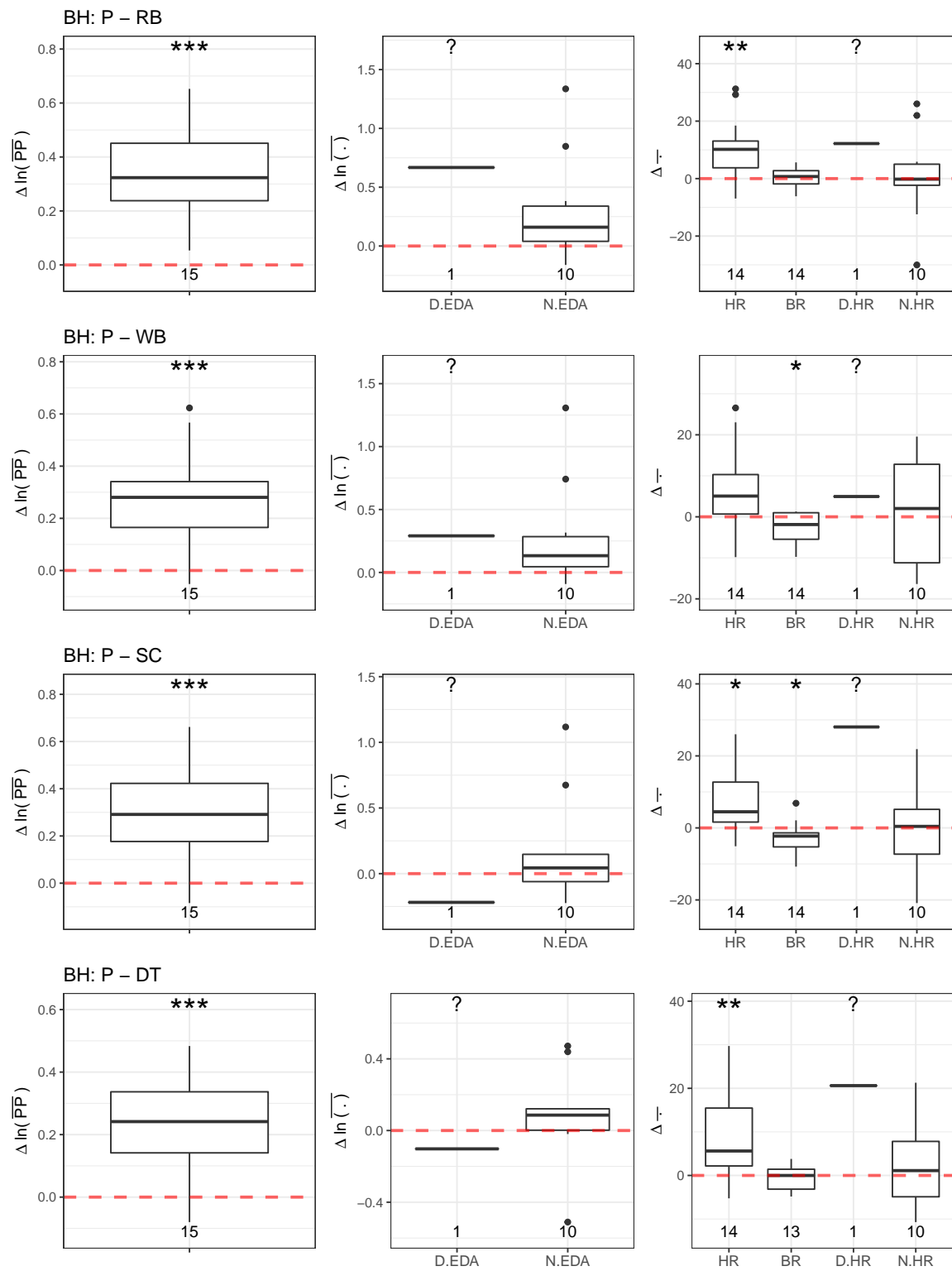
Batch-High (BH)

Sensor Channels per Activity

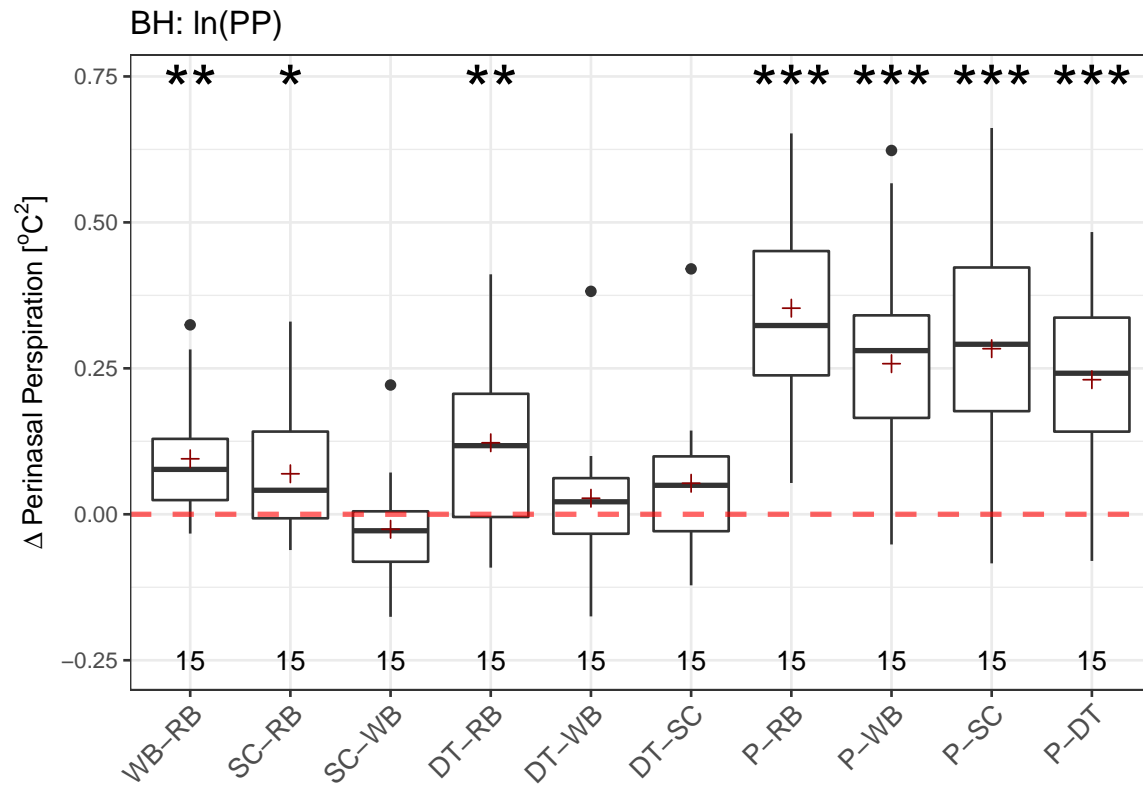






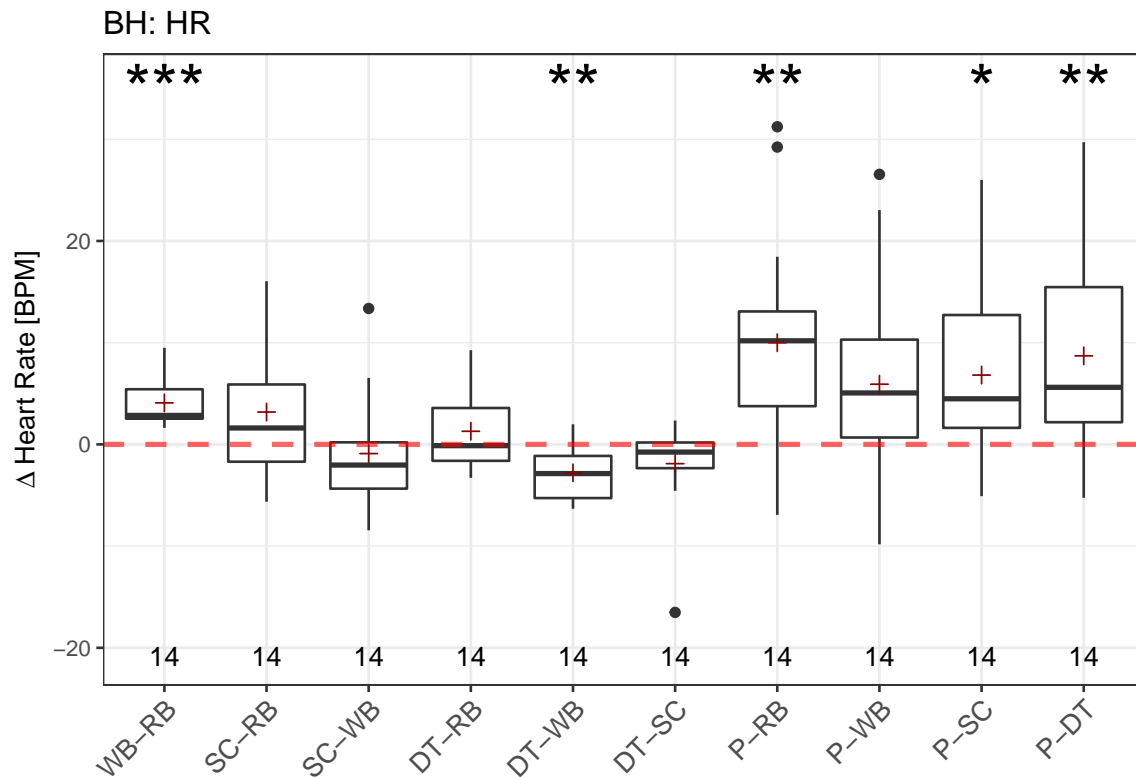


Sensor Channel across Activities



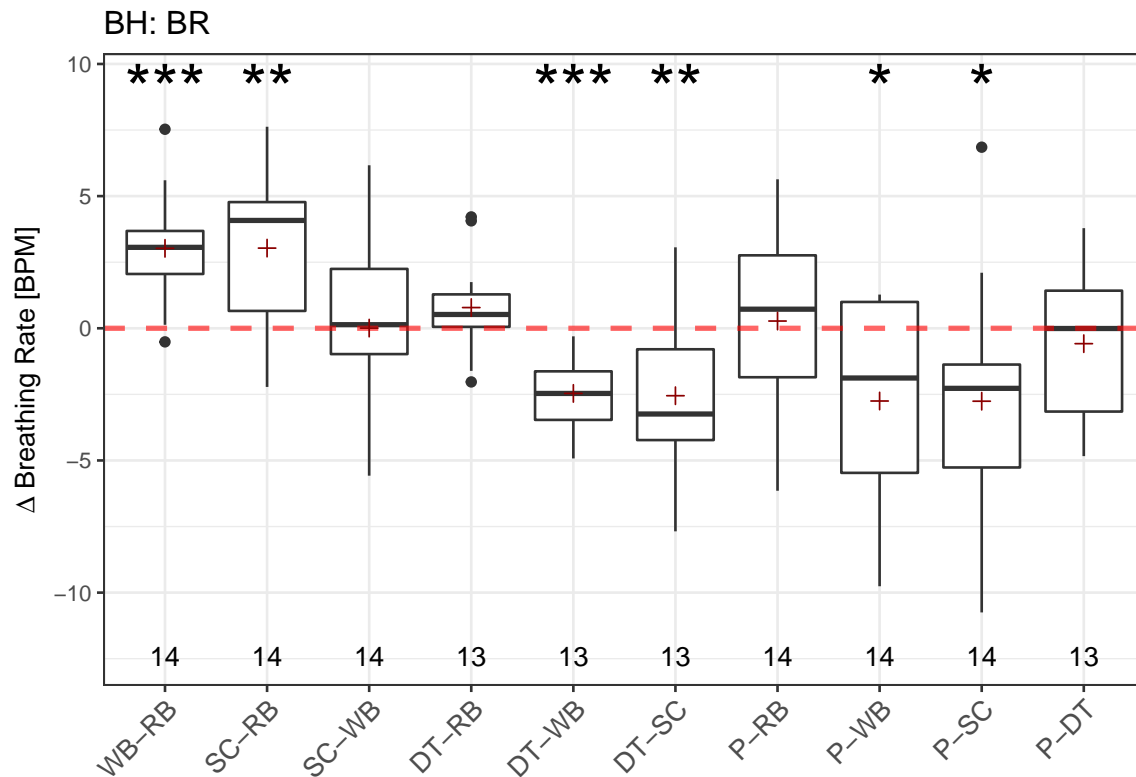
```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.0039 < 0.01  **
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0215 < 0.05  *
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.3011 > 0.05
##
## Dual Task - Resting Baseline
## Transformed 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 *
```

