# PHYSICAL ACTIVITY ENVIRONMENT AND PERFEC/TENACI

Ma. Fer. Serrano

Today's Date

# INTRODUCTION.

Previous analyses showed that enviromental variables, such as school, have significant effects on IQ and Perf. variables.

For this reason:

- we explore the effect of the enviroment variables that promote physiscal activity in schools on IQ and Perf variables.
- Variables related to how the evironment of schools devoted to physical activity were collected.
- They are named and defined in the following section.

# DOCUMENTATION

## VARIABLES DE AMBIENTE PARA ACTIVIDAD FISICA

El sufijo aaf_ en todas las variables abrevia: Ambiente (para) Actividad Fisica.

- aaf_

### OBSERVED VARIABLES

| Nombre d Variable | Definicion | Valores |
|---|---|---|
| aaf_t_pe_class | t Tiempo en clase de ed. fisica | Minutos por semana |
| aaf_t_recess | t Tiempo de recreo | Minutos por semana |
| aaf_population_size | Poblacion total de la escuela | 1 - 4 = chica, mediana, grande, muy_gr |
| aaf_s_size | s Tamannho d Espacio para actividad | 0 - 4 = no_hay, chico, mediano, grande, muy_gr |
| aaf_s_avail | s Espacio esta disponible o no | 0, 1 |
| aaf_s_used | s Espacio se usa o no | 0, 1 |
| aaf_s_shape | s Forma del espacio | rectang, triang, irregular, other |

### COMPUTED VARIABLES

| Computed Variable | Definition | Formula |
|---|---|---|
| aaf_t_sum_total | total aggregated class+recess time | t_sum = t_class + t_recess |
| aaf_ratio_s_pop | space-size population-size ratio | ratio_sp = s_size / pop_size |
| aaf_indica_rec_t_s_p | time_space/population Indicator: Product of recess-time times the space/population ratio | indica_tsp = t_recesss * ratio_sp |
| aaf_indica_sum_t_s_p | total time_space/population Indicator: Product of aggregated time (class+recess) times the space/population ratio | indica_sum_tsp = t_sum * ratio_sp |

# ANALYSES.

## LINEAR REGRESSSION ASSOCIATION ANALYSES.

### PHYSICAL ACTIVITY ENVIROMENT VS IQ/FROST/OROS VARIABLES.

Six significant associations were found.

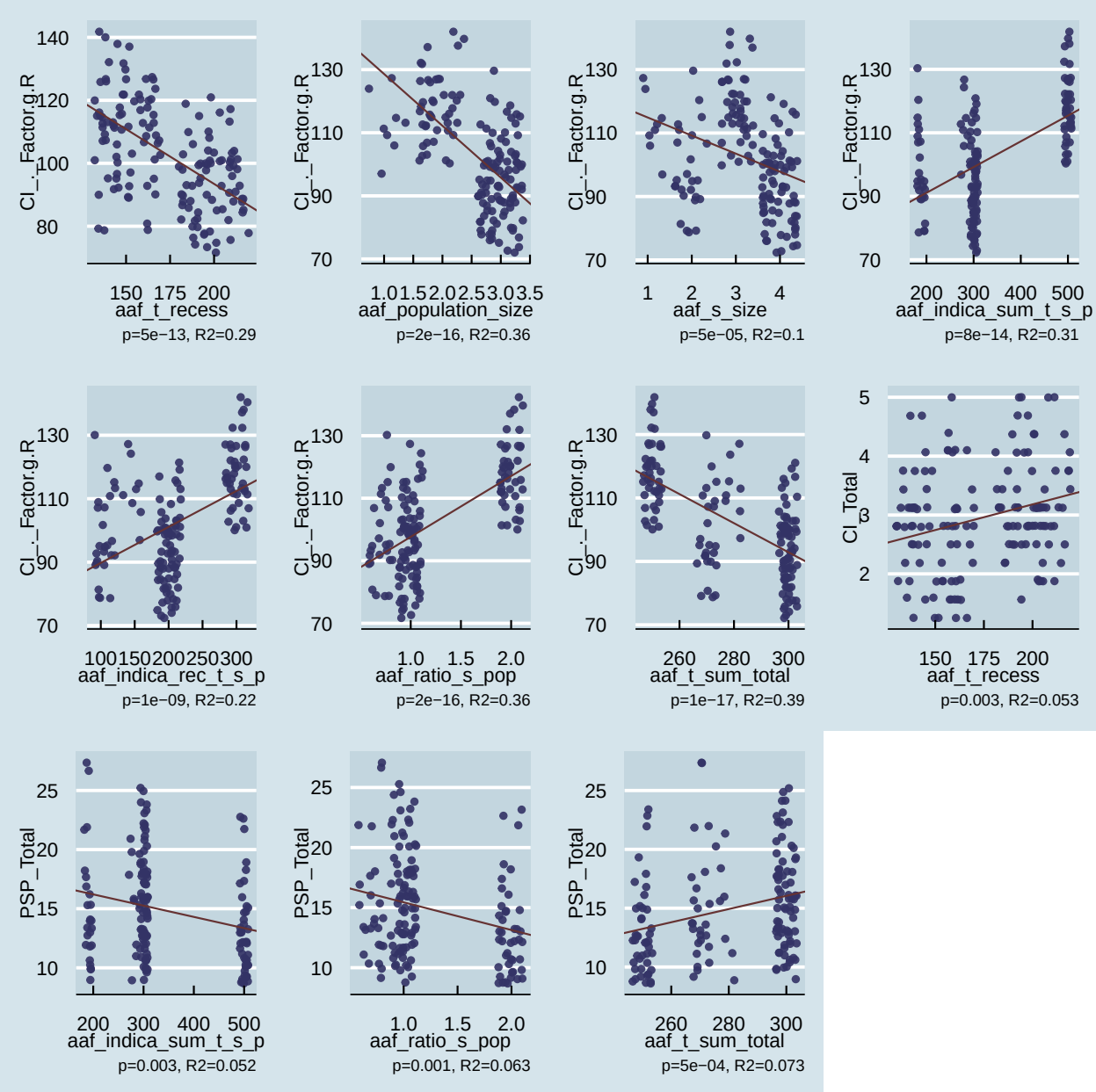
- The strongest association (r>0.6) was found between IQ and physical activity aggregated time.
- Of particular interest:
- Association between Oros's PSP social dimension and aggregated time was found.

