

# 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:

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

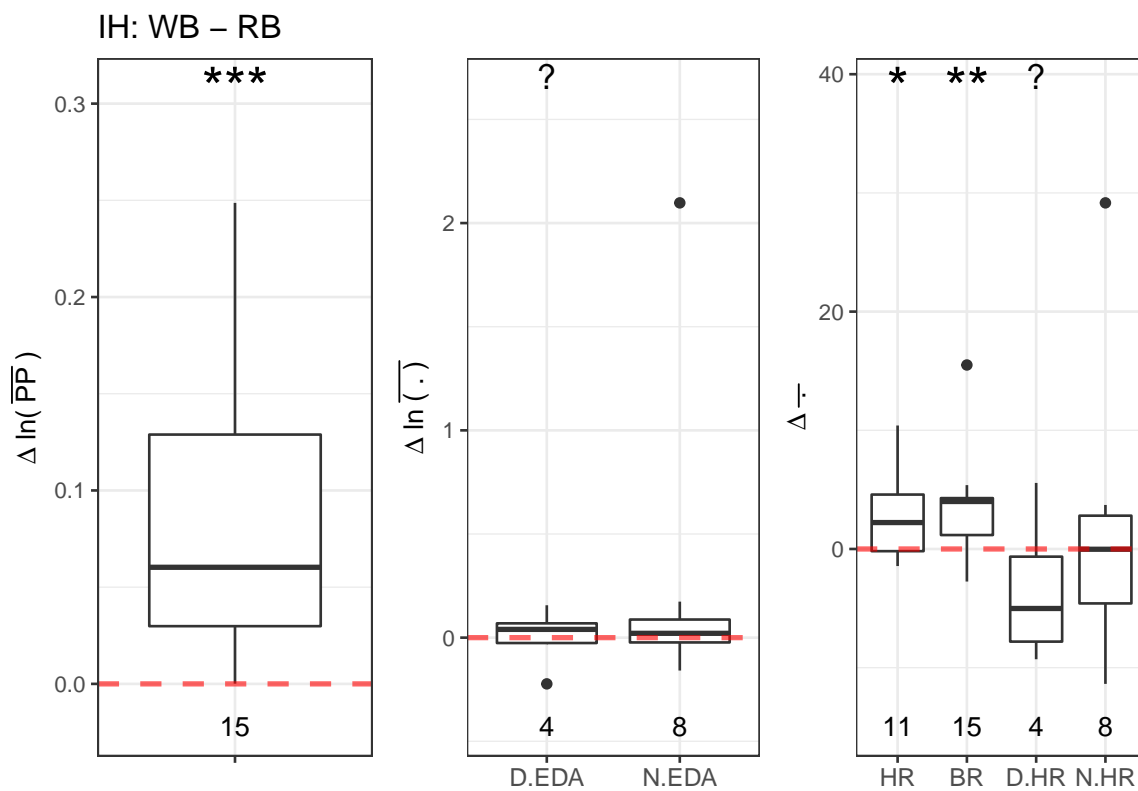
**\*\*** =  $0.001 < p \leq 0.01$

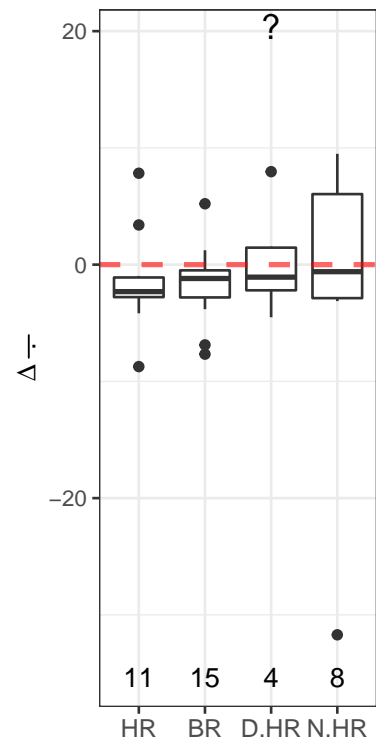
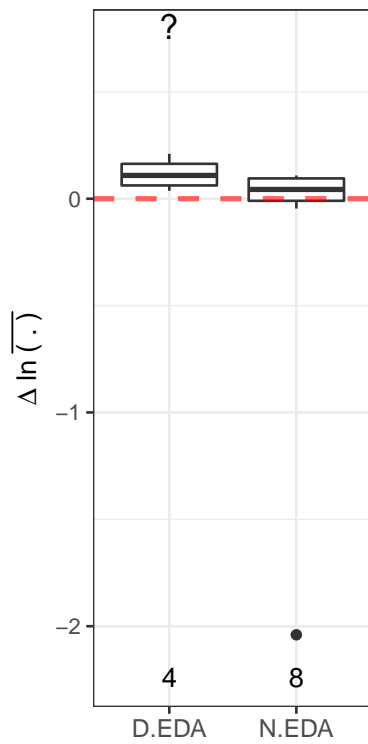
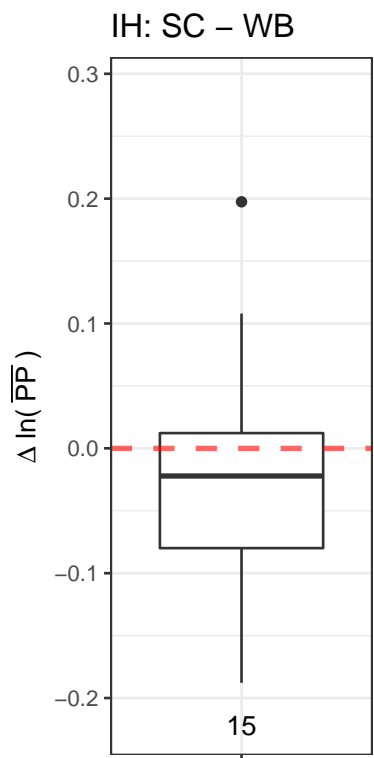
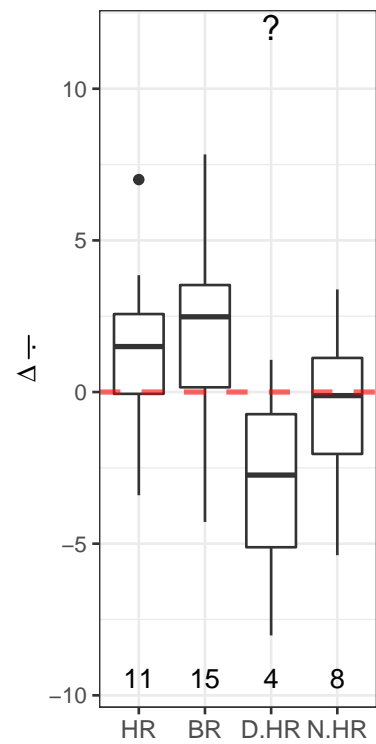
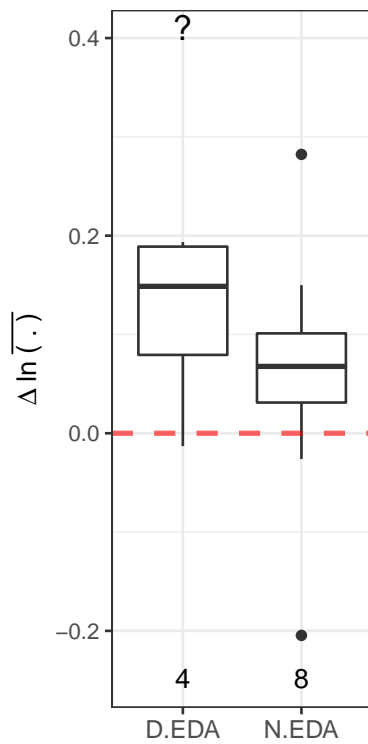
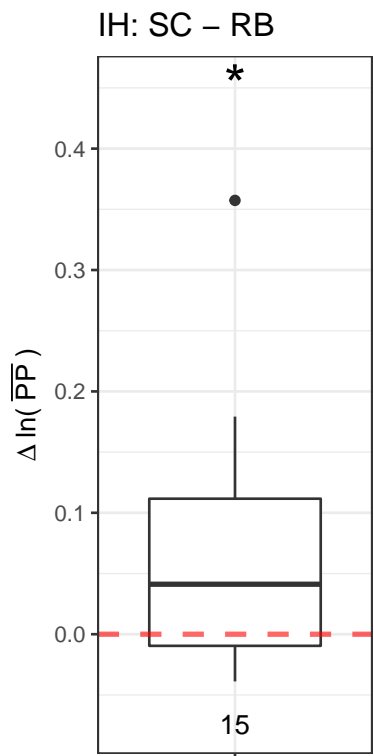
**\*\*\*** =  $p \leq 0.001$

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

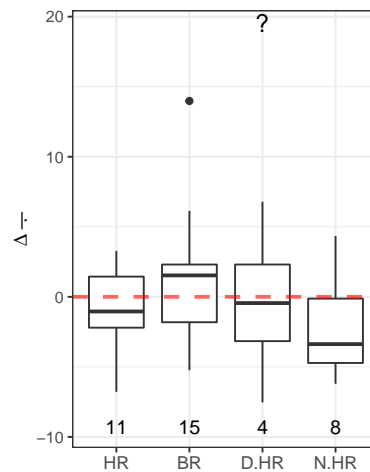
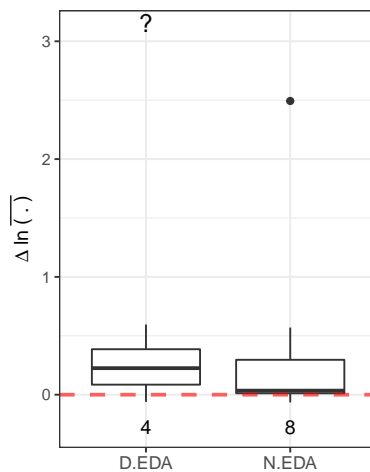
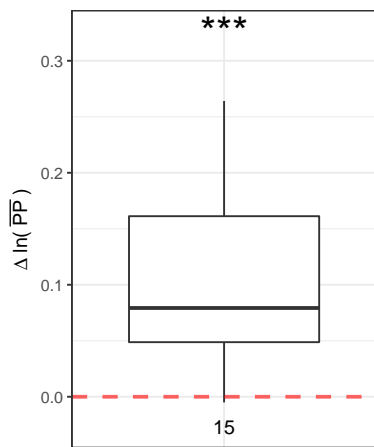
**Intermittent-High (IH)**

## Sensor Channels per Activity

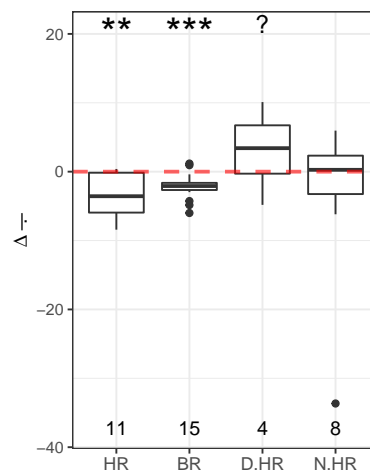
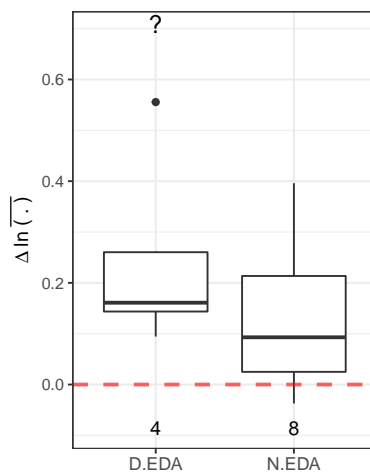
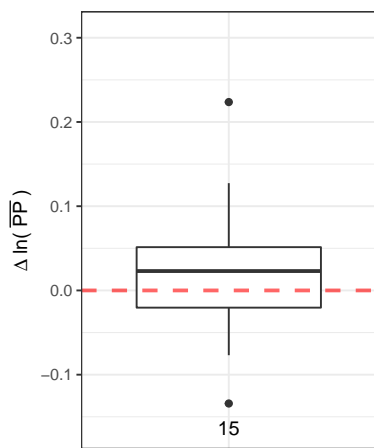




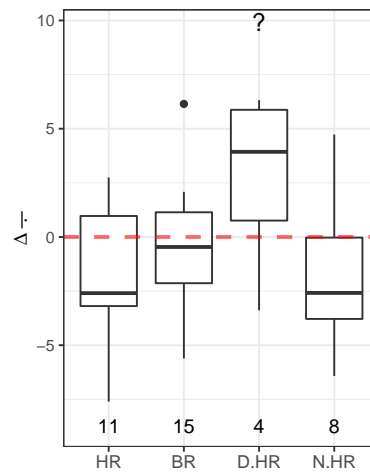
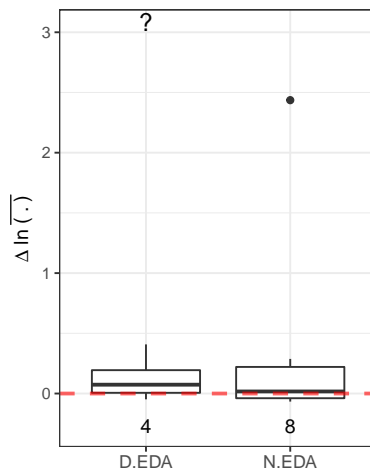
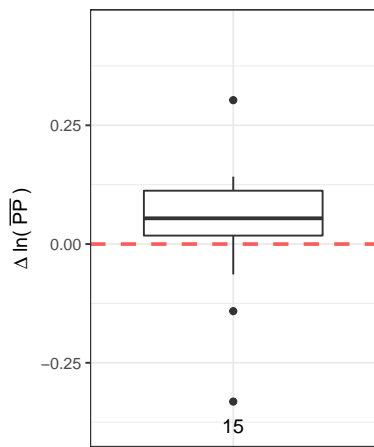
IH: DT - RB

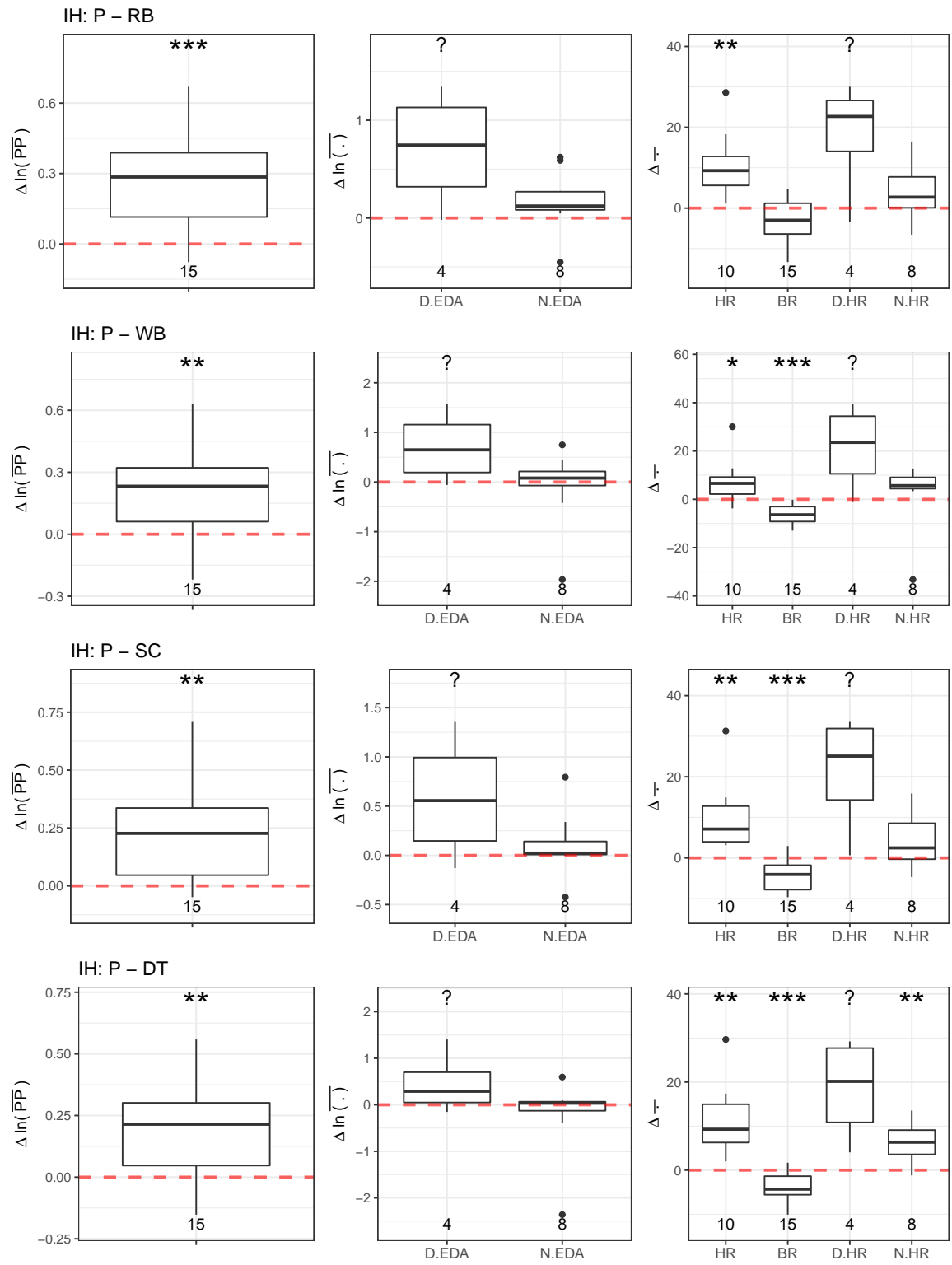


IH: DT - WB

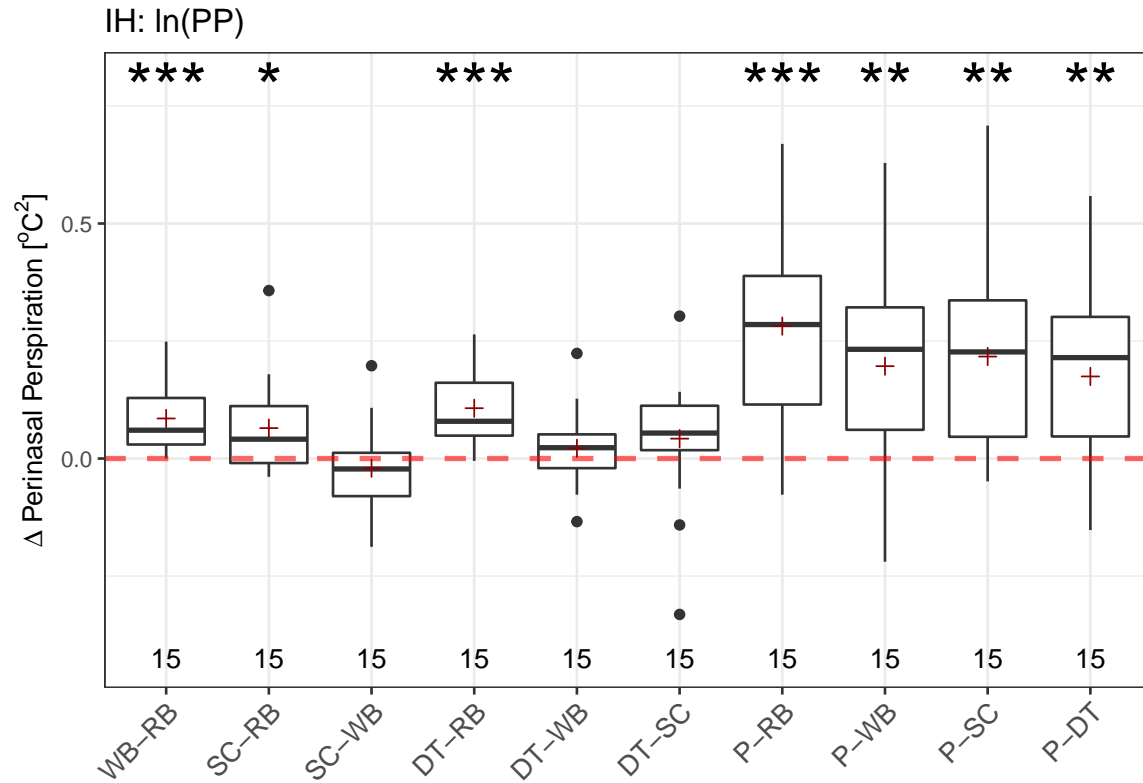


IH: DT - SC





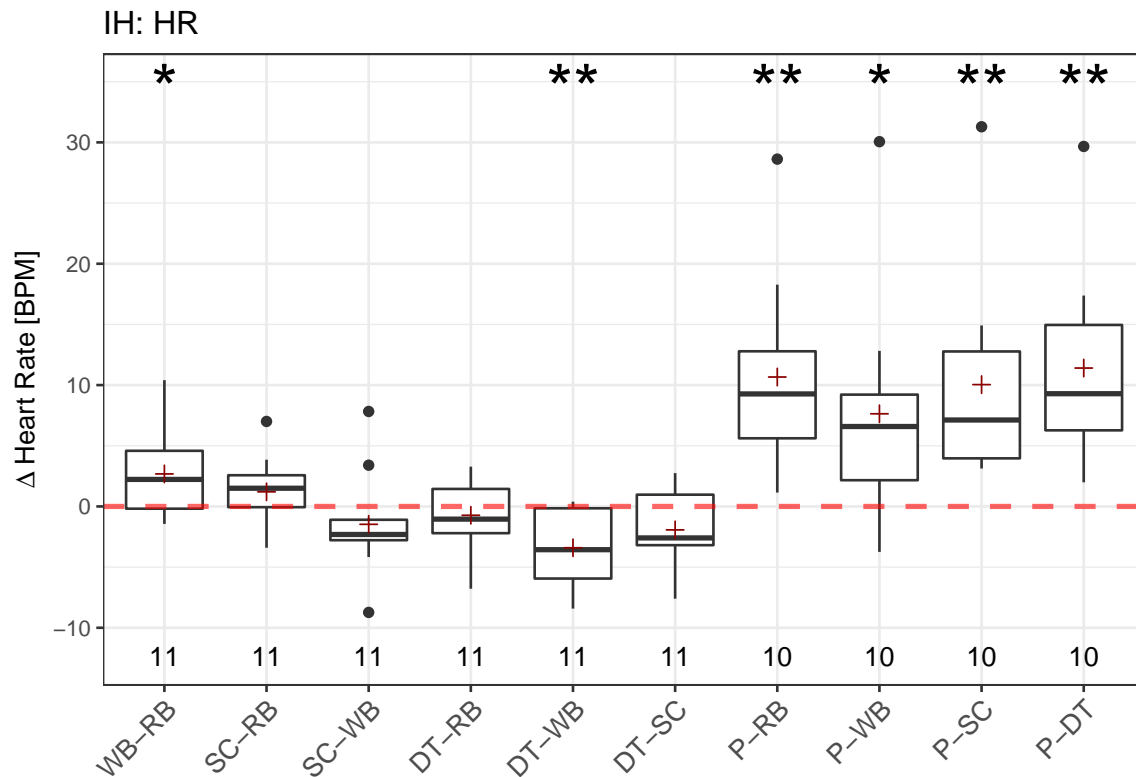
## Sensor Channel across Activities



```
## In the following tests, we applied ln(PP).
##
## Writing Baseline - Resting Baseline
## Transformed t-test p = 6e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.0342 < 0.05 *
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.4109 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 1e-04 < 0.001 ***
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.3542 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.273 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 2e-04 < 0.001 ***
##
```