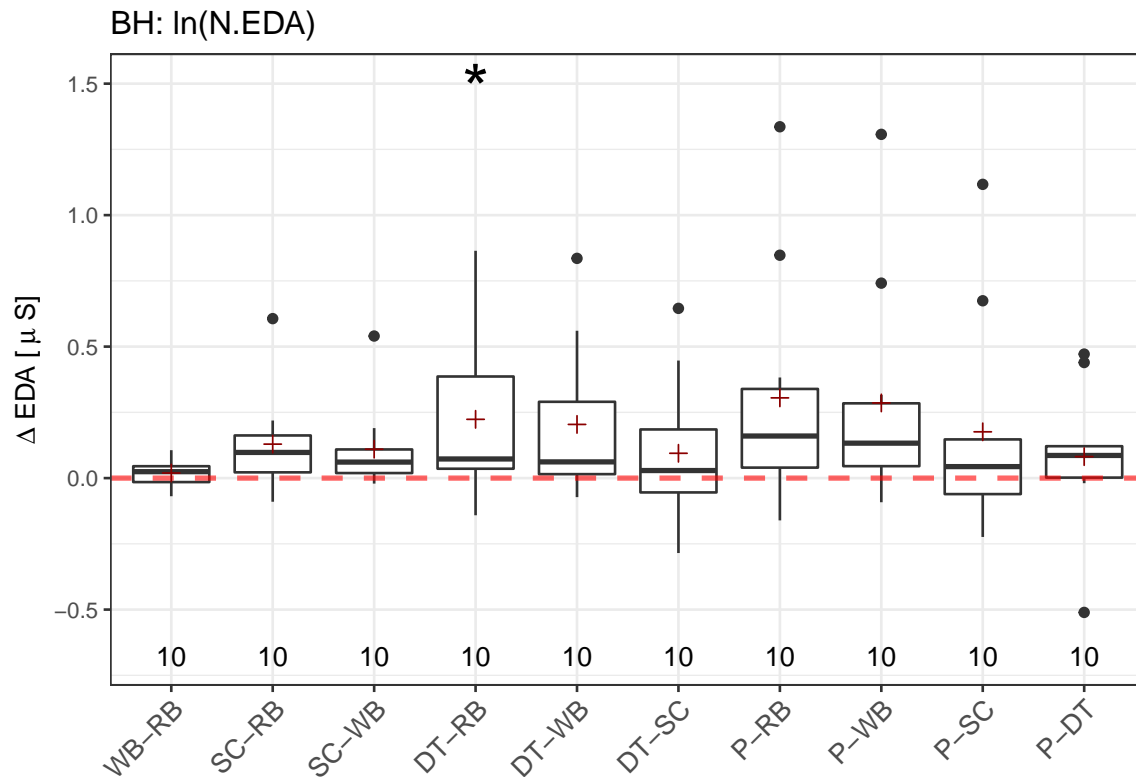
```
##  
## Presentation - Dual Task  
## t-test  $p = 0.0074 < 0.01$  **
```

```
## 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  $p = 0.4905 > 0.05$ 
```

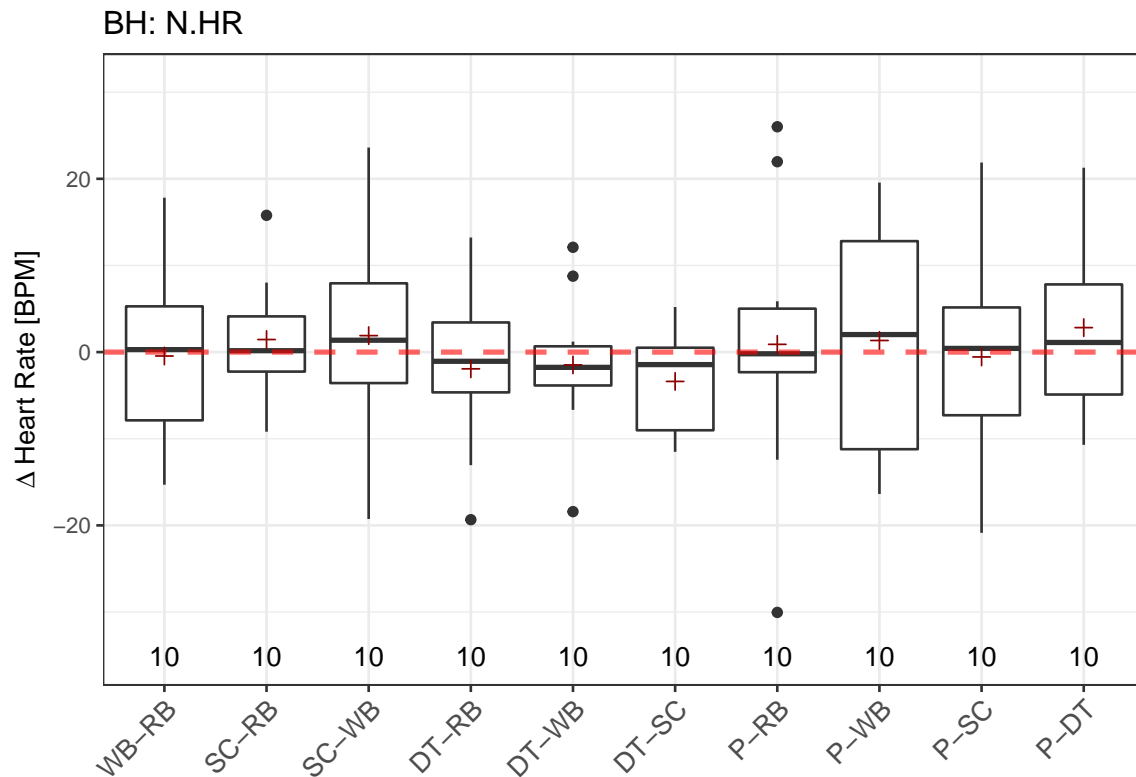
```
## BH has LESS than 7 subjects for D.EDA. Cannot continue with test.  
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.2534 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0609 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.0622 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.0463 < 0.05  *
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.0542 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.3059 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.062 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.0625 > 0.05
##
## Presentation - Stress Condition
## Transformed t-test p = 0.2062 > 0.05
```

```
##  
## Presentation - Dual Task  
## Transformed t-test  $p = 0.3639 > 0.05$ 
```

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

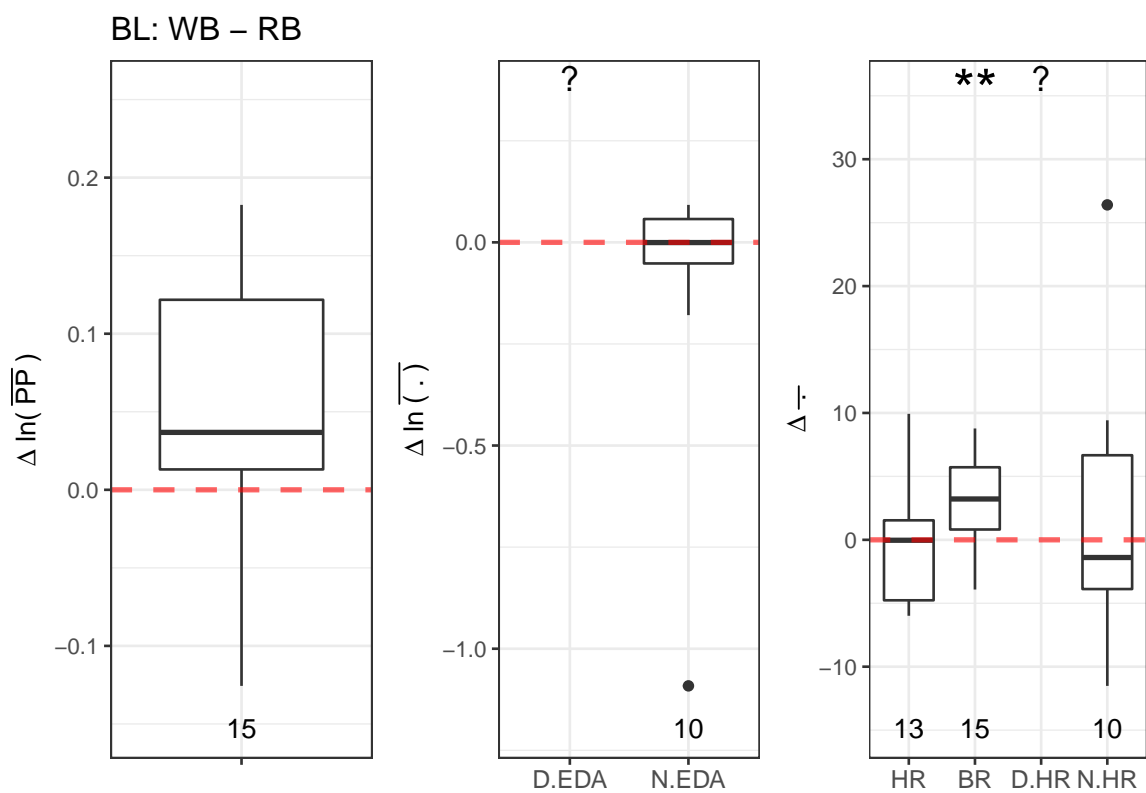


```
## Writing Baseline - Resting Baseline
## t-test p = 0.8962 > 0.05
##
## Stress Condition - Resting Baseline
## t-test p = 0.5287 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.6089 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.5231 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.5861 > 0.05
##
## Dual Task - Stress Condition
## t-test p = 0.0955 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.8627 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.7565 > 0.05
##
## Presentation - Stress Condition
## t-test p = 0.8971 > 0.05
```