The following is the list of significant results, listing the name of variables, pvalue and Rsquared.

```
## ACTIVITY REGRESSION ANALYSES
res_activity_corr <- regression_significant_main(oactivity_df, joint_nums, varnames_activity, significa
```

```
## [1] "CI_._Factor.g.R aaf_t_recess"
## pv= 5e-13
## R2= 0.29
## [1] "CI_._Factor.g.R aaf_population_size"
## pv= 2e-16
## R2= 0.36
## [1] "CI_._Factor.g.R aaf_s_size"
## pv= 5e-05
## R2= 0.1
## [1] "CI_._Factor.g.R aaf_indica_sum_t_s_p"
## pv= 8e-14
## R2= 0.31
## [1] "CI_._Factor.g.R aaf_indica_rec_t_s_p"
## pv= 1e-09
## R2= 0.22
## [1] "CI_._Factor.g.R aaf_ratio_s_pop"
## pv= 2e-16
## R2= 0.36
## [1] "CI_._Factor.g.R aaf_t_sum_total"
## pv= 1e-17
## R2= 0.39
## [1] "CI_Total aaf_t_recess"
## pv= 0.003
## R2= 0.053
```

```
## [1] "PSP_Total aaf_indica_sum_t_s_p"
## pv= 0.003
## R2= 0.052
## [1] "PSP_Total aaf_ratio_s_pop"
## pv= 0.001
## R2= 0.063
## [1] "PSP_Total aaf_t_sum_total"
## pv= 5e-04
## R2= 0.073
## [1] "NUMBER OF SIGNIFICANT ANALYSES:"
## [1] 11
```




```
## [1] "NUMBER OF GRAPHICS IN GRID:"
## [1] 11
```

```
## SHOW THE CORRELATIONS GRID
res_activity_corr[['grid']]
```

```
## TableGrob (3 x 4) "arrange": 11 grobs
##                                          z     cells    name           grob
## CI_._Factor.g.R_~_aaf_t_recess           1 (1-1,1-1) arrange gtable[layout]
## CI_._Factor.g.R_~_aaf_population_size    2 (1-1,2-2) arrange gtable[layout]
## CI_._Factor.g.R_~_aaf_s_size             3 (1-1,3-3) arrange gtable[layout]
## CI_._Factor.g.R_~_aaf_indica_sum_t_s_p   4 (1-1,4-4) arrange gtable[layout]
## CI_._Factor.g.R_~_aaf_indica_rec_t_s_p   5 (2-2,1-1) arrange gtable[layout]
## CI_._Factor.g.R_~_aaf_ratio_s_pop        6 (2-2,2-2) arrange gtable[layout]
## CI_._Factor.g.R_~_aaf_t_sum_total        7 (2-2,3-3) arrange gtable[layout]
## CI_Total_~_aaf_t_recess                  8 (2-2,4-4) arrange gtable[layout]
## PSP_Total_~_aaf_indica_sum_t_s_p         9 (3-3,1-1) arrange gtable[layout]
## PSP_Total_~_aaf_ratio_s_pop             10 (3-3,2-2) arrange gtable[layout]
## PSP_Total_~_aaf_t_sum_total             11 (3-3,3-3) arrange gtable[layout]
```