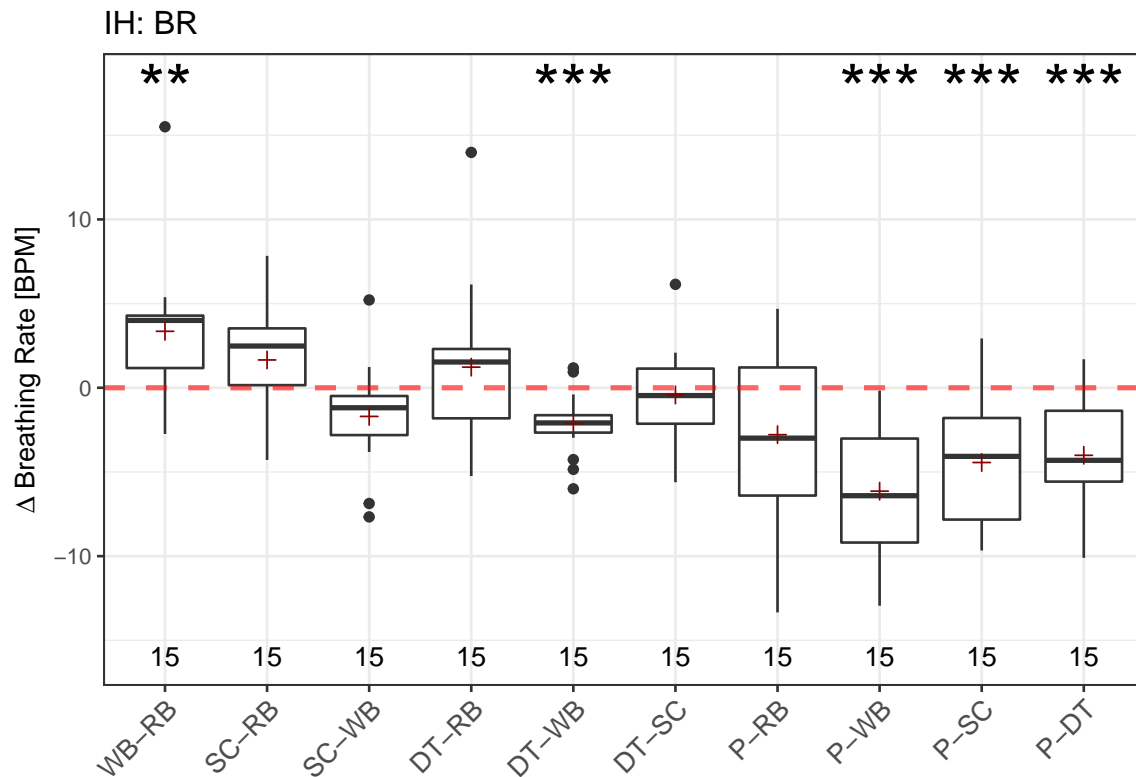
```
## Presentation - Writing Baseline
## Transformed t-test  $p = 0.0037 < 0.01$  **
##
## Presentation - Stress Condition
## Transformed t-test  $p = 0.0013 < 0.01$  **
##
## Presentation - Dual Task
## Transformed t-test  $p = 0.0057 < 0.01$  **
```





```
## Writing Baseline - Resting Baseline
## t-test p = 0.0315 < 0.05  *
##
## Stress Condition - Resting Baseline
## t-test p = 0.2035 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.2709 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.4189 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.0054 < 0.01  **
##
## Dual Task - Stress Condition
## t-test p = 0.0776 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0024 < 0.01  **
##
## Presentation - Writing Baseline
## t-test p = 0.0278 < 0.05  *
##
## Presentation - Stress Condition
```

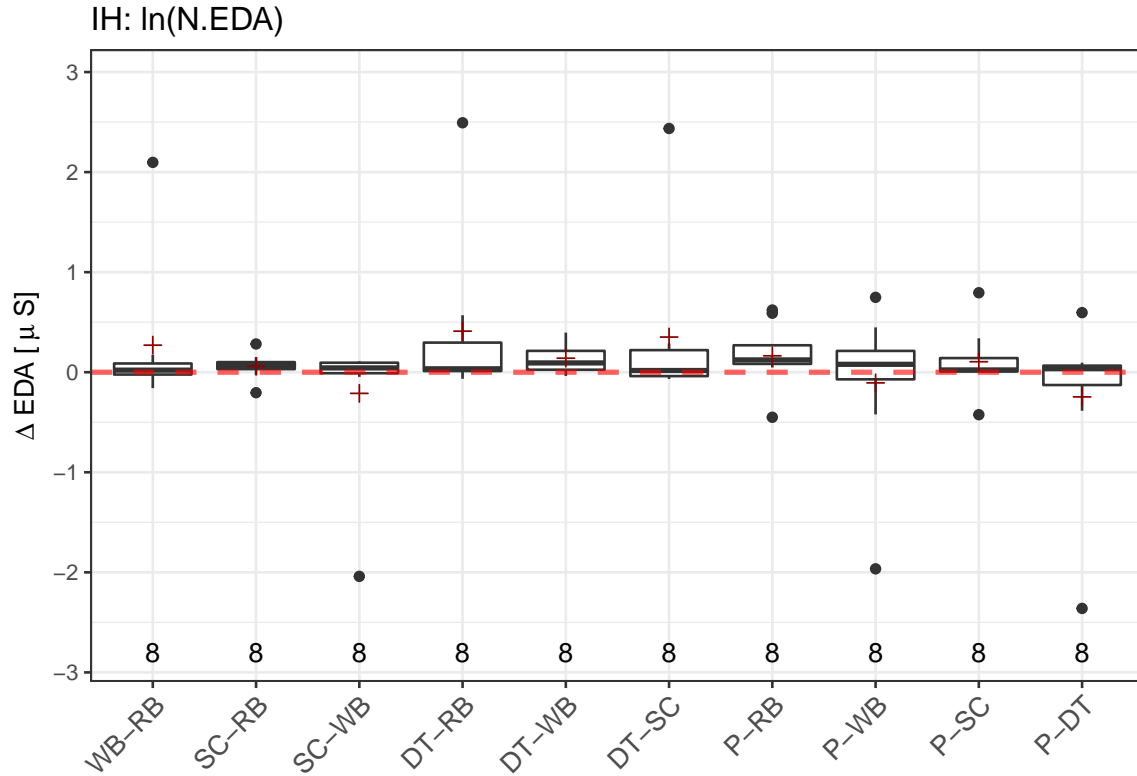
```
## t-test p = 0.0051 < 0.01 **  
##  
## Presentation - Dual Task  
## t-test p = 0.0015 < 0.01 **
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.0083 < 0.01 **
##
## Stress Condition - Resting Baseline
## t-test p = 0.0916 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.0506 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.3327 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 7e-04 < 0.001 ***
##
## Dual Task - Stress Condition
## t-test p = 0.5657 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0545 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0 < 0.001 ***
##
## Presentation - Stress Condition
```

```
## t-test p = 8e-04 < 0.001 ***  
##  
## Presentation - Dual Task  
## t-test p = 5e-04 < 0.001 ***
```

```
## 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  $p = 0.3383 > 0.05$

##

## Stress Condition - Resting Baseline

## Transformed t-test  $p = 0.2703 > 0.05$

##

## StressCondition - Writing Baseline

## Transformed t-test  $p = 0.4462 > 0.05$

##

## Dual Task - Resting Baseline

## Transformed t-test  $p = 0.2217 > 0.05$

##

## Dual Task - Writing Baseline

## Transformed t-test  $p = 0.0542 > 0.05$

##

## Dual Task - Stress Condition

## Transformed t-test  $p = 0.2815 > 0.05$

##

## Presentation - Resting Baseline

## Transformed t-test  $p = 0.2098 > 0.05$

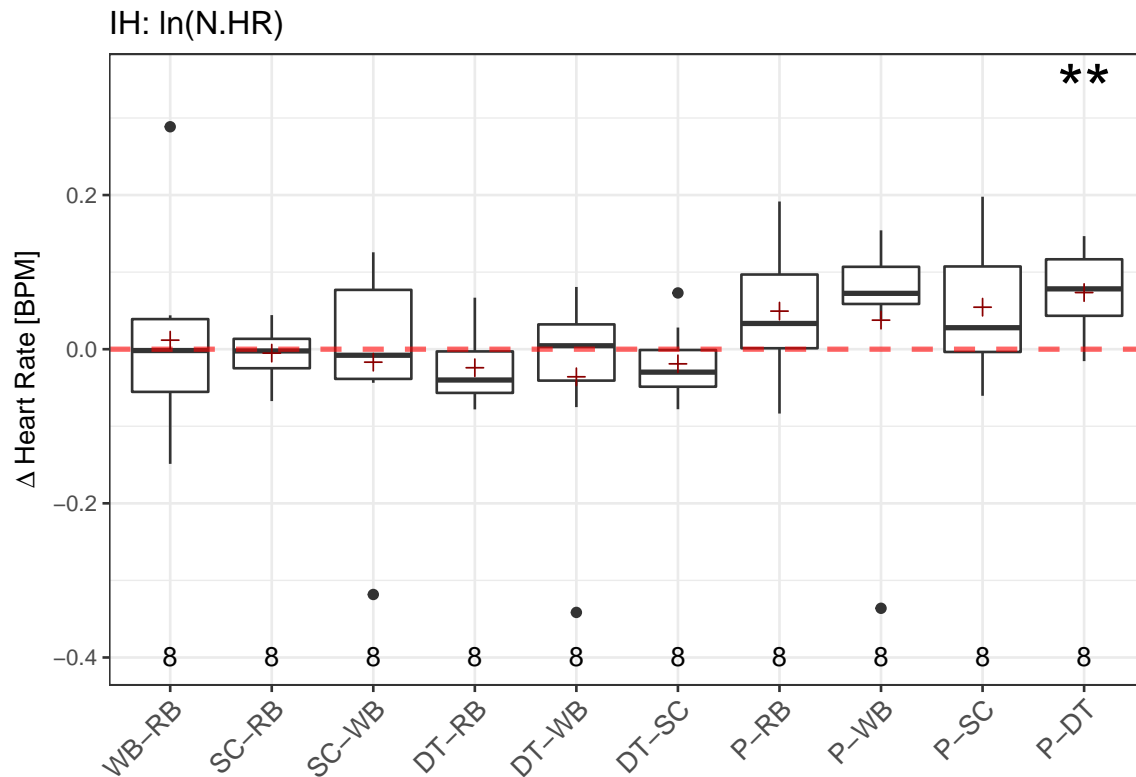
##

## Presentation - Writing Baseline

## Transformed t-test  $p = 0.7255 > 0.05$

```
##  
## Presentation - Stress Condition  
## Transformed t-test p = 0.4209 > 0.05  
##  
## Presentation - Dual Task  
## Transformed t-test p = 0.4616 > 0.05
```

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



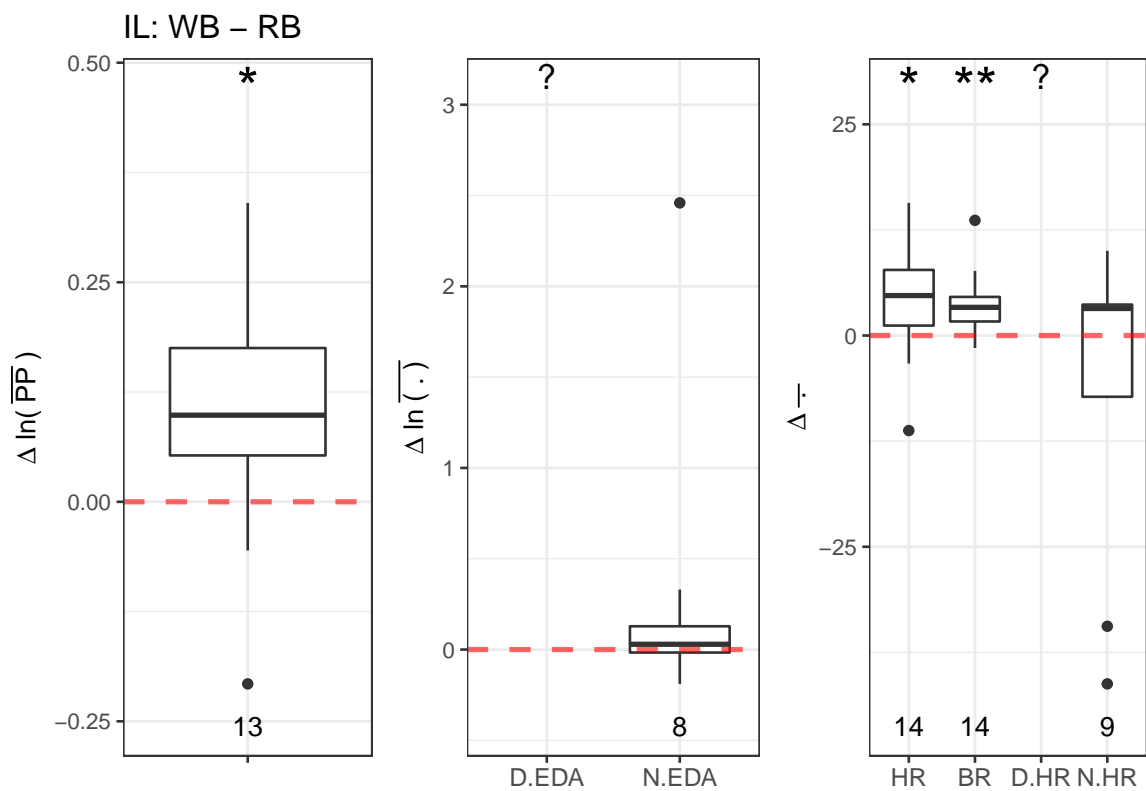
```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.8056 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.6971 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.7377 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.2221 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.4687 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.3102 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.1963 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.5161 > 0.05
##
## Presentation - Stress Condition
```

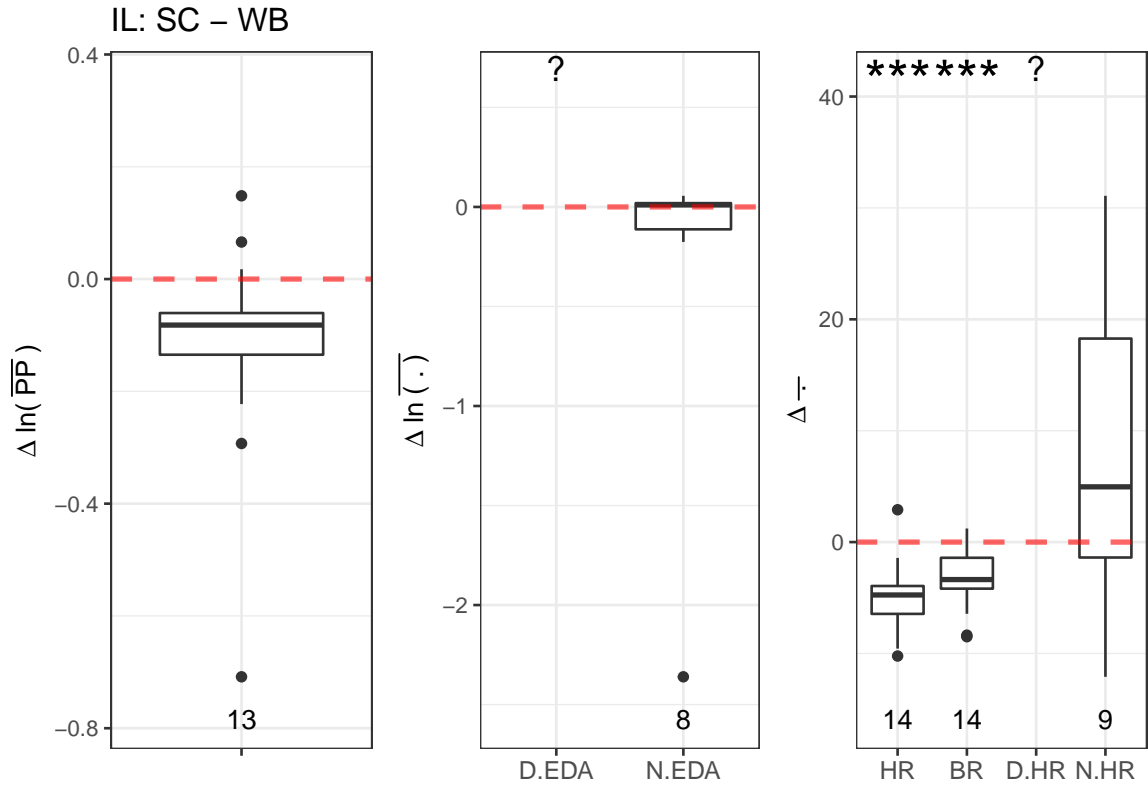
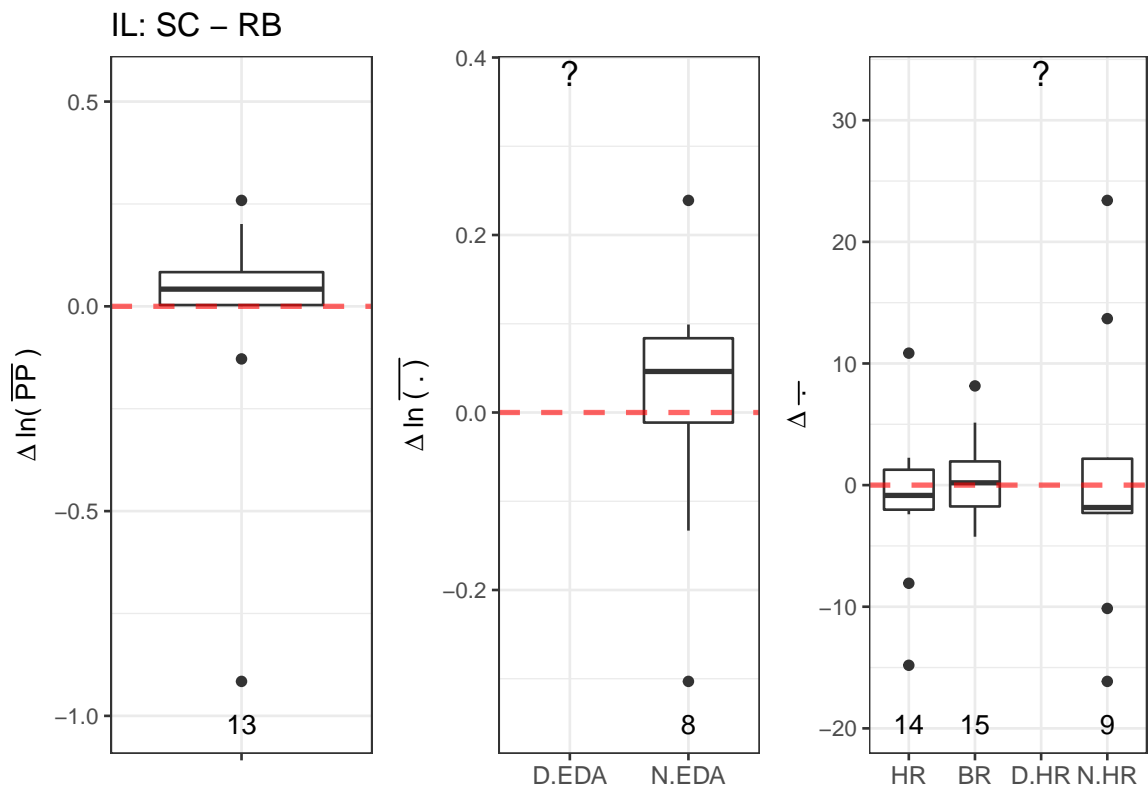
```
## Transformed t-test p = 0.1364 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.0086 < 0.01  **
```

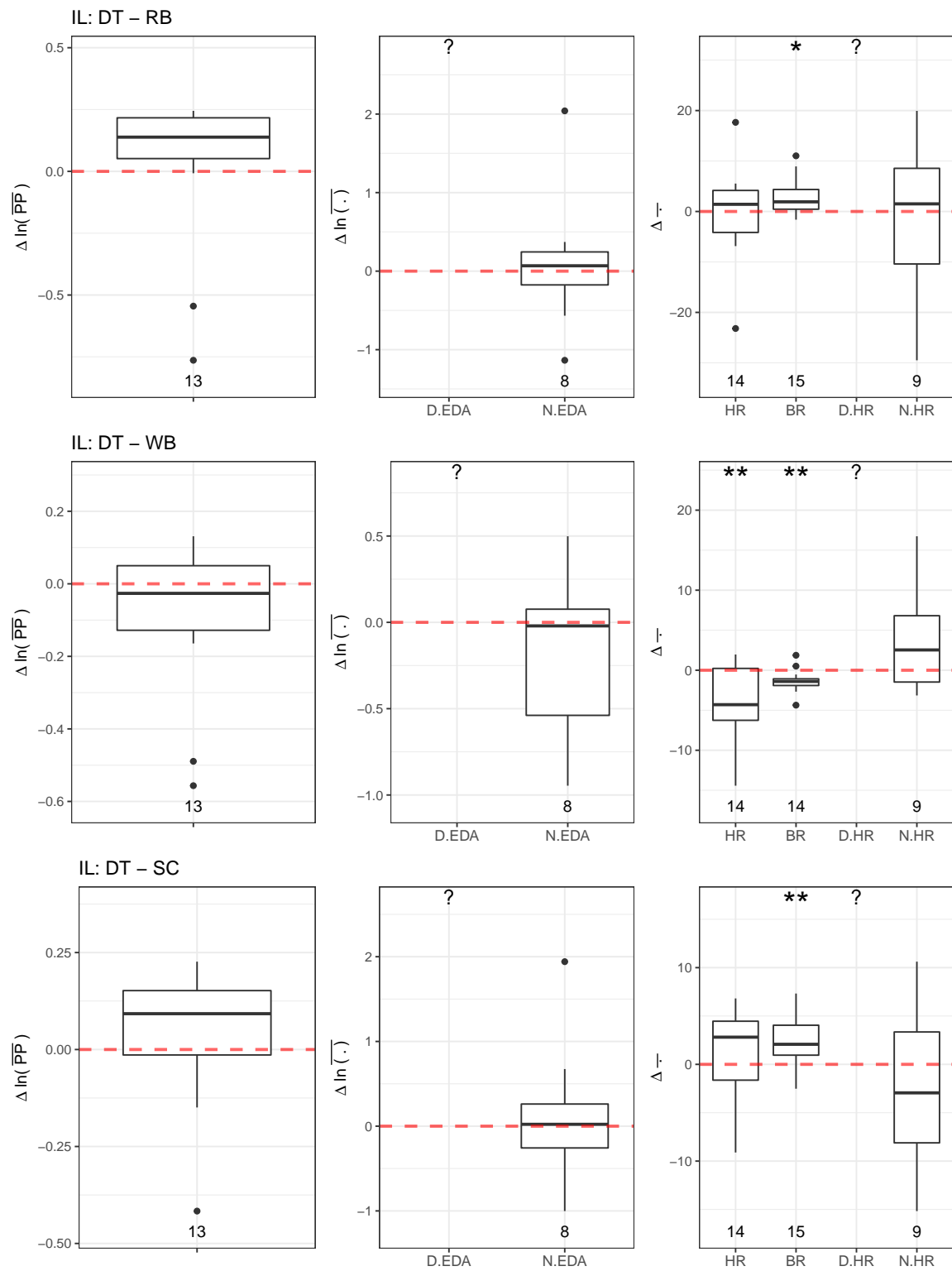


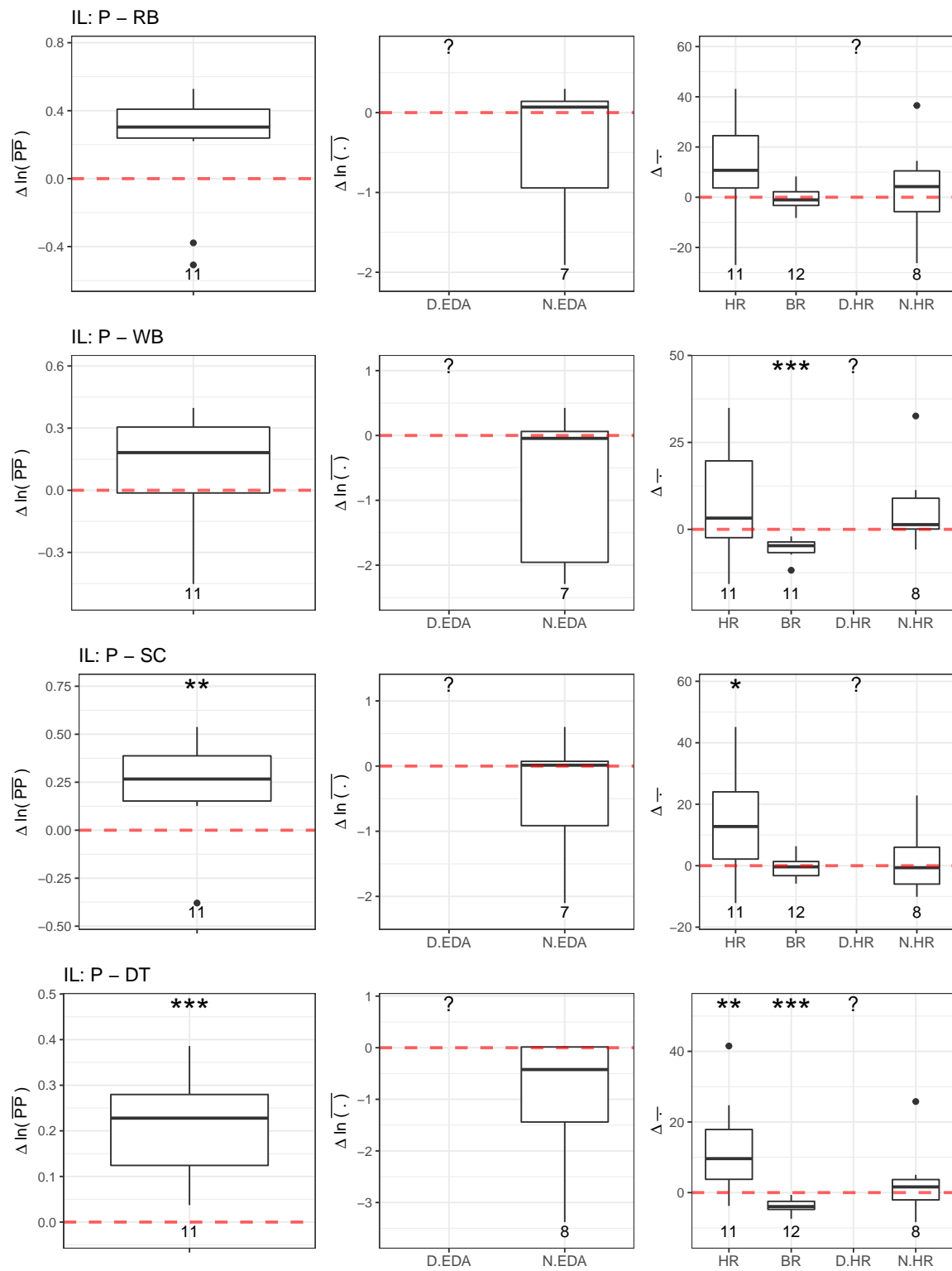
**Intermittent-Low (IL)**

## Sensor Channels per Activity

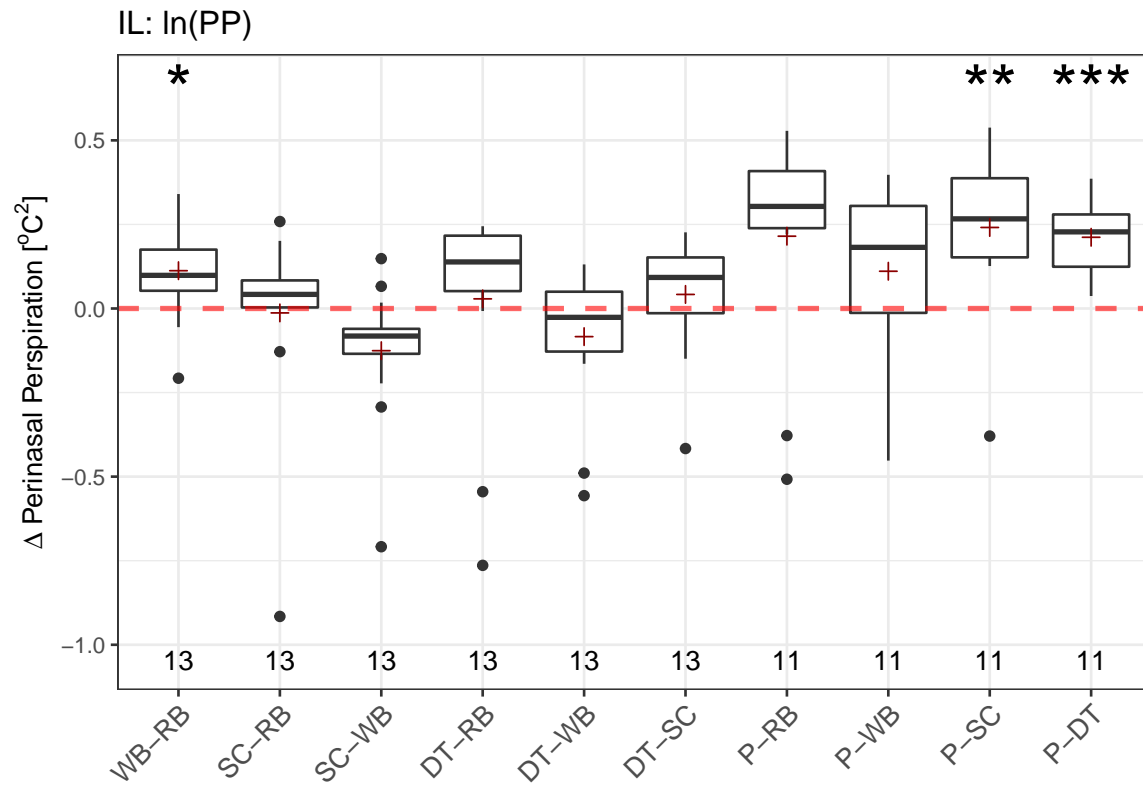






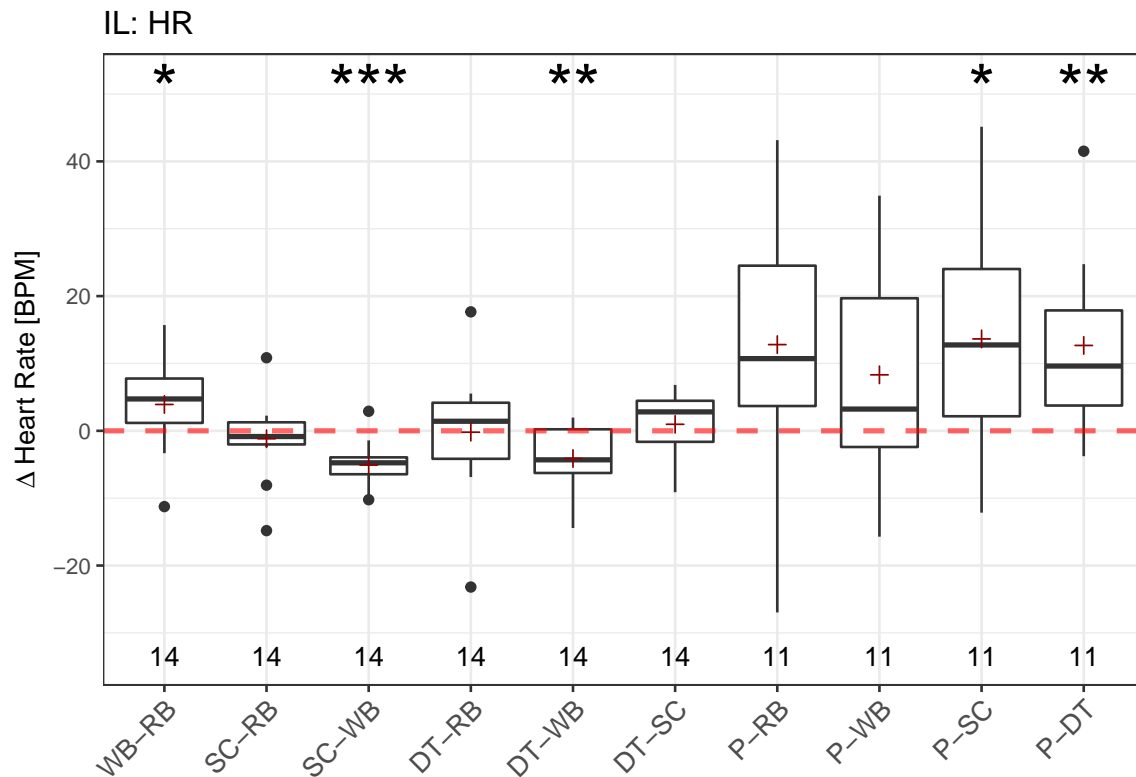


## Sensor Channel across Activities



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.017 < 0.05  *
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.8723 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.051 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.7483 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.1817 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.4026 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.0624 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.1846 > 0.05
```

