NOTE: CONDITION IN THE DATA IS EQUIVALENT TO ORDER IN THE PAPER.

```
> library(readr)
> times_by_taskOrderLayout <- read_csv("C:/Users/harde/OneDrive/Desktop/Resea
rch Stuff mark 2/2Dv1D CNB Efficiency Times.csv",
+      col_types = cols(Layout = col_character()))
> View(times_by_taskOrderLayout)
> find_task = times_by_taskOrderLayout[times_by_taskOrderLayout$Task == 'Find
',]
> View(find_task)
> View(times_by_taskOrderLayout)
> find_data = data.frame(find_task$Condition, find_task$Layout, find_task$Tim
e)
> View(find_data)
> View(find_task)
> str(find_data)
'data.frame':   60 obs. of  3 variables:
 $ find_task.Condition: chr  "1Dv2D" "1Dv2D" "1Dv2D" "1Dv2D" ...
 $ find_task.Layout   : chr  "1D" "2D" "1D" "2D" ...
 $ find_task.Time     : num  72 88 92 102 37 52 110 51 75 30 ...
> library(rcompanion)
> scheirerRayHare(find_task.Time ~ find_task.Condition + find_task.Layout, da
ta = find_data)

DV:  find_task.Time
Observations:  60
D:  0.998444
MS total:  305

                                            Df  Sum Sq      H p.value
find_task.Condition                          1   673.4 2.2111 0.13702
find_task.Layout                             1  1135.4 3.7283 0.05350
find_task.Condition:find_task.Layout         1    86.4 0.2837 0.59427
Residuals                                   56 16071.9
> gc_task = times_by_taskOrderLayout[times_by_taskOrderLayout$Task == 'Graph
Compare',]
> View(gc_task)
> gc_data = data.frame(gc_task$Condition, gc_task$Layout, gc_task$Time)
> str(gc_data)
'data.frame':   60 obs. of  3 variables:
 $ gc_task.Condition: chr  "1Dv2D" "1Dv2D" "1Dv2D" "1Dv2D" ...
 $ gc_task.Layout   : chr  "1D" "2D" "1D" "2D" ...
 $ gc_task.Time     : num  171 114 157 133 113 62 170 74 112 73 ...
> View(gc_data)
> scheirerRayHare(gc_task.Time ~ gc_task.Condition + gc_task.Layout, data = g
c_data)

DV:  gc_task.Time
Observations:  60
D:  0.9992776
MS total:  305

                                    Df  Sum Sq       H  p.value
gc_task.Condition                    1   395.3  1.2969 0.254781
gc_task.Layout                       1  5115.3 16.7835 0.000042
gc_task.Condition:gc_task.Layout     1   693.6  2.2757 0.131412
Residuals                           56 11777.9
> nc_task = times_by_taskOrderLayout[times_by_taskOrderLayout$Task == 'Number
Compare',]
> View(nc_task)
> nc_data = data.frame(nc_task$Condition, nc_task$Layout, nc_task$Time)
> View(nc_data)
```

```
> scheirerRayHare(nc_task.Time ~ nc_task.Condition + nc_task.Layout, data = n
c_data)

DV:  nc_task.Time
Observations:  60
D:  0.9987219
MS total:  305

                                   Df  Sum Sq        H p.value
nc_task.Condition                   1   104.0   0.3415 0.55898
nc_task.Layout                      1  6262.8  20.5601 0.00001
nc_task.Condition:nc_task.Layout    1   614.4   2.0170 0.15555
Residuals                          56 10990.8
> pt_task = times_by_taskOrderLayout[times_by_taskOrderLayout$Task == 'Parame
ter Tuning',]
> View(pt_task)
> pt_data = data.frame(pt_task$Condition, pt_task$Layout, pt_task$Time)
> View(pt_data)
> scheirerRayHare(pt_task.Time ~ pt_task.Condition + pt_task.Layout, data = p
t_data)

DV:  pt_task.Time
Observations:  60
D:  0.9997221
MS total:  305

                                   Df  Sum Sq        H p.value
pt_task.Condition                   1    24.1   0.0789 0.77875
pt_task.Layout                      1  2613.6   8.5716 0.00341
pt_task.Condition:pt_task.Layout    1   147.3   0.4830 0.48708
Residuals                          56 15205.1
> cc_task = times_by_taskOrderLayout[times_by_taskOrderLayout$Task == 'Code C
omparison',]
> View(cc_task)
> cc_data = data.frame(cc_task$Condition, cc_task$Layout, cc_task$Time)
> View(cc_data)
> scheirerRayHare(cc_task.Time ~ cc_task.Condition + cc_task.Layout, data = c
c_data)

DV:  cc_task.Time
Observations:  60
D:  0.9997499
MS total:  305

                                   Df  Sum Sq        H p.value
cc_task.Condition                   1     6.7   0.0219 0.88245
cc_task.Layout                      1  3904.3  12.8041 0.00035
cc_task.Condition:cc_task.Layout    1  3744.6  12.2804 0.00046
Residuals                          56 10335.0




> dunnTest(gc_task.Time ~ gc_task.Layout, data = gc_data, method = "bonferron
i")
Dunn (1964) Kruskal-Wallis multiple comparison
  p-values adjusted with the Bonferroni method.