### DIFFERENCES BETWEEN GROUPS ANALYSES.

The following is the list of significant results, listing the name of variables, pvalue and Rsquared.

```
## ACTIVITY SAME ANALYSIS AS ABOVE BUT THE ACTIVITIES ARE TAKEN AS CATEFORIES FOR  DIFFERENCE ANALYSES
res_activity_diff <- regression_significant_main(oactivity_factored_df, joint_nums, varnames_activity, s
```

```
## [1] "CI_._Factor.g.R aaf_t_recess"
## pv= 5e-13
## R2= 0.29
## [1] "CI_._Factor.g.R aaf_population_size"
## pv= 4e-05
## R2= 0.46
## [1] "CI_._Factor.g.R aaf_s_size"
## pv= 2e-05
## R2= 0.46
## [1] "CI_._Factor.g.R aaf_indica_sum_t_s_p"
## pv= 1e-10
## R2= 0.46
## [1] "CI_._Factor.g.R aaf_indica_rec_t_s_p"
## pv= 1e-10
## R2= 0.46
## [1] "CI_._Factor.g.R aaf_ratio_s_pop"
## pv= 1e-09
## R2= 0.39
## [1] "CI_._Factor.g.R aaf_t_sum_total"
## pv= 8e-21
## R2= 0.46
## [1] "CI_Total aaf_t_pe_class"
## pv= 0.03
## R2= 0.022
## [1] "CI_Total aaf_t_recess"
## pv= 0.003
## R2= 0.053
## [1] "CI_Total aaf_indica_sum_t_s_p"
## pv= 0.004
## R2= 0.055
## [1] "CI_Total aaf_indica_rec_t_s_p"
```

```
## pv= 0.004
## R2= 0.055
## [1] "CI_Total aaf_ratio_s_pop"
## pv= 0.004
## R2= 0.061
## [1] "CI_Total aaf_t_sum_total"
## pv= 0.01
## R2= 0.055
## [1] "Grit.S aaf_t_pe_class"
## pv= 0.006
## R2= 0.04
## [1] "Grit.S aaf_t_recess"
## pv= 0.02
## R2= 0.028
## [1] "Grit.S aaf_indica_sum_t_s_p"
## pv= 0.002
## R2= 0.047
## [1] "Grit.S aaf_indica_rec_t_s_p"
## pv= 0.002
## R2= 0.047
## [1] "Grit.S aaf_ratio_s_pop"
## pv= 0.002
## R2= 0.053
## [1] "ESP_Total aaf_t_pe_class"
## pv= 0.02
## R2= 0.027
## [1] "ESP_Total aaf_population_size"
## pv= 0.01
## R2= 0.031
## [1] "ESP_Total aaf_s_size"
## pv= 0.01
## R2= 0.026
## [1] "ESP_Total aaf_indica_sum_t_s_p"
## pv= 0.03
## R2= 0.026
## [1] "ESP_Total aaf_indica_rec_t_s_p"
## pv= 0.03
## R2= 0.026
## [1] "ESP_Total aaf_t_sum_total"
## pv= 0.01
## R2= 0.026
## [1] "Preocupaci..n_perfeccionista aaf_t_sum_total"
## pv= 0.03
## R2= 0.016
## [1] "Esfuerzo_Perfeccionista aaf_population_size"
## pv= 0.02
## R2= 0.024
## [1] "Esfuerzo_Perfeccionista aaf_s_size"
## pv= 0.02
## R2= 0.02
## [1] "Esfuerzo_Perfeccionista aaf_t_sum_total"
## pv= 0.02
## R2= 0.02
## [1] "Perfeccionismo_de_.Frost aaf_t_sum_total"
```

```
## pv= 0.03
## R2= 0.023
## [1] "PSP_Total aaf_t_recess"
## pv= 0.004
## R2= 0.047
## [1] "PSP_Total aaf_t_sum_total"
## pv= 3e-04
## R2= 0.067
## [1] "POO_Total aaf_t_pe_class"
## pv= 0.01
## R2= 0.051
## [1] "POO_Total aaf_population_size"
## pv= 0.004
## R2= 0.042
## [1] "POO_Total aaf_s_size"
## pv= 0.002
## R2= 0.046
## [1] "POO_Total aaf_indica_sum_t_s_p"
## pv= 0.002
## R2= 0.046
## [1] "POO_Total aaf_indica_rec_t_s_p"
## pv= 0.002
## R2= 0.046
## [1] "POO_Total aaf_t_sum_total"
## pv= 0.02
## R2= 0.046
## [1] "NUMBER OF SIGNIFICANT ANALYSES:"
## [1] 37
```