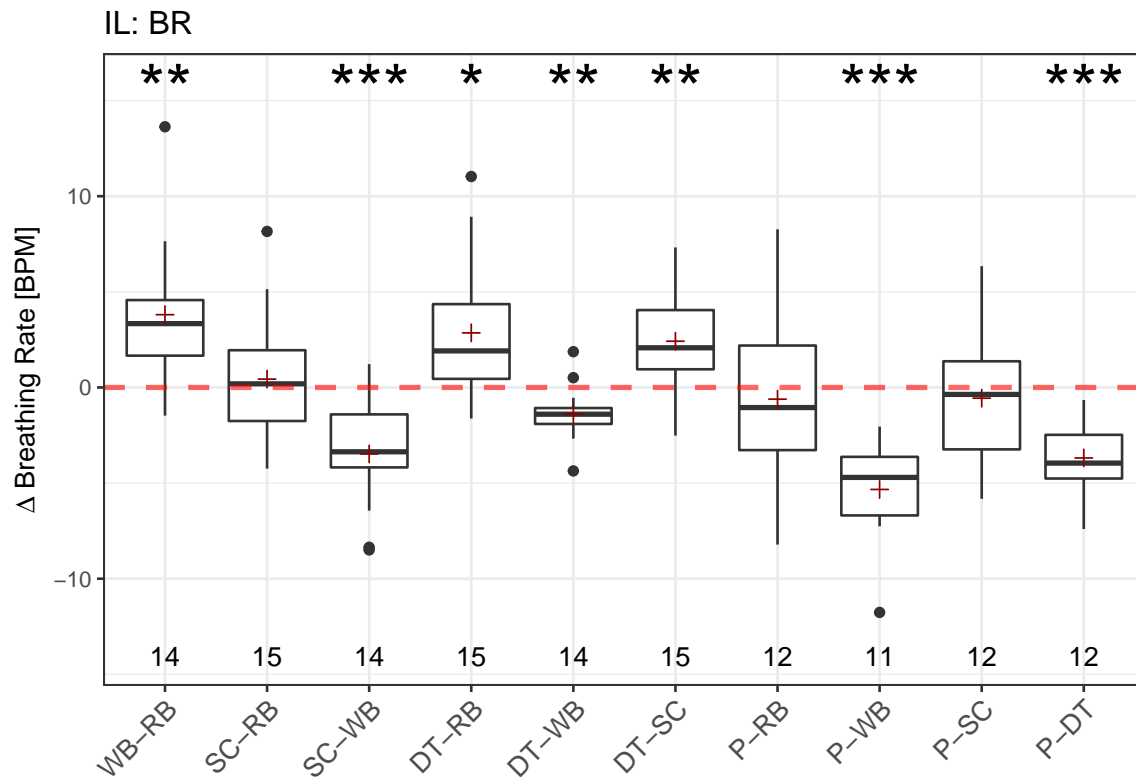
```
##  
## Presentation - Stress Condition  
## Transformed t-test p = 0.0091 < 0.01  **  
##  
## Presentation - Dual Task  
## Transformed t-test p = 1e-04 < 0.001  ***
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.0444 < 0.05  *
##
## Stress Condition - Resting Baseline
## t-test p = 0.4522 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 1e-04 < 0.001  ***
##
## Dual Task - Resting Baseline
## t-test p = 0.9351 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.0079 < 0.01  **
##
## Dual Task - Stress Condition
## t-test p = 0.4751 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0552 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.0986 > 0.05
##
## Presentation - Stress Condition
```



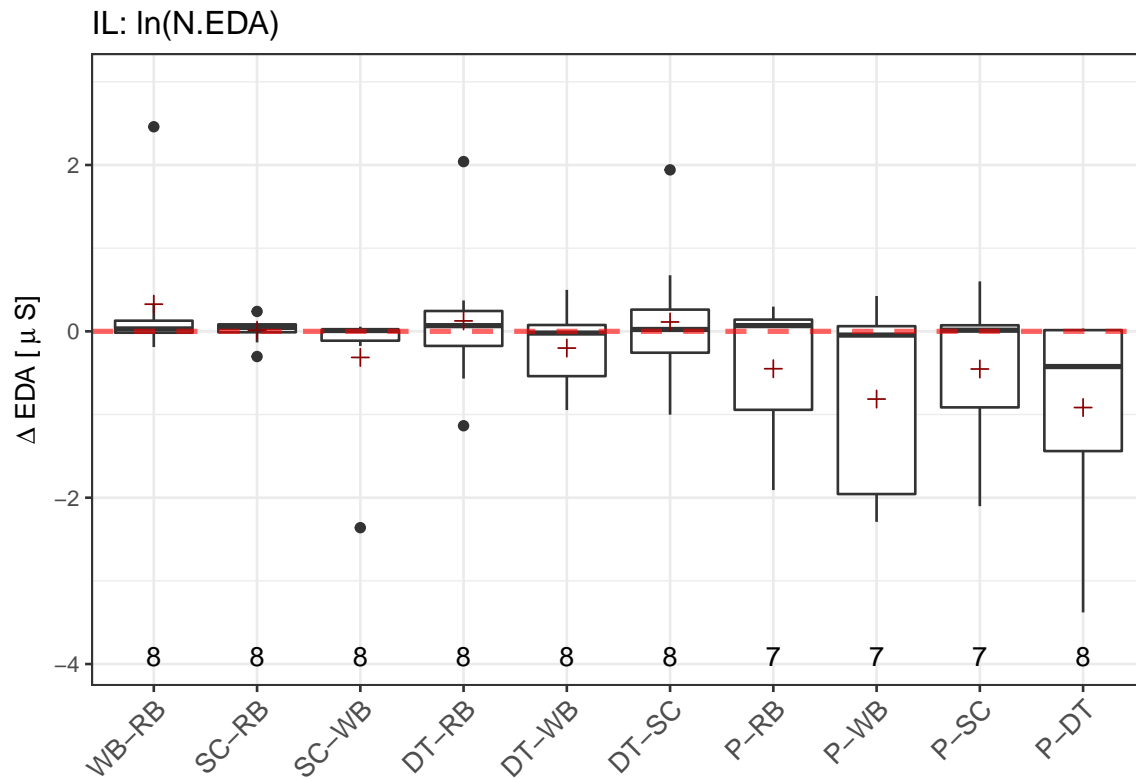
```
## t-test p = 0.0187 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.0091 < 0.01  **
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.0021 < 0.01 **
##
## Stress Condition - Resting Baseline
## t-test p = 0.6182 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 4e-04 < 0.001 ***
##
## Dual Task - Resting Baseline
## t-test p = 0.0106 < 0.05 *
##
## Dual Task - Writing Baseline
## t-test p = 0.0035 < 0.01 **
##
## Dual Task - Stress Condition
## t-test p = 0.0057 < 0.01 **
##
## Presentation - Resting Baseline
## t-test p = 0.6684 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 1e-04 < 0.001 ***
##
## Presentation - Stress Condition
```

```
## t-test p = 0.6101 > 0.05
##
## Presentation - Dual Task
## t-test p = 0 < 0.001 ***
```

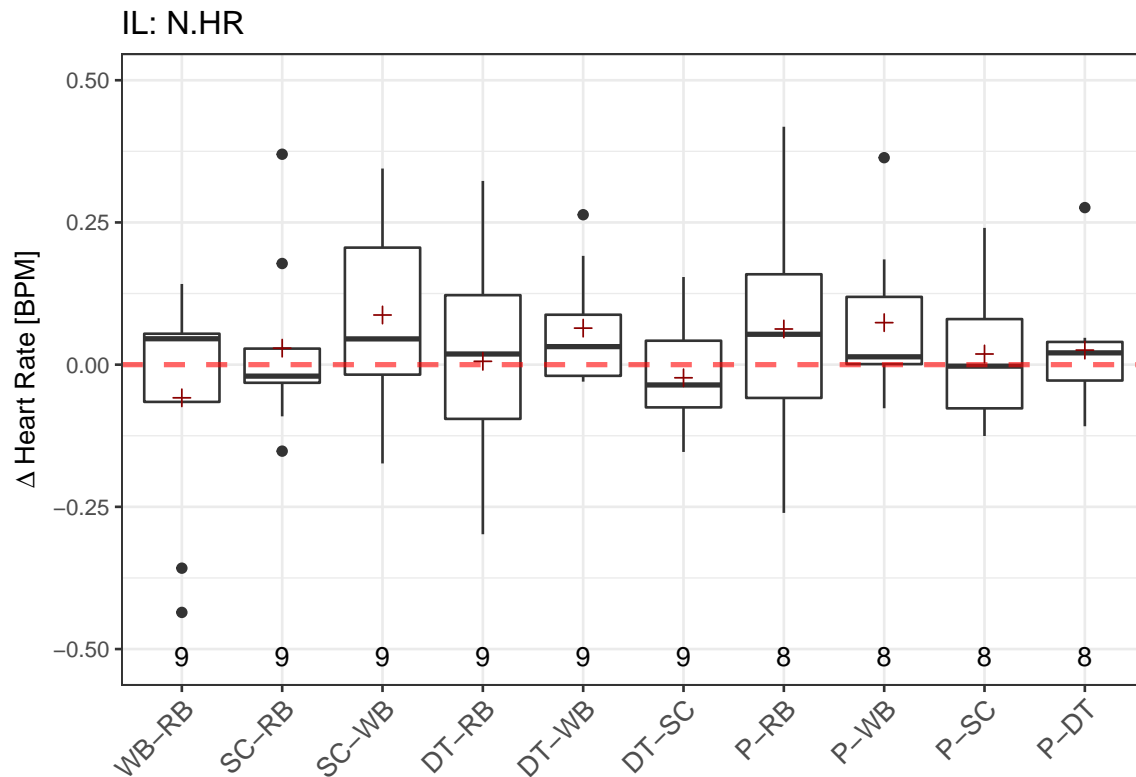
```
## IL has LESS than 7 subjects for D.EDA. Cannot continue with test.
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.3263 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.8311 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.3205 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.7091 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.3025 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.7364 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.273 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.1214 > 0.05
##
## Presentation - Stress Condition
```

```
## Transformed t-test p = 0.2936 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.0721 > 0.05
```

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



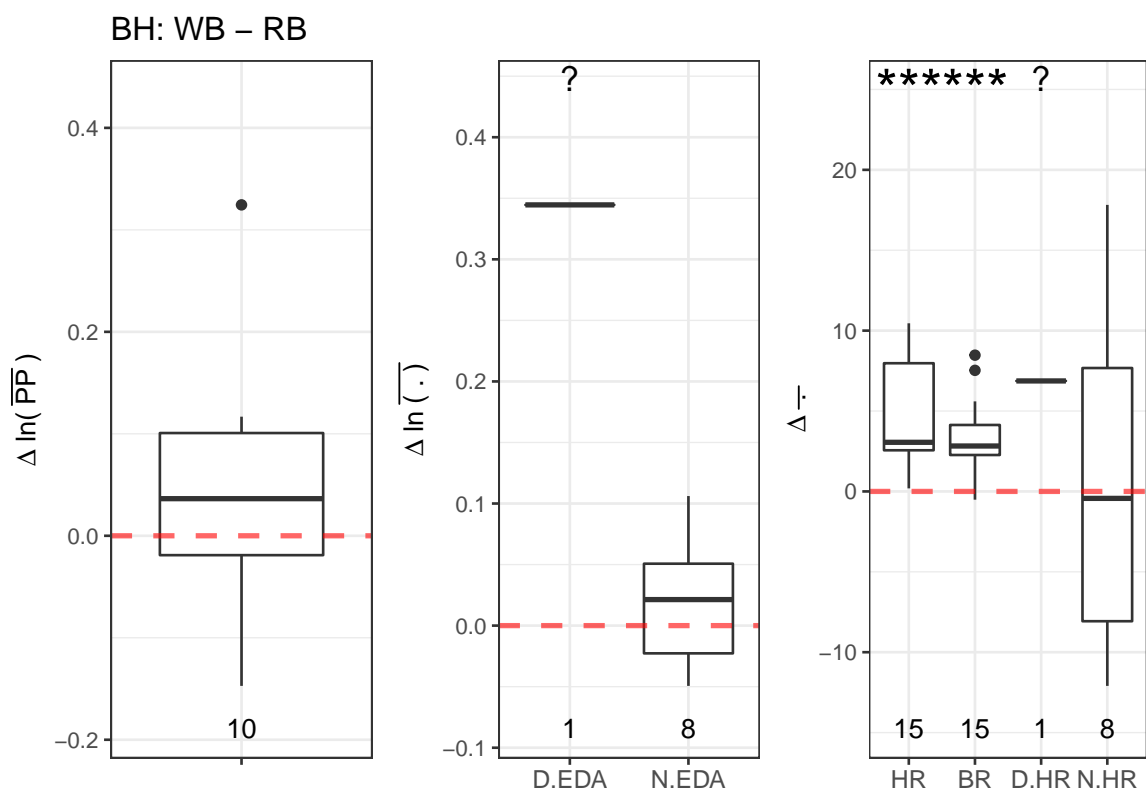
```
## Writing Baseline - Resting Baseline
## Wilcoxon p = 0.9102 > 0.05
##
## Stress Condition - Resting Baseline
## Wilcoxon p = 1 > 0.05
##
## StressCondition - Writing Baseline
## Wilcoxon p = 0.25 > 0.05
##
## Dual Task - Resting Baseline
## Wilcoxon p = 0.7344 > 0.05
##
## Dual Task - Writing Baseline
## Wilcoxon p = 0.0977 > 0.05
##
## Dual Task - Stress Condition
## Wilcoxon p = 0.5703 > 0.05
##
## Presentation - Resting Baseline
## Wilcoxon p = 0.4609 > 0.05
##
## Presentation - Writing Baseline
## Wilcoxon p = 0.1953 > 0.05
##
## Presentation - Stress Condition
```