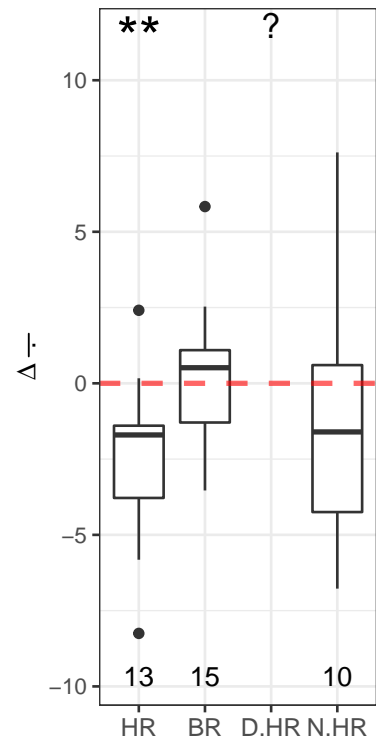
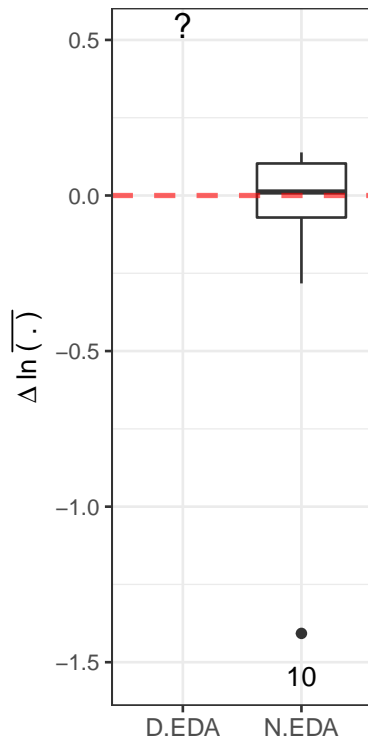
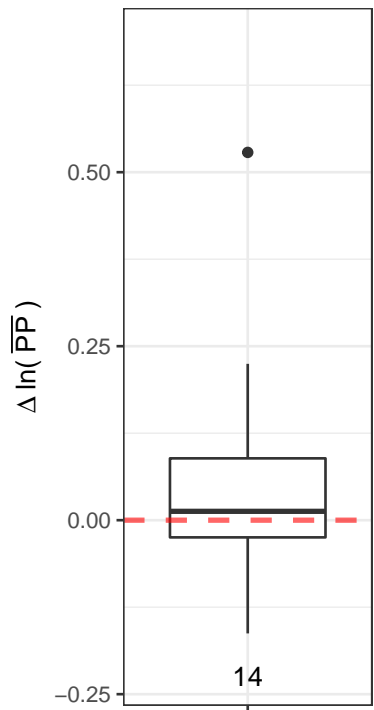
```
##  
## Presentation - Dual Task  
## t-test  $p = 0.4014 > 0.05$ 
```

Batch-Low (BL)

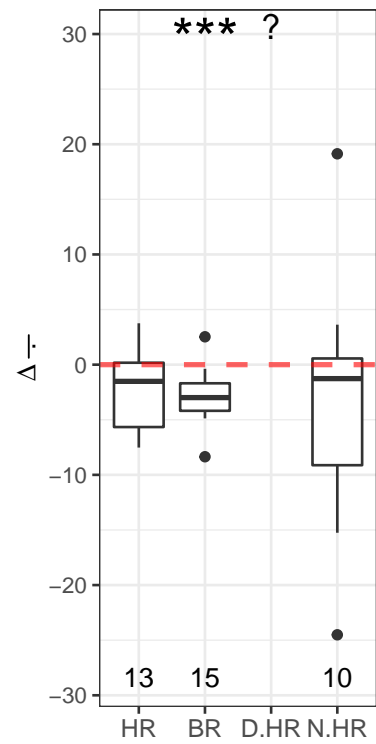
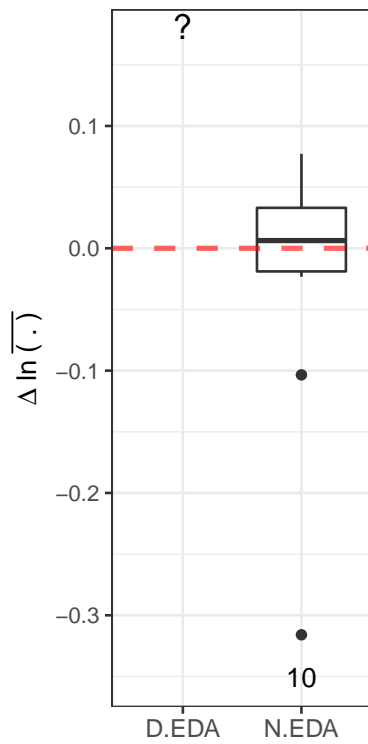
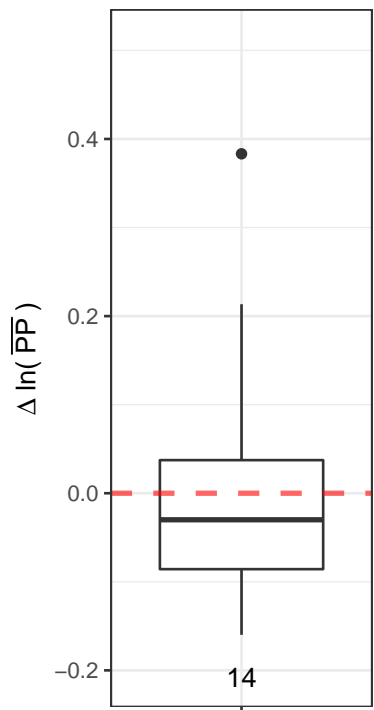
Sensor Channels per Activity