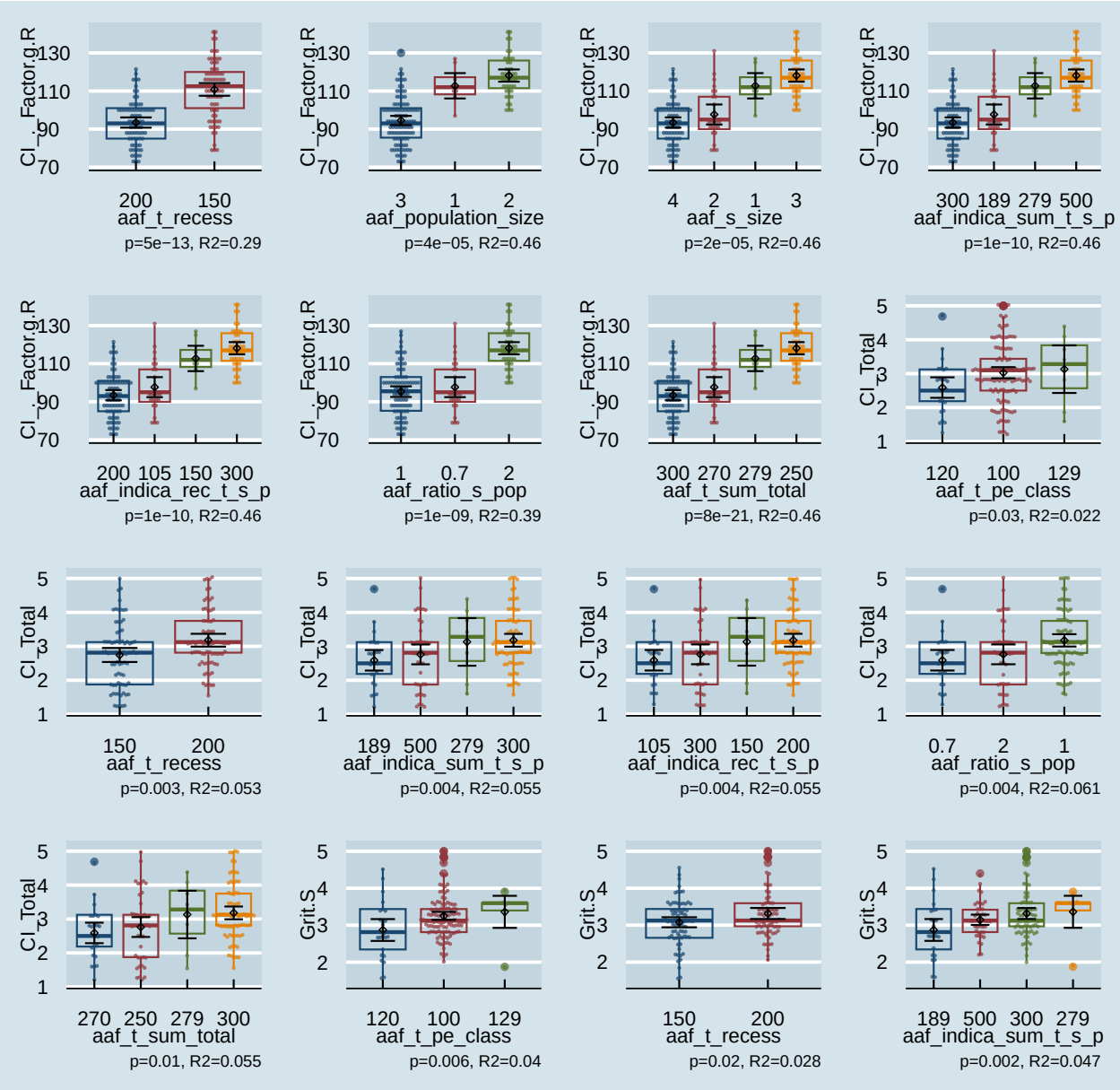
```
## [1] "NUMBER OF GRAPHICS IN GRID:"
## [1] 37
```