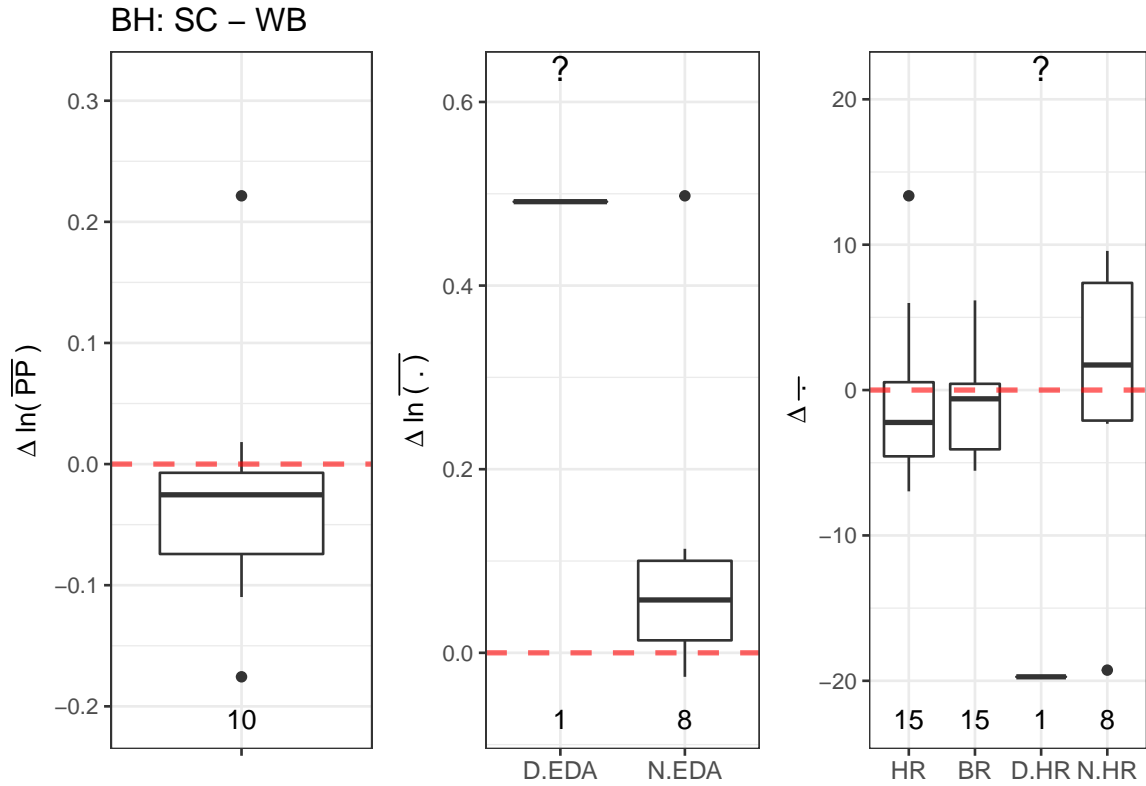
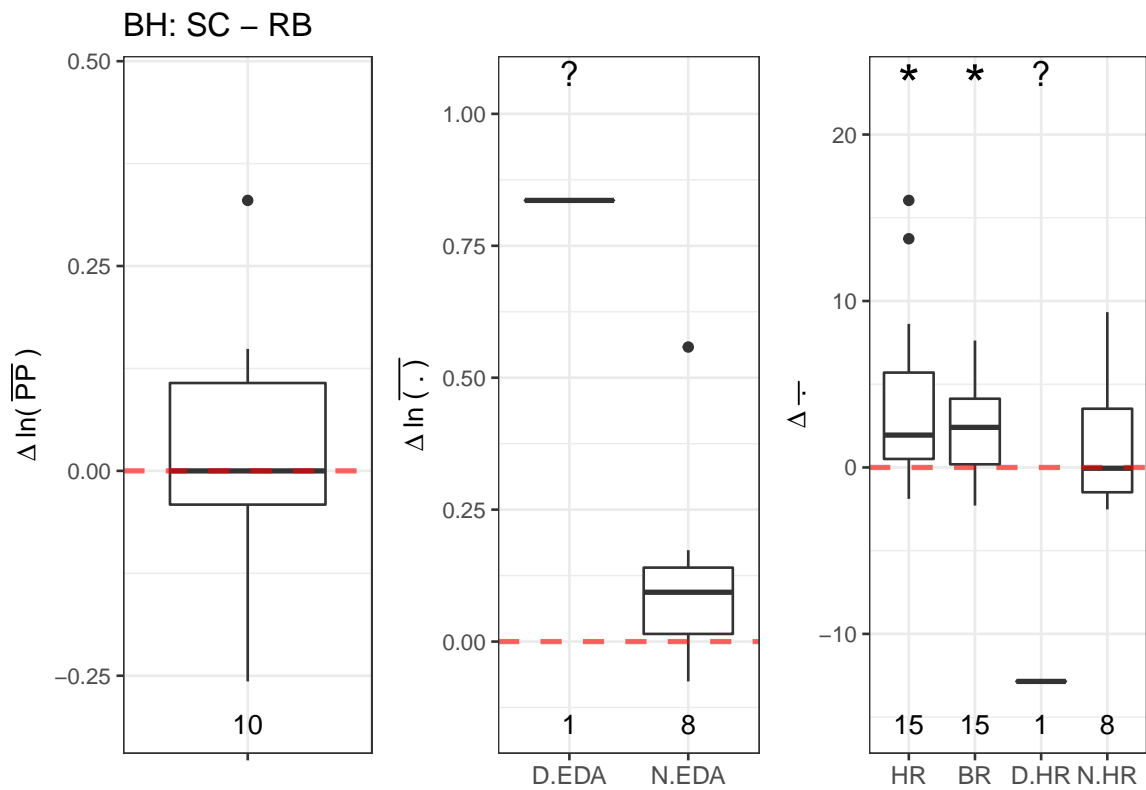
```
## Wilcoxon p = 0.9453 > 0.05
##
## Presentation - Dual Task
## Wilcoxon p = 0.7422 > 0.05
```

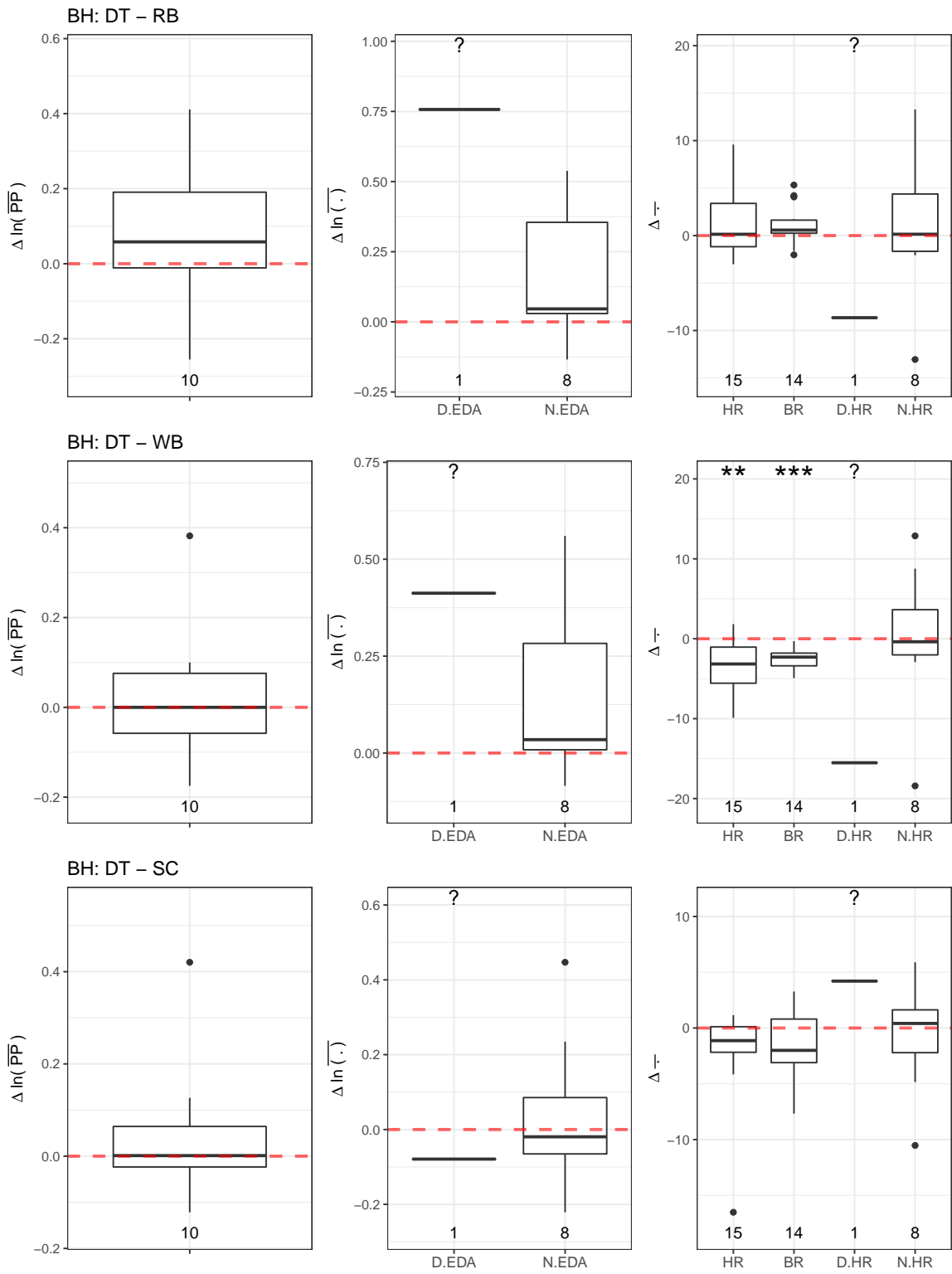
**Batch-High (BH)**

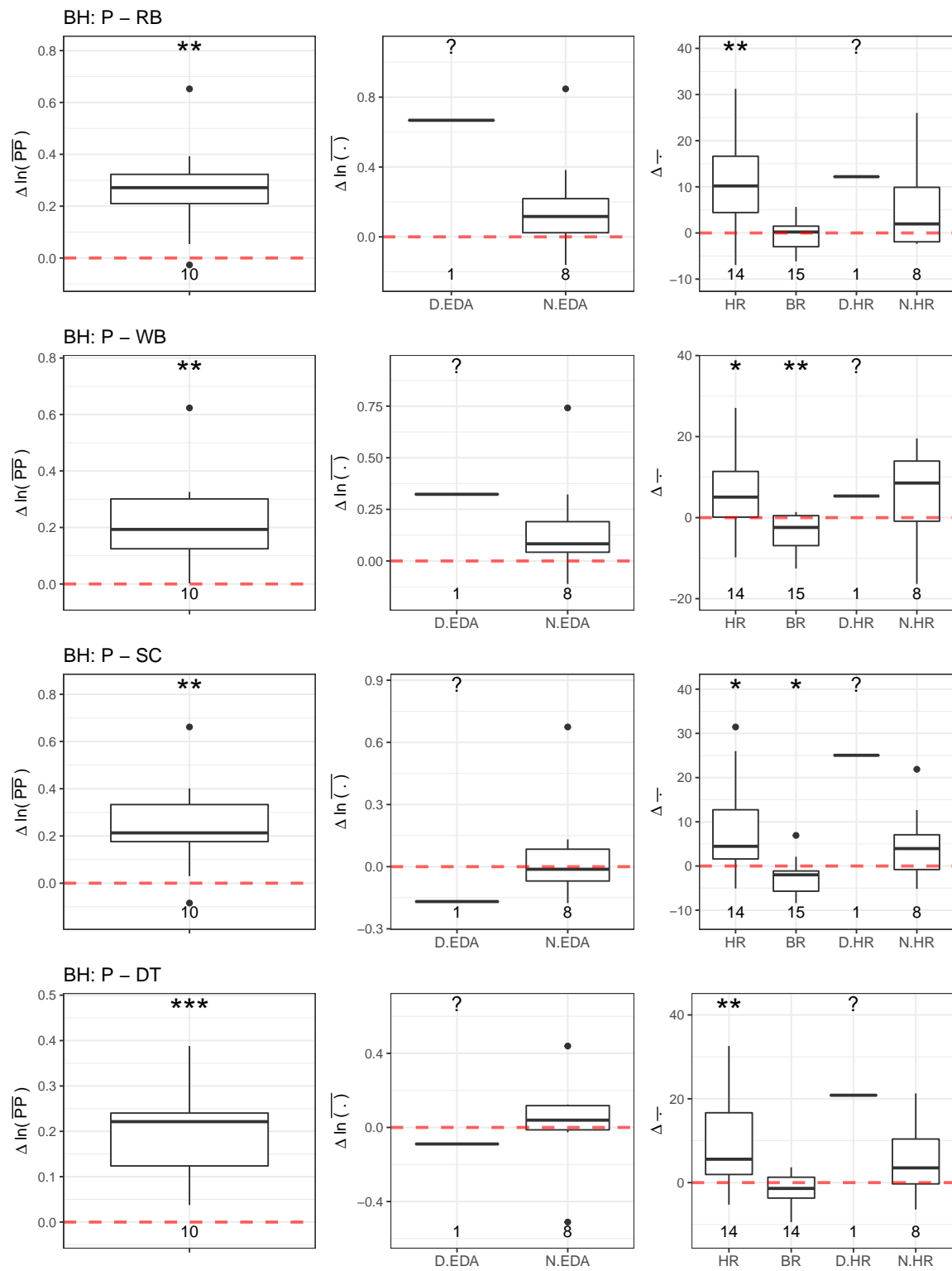


## Sensor Channels per Activity

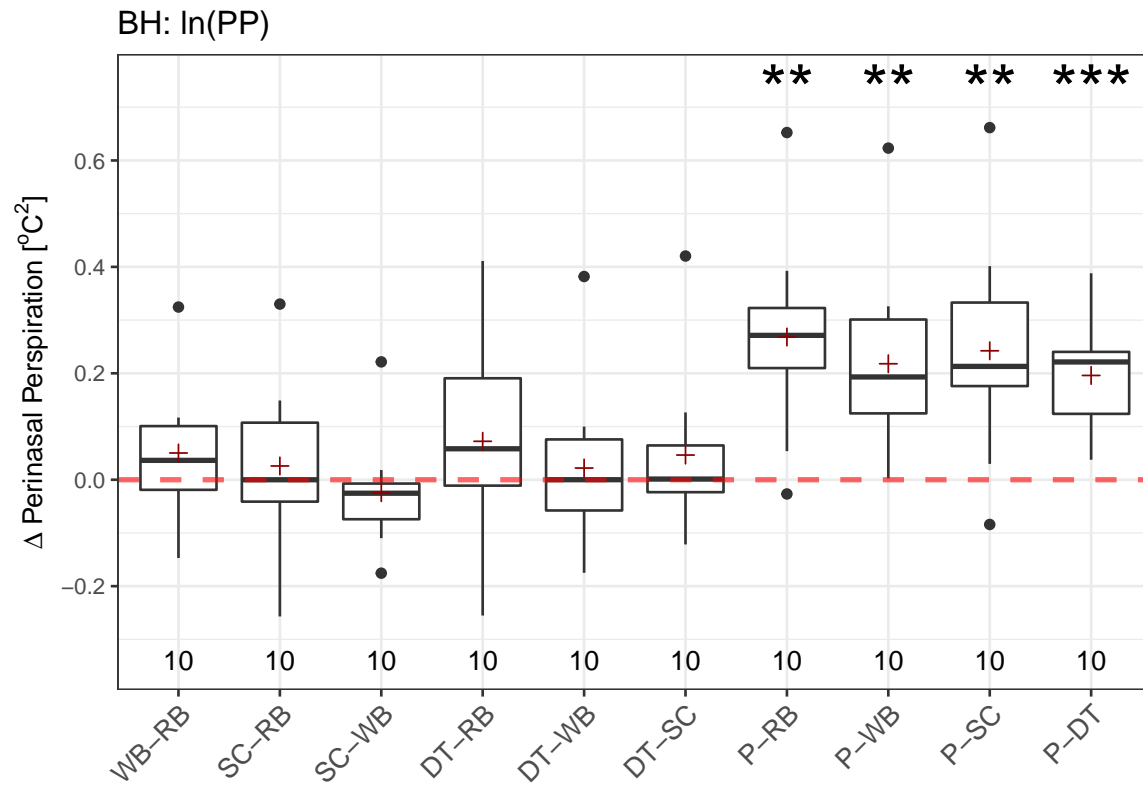






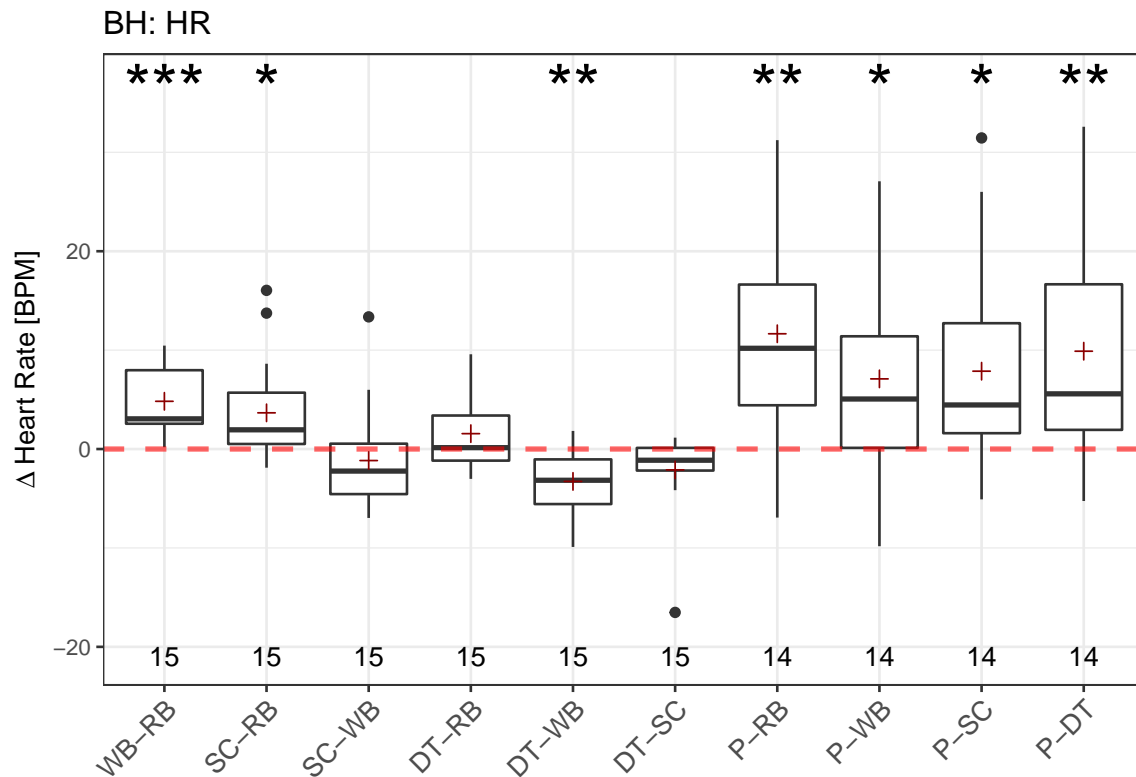


## Sensor Channel across Activities



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.2316 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.6104 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.4765 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.2511 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.6593 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.3462 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.0013 < 0.01  **
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.0041 < 0.01  **
```

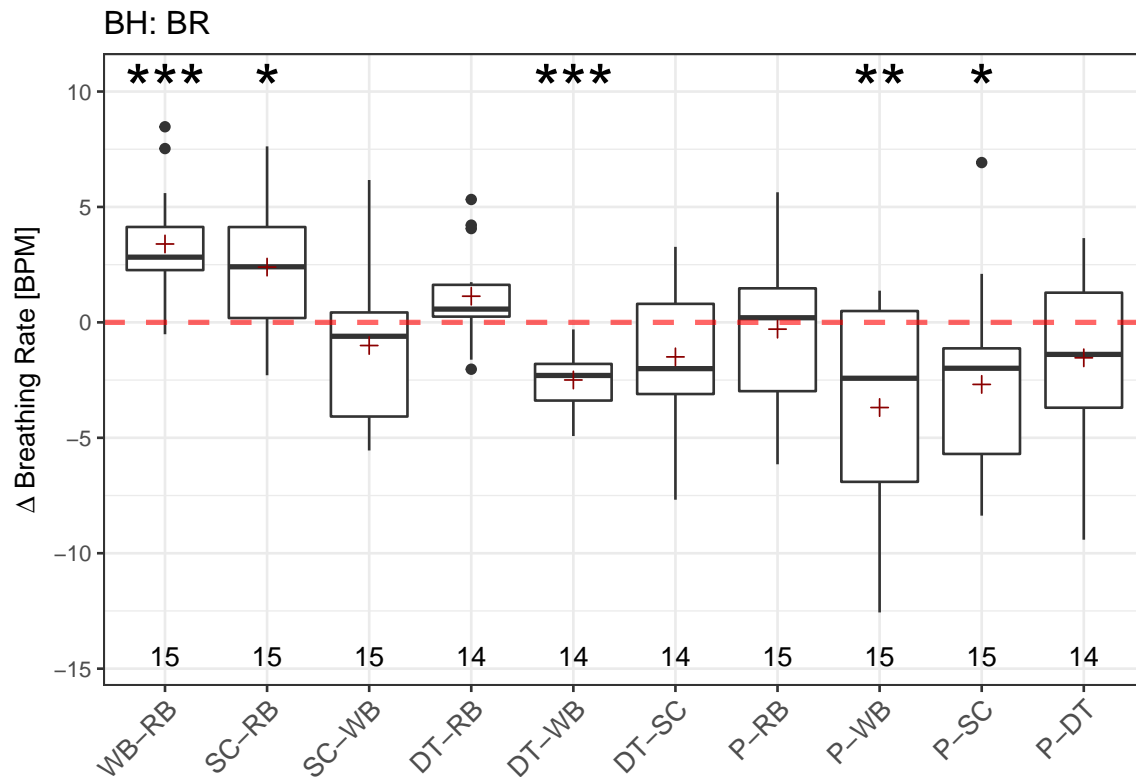
```
##  
## Presentation - Stress Condition  
## Transformed t-test p = 0.0046 < 0.01  **  
##  
## Presentation - Dual Task  
## Transformed t-test p = 3e-04 < 0.001  ***
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0 < 0.001 ***
##
## Stress Condition - Resting Baseline
## t-test p = 0.0207 < 0.05 *
##
## StressCondition - Writing Baseline
## t-test p = 0.4186 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.1257 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.0014 < 0.01 **
##
## Dual Task - Stress Condition
## t-test p = 0.0755 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.0026 < 0.01 **
##
## Presentation - Writing Baseline
## t-test p = 0.0385 < 0.05 *
##
## Presentation - Stress Condition
```