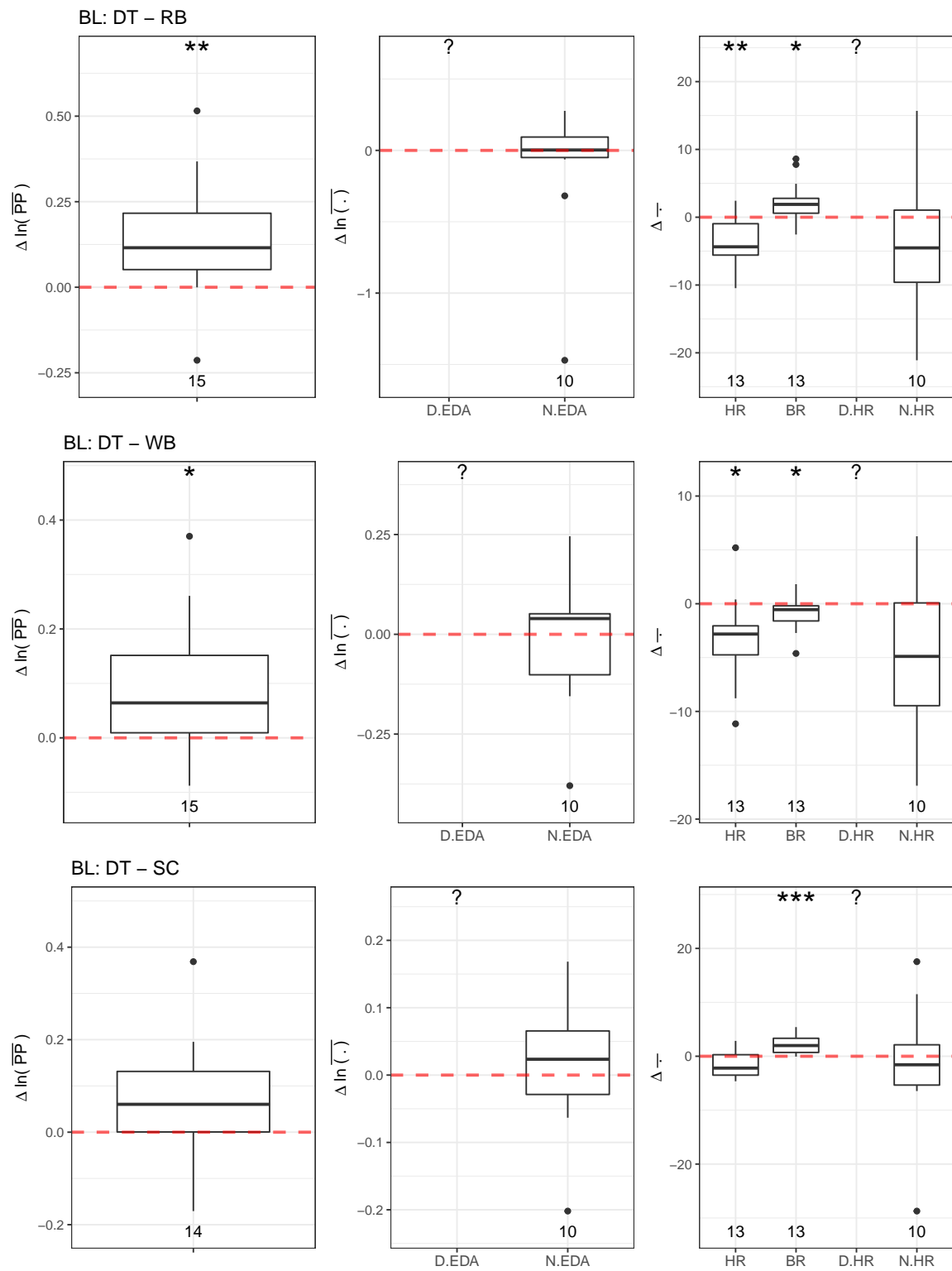


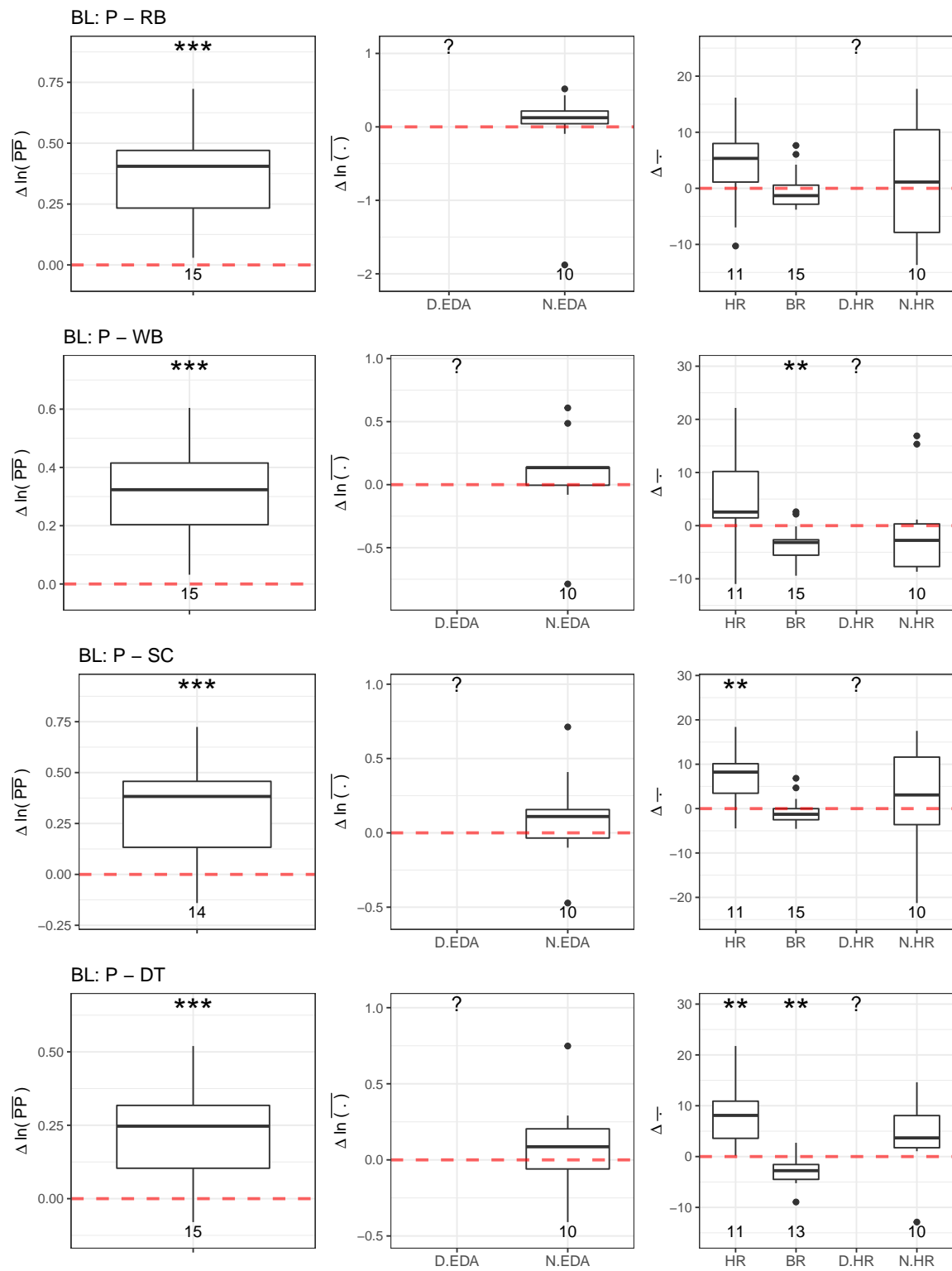
BL: SC – RB



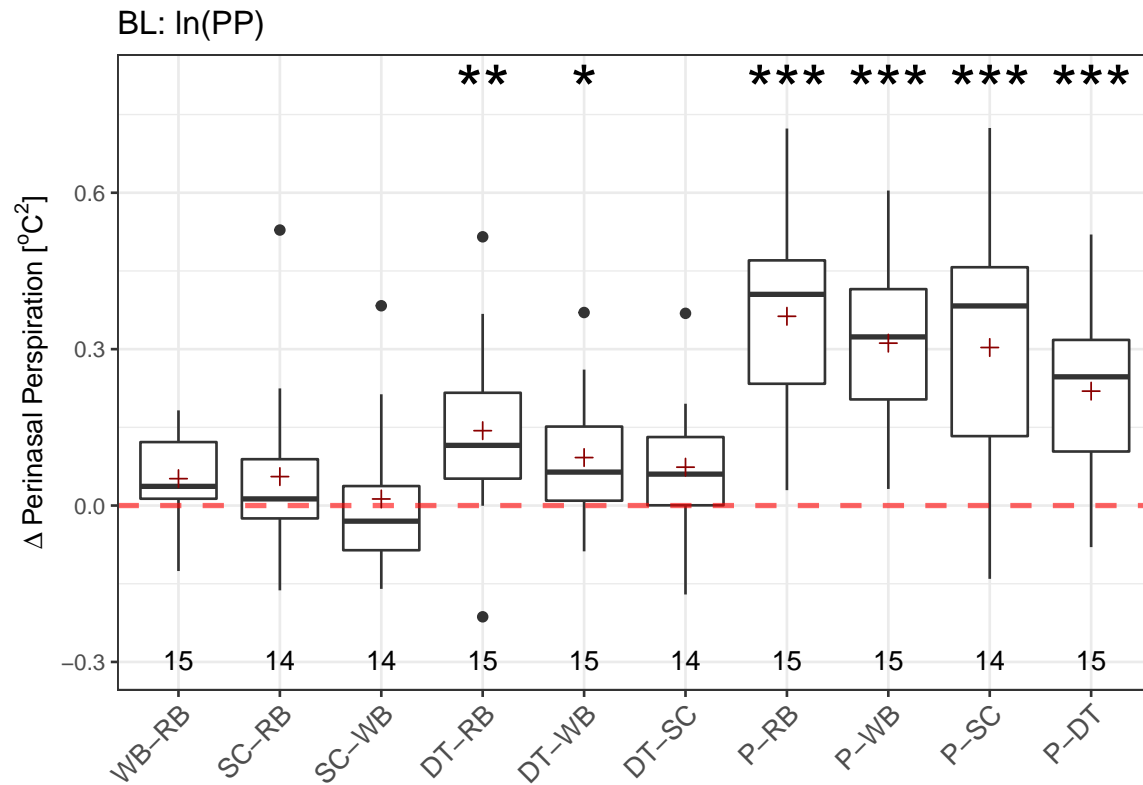
BL: SC – WB





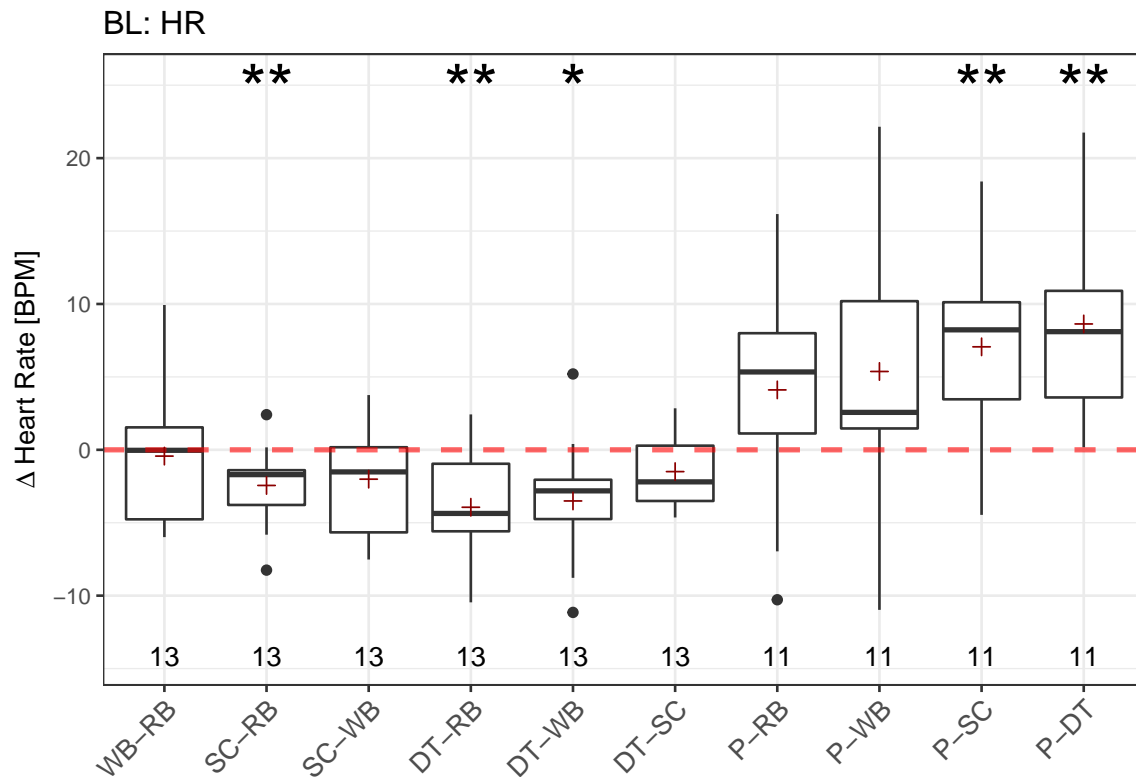


Sensor Channel across Activities



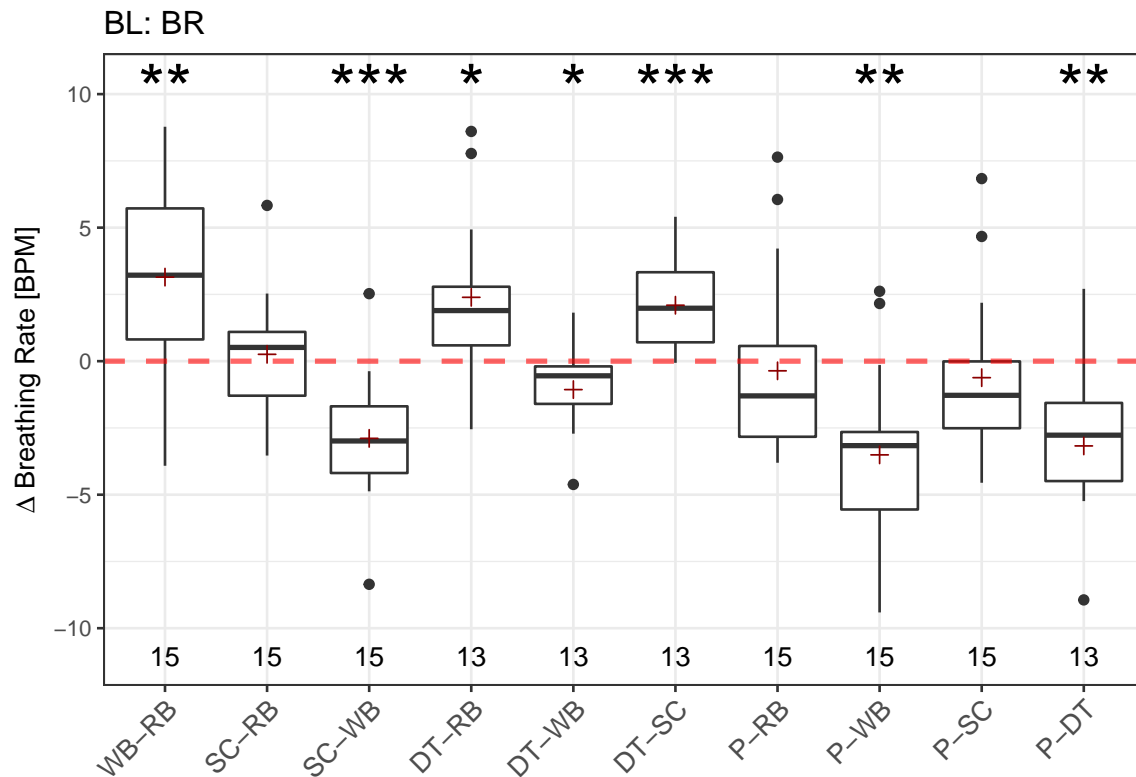
```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.0524 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.2437 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.7578 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test 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  $p = 0.0019 < 0.01$  **
```

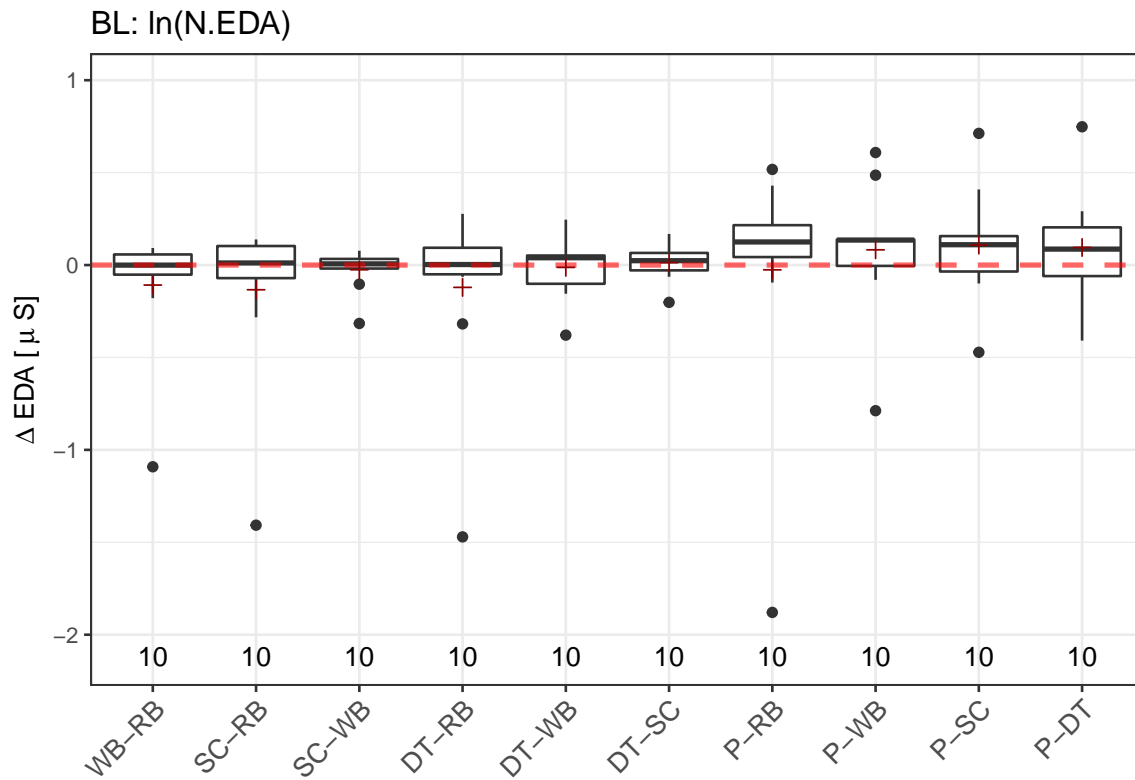


```
## Writing Baseline - Resting Baseline
## t-test p = 0.0022 < 0.01 **
##
## Stress Condition - Resting Baseline
## t-test p = 0.6729 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 5e-04 < 0.001 ***
##
## Dual Task - Resting Baseline
## t-test p = 0.0179 < 0.05 *
##
## Dual Task - Writing 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  $p = 0.0014 < 0.01$  **
```