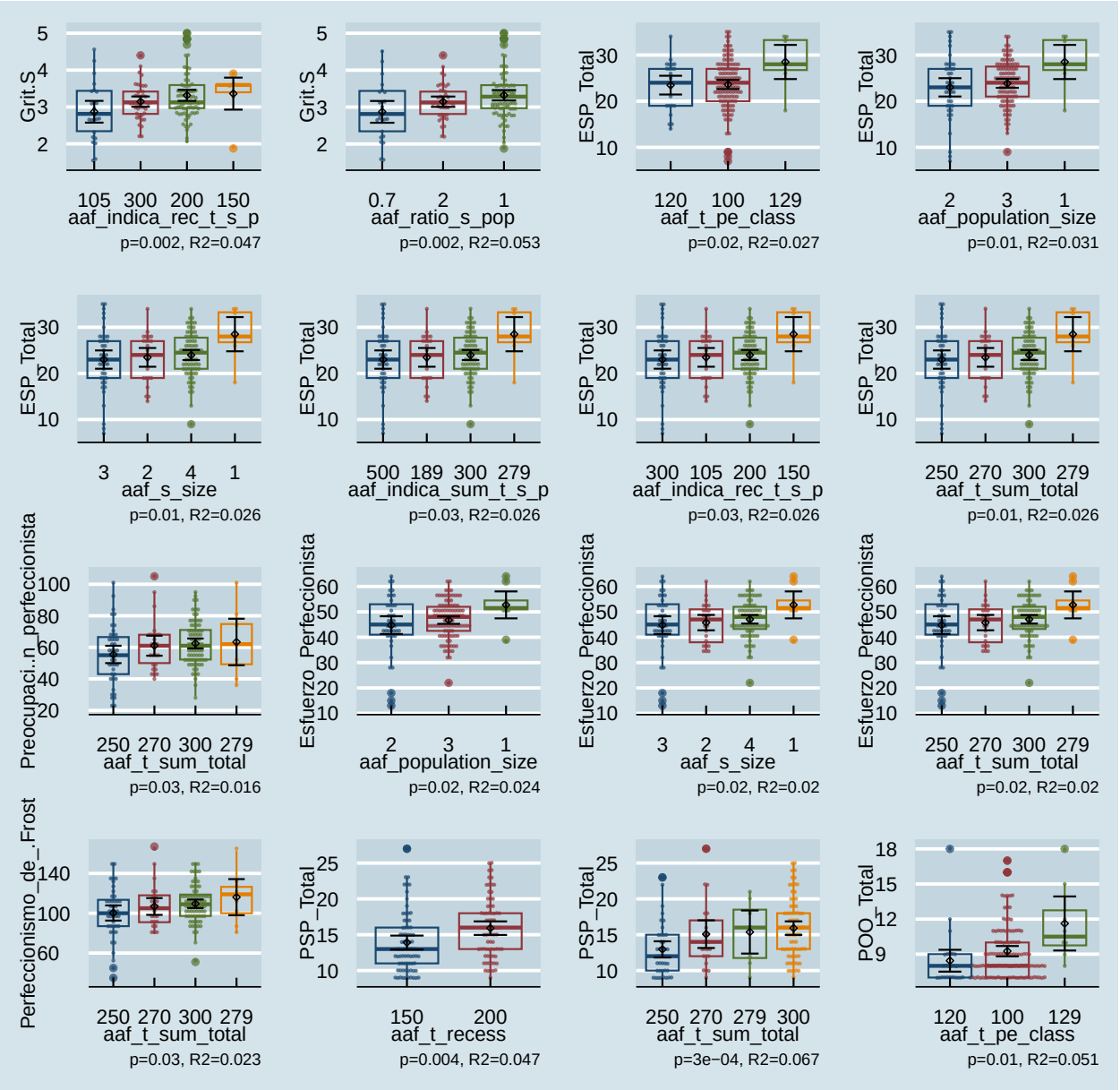
```
## RENAME THE CATEGORICAL ACTIVITY GRID OF PLOT FOR EASY REFERENCE LATER
actdiffgrid <- res_activity_diff[['grid']]
actdiffsiglength <- length(res_activity_diff[['plots']])
```