```
## t-test p = 0.0183 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.0084 < 0.01  **
```

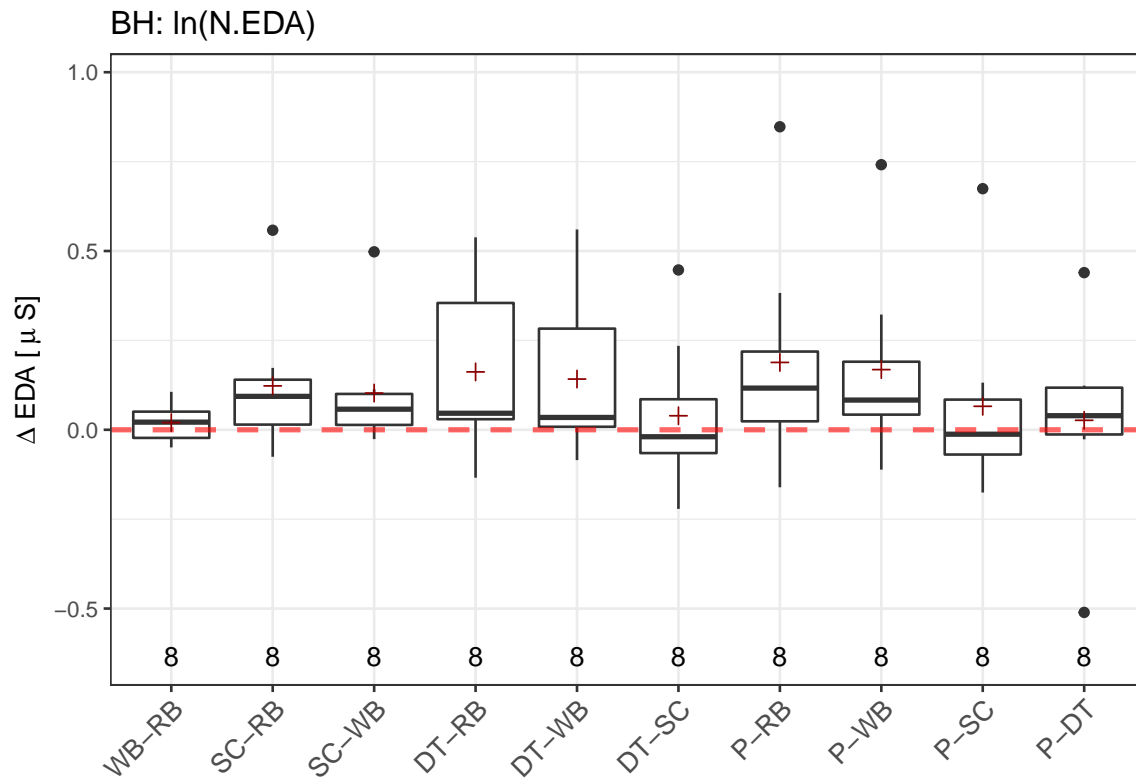




```
## Writing Baseline - Resting Baseline
## t-test p = 1e-04 < 0.001 ***
##
## Stress Condition - Resting Baseline
## t-test p = 0.0101 < 0.05 *
##
## StressCondition - Writing Baseline
## t-test p = 0.2491 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.066 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0 < 0.001 ***
##
## Dual Task - Stress Condition
## t-test p = 0.0783 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.7444 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.0065 < 0.01 **
##
## Presentation - Stress Condition
```

```
## t-test p = 0.0272 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.1269 > 0.05
```

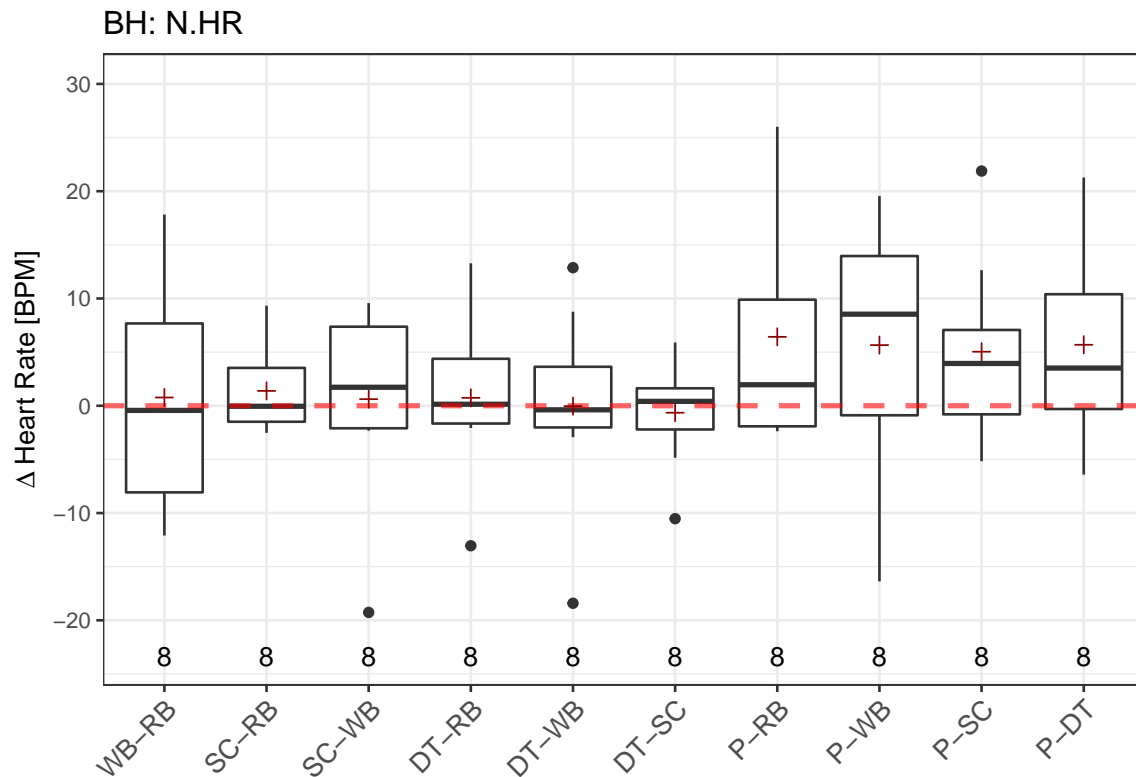
```
## BH has LESS than 7 subjects for D.EDA. Cannot continue with test.  
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.3082 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.1157 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.1242 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.0914 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.1073 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.6121 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.1275 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.112 > 0.05
##
## Presentation - Stress Condition
```

```
## Transformed t-test p = 0.5046 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.7837 > 0.05
```

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

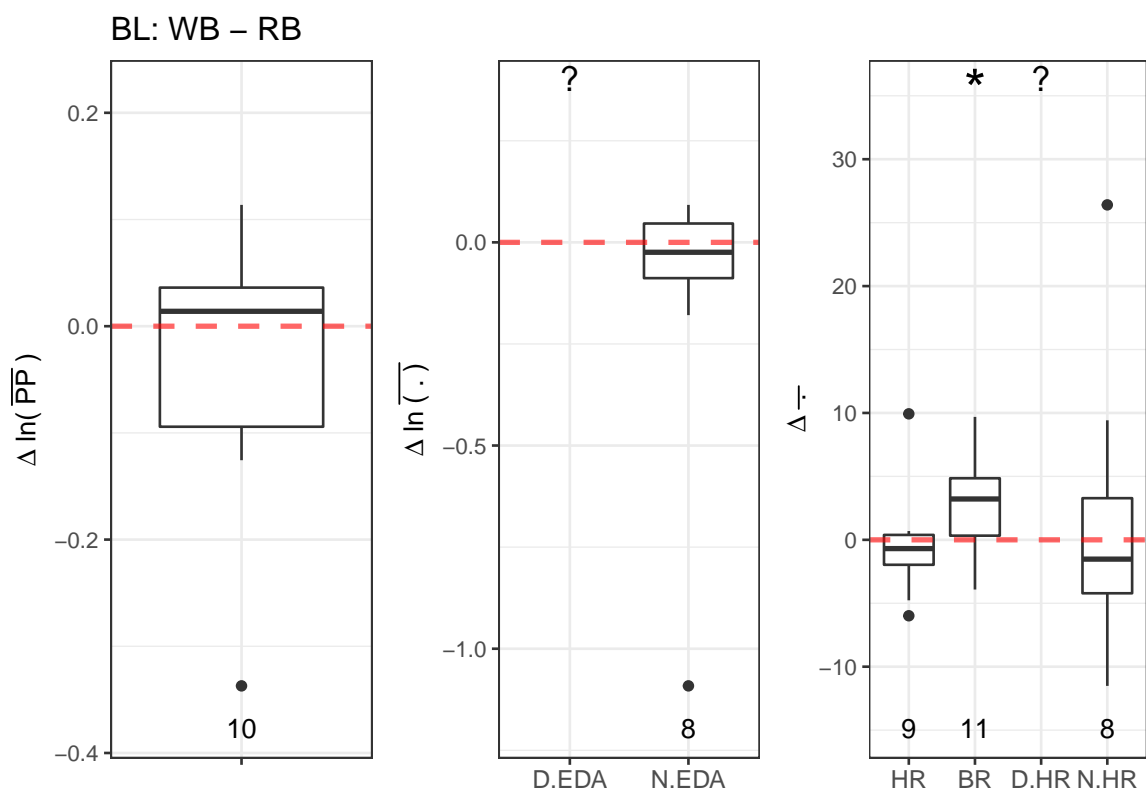


```
## Writing Baseline - Resting Baseline
## t-test p = 0.8417 > 0.05
##
## Stress Condition - Resting Baseline
## t-test p = 0.3592 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.8555 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.7879 > 0.05
##
## Dual Task - Writing Baseline
## t-test p = 0.9925 > 0.05
##
## Dual Task - Stress Condition
## t-test p = 0.7312 > 0.05
##
## Presentation - Resting Baseline
## t-test p = 0.1502 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.2146 > 0.05
##
## Presentation - Stress Condition
```

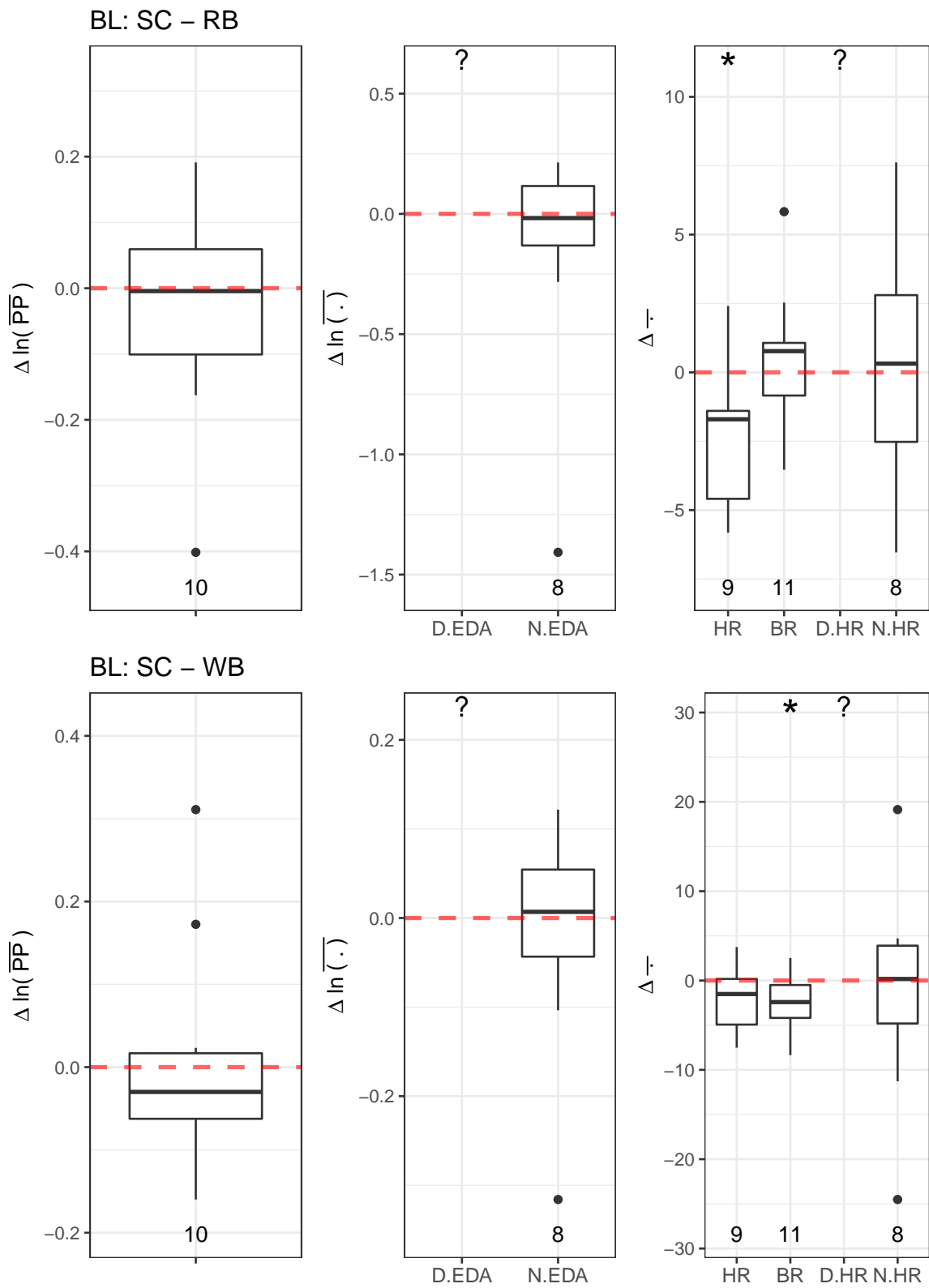
```
## t-test p = 0.1441 > 0.05
##
## Presentation - Dual Task
## t-test p = 0.1209 > 0.05
```

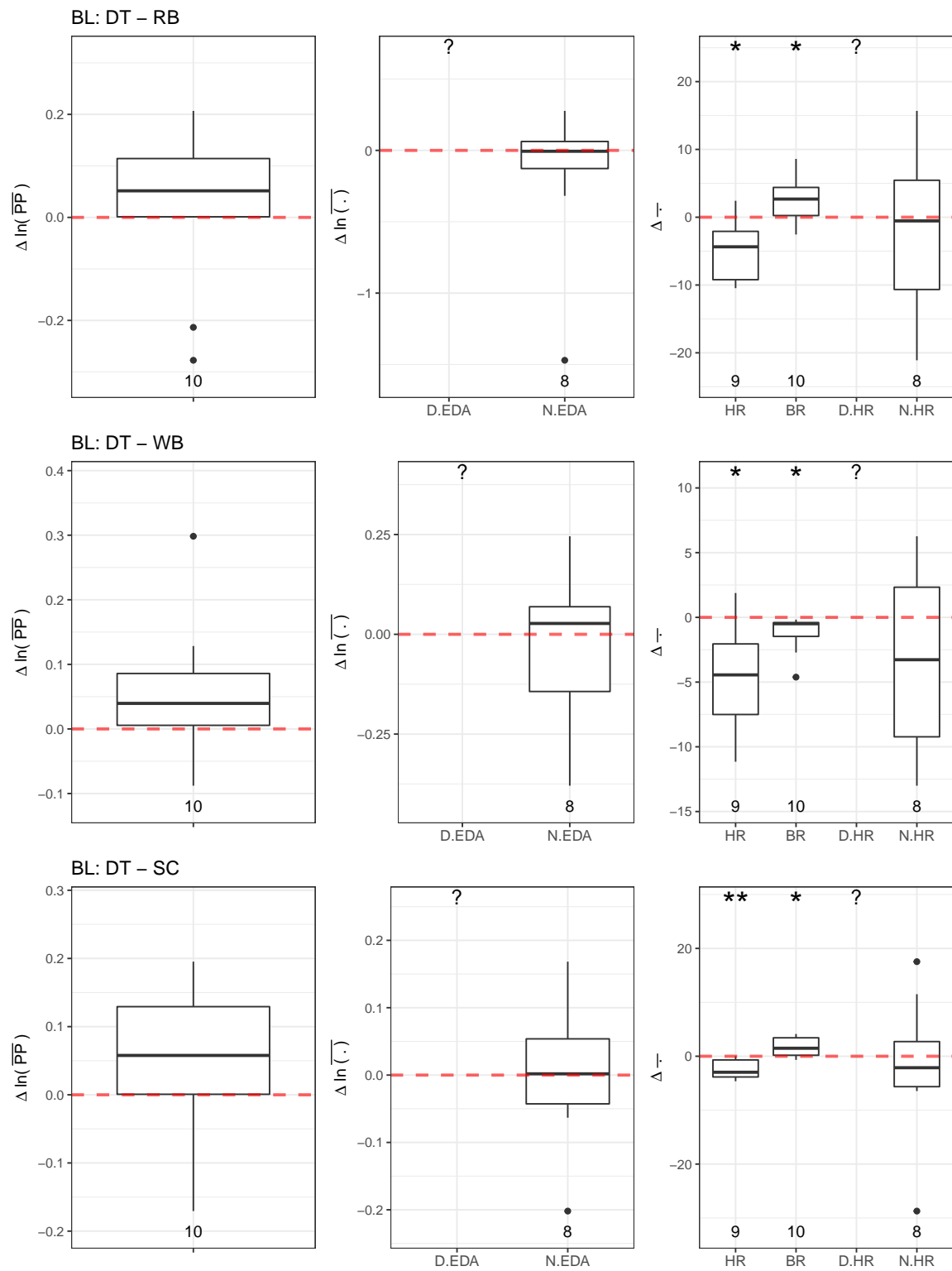
**Batch-Low (BL)**

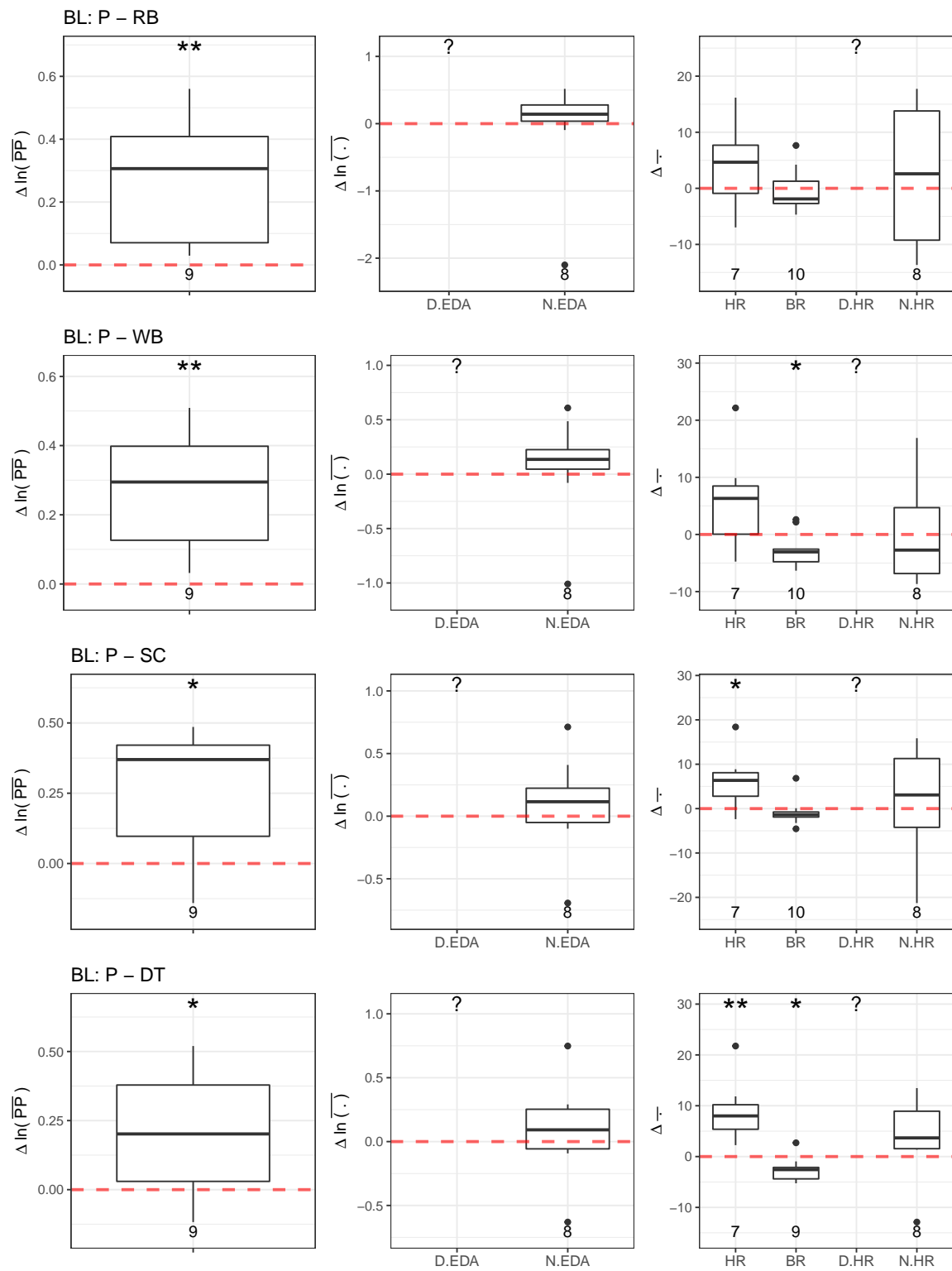
## Sensor Channels per Activity



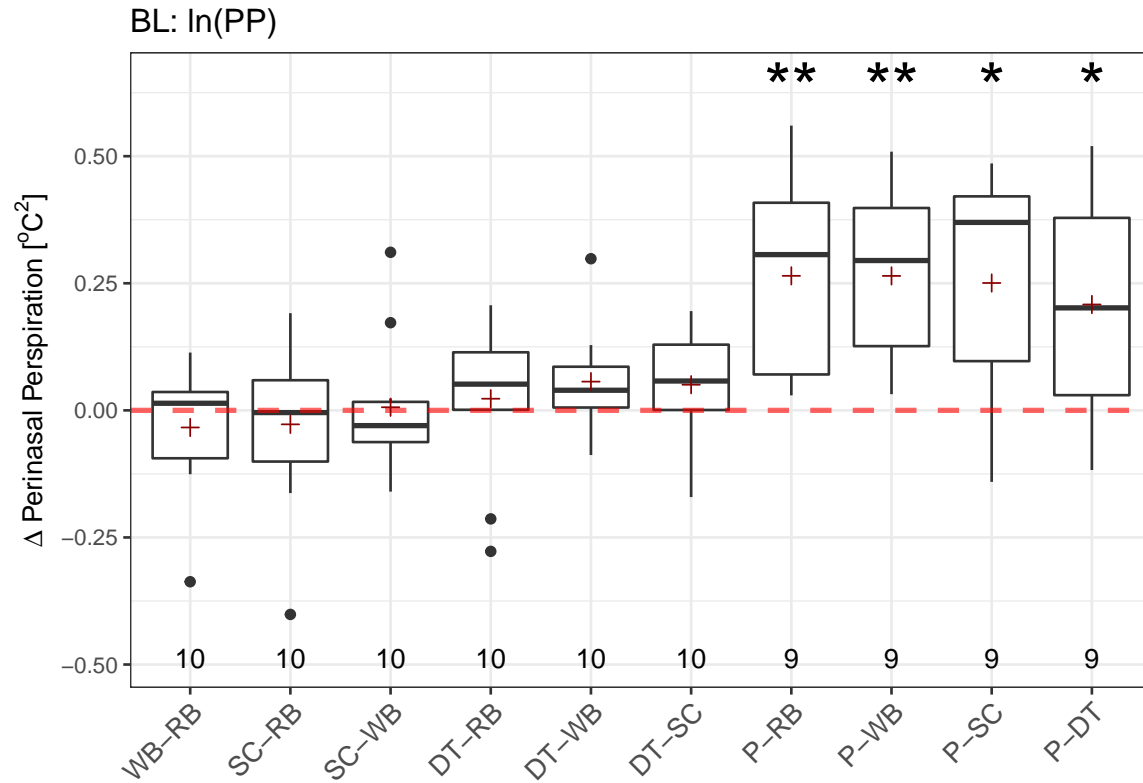






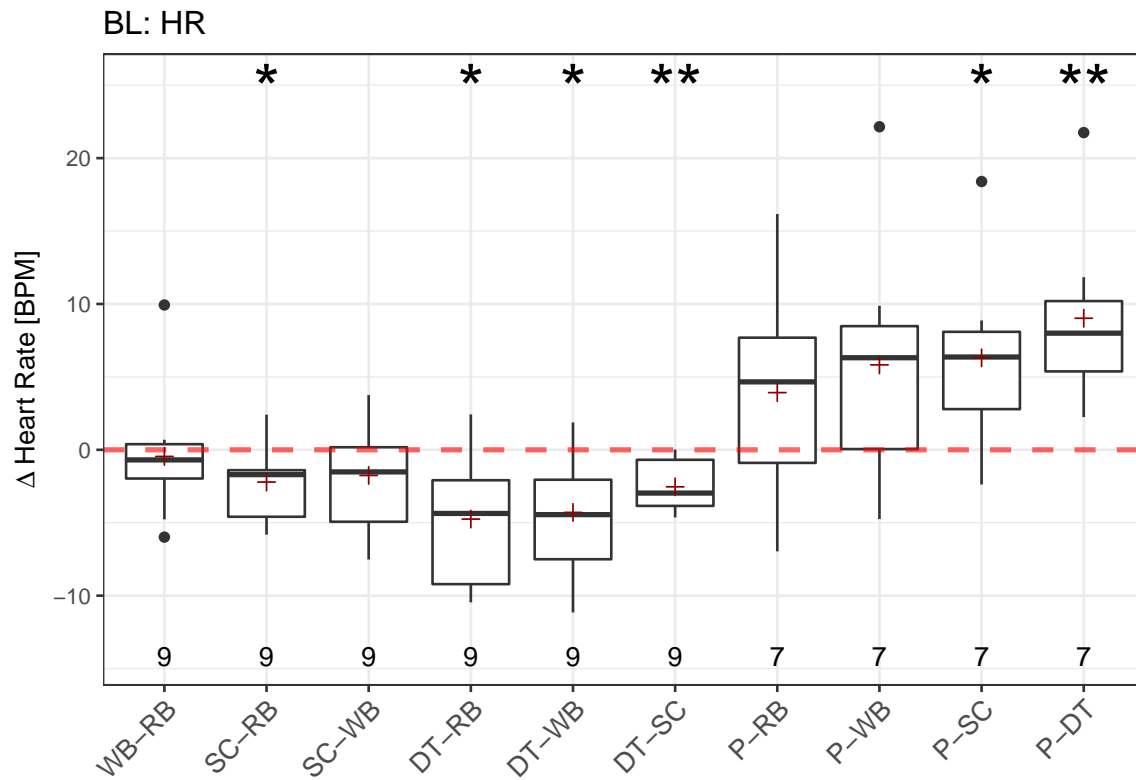


## Sensor Channel across Activities



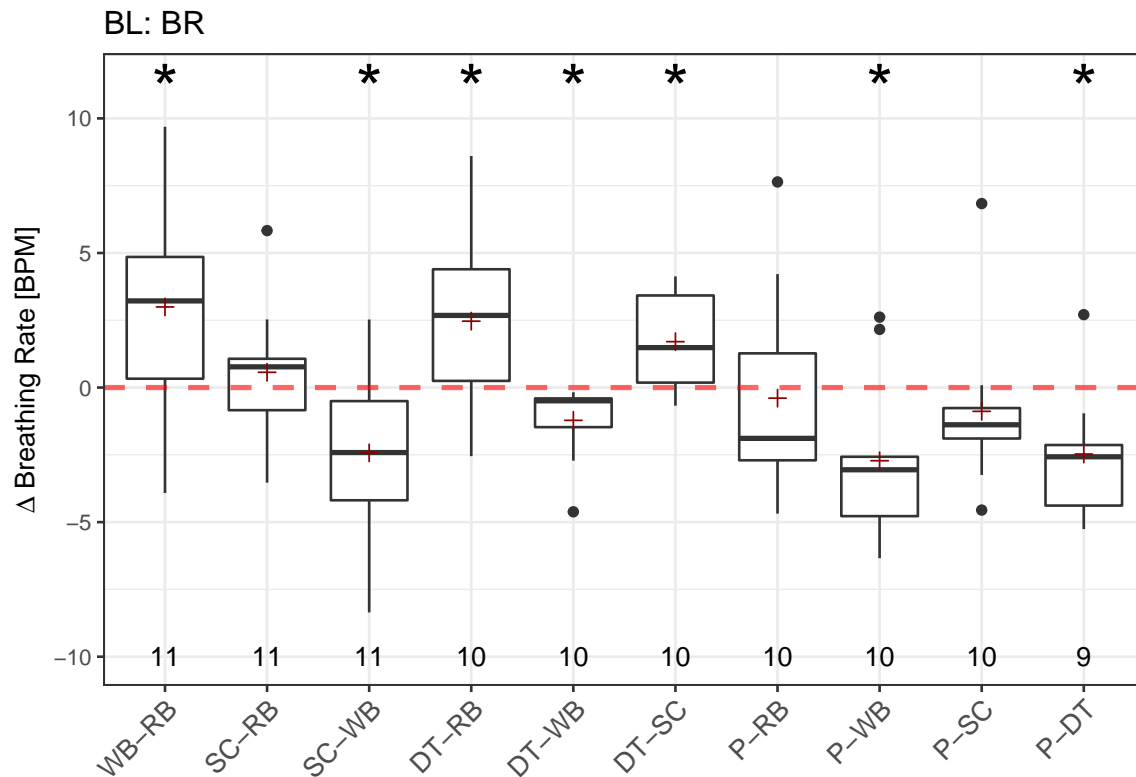
```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.4343 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.6268 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.8917 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.6557 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.1224 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.1706 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.0032 < 0.01 **
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.002 < 0.01 **
```