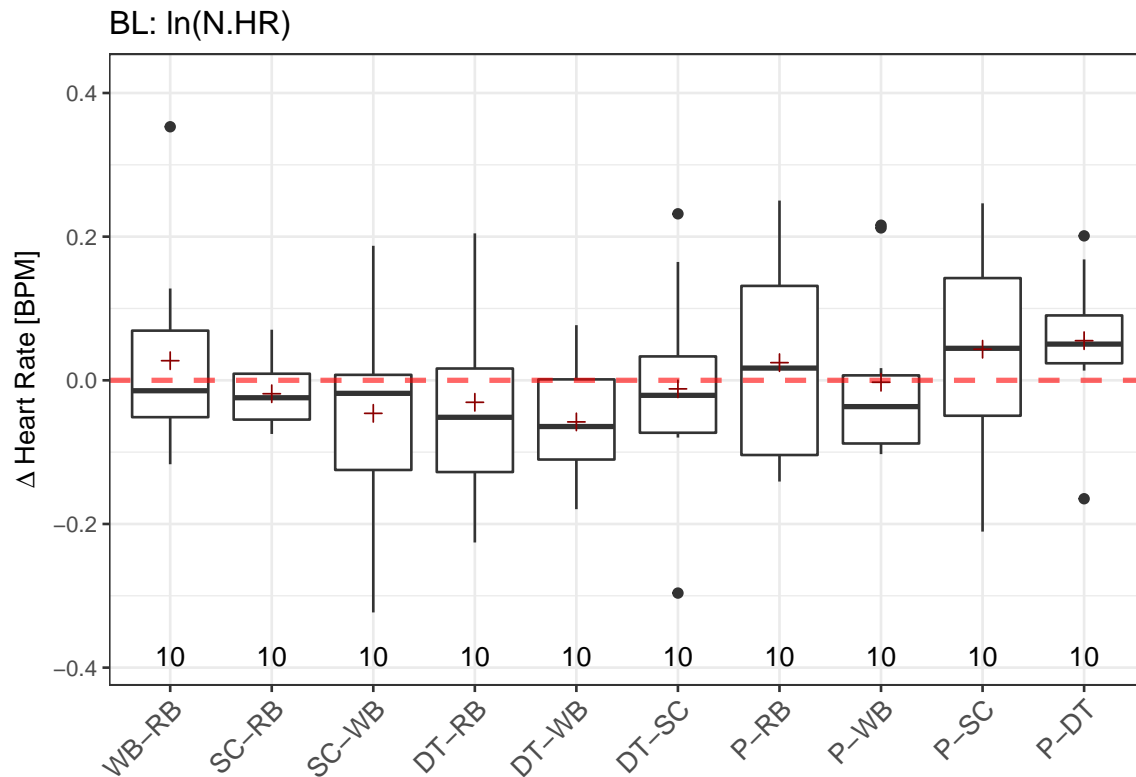
```
## BL has LESS than 7 subjects for D.EDA. Cannot continue with test.  
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.36 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.3865 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.4937 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.4649 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.8224 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.6979 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.9064 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.5021 > 0.05
##
## Presentation - Stress Condition
## Transformed t-test p = 0.3021 > 0.05
```

```
##  
## Presentation - Dual Task  
## Transformed t-test  $p = 0.3449 > 0.05$ 
```

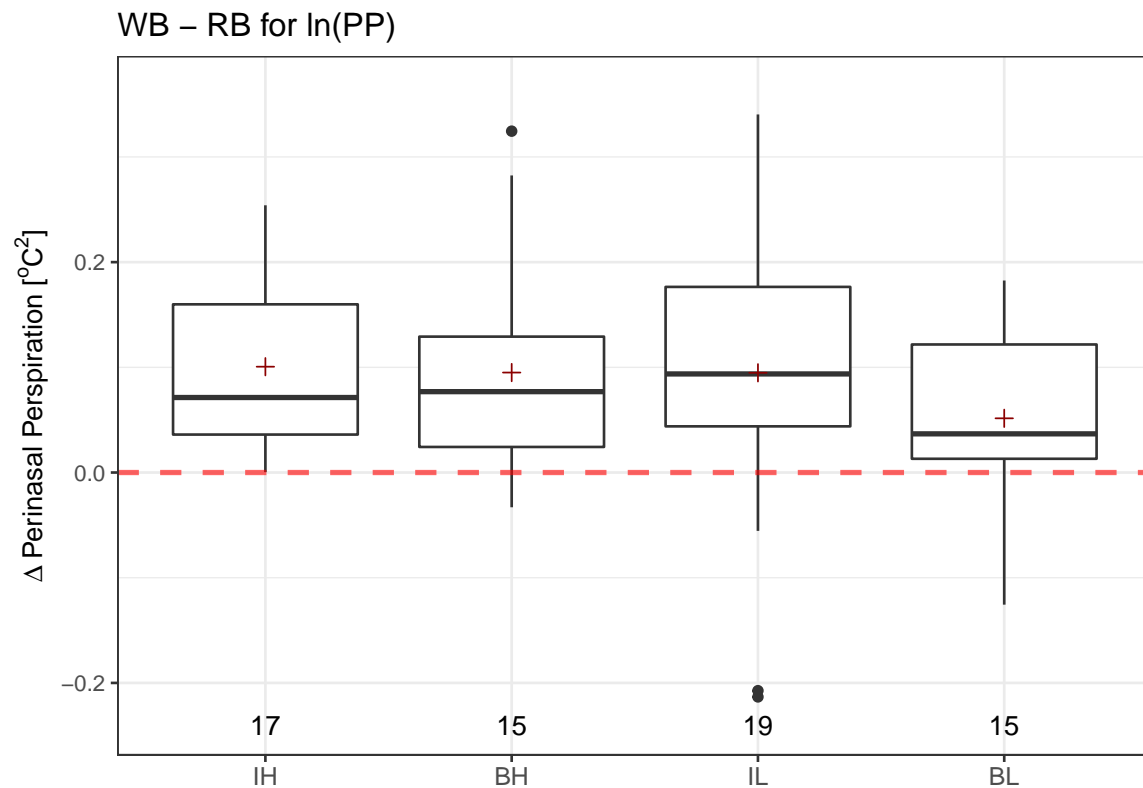
```
## BL has LESS than 7 subjects for D.HR. Cannot continue with test.  
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.5415 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.2415 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.3215 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.5153 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.06 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.7994 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.6095 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.9447 > 0.05
##
## Presentation - Stress Condition
## Transformed t-test p = 0.3598 > 0.05
```

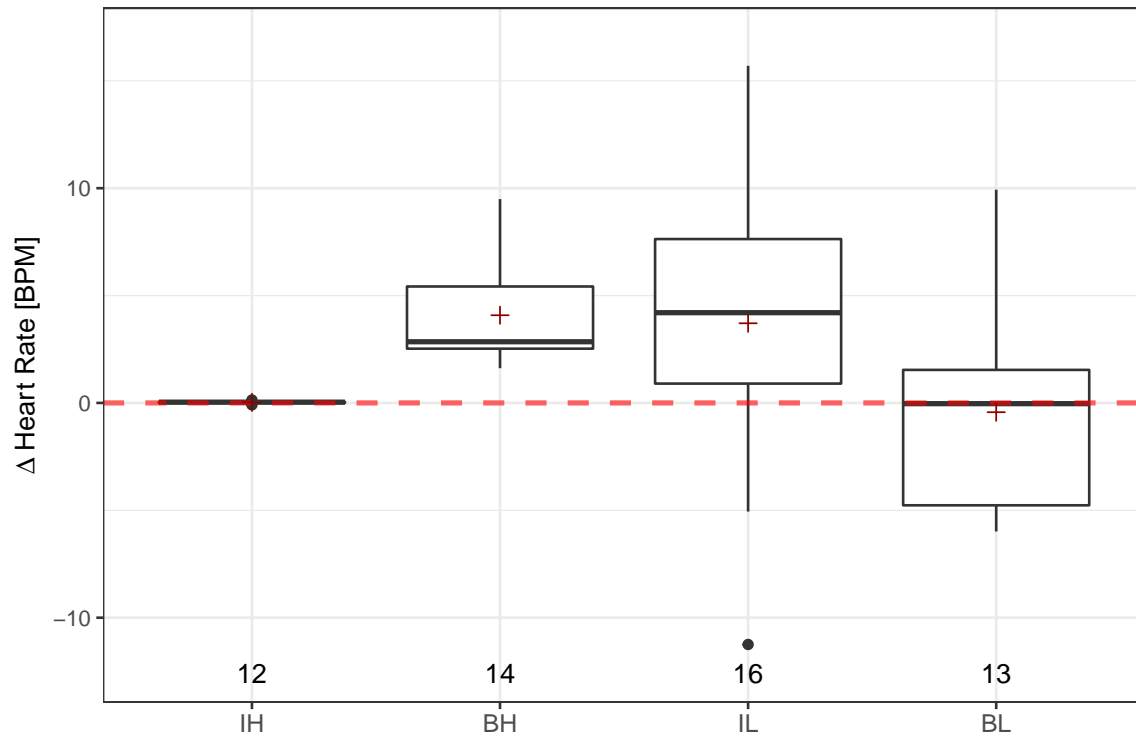
```
##  
## Presentation - Dual Task  
## Transformed t-test  $p = 0.1119 > 0.05$ 
```