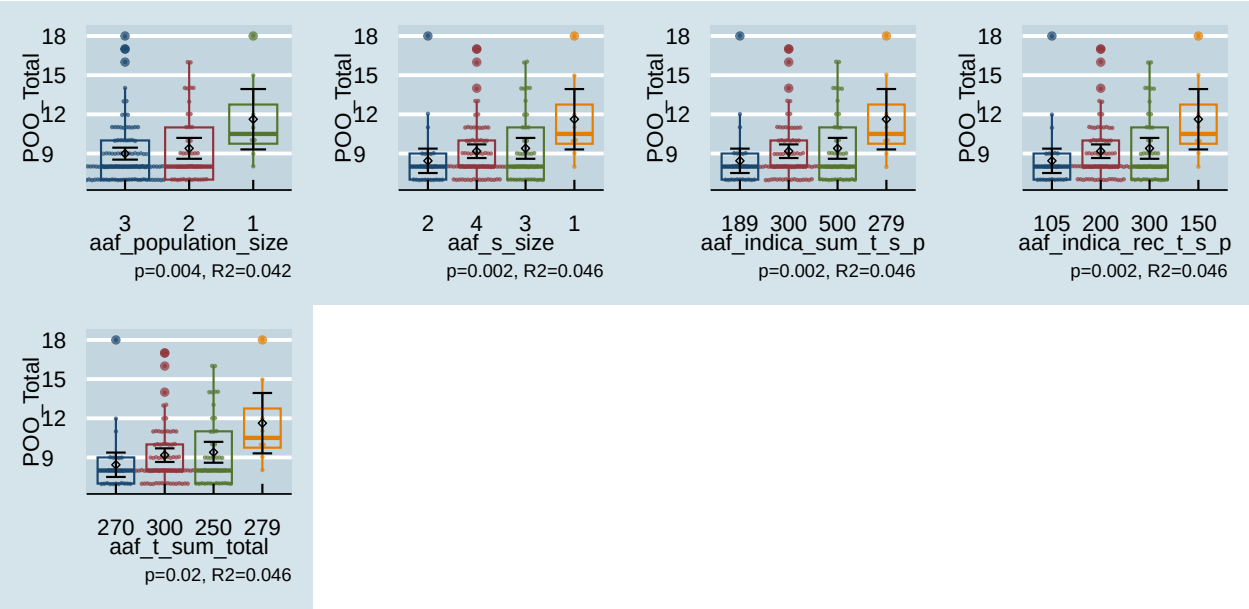
**RESULTS FROM DIFFERENCE ANALYSES.** By using the physical activity as groupping variables:

- 37 significant differences were found.
- Most of them with small effects.
- However, the associtiaion between IQ and Oros's PSP social dimension was replicated.

```
## SHOW THE GRID
actdiffgrid
```


CI_Factor.g.R
130
110
90
70
200 150
aaf_t_recess
p=5e−13, R2=0.29
3 1 2
aaf_population_size
p=4e−05, R2=0.46
4 2 1 3
aaf_s_size
p=2e−05, R2=0.46
300 189 279 500
aaf_indica_sum_t_s_p
p=1e−10, R2=0.46
200 105 150 300
aaf_indica_rec_t_s_p
p=1e−10, R2=0.46
1 0.7 2
aaf_ratio_s_pop
p=1e−09, R2=0.39
300 270 279 250
aaf_t_sum_total
p=8e−21, R2=0.46
CI_Total
5
4
3
2
1
120 100 129
aaf_t_pe_class
p=0.03, R2=0.022
150 200
aaf_t_recess
p=0.003, R2=0.053
189 500 279 300
aaf_indica_sum_t_s_p
p=0.004, R2=0.055
105 300 150 200
aaf_indica_rec_t_s_p
p=0.004, R2=0.055
0.7 2 1
aaf_ratio_s_pop
p=0.004, R2=0.061
270 250 279 300
aaf_t_sum_total
p=0.01, R2=0.055
Grit.S
120 100 129
aaf_t_pe_class
p=0.006, R2=0.04
150 200
aaf_t_recess
p=0.02, R2=0.028
189 500 300 279
aaf_indica_sum_t_s_p
p=0.002, R2=0.047