```
##  
## Presentation - Stress Condition  
## Transformed t-test  $p = 0.0162 < 0.05$  *  
##  
## Presentation - Dual Task  
## Transformed t-test  $p = 0.0183 < 0.05$  *
```



```
## Writing Baseline - Resting Baseline
## t-test p = 0.7702 > 0.05
##
## Stress Condition - Resting Baseline
## t-test p = 0.0428 < 0.05  *
##
## StressCondition - Writing Baseline
## t-test p = 0.2133 > 0.05
##
## Dual Task - Resting Baseline
## t-test p = 0.0122 < 0.05  *
##
## Dual Task - Writing Baseline
## t-test p = 0.0169 < 0.05  *
##
## Dual Task - Stress Condition
## t-test p = 0.0027 < 0.01  **
##
## Presentation - Resting Baseline
## t-test p = 0.2311 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.1334 > 0.05
##
## Presentation - Stress Condition
```

```
## t-test p = 0.0432 < 0.05  *  
##  
## Presentation - Dual Task  
## t-test p = 0.0097 < 0.01  **
```

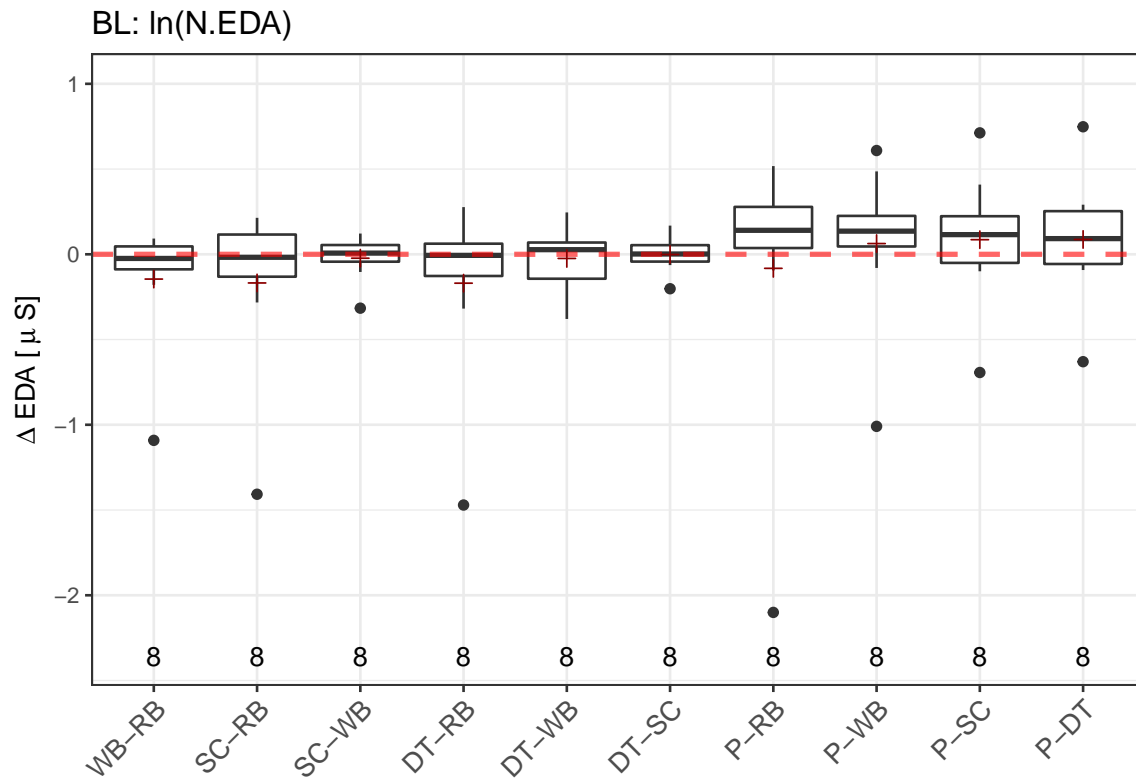


```
## Writing Baseline - Resting Baseline
## t-test p = 0.0333 < 0.05  *
##
## Stress Condition - Resting Baseline
## t-test p = 0.4497 > 0.05
##
## StressCondition - Writing Baseline
## t-test p = 0.0213 < 0.05  *
##
## Dual Task - Resting Baseline
## t-test p = 0.0377 < 0.05  *
##
## Dual Task - Writing Baseline
## t-test p = 0.0248 < 0.05  *
##
## Dual Task - Stress Condition
## t-test p = 0.0141 < 0.05  *
##
## Presentation - Resting Baseline
## t-test p = 0.7553 > 0.05
##
## Presentation - Writing Baseline
## t-test p = 0.0173 < 0.05  *
##
## Presentation - Stress Condition
```



```
## t-test p = 0.3786 > 0.05
##
## Presentation - Dual Task
## t-test p = 0.014 < 0.05  *
```

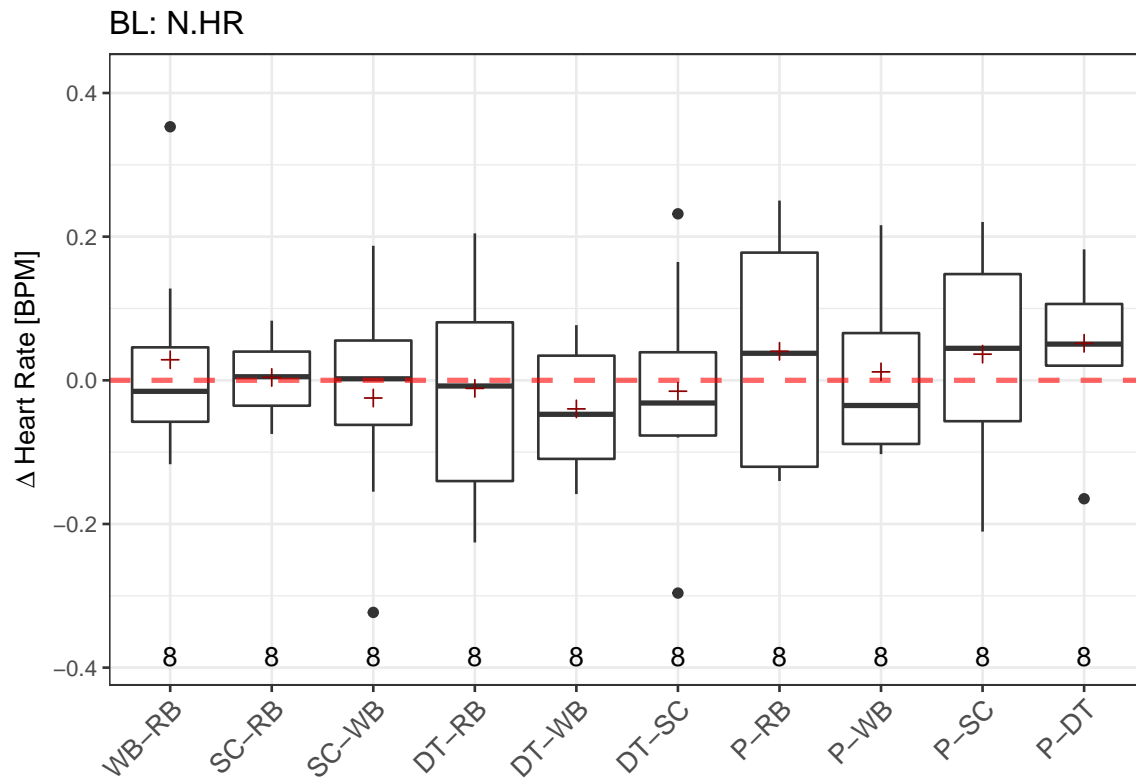
```
## BL has LESS than 7 subjects for D.EDA. Cannot continue with test.
## -----
```



```
## Writing Baseline - Resting Baseline
## Transformed t-test p = 0.3298 > 0.05
##
## Stress Condition - Resting Baseline
## Transformed t-test p = 0.394 > 0.05
##
## StressCondition - Writing Baseline
## Transformed t-test p = 0.6496 > 0.05
##
## Dual Task - Resting Baseline
## Transformed t-test p = 0.4177 > 0.05
##
## Dual Task - Writing Baseline
## Transformed t-test p = 0.736 > 0.05
##
## Dual Task - Stress Condition
## Transformed t-test p = 0.975 > 0.05
##
## Presentation - Resting Baseline
## Transformed t-test p = 0.7893 > 0.05
##
## Presentation - Writing Baseline
## Transformed t-test p = 0.7259 > 0.05
##
## Presentation - Stress Condition
```

```
## Transformed t-test p = 0.57 > 0.05
##
## Presentation - Dual Task
## Transformed t-test p = 0.5481 > 0.05
```

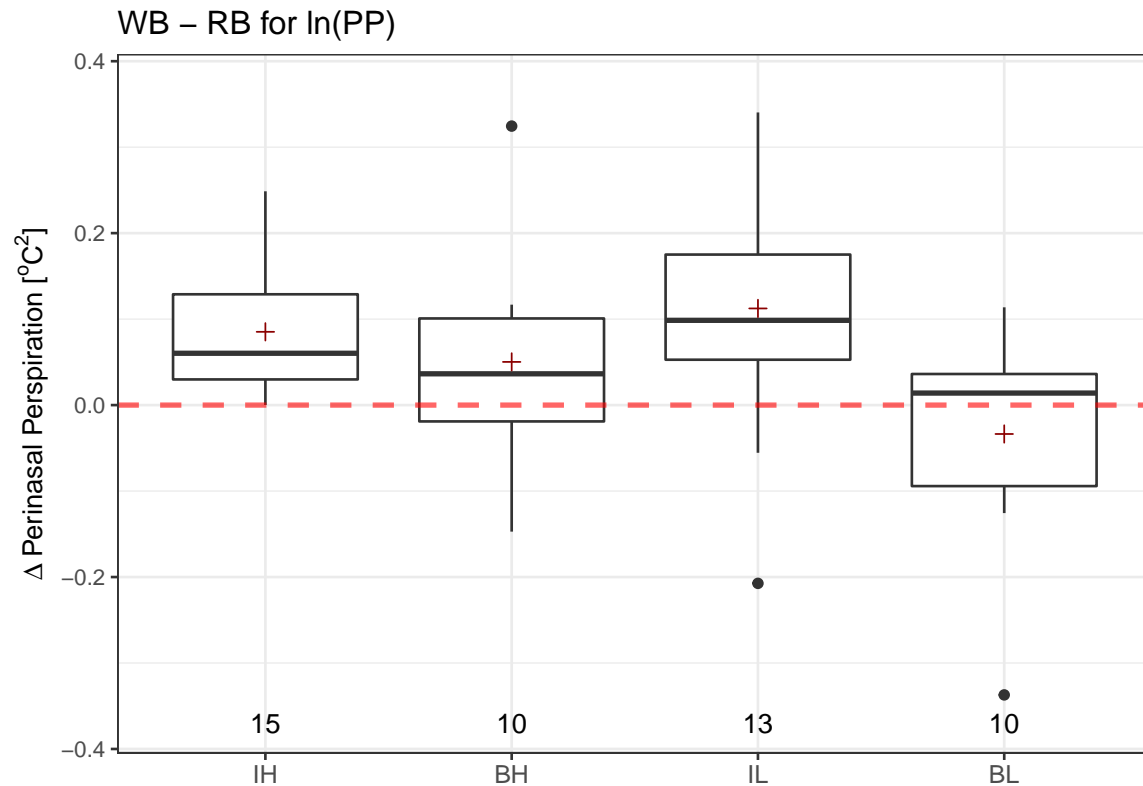
```
## BL has LESS than 7 subjects for D.HR. Cannot continue with test.
## -----
```



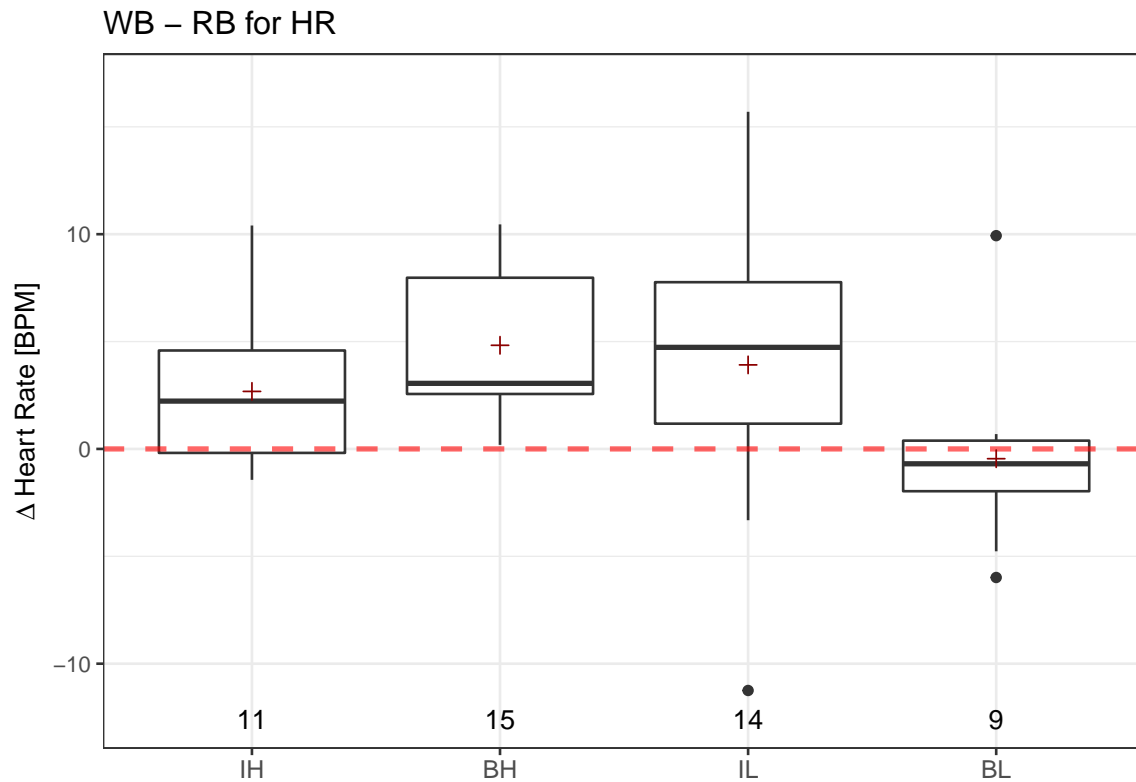
```
## Writing Baseline - Resting Baseline
## Wilcoxon p = 1 > 0.05
##
## Stress Condition - Resting Baseline
## Wilcoxon p = 0.8438 > 0.05
##
## StressCondition - Writing Baseline
## Wilcoxon p = 1 > 0.05
##
## Dual Task - Resting Baseline
## Wilcoxon p = 0.8438 > 0.05
##
## Dual Task - Writing Baseline
## Wilcoxon p = 0.3125 > 0.05
##
## Dual Task - Stress Condition
## Wilcoxon p = 0.5469 > 0.05
##
## Presentation - Resting Baseline
## Wilcoxon p = 0.4609 > 0.05
##
## Presentation - Writing Baseline
## Wilcoxon p = 0.8438 > 0.05
##
## Presentation - Stress Condition
```

```
## Wilcoxon p = 0.4609 > 0.05
##
## Presentation - Dual Task
## Wilcoxon p = 0.1094 > 0.05
```

## Across Activities

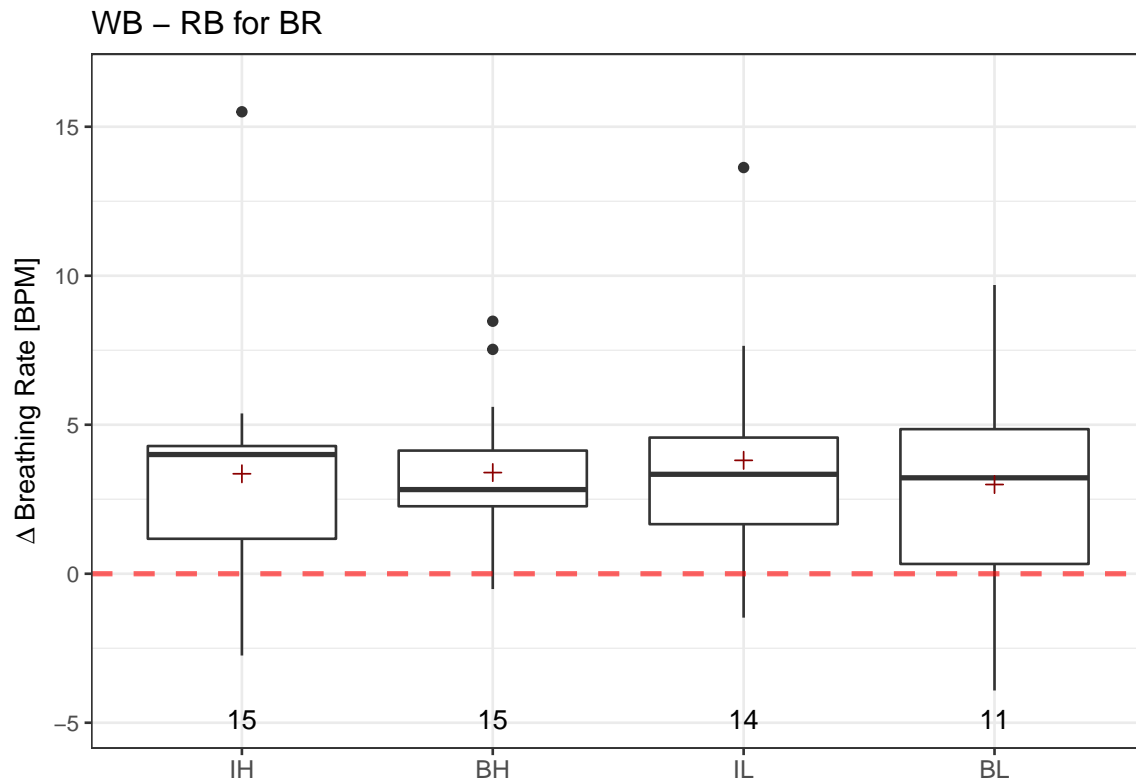


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.1338  0.04460    3.134  0.0349 *
## Residuals  44  0.6262  0.01423
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -0.08383790 -0.22629177  0.05861598  0.4051270
## IH-BH  0.03499660 -0.09504540  0.16503860  0.8891898
## IL-BH  0.06217453 -0.07180903  0.19615808  0.6058502
## IH-BL  0.11883450 -0.01120750  0.24887650  0.0843080
## IL-BL  0.14601242  0.01202886  0.27999598  0.0278962
## IL-IH  0.02717792 -0.09352589  0.14788173  0.9311434
```