Across Activities

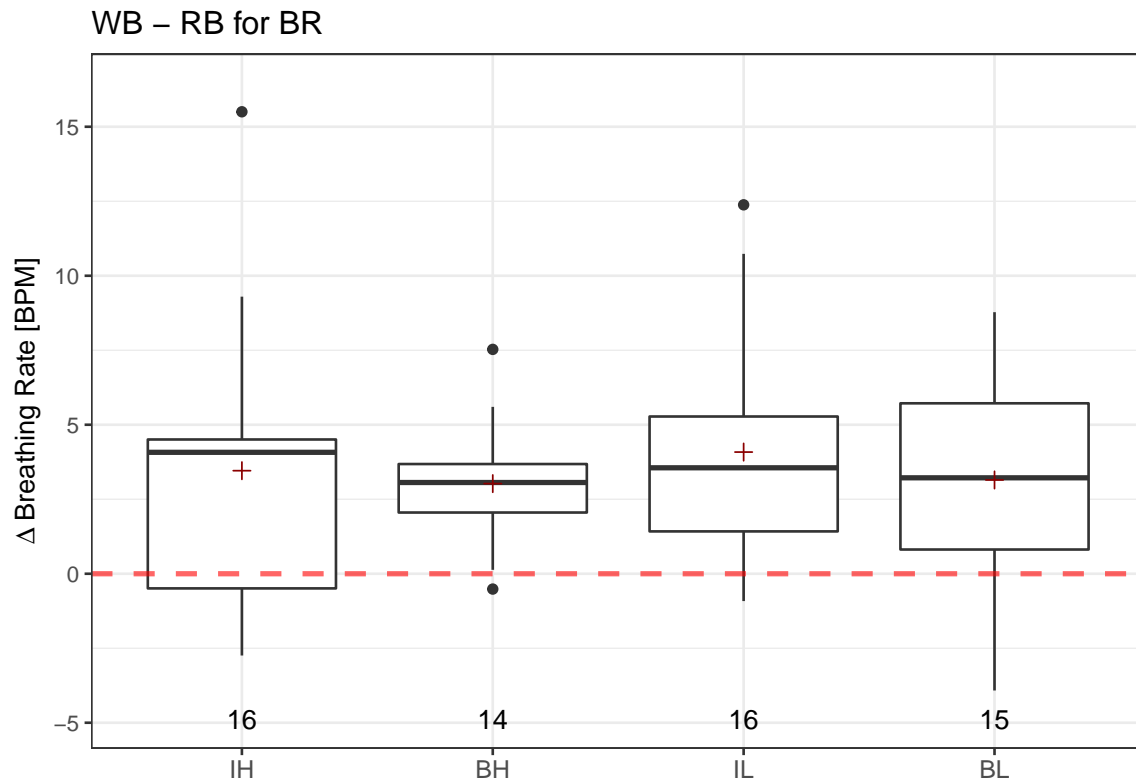


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0241  0.008043   0.647  0.588
## Residuals  62  0.7710  0.012435
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), 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
```

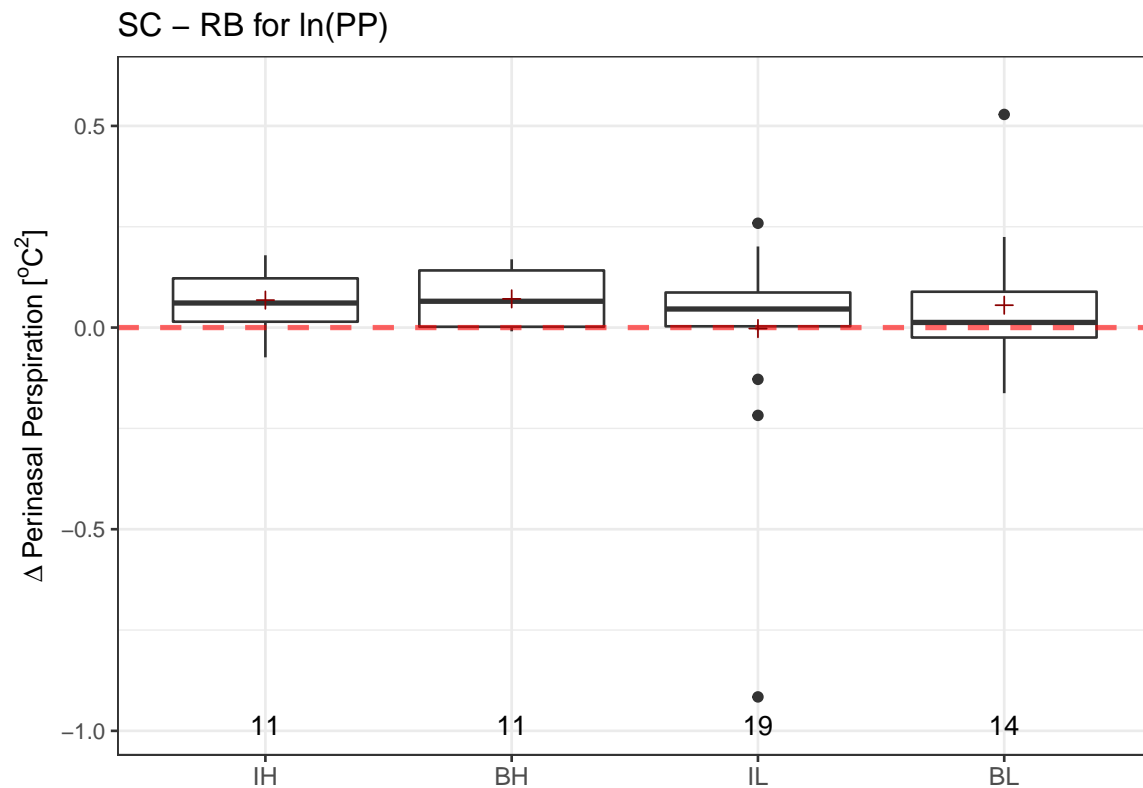
WB – RB for HR



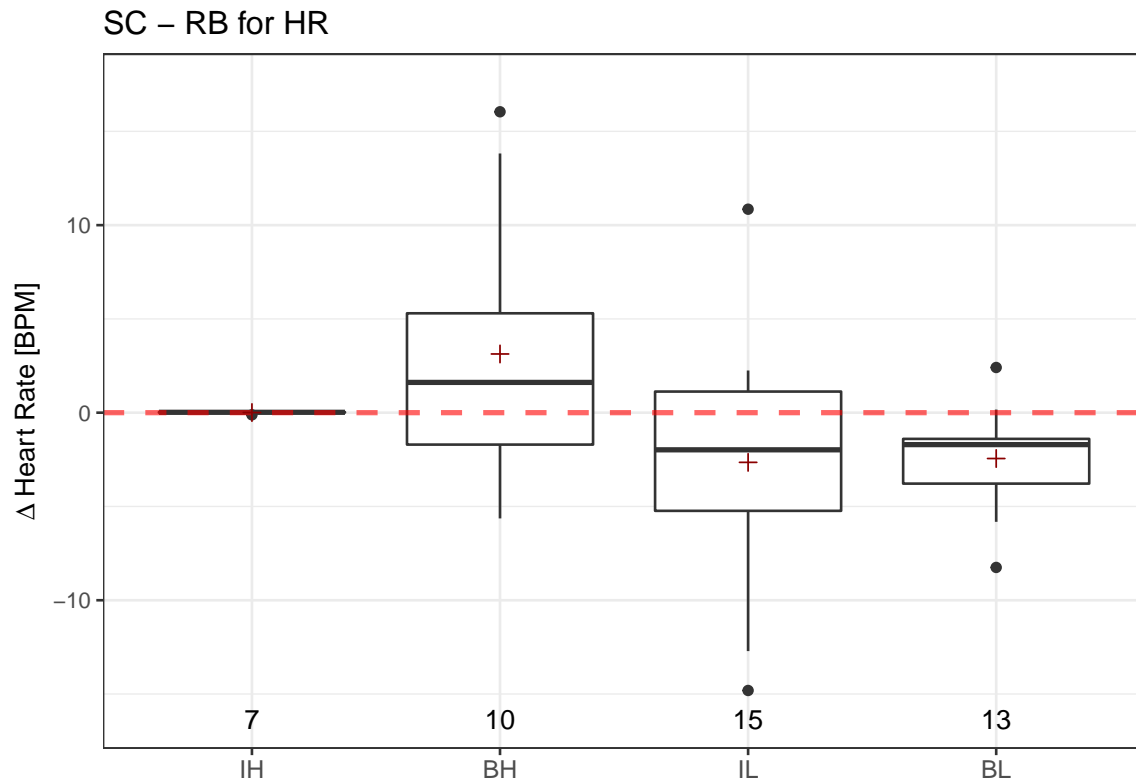
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  231.1    77.03   4.167 0.0103 *
## Residuals  51  942.8    18.49
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence 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
```

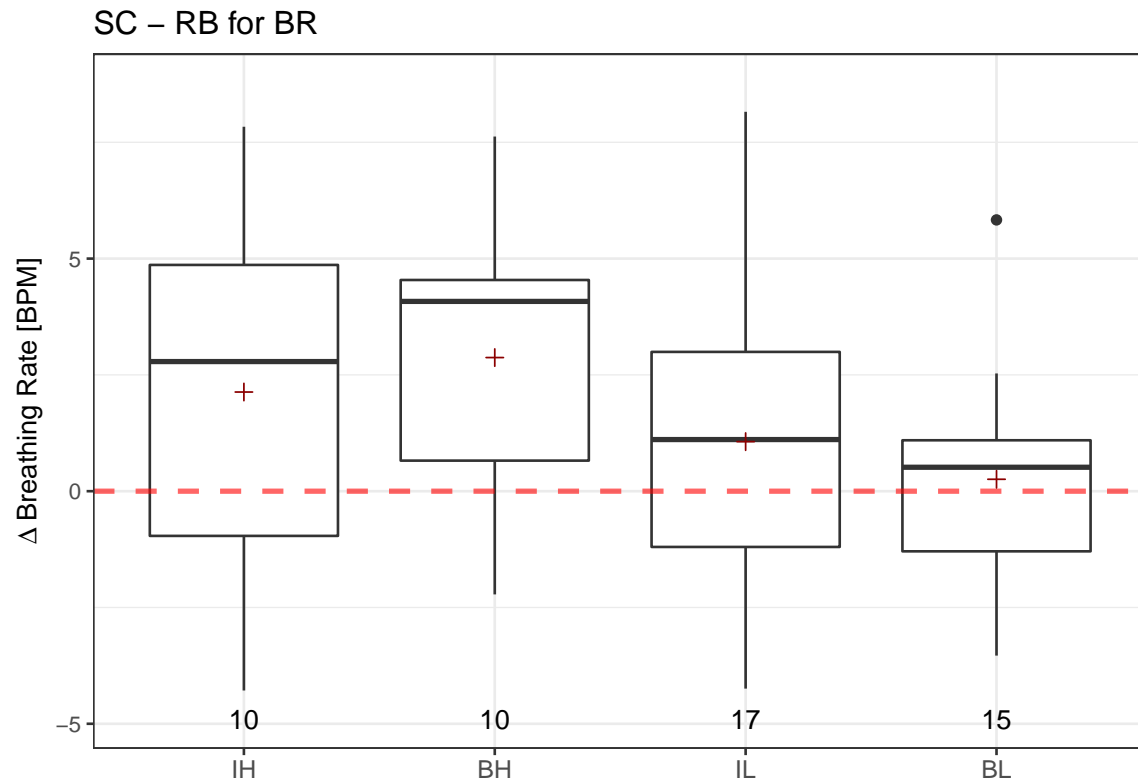
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   10.3    3.443    0.271  0.846
## Residuals  57  723.4   12.692
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), 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
```



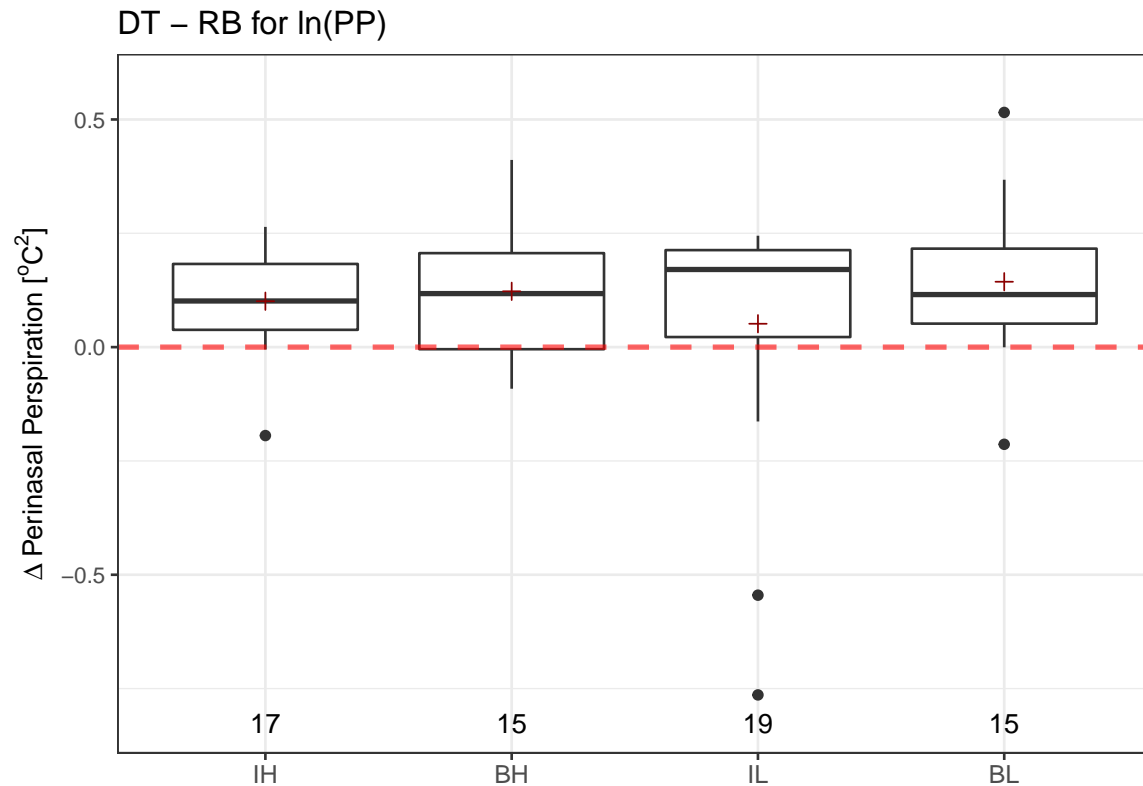
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0569  0.01896   0.622  0.604
## Residuals  51  1.5537  0.03046
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -0.015641138 -0.2024089  0.1711266  0.9960682
## IH-BH -0.003071433 -0.2007278  0.1945850  0.9999744
## IL-BH -0.073595079 -0.2492174  0.1020272  0.6833117
## IH-BL  0.012569705 -0.1741980  0.1993375  0.9979452
## IL-BL -0.057953942 -0.2212247  0.1053168  0.7820565
## IL-IH -0.070523647 -0.2461460  0.1050987  0.7112615
```