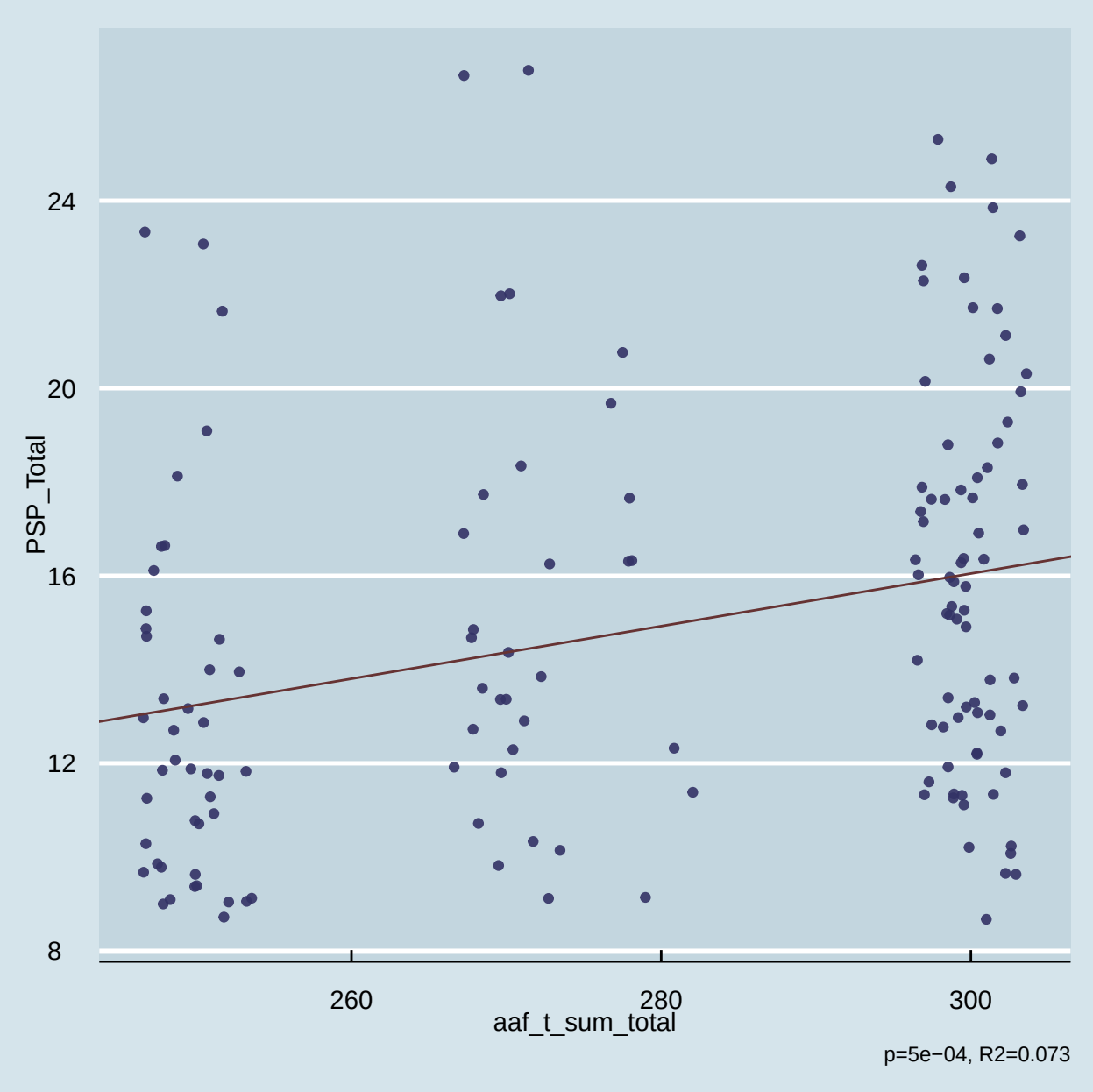

Grit.S
aaf_indica_rec_t_s_p
p=0.002, R2=0.047
Grit.S
aaf_ratio_s_pop
p=0.002, R2=0.053
ESP_Total
aaf_t_pe_class
p=0.02, R2=0.027
ESP_Total
aaf_population_size
p=0.01, R2=0.031
ESP_Total
aaf_s_size
p=0.01, R2=0.026
ESP_Total
aaf_indica_sum_t_s_p
p=0.03, R2=0.026
ESP_Total
aaf_indica_rec_t_s_p
p=0.03, R2=0.026
ESP_Total
aaf_t_sum_total
p=0.01, R2=0.026
Preocupaci..n_perfeccionista
aaf_t_sum_total
p=0.03, R2=0.016
Esfuerzo_Perfeccionista
aaf_population_size
p=0.02, R2=0.024
Esfuerzo_Perfeccionista
aaf_s_size
p=0.02, R2=0.02
Esfuerzo_Perfeccionista
aaf_t_sum_total
p=0.02, R2=0.02
Perfeccionismo_de_.Frost
aaf_t_sum_total
p=0.03, R2=0.023
PSP_Total
aaf_t_recess
p=0.004, R2=0.047
PSP_Total
aaf_t_sum_total
p=3e−04, R2=0.067
POO_Total
aaf_t_pe_class
p=0.01, R2=0.051