  Comparison        Z      P.unadj        P.adj
1    1D - 2D 4.096766 4.189622e-05 4.189622e-05
Warning message:
gc_task.Layout was coerced to a factor.
> dunnTest(nc_task.Time ~ nc_task.Layout, data = nc_data, method = "bonferron
i")
```

```
Dunn (1964) Kruskal-Wallis multiple comparison
  p-values adjusted with the Bonferroni method.

   Comparison        Z      P.unadj        P.adj
1     1D - 2D 4.534325 5.778798e-06 5.778798e-06
Warning message:
nc_task.Layout was coerced to a factor.
> dunnTest(pt_task.Time ~ pt_task.Layout, data = pt_data, method = "bonferron
i")
Dunn (1964) Kruskal-Wallis multiple comparison
  p-values adjusted with the Bonferroni method.

   Comparison        Z      P.unadj        P.adj
1     1D - 2D 2.927723 0.003414541 0.003414541
Warning message:
pt_task.Layout was coerced to a factor.
> dunnTest(cc_task.Time ~ cc_task.Layout, data = cc_data, method = "bonferron
i")
Dunn (1964) Kruskal-Wallis multiple comparison
  p-values adjusted with the Bonferroni method.

   Comparison        Z      P.unadj        P.adj
1     1D - 2D 3.578278 0.000345865 0.000345865
Warning message:
cc_task.Layout was coerced to a factor.




> View(gc_data_1D)
> gc_data_2D = gc_data[gc_data$gc_task.Layout == "2D",]
> median(gc_data_1D$gc_task.Time) - median(gc_data_2D$gc_task.Time)
[1] 43
> median(gc_data_1D$gc_task.Time)
[1] 96
> median(gc_data_2D$gc_task.Time)
[1] 53
> 43/96
[1] 0.4479167
> nc_data_1D = nc_data[nc_data$nc_task.Layout == "1D",]
> nc_data_2D = nc_data[nc_data$nc_task.Layout == "2D",]
> median(nc_data_1D)
Error in median.default(nc_data_1D) : need numeric data
> median(nc_data_1D$nc_task.Time)
[1] 43
> median(nc_data_2D$nc_task.Time)
[1] 28.5
> 43 - 28.5
[1] 14.5
> 14.5 / 43
[1] 0.3372093
> pt_data_2D = pt_data[pt_data$pt_task.Layout == "2D",]
> pt_data_2D = pt_data[pt_data$pt_task.Layout == "1D",]
> median(pt_data_1D$pt_task.Time)
Error: object 'pt_data_1D' not found
> pt_data_2D = pt_data[pt_data$pt_task.Layout == "2D",]
> pt_data_1D = pt_data[pt_data$pt_task.Layout == "1D",]
> median(pt_data_1D$pt_task.Time)
[1] 255
> median(pt_data_2D$pt_task.Time)
[1] 196.5
> 255 - 196.5
[1] 58.5
> 58.5/255
```

```
[1] 0.2294118
> cc_data_1D = cc_data[cc_data$cc_task.Layout == "1D",]
> cc_data_2D = cc_data[cc_data$cc_task.Layout == "2D",]
> median(cc_data_1D$cc_task.Time)
[1] 157.5
> median(cc_data_2D$cc_task.Time)
[1] 106
> 157.5 - 106
[1] 51.5
> 51.5/157.5
[1] 0.3269841
```