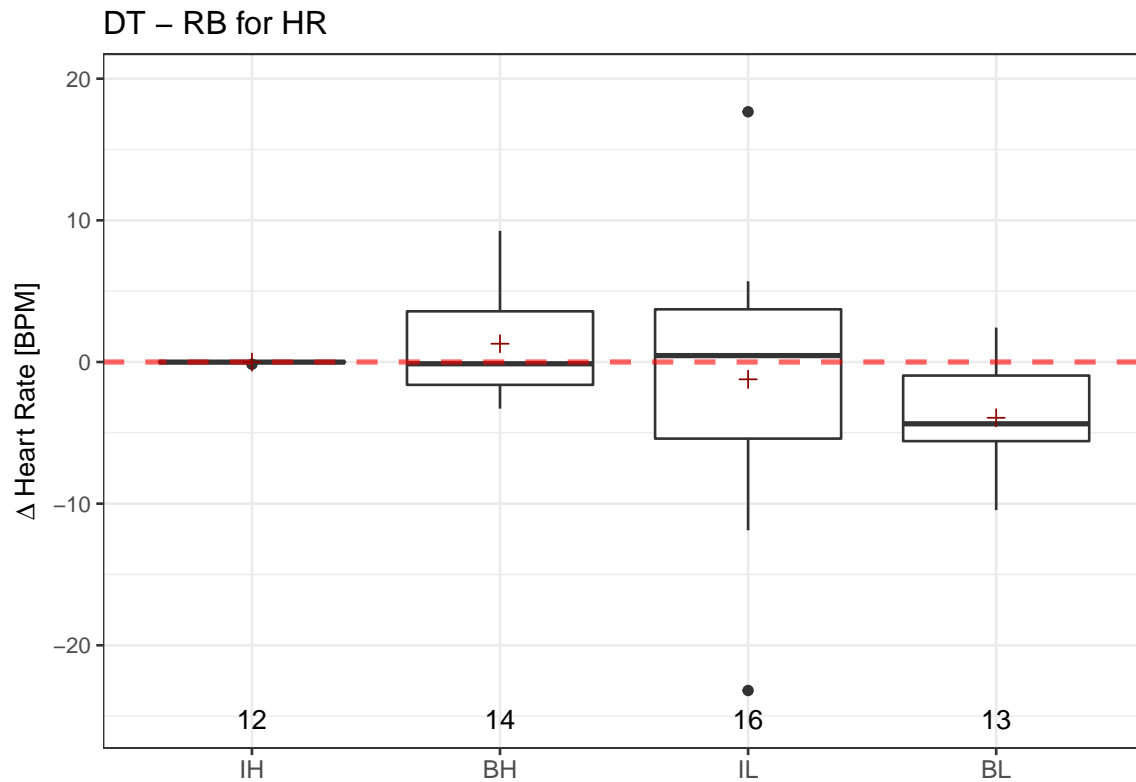
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3    245   81.68    2.933 0.0447 *
## Residuals  41   1142   27.85
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ---
##
##      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 -5.5746473 -11.518549  0.369254660 0.0730085
## IH-BH -3.1233696 -10.087307  3.840567409 0.6297651
## IL-BH -5.7787217 -11.547765 -0.009678793 0.0494783
## IH-BL  2.4512777  -4.173536  9.076091756 0.7554681
## IL-BL -0.2040744  -5.558848  5.150699055 0.9996130
## IL-IH -2.6553521  -9.123740  3.813036232 0.6920216
```



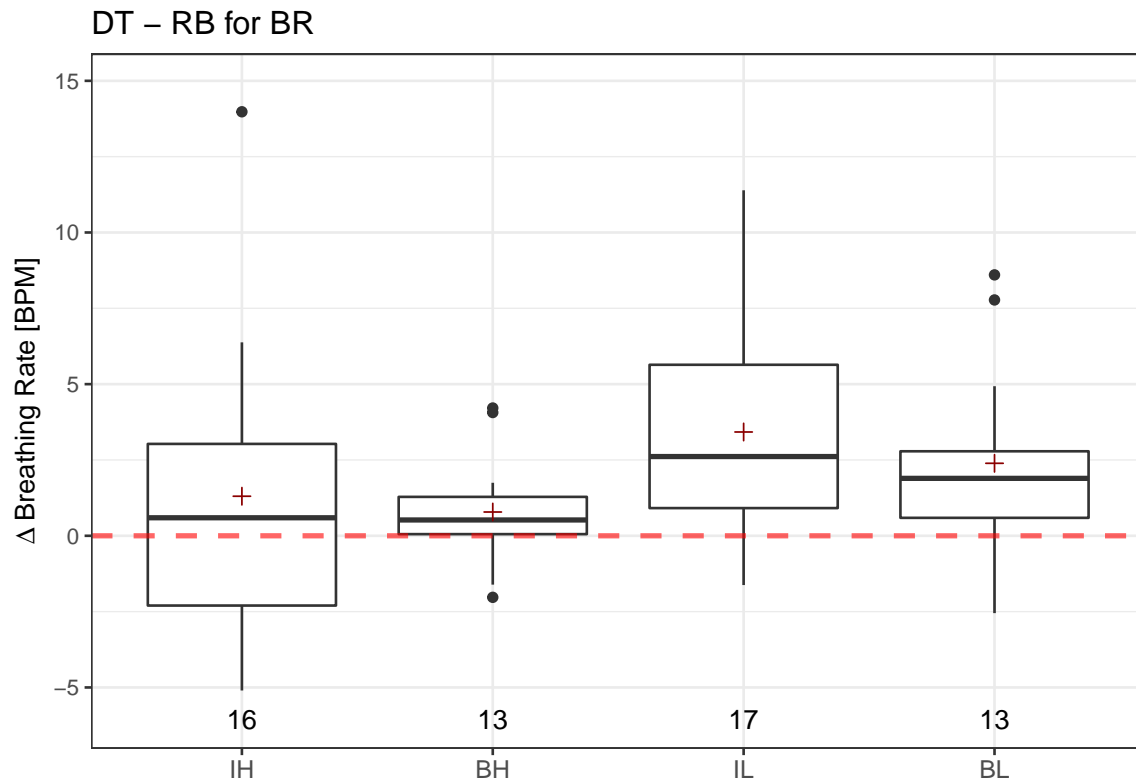
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   48.6   16.184    1.651   0.19
## Residuals  48  470.6    9.805
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -2.6161334 -6.018295  0.7860278  0.1856309
## IH-BH -0.7405680 -4.467449  2.9863130  0.9516628
## IL-BH -1.8072758 -5.128422  1.5138700  0.4762528
## IH-BL  1.8755655 -1.526596  5.2777268  0.4649051
## IL-BL  0.8088577 -2.143272  3.7609873  0.8849100
## IL-IH -1.0667078 -4.387854  2.2544380  0.8278581
```



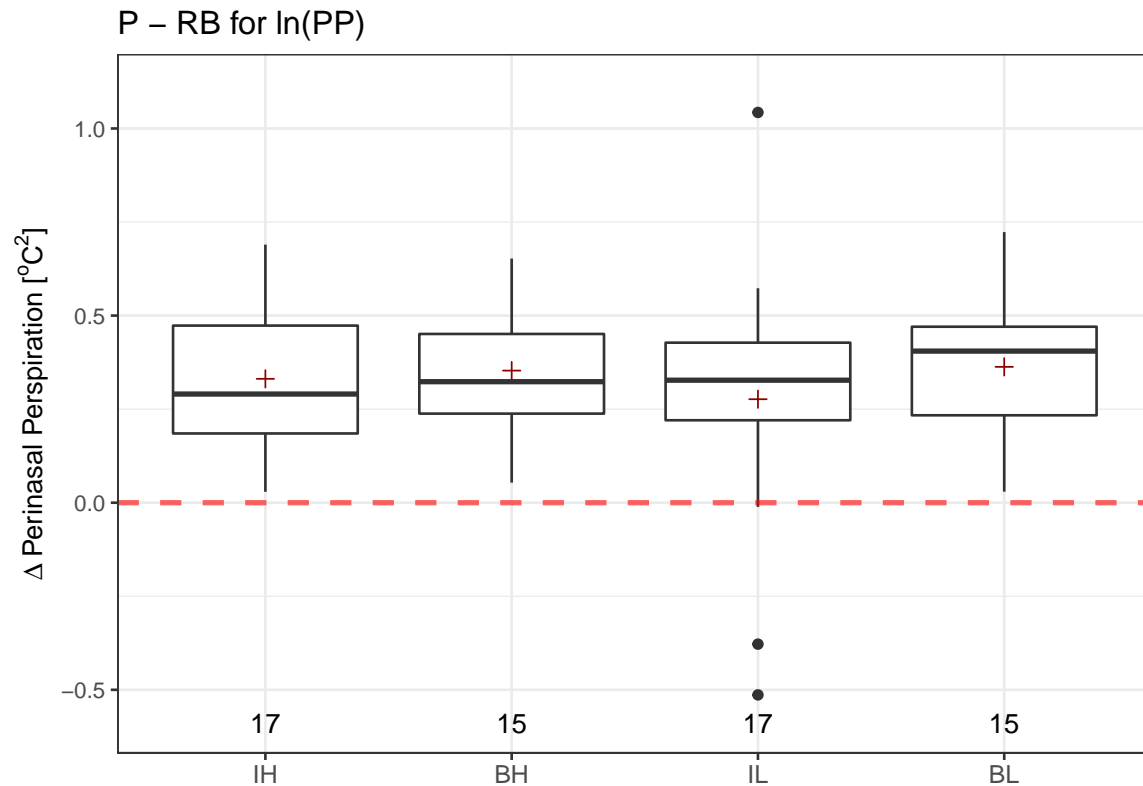
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.081  0.02701   0.754  0.524
## Residuals  62  2.222  0.03584
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), 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
```



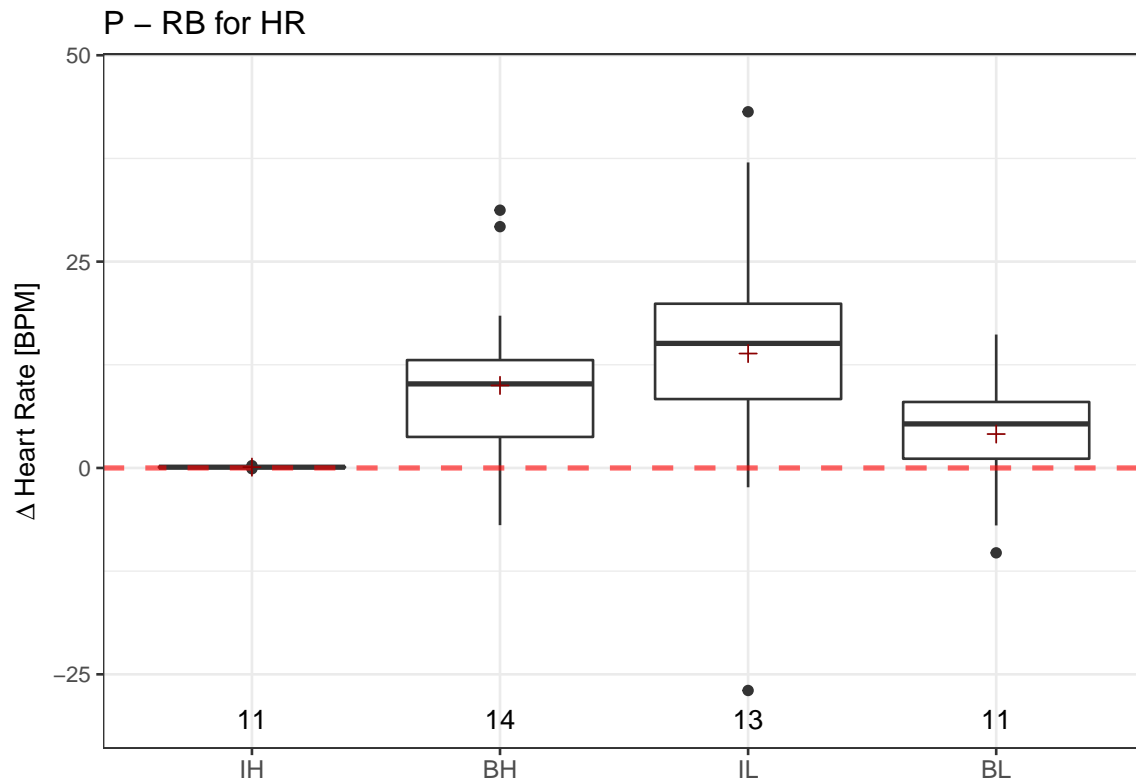
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  198.2   66.07    2.109  0.111
## Residuals  51 1597.5   31.32
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = 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
```