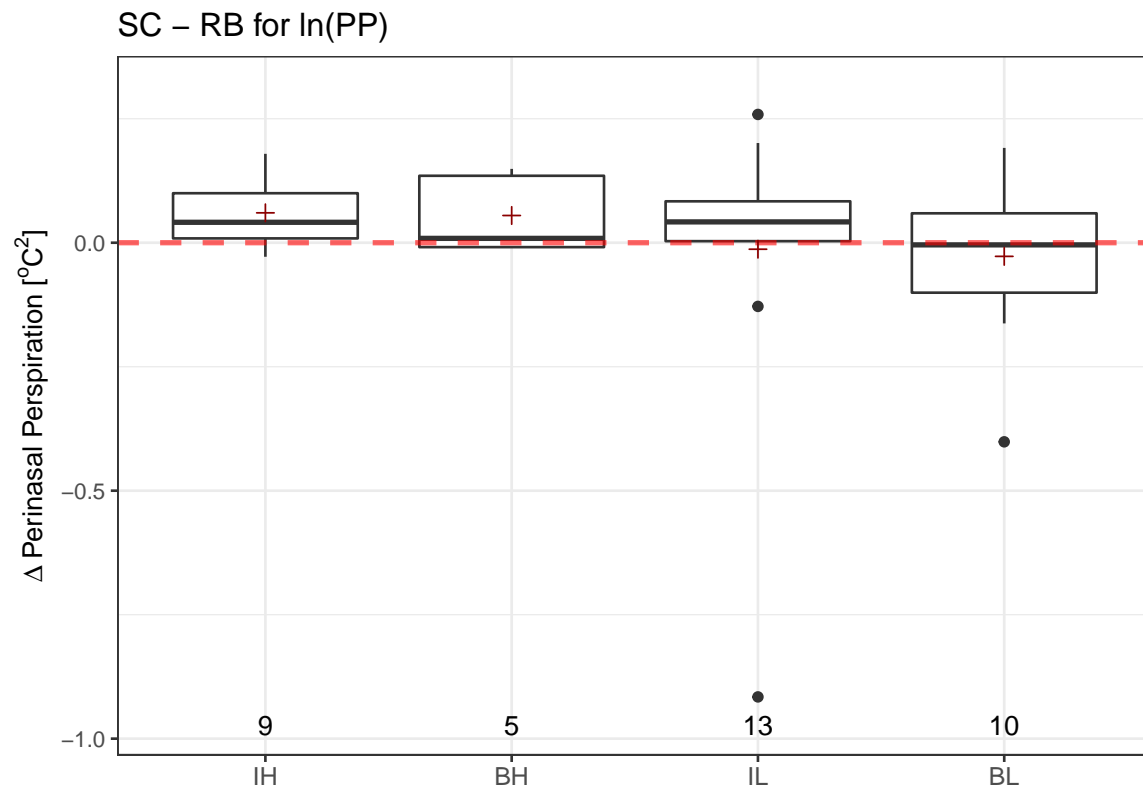


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  169.7    56.55     2.56 0.0667 .
## Residuals  45  993.9    22.09
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -5.2814127 -10.5675624  0.004736999  0.0502828
## IH-BH -2.1473334  -7.1240788  2.829411976  0.6602759
## IL-BH -0.9128669  -5.5718386  3.746104797  0.9531811
## IH-BL  3.1340793  -2.5009752  8.769133769  0.4555738
## IL-BL  4.3685458  -0.9879327  9.725024273  0.1456585
## IL-IH  1.2344665  -3.8169172  6.285850262  0.9143224
```

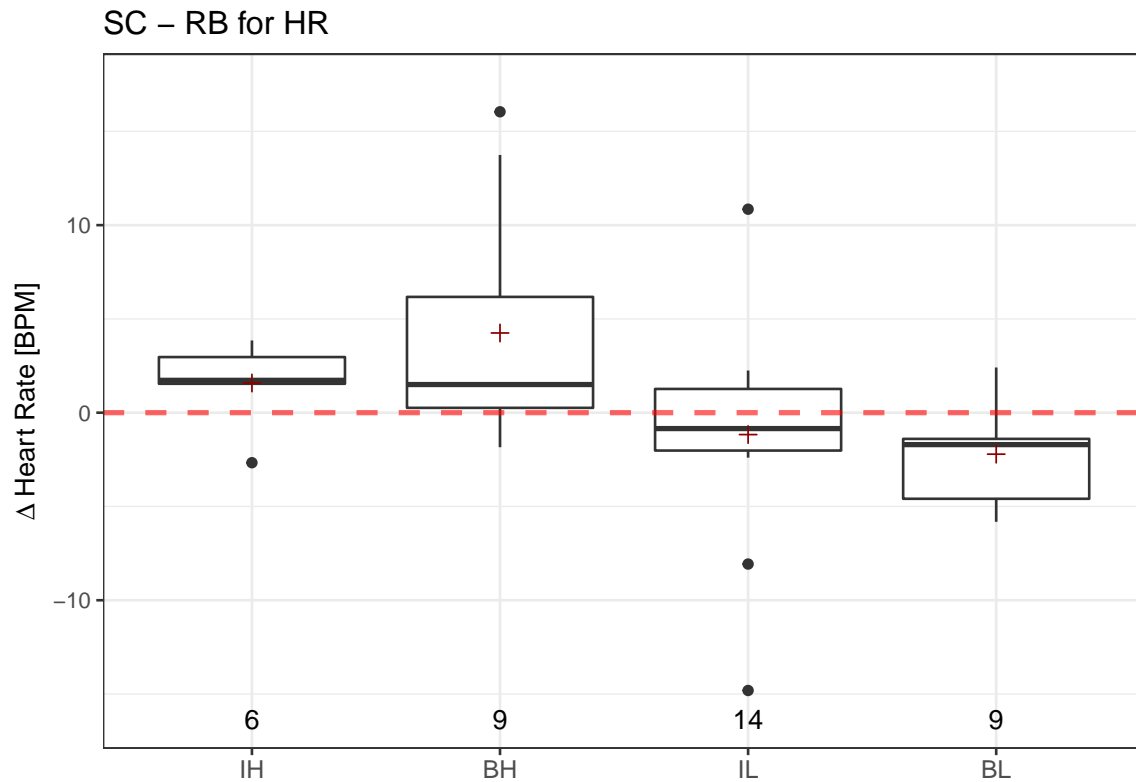




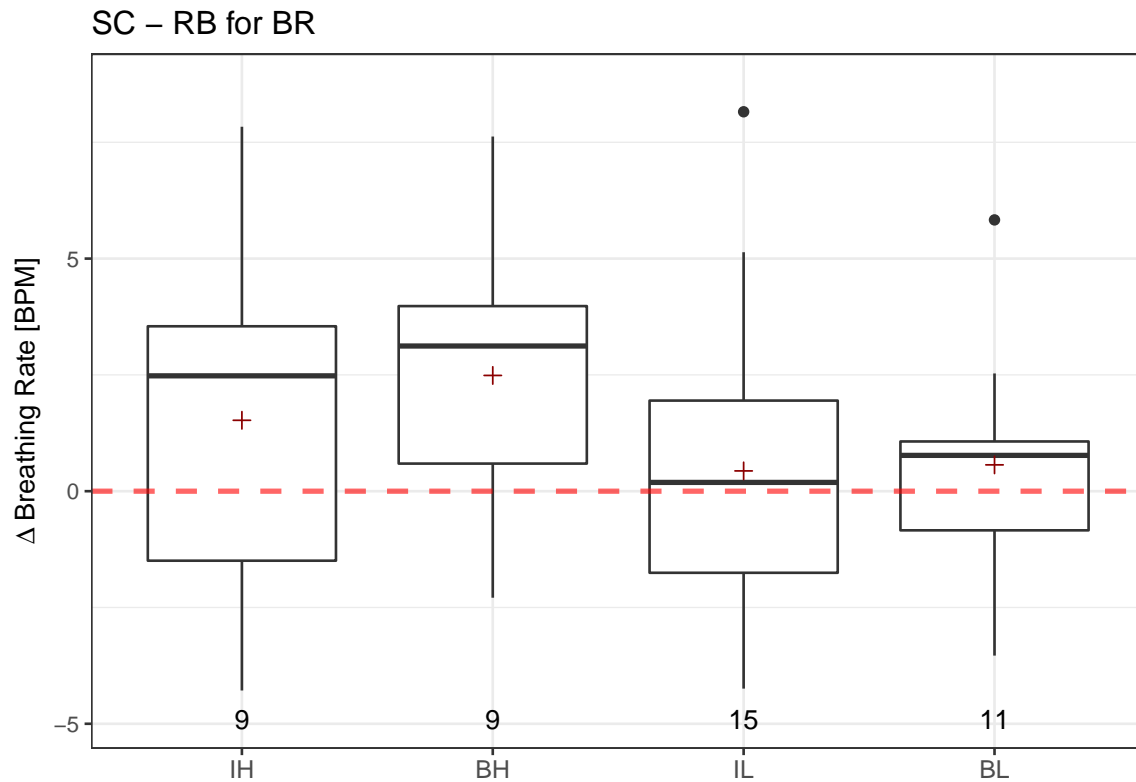
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3    4.1   1.379    0.104  0.957
## Residuals  51  674.3   13.221
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff          lwr          upr          p adj
## BL-BH -0.40148619 -4.234840  3.431868  0.9923935
## IH-BH -0.04142166 -3.567594  3.484751  0.9999889
## IL-BH  0.40943480 -3.179153  3.998023  0.9902226
## IH-BL  0.36006453 -3.473289  4.193419  0.9944804
## IL-BL  0.81092099 -3.079923  4.701765  0.9451724
## IL-IH  0.45085646 -3.137731  4.039444  0.9870445
```



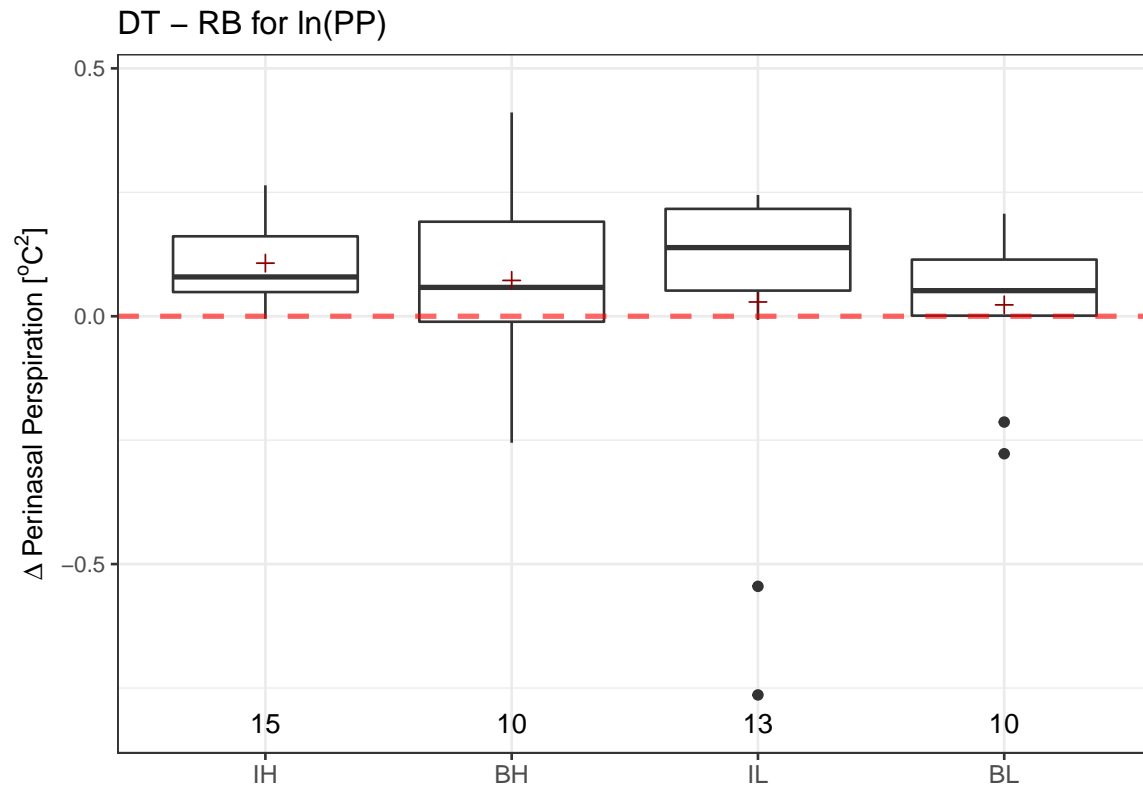
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0538  0.01793    0.446  0.722
## Residuals  33  1.3257  0.04017
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -0.082385001 -0.3793376  0.2145676  0.8758152
## IH-BH  0.005365023 -0.2970367  0.3077668  0.9999594
## IL-BH -0.067979455 -0.3532823  0.2173234  0.9167062
## IH-BL  0.087750024 -0.1613548  0.3368548  0.7766867
## IL-BL  0.014405546 -0.2136385  0.2424496  0.9981894
## IL-IH -0.073344478 -0.3084403  0.1617514  0.8331350
```



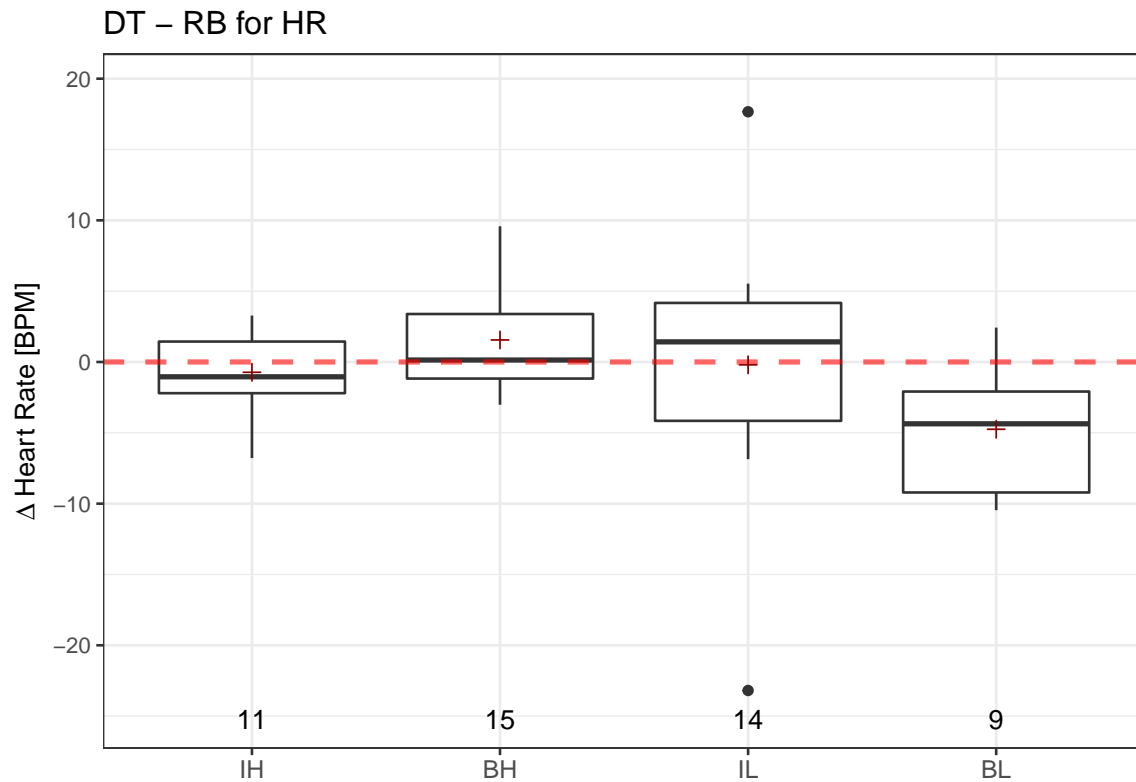
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  237.3    79.09   3.202 0.0354 *
## Residuals  34  839.8    24.70
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## ---
##
##      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 -6.462221 -12.789640 -0.1348014 0.0438279
## IH-BH -2.667175  -9.741445  4.4070944 0.7399742
## IL-BH -5.417700 -11.152411  0.3170101 0.0697190
## IH-BL  3.795045  -3.279224 10.8693150 0.4787008
## IL-BL  1.044520  -4.690191  6.7792307 0.9603634
## IL-IH -2.750525  -9.300026  3.7989759 0.6712975
```



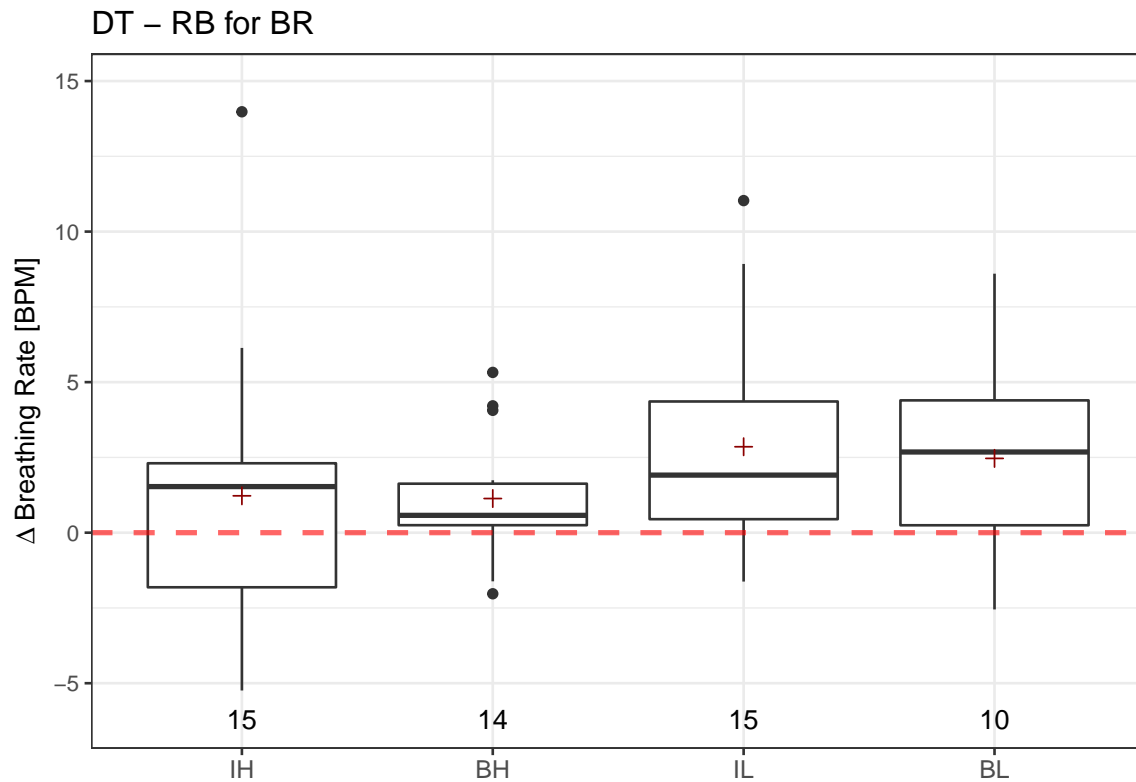
```
## [1] "Removed 12 subjects who had Stroop scores less than 30."
##
## ---
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   28.7    9.57    0.916  0.442
## Residuals  40  417.7   10.44
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr          upr          p adj
## BL-BH -1.9219267 -5.814979  1.971126  0.5538979
## IH-BH -0.9638753 -5.046943  3.119193  0.9208512
## IL-BH -2.0523985 -5.704406  1.599609  0.4432901
## IH-BL  0.9580514 -2.935001  4.851104  0.9115233
## IL-BL -0.1304718 -3.568723  3.307779  0.9996166
## IL-IH -1.0885232 -4.740530  2.563484  0.8544828
```



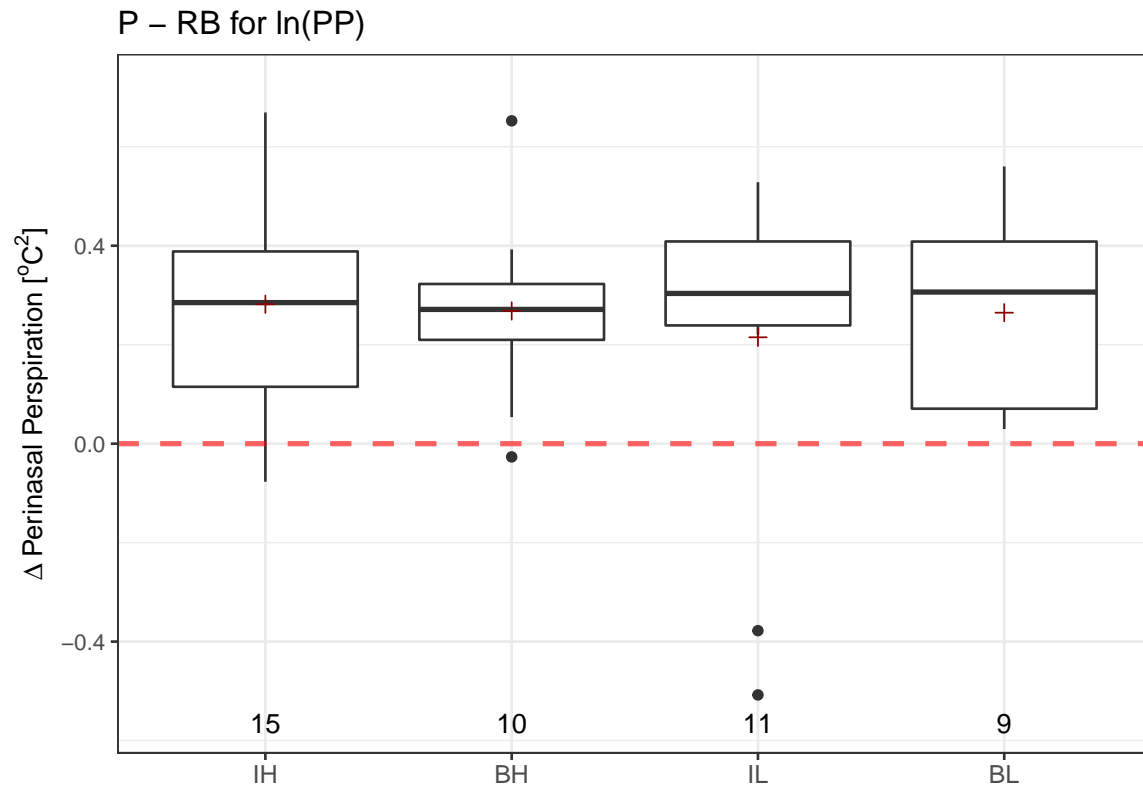
```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0611  0.02038    0.493   0.689
## Residuals  44  1.8202  0.04137
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr           p adj
## BL-BH -0.049265182 -0.2921306  0.1936003  0.9483086
## IH-BH  0.034881802 -0.1868230  0.2565866  0.9747539
## IL-BH -0.043476591 -0.2719012  0.1849481  0.9567128
## IH-BL  0.084146984 -0.1375578  0.3058518  0.7425043
## IL-BL  0.005788591 -0.2226361  0.2342132  0.9998871
## IL-IH -0.078358393 -0.2841428  0.1274260  0.7406074
```



```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3    227   75.68    2.292 0.0909 .
## Residuals  45   1486   33.02
## ---
## 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 -6.3047285 -12.768469  0.1590117 0.0582857
## IH-BH -2.2826067  -8.368017  3.8028035 0.7497856
## IL-BH -1.7554538  -7.452300  3.9413926 0.8437379
## IH-BL  4.0221219  -2.868248 10.9124921 0.4129178
## IL-BL  4.5492748  -2.000461 11.0990109 0.2627547
## IL-IH  0.5271529  -5.649523  6.7038286 0.9957790
```