## VARIABLE OF INTERES, OROS'S PSP SOCIAL DIMENSION, GRAPHICS IN DETAIL.

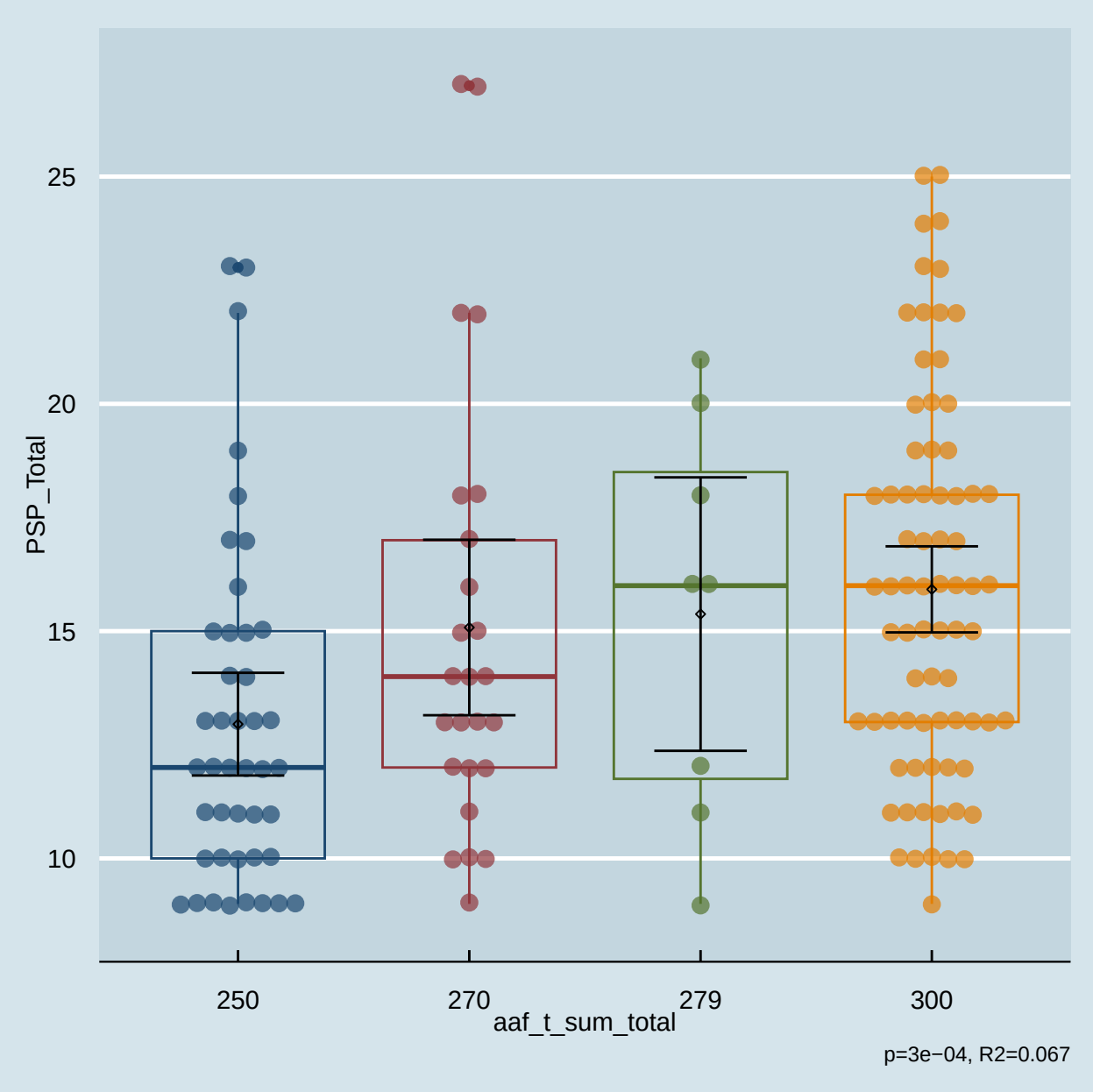
### PSP-TIME ASSOCIATION.

```
## SHOW THE PSP CORRELATION GRAPH
res_activity_corr[['plots']][['PSP_Total_~_aaf_t_sum_total']]
```




**DIFFERENCES IN PSP SOCIAL DIMENSION.**

```
## SHOW THE PSP CORRELATION GRAPH
res_activity_diff[['plots']][['PSP_Total_~_aaf_t_sum_total']]
```


25
20
15
10
PSP_Total
250
270
279
300
aaf_t_sum_total
p=3e−04, R2=0.067