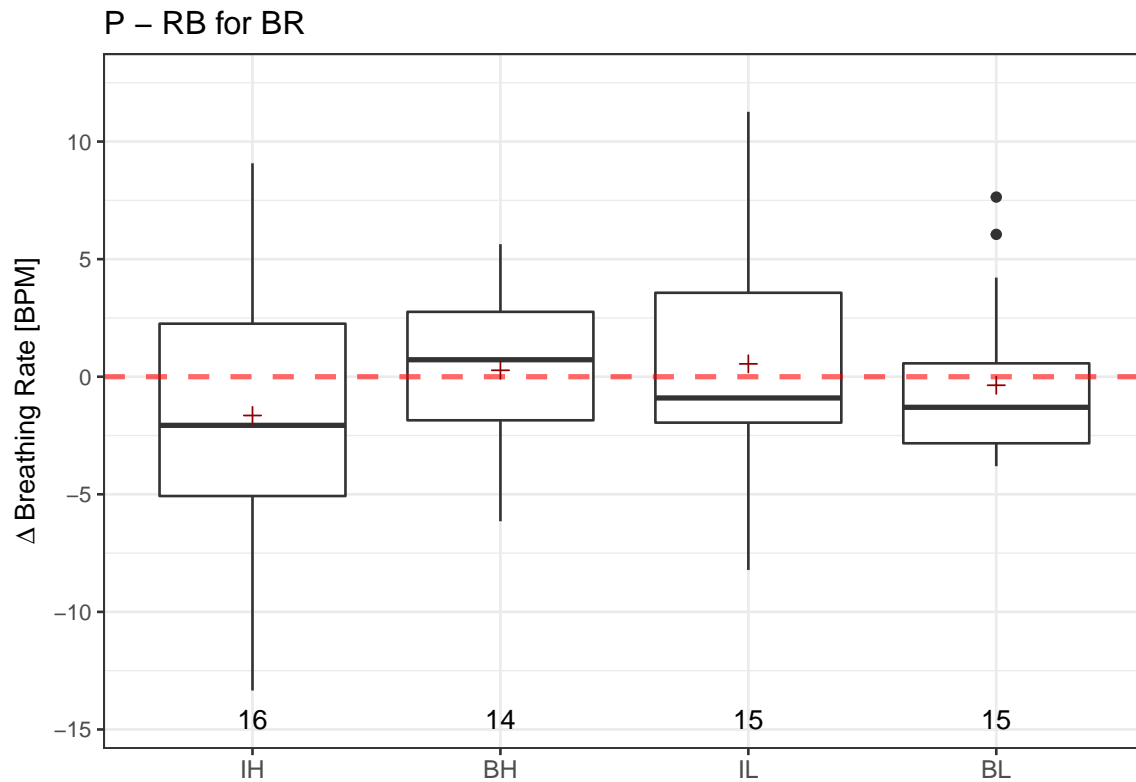
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   63.3    21.09   1.505  0.223
## Residuals  55  770.5     14.01
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), 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	WB - RB	N.EDA	0.2534179	Transformed t-test	10	
BH	WB - RB	N.HR	0.8962389	t-test	10	
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 - RB	N.EDA	0.0609244	Transformed t-test	10	
BH	SC - RB	N.HR	0.5286897	t-test	10	
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	SC - WB	N.EDA	0.0621603	Transformed t-test	10	
BH	SC - WB	N.HR	0.6088627	t-test	10	
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 - RB	N.EDA	0.0462830	Transformed t-test	10	*
BH	DT - RB	N.HR	0.5231194	t-test	10	
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 - WB	N.EDA	0.0541748	Transformed t-test	10	
BH	DT - WB	N.HR	0.5861420	t-test	10	
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	DT - SC	N.EDA	0.3059258	Transformed t-test	10	
BH	DT - SC	N.HR	0.0955421	t-test	10	
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 - RB	N.EDA	0.0619911	Transformed t-test	10	
BH	P - RB	N.HR	0.8626994	t-test	10	
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 - WB	N.EDA	0.0624879	Transformed t-test	10	
BH	P - WB	N.HR	0.7565417	t-test	10	
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 - SC	N.EDA	0.2061865	Transformed t-test	10	
BH	P - SC	N.HR	0.8970905	t-test	10	

(continued)

Condition	Difference	Measure	p	Test	n	Significance
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	
BH	P - DT	N.EDA	0.3638723	Transformed t-test	10	
BH	P - DT	N.HR	0.4013641	t-test	10	
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	WB - RB	N.EDA	0.3600094	Transformed t-test	10	
BL	WB - RB	N.HR	0.5414894	Transformed t-test	10	
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 - RB	N.EDA	0.3865046	Transformed t-test	10	
BL	SC - RB	N.HR	0.2414794	Transformed t-test	10	
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	SC - WB	N.EDA	0.4936833	Transformed t-test	10	
BL	SC - WB	N.HR	0.3215454	Transformed t-test	10	
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 - RB	N.EDA	0.4648969	Transformed t-test	10	
BL	DT - RB	N.HR	0.5152704	Transformed t-test	10	
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	*
BL	DT - WB	N.EDA	0.8223658	Transformed t-test	10	
BL	DT - WB	N.HR	0.0600485	Transformed t-test	10	
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	DT - SC	N.EDA	0.6978977	Transformed t-test	10	
BL	DT - SC	N.HR	0.7994275	Transformed t-test	10	
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 - RB	N.EDA	0.9064316	Transformed t-test	10	
BL	P - RB	N.HR	0.6094821	Transformed t-test	10	
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 - WB	N.EDA	0.5020786	Transformed t-test	10	
BL	P - WB	N.HR	0.9446712	Transformed t-test	10	
BL	P - SC	PP	0.0003035	Transformed t-test	14	***
BL	P - SC	HR	0.0068502	t-test	11	**

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Condition	Difference	Measure	p	Test	n	Significance
BL	P - SC	BR	0.4544982	t-test	15	
BL	P - SC	N.EDA	0.3020977	Transformed t-test	10	
BL	P - SC	N.HR	0.3598299	Transformed t-test	10	
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	**
BL	P - DT	N.EDA	0.3449199	Transformed t-test	10	
BL	P - DT	N.HR	0.1119367	Transformed t-test	10	
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	WB - RB	N.EDA	0.1796233	Transformed t-test	9	
IH	WB - RB	N.HR	0.3593750	Wilcoxon	9	
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 - RB	N.EDA	0.1701327	Transformed t-test	9	
IH	SC - RB	N.HR	0.6523438	Wilcoxon	9	
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	SC - WB	N.EDA	0.4136931	Transformed t-test	9	
IH	SC - WB	N.HR	0.4960938	Wilcoxon	9	
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 - RB	N.EDA	0.1074189	Transformed t-test	9	
IH	DT - RB	N.HR	0.1289062	Wilcoxon	9	
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 - WB	N.EDA	0.0501999	Transformed t-test	9	
IH	DT - WB	N.HR	0.7343750	Wilcoxon	9	
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	DT - SC	N.EDA	0.2500363	Transformed t-test	9	
IH	DT - SC	N.HR	0.1640625	Wilcoxon	9	
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 - RB	N.EDA	0.2412087	Transformed t-test	9	
IH	P - RB	N.HR	0.4257812	Wilcoxon	9	
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 - WB	N.EDA	0.4940290	Transformed t-test	9	

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Condition	Difference	Measure	p	Test	n	Significance
IH	P - WB	N.HR	0.1289062	Wilcoxon	9	
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 - SC	N.EDA	0.9167294	Transformed t-test	9	
IH	P - SC	N.HR	0.3007812	Wilcoxon	9	
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	*
IH	P - DT	N.EDA	0.2971289	Transformed t-test	9	
IH	P - DT	N.HR	0.0742188	Wilcoxon	9	
IL	WB - RB	PP	0.0110517	Transformed t-test	19	*
IL	WB - RB	HR	0.0339757	t-test	16	*
IL	WB - RB	BR	0.0005059	t-test	16	***
IL	WB - RB	N.EDA	0.3149969	Transformed t-test	11	
IL	WB - RB	N.HR	0.8500977	Wilcoxon	12	
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 - RB	N.EDA	0.8558378	Transformed t-test	11	
IL	SC - RB	N.HR	0.4238281	Wilcoxon	12	
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	SC - WB	N.EDA	0.2692000	Transformed t-test	11	
IL	SC - WB	N.HR	0.3803711	Wilcoxon	12	
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 - RB	N.EDA	0.8780038	Transformed t-test	11	
IL	DT - RB	N.HR	1.0000000	Wilcoxon	12	
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 - WB	N.EDA	0.1658008	Transformed t-test	11	
IL	DT - WB	N.HR	0.1293945	Wilcoxon	12	
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	DT - SC	N.EDA	0.8370137	Transformed t-test	11	
IL	DT - SC	N.HR	0.7910156	Wilcoxon	12	
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 - RB	N.EDA	0.1952869	Transformed t-test	10	
IL	P - RB	N.HR	0.9658203	Wilcoxon	11	
IL	P - WB	PP	0.0203817	Transformed t-test	17	*

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Condition	Difference	Measure	p	Test	n	Significance
IL	P - WB	HR	0.0132198	t-test	13	*
IL	P - WB	BR	0.0006932	t-test	14	***
IL	P - WB	N.EDA	0.0864501	Transformed t-test	10	
IL	P - WB	N.HR	0.3203125	Wilcoxon	11	
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 - SC	N.EDA	0.2335647	Transformed t-test	10	
IL	P - SC	N.HR	0.9658203	Wilcoxon	11	
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	**
IL	P - DT	N.EDA	0.0760791	Transformed t-test	11	
IL	P - DT	N.HR	0.8310547	Wilcoxon	11	