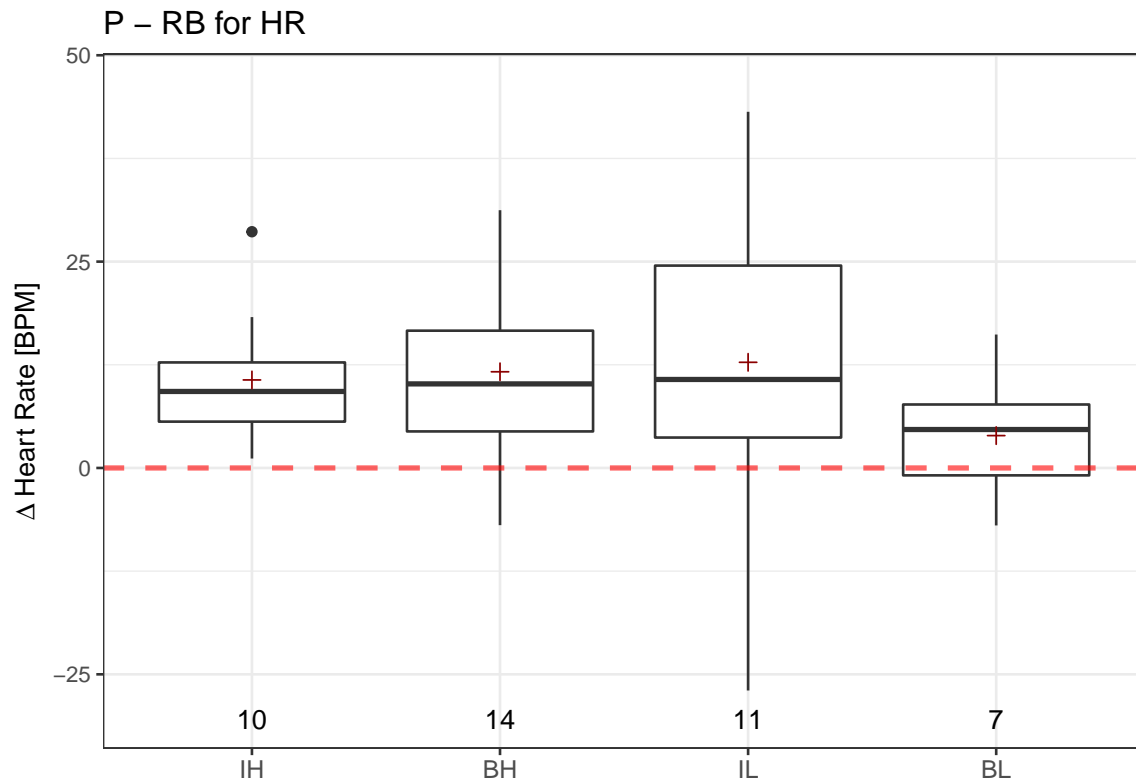


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   31.9   10.64    0.806  0.497
## Residuals  50  660.1    13.20
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff          lwr          upr          p adj
## BL-BH  1.33296028 -2.665173  5.331094  0.8120896
## IH-BH  0.09075228 -3.497682  3.679187  0.9998895
## IL-BH  1.72032421 -1.868110  5.308759  0.5834676
## IH-BL -1.24220800 -5.184421  2.700005  0.8363879
## IL-BL  0.38736393 -3.554849  4.329576  0.9936817
## IL-IH  1.62957193 -1.896450  5.155594  0.6121271
```

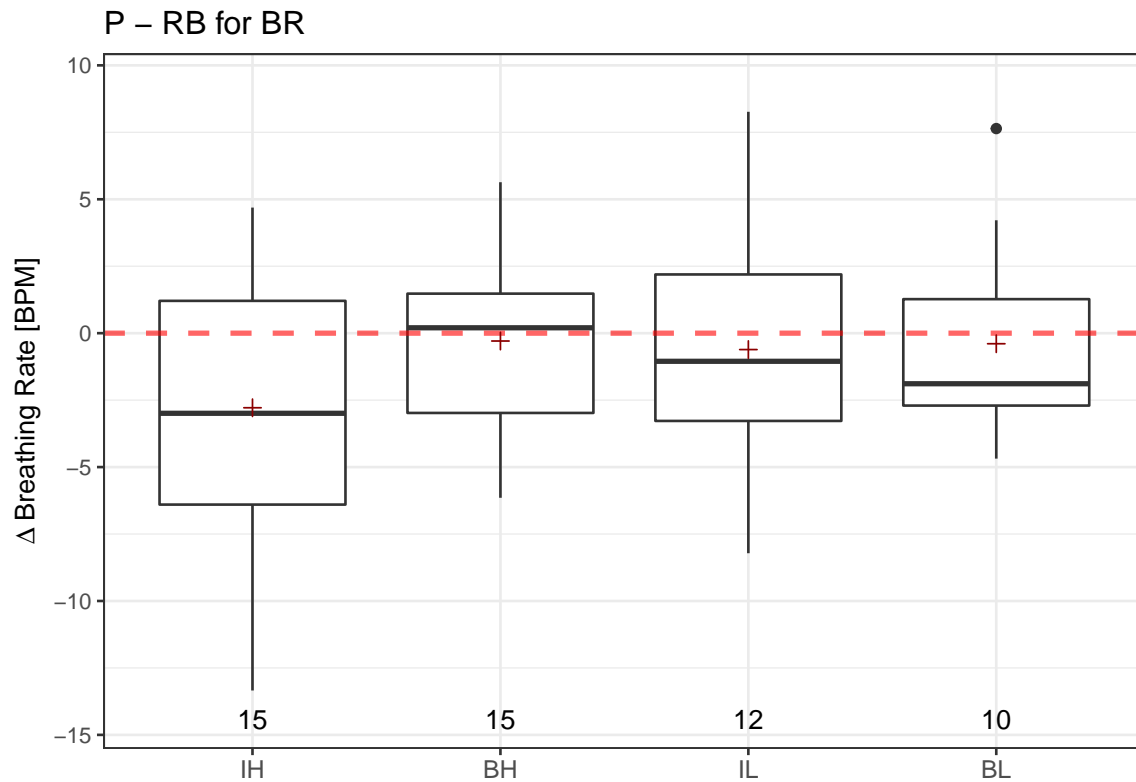


```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3  0.0302  0.01007    0.171   0.915
## Residuals  41  2.4099  0.05878
##
## ---
##
##      Tukey multiple comparisons of means
##      95% family-wise confidence level
##
## Fit: aov(formula = formula(paste(diff, "~ Condition")), data = anova_df)
##
## $Condition
##           diff           lwr           upr         p adj
## BL-BH -0.00353162 -0.3018039  0.2947406  0.9999884
## IH-BH  0.01359213 -0.2514297  0.2786140  0.9990601
## IL-BH -0.05319012 -0.3368322  0.2304519  0.9581126
## IH-BL  0.01712375 -0.2565897  0.2908371  0.9983003
## IL-BL -0.04965850 -0.3414380  0.2421210  0.9681362
## IL-IH -0.06678225 -0.3244749  0.1909104  0.8988289
```





```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3    380   126.6    0.732  0.539
## Residuals  38   6575   173.0
##
## ---
##
##      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 -7.7337013 -24.092166  8.624763 0.5871706
## IH-BH -0.9906987 -15.622154 13.640757 0.9978251
## IL-BH  1.1453187 -13.092897 15.383535 0.9963734
## IH-BL  6.7430026 -10.671913 24.157918 0.7271380
## IL-BL  8.8790200  -8.206839 25.964879 0.5095144
## IL-IH  2.1360174 -13.304407 17.576442 0.9822160
```



```
## ANOVA:
##           Df Sum Sq Mean Sq F value Pr(>F)
## Condition   3   60.2   20.07    1.043  0.382
## Residuals  48  923.7   19.24
##
## ---
##
##      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 -0.1014122 -4.867702  4.664878  0.9999339
## IH-BH -2.4921638 -6.755263  1.770936  0.4131373
## IL-BH -0.3193222 -4.841022  4.202378  0.9976122
## IH-BL -2.3907516 -7.157042  2.375539  0.5456873
## IL-BL -0.2179100 -5.216837  4.781017  0.9994335
## IL-IH  2.1728416 -2.348858  6.694541  0.5806199
```

## Summary

Condition	Difference	Measure	p	Test	n	Significance
BH	WB - RB	PP	0.2315969	Transformed t-test	10	
BH	WB - RB	HR	0.0000397	t-test	15	***
BH	WB - RB	BR	0.0000819	t-test	15	***
BH	WB - RB	N.EDA	0.3082373	Transformed t-test	8	
BH	WB - RB	N.HR	0.8417278	t-test	8	
BH	SC - RB	PP	0.6104228	Transformed t-test	10	
BH	SC - RB	HR	0.0206642	t-test	15	*
BH	SC - RB	BR	0.0101217	t-test	15	*
BH	SC - RB	N.EDA	0.1157081	Transformed t-test	8	
BH	SC - RB	N.HR	0.3592209	t-test	8	
BH	SC - WB	PP	0.4765328	Transformed t-test	10	
BH	SC - WB	HR	0.4186405	t-test	15	
BH	SC - WB	BR	0.2490832	t-test	15	
BH	SC - WB	N.EDA	0.1241598	Transformed t-test	8	
BH	SC - WB	N.HR	0.8555270	t-test	8	
BH	DT - RB	PP	0.2511473	Transformed t-test	10	
BH	DT - RB	HR	0.1257425	t-test	15	
BH	DT - RB	BR	0.0659588	t-test	14	
BH	DT - RB	N.EDA	0.0913543	Transformed t-test	8	
BH	DT - RB	N.HR	0.7878648	t-test	8	
BH	DT - WB	PP	0.6593106	Transformed t-test	10	
BH	DT - WB	HR	0.0014260	t-test	15	**
BH	DT - WB	BR	0.0000036	t-test	14	***
BH	DT - WB	N.EDA	0.1073219	Transformed t-test	8	
BH	DT - WB	N.HR	0.9925262	t-test	8	
BH	DT - SC	PP	0.3462413	Transformed t-test	10	
BH	DT - SC	HR	0.0754511	t-test	15	
BH	DT - SC	BR	0.0783487	t-test	14	
BH	DT - SC	N.EDA	0.6121291	Transformed t-test	8	
BH	DT - SC	N.HR	0.7312055	t-test	8	
BH	P - RB	PP	0.0013270	Transformed t-test	10	**
BH	P - RB	HR	0.0026135	t-test	14	**
BH	P - RB	BR	0.7444038	t-test	15	
BH	P - RB	N.EDA	0.1275027	Transformed t-test	8	
BH	P - RB	N.HR	0.1501817	t-test	8	
BH	P - WB	PP	0.0041298	Transformed t-test	10	**
BH	P - WB	HR	0.0384611	t-test	14	*
BH	P - WB	BR	0.0064616	t-test	15	**
BH	P - WB	N.EDA	0.1120002	Transformed t-test	8	
BH	P - WB	N.HR	0.2145898	t-test	8	
BH	P - SC	PP	0.0045991	Transformed t-test	10	**
BH	P - SC	HR	0.0182793	t-test	14	*
BH	P - SC	BR	0.0271823	t-test	15	*
BH	P - SC	N.EDA	0.5045767	Transformed t-test	8	
BH	P - SC	N.HR	0.1441297	t-test	8	

(continued)

Condition	Difference	Measure	p	Test	n	Significance
BH	P - DT	PP	0.0002502	Transformed t-test	10	***
BH	P - DT	HR	0.0083713	t-test	14	**
BH	P - DT	BR	0.1269182	t-test	14	
BH	P - DT	N.EDA	0.7836899	Transformed t-test	8	
BH	P - DT	N.HR	0.1208967	t-test	8	
BL	WB - RB	PP	0.4342707	Transformed t-test	10	
BL	WB - RB	HR	0.7702325	t-test	9	
BL	WB - RB	BR	0.0332722	t-test	11	*
BL	WB - RB	N.EDA	0.3297979	Transformed t-test	8	
BL	WB - RB	N.HR	1.0000000	Wilcoxon	8	
BL	SC - RB	PP	0.6267730	Transformed t-test	10	
BL	SC - RB	HR	0.0428335	t-test	9	*
BL	SC - RB	BR	0.4496888	t-test	11	
BL	SC - RB	N.EDA	0.3939893	Transformed t-test	8	
BL	SC - RB	N.HR	0.8437500	Wilcoxon	8	
BL	SC - WB	PP	0.8916624	Transformed t-test	10	
BL	SC - WB	HR	0.2133105	t-test	9	
BL	SC - WB	BR	0.0212998	t-test	11	*
BL	SC - WB	N.EDA	0.6495591	Transformed t-test	8	
BL	SC - WB	N.HR	1.0000000	Wilcoxon	8	
BL	DT - RB	PP	0.6556868	Transformed t-test	10	
BL	DT - RB	HR	0.0122494	t-test	9	*
BL	DT - RB	BR	0.0377051	t-test	10	*
BL	DT - RB	N.EDA	0.4176734	Transformed t-test	8	
BL	DT - RB	N.HR	0.8437500	Wilcoxon	8	
BL	DT - WB	PP	0.1224239	Transformed t-test	10	
BL	DT - WB	HR	0.0169332	t-test	9	*
BL	DT - WB	BR	0.0248169	t-test	10	*
BL	DT - WB	N.EDA	0.7359741	Transformed t-test	8	
BL	DT - WB	N.HR	0.3125000	Wilcoxon	8	
BL	DT - SC	PP	0.1705807	Transformed t-test	10	
BL	DT - SC	HR	0.0027195	t-test	9	**
BL	DT - SC	BR	0.0141386	t-test	10	*
BL	DT - SC	N.EDA	0.9749690	Transformed t-test	8	
BL	DT - SC	N.HR	0.5468750	Wilcoxon	8	
BL	P - RB	PP	0.0031556	Transformed t-test	9	**
BL	P - RB	HR	0.2311147	t-test	7	
BL	P - RB	BR	0.7553236	t-test	10	
BL	P - RB	N.EDA	0.7892852	Transformed t-test	8	
BL	P - RB	N.HR	0.4609375	Wilcoxon	8	
BL	P - WB	PP	0.0019720	Transformed t-test	9	**
BL	P - WB	HR	0.1333641	t-test	7	
BL	P - WB	BR	0.0172680	t-test	10	*
BL	P - WB	N.EDA	0.7258715	Transformed t-test	8	
BL	P - WB	N.HR	0.8437500	Wilcoxon	8	
BL	P - SC	PP	0.0161642	Transformed t-test	9	*
BL	P - SC	HR	0.0432154	t-test	7	*

(continued)

Condition	Difference	Measure	p	Test	n	Significance
BL	P - SC	BR	0.3786099	t-test	10	
BL	P - SC	N.EDA	0.5700326	Transformed t-test	8	
BL	P - SC	N.HR	0.4609375	Wilcoxon	8	
BL	P - DT	PP	0.0182805	Transformed t-test	9	*
BL	P - DT	HR	0.0097486	t-test	7	**
BL	P - DT	BR	0.0139682	t-test	9	*
BL	P - DT	N.EDA	0.5481070	Transformed t-test	8	
BL	P - DT	N.HR	0.1093750	Wilcoxon	8	
IH	WB - RB	PP	0.0006283	Transformed t-test	15	***
IH	WB - RB	HR	0.0314563	t-test	11	*
IH	WB - RB	BR	0.0083163	t-test	15	**
IH	WB - RB	N.EDA	0.3383382	Transformed t-test	8	
IH	WB - RB	N.HR	0.8055849	Transformed t-test	8	
IH	SC - RB	PP	0.0341621	Transformed t-test	15	*
IH	SC - RB	HR	0.2034842	t-test	11	
IH	SC - RB	BR	0.0915599	t-test	15	
IH	SC - RB	N.EDA	0.2702688	Transformed t-test	8	
IH	SC - RB	N.HR	0.6971260	Transformed t-test	8	
IH	SC - WB	PP	0.4108502	Transformed t-test	15	
IH	SC - WB	HR	0.2709306	t-test	11	
IH	SC - WB	BR	0.0506174	t-test	15	
IH	SC - WB	N.EDA	0.4462177	Transformed t-test	8	
IH	SC - WB	N.HR	0.7377091	Transformed t-test	8	
IH	DT - RB	PP	0.0001453	Transformed t-test	15	***
IH	DT - RB	HR	0.4189483	t-test	11	
IH	DT - RB	BR	0.3327191	t-test	15	
IH	DT - RB	N.EDA	0.2217029	Transformed t-test	8	
IH	DT - RB	N.HR	0.2221391	Transformed t-test	8	
IH	DT - WB	PP	0.3541678	Transformed t-test	15	
IH	DT - WB	HR	0.0053983	t-test	11	**
IH	DT - WB	BR	0.0007475	t-test	15	***
IH	DT - WB	N.EDA	0.0542093	Transformed t-test	8	
IH	DT - WB	N.HR	0.4686743	Transformed t-test	8	
IH	DT - SC	PP	0.2729733	Transformed t-test	15	
IH	DT - SC	HR	0.0775992	t-test	11	
IH	DT - SC	BR	0.5657289	t-test	15	
IH	DT - SC	N.EDA	0.2814879	Transformed t-test	8	
IH	DT - SC	N.HR	0.3102131	Transformed t-test	8	
IH	P - RB	PP	0.0001778	Transformed t-test	15	***
IH	P - RB	HR	0.0023820	t-test	10	**
IH	P - RB	BR	0.0545015	t-test	15	
IH	P - RB	N.EDA	0.2098217	Transformed t-test	8	
IH	P - RB	N.HR	0.1963474	Transformed t-test	8	
IH	P - WB	PP	0.0037232	Transformed t-test	15	**
IH	P - WB	HR	0.0278212	t-test	10	*
IH	P - WB	BR	0.0000461	t-test	15	***
IH	P - WB	N.EDA	0.7254665	Transformed t-test	8	

(continued)

Condition	Difference	Measure	p	Test	n	Significance
IH	P - WB	N.HR	0.5161270	Transformed t-test	8	
IH	P - SC	PP	0.0013151	Transformed t-test	15	**
IH	P - SC	HR	0.0051203	t-test	10	**
IH	P - SC	BR	0.0007951	t-test	15	***
IH	P - SC	N.EDA	0.4208914	Transformed t-test	8	
IH	P - SC	N.HR	0.1364381	Transformed t-test	8	
IH	P - DT	PP	0.0056969	Transformed t-test	15	**
IH	P - DT	HR	0.0014824	t-test	10	**
IH	P - DT	BR	0.0005062	t-test	15	***
IH	P - DT	N.EDA	0.4616190	Transformed t-test	8	
IH	P - DT	N.HR	0.0085617	Transformed t-test	8	**
IL	WB - RB	PP	0.0169797	Transformed t-test	13	*
IL	WB - RB	HR	0.0444250	t-test	14	*
IL	WB - RB	BR	0.0021295	t-test	14	**
IL	WB - RB	N.EDA	0.3262557	Transformed t-test	8	
IL	WB - RB	N.HR	0.9101562	Wilcoxon	9	
IL	SC - RB	PP	0.8723238	Transformed t-test	13	
IL	SC - RB	HR	0.4521805	t-test	14	
IL	SC - RB	BR	0.6181948	t-test	15	
IL	SC - RB	N.EDA	0.8310885	Transformed t-test	8	
IL	SC - RB	N.HR	1.0000000	Wilcoxon	9	
IL	SC - WB	PP	0.0510345	Transformed t-test	13	
IL	SC - WB	HR	0.0000816	t-test	14	***
IL	SC - WB	BR	0.0004476	t-test	14	***
IL	SC - WB	N.EDA	0.3205288	Transformed t-test	8	
IL	SC - WB	N.HR	0.2500000	Wilcoxon	9	
IL	DT - RB	PP	0.7483110	Transformed t-test	13	
IL	DT - RB	HR	0.9350998	t-test	14	
IL	DT - RB	BR	0.0105619	t-test	15	*
IL	DT - RB	N.EDA	0.7090759	Transformed t-test	8	
IL	DT - RB	N.HR	0.7343750	Wilcoxon	9	
IL	DT - WB	PP	0.1817115	Transformed t-test	13	
IL	DT - WB	HR	0.0079476	t-test	14	**
IL	DT - WB	BR	0.0035452	t-test	14	**
IL	DT - WB	N.EDA	0.3024548	Transformed t-test	8	
IL	DT - WB	N.HR	0.0976562	Wilcoxon	9	
IL	DT - SC	PP	0.4026303	Transformed t-test	13	
IL	DT - SC	HR	0.4751496	t-test	14	
IL	DT - SC	BR	0.0057118	t-test	15	**
IL	DT - SC	N.EDA	0.7364380	Transformed t-test	8	
IL	DT - SC	N.HR	0.5703125	Wilcoxon	9	
IL	P - RB	PP	0.0624070	Transformed t-test	11	
IL	P - RB	HR	0.0552440	t-test	11	
IL	P - RB	BR	0.6683606	t-test	12	
IL	P - RB	N.EDA	0.2730305	Transformed t-test	7	
IL	P - RB	N.HR	0.4609375	Wilcoxon	8	
IL	P - WB	PP	0.1846054	Transformed t-test	11	

(continued)

Condition	Difference	Measure	p	Test	n	Significance
IL	P - WB	HR	0.0985952	t-test	11	
IL	P - WB	BR	0.0000690	t-test	11	***
IL	P - WB	N.EDA	0.1214165	Transformed t-test	7	
IL	P - WB	N.HR	0.1953125	Wilcoxon	8	
IL	P - SC	PP	0.0090643	Transformed t-test	11	**
IL	P - SC	HR	0.0186726	t-test	11	*
IL	P - SC	BR	0.6101495	t-test	12	
IL	P - SC	N.EDA	0.2935919	Transformed t-test	7	
IL	P - SC	N.HR	0.9453125	Wilcoxon	8	
IL	P - DT	PP	0.0001277	Transformed t-test	11	***
IL	P - DT	HR	0.0090699	t-test	11	**
IL	P - DT	BR	0.0000458	t-test	12	***
IL	P - DT	N.EDA	0.0721371	Transformed t-test	8	
IL	P - DT	N.HR	0.7421875	Wilcoxon	8	