Tarea 4

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Tarea 4 ANOVA

```r
setwd("C:/WorkR")

library(mosaic)
```

```
## Registered S3 method overwritten by 'mosaic':
##   method                           from
##   fortify.SpatialPolygonsDataFrame ggplot2
```

```
##
## The 'mosaic' package masks several functions from core packages in order to add
## additional features.  The original behavior of these functions should not be affected by this.
```

```
##
## Attaching package: 'mosaic'
```

```
## The following objects are masked from 'package:dplyr':
##
##     count, do, tally
```

```
## The following object is masked from 'package:Matrix':
##
##     mean
```

```
## The following object is masked from 'package:ggplot2':
##
##     stat
```

```
## The following objects are masked from 'package:stats':
##
##     binom.test, cor, cor.test, cov, fivenum, IQR, median, prop.test,
##     quantile, sd, t.test, var
```

```
## The following objects are masked from 'package:base':
##
##     max, mean, min, prod, range, sample, sum
```

```r
library(UsingR)
```

```
## Loading required package: MASS
```

```
##
## Attaching package: 'MASS'
```

```
## The following object is masked from 'package:dplyr':
##
##     select
```

```
## Loading required package: HistData
```

```
##
## Attaching package: 'HistData'
```

```
## The following object is masked from 'package:mosaicData':
##
##     Galton
```

```
## Loading required package: Hmisc
```

```
##
## Attaching package: 'Hmisc'
```

```
## The following objects are masked from 'package:dplyr':
##
##     src, summarize
```

```
## The following objects are masked from 'package:base':
##
##     format.pval, units
```

```
## Registered S3 method overwritten by 'UsingR':
##   method         from
##   confint.htest mosaic
```

```
##
## Attaching package: 'UsingR'
```

```
## The following object is masked from 'package:mosaicData':
##
##     SAT
```

```r
library(apaTables)

library(apa)
```

```
##
## Attaching package: 'apa'
```

```
## The following object is masked from 'package:mosaic':
##
##      t_test
```

```r
library(readxl)
Halterofilia<-read.csv2("Halterofilia.csv", dec = ",")
colnames(Halterofilia)
```

```
## [1] "Peso"        "Arrancada"   "Dos.Tiempos" "Total"       "Categoria"
## [6] "Sexo"
```

```r
#Paquetes para la sesión
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v forcats   1.0.0      v stringr   1.5.1
## v lubridate 1.9.3      v tibble    3.2.1
## v purrr     1.0.2      v tidyr     1.3.1
## v readr     2.1.5

## -- Conflicts ------------------------------------------- tidyverse_conflicts() --
## x mosaic::count()     masks dplyr::count()
## x purrr::cross()      masks mosaic::cross()
## x mosaic::do()        masks dplyr::do()
## x tidyr::expand()     masks Matrix::expand()
## x dplyr::filter()     masks stats::filter()
## x dplyr::lag()        masks stats::lag()
## x tidyr::pack()       masks Matrix::pack()
## x MASS::select()      masks dplyr::select()
## x Hmisc::src()        masks dplyr::src()
## x mosaic::stat()      masks ggplot2::stat()
## x Hmisc::summarize() masks dplyr::summarize()
## x mosaic::tally()     masks dplyr::tally()
## x tidyr::unpack()     masks Matrix::unpack()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```r
library(utils)
library(mosaic)
head(Halterofilia)
```

```
##    Peso Arrancada Dos.Tiempos Total Categoria Sexo
## 1 55.61       132         160   292  menos 56    M
## 2 55.64       127         161   288  menos 56    M
## 3 55.87       130         150   280  menos 56    M
## 4 55.73       123         150   273  menos 56    M
## 5 55.93       120         149   269  menos 56    M
## 6 55.87       127         140   267  menos 56    M
```

```r
unique(Halterofilia$Categoria)
```

```
##  [1] "menos 56"  "menos 62"  "menos 69"  "menos 77"  "menos 85"  "menos 94"
##  [7] "menos 105" "mas 105"   "menos 48"  "menos 53"  "menos 58"  "menos 63"
## [13] "menos 75"  "mas 75"
```

```r
unique(Halterofilia$Sexo)
```

```
## [1] "M" "F"
```

```r
#Extraer y crear una nueva base de datos mas reducida con los datos que son necesarios
Halterofilia %>% dplyr::select(Sexo , Arrancada)->Datos
summary(Datos)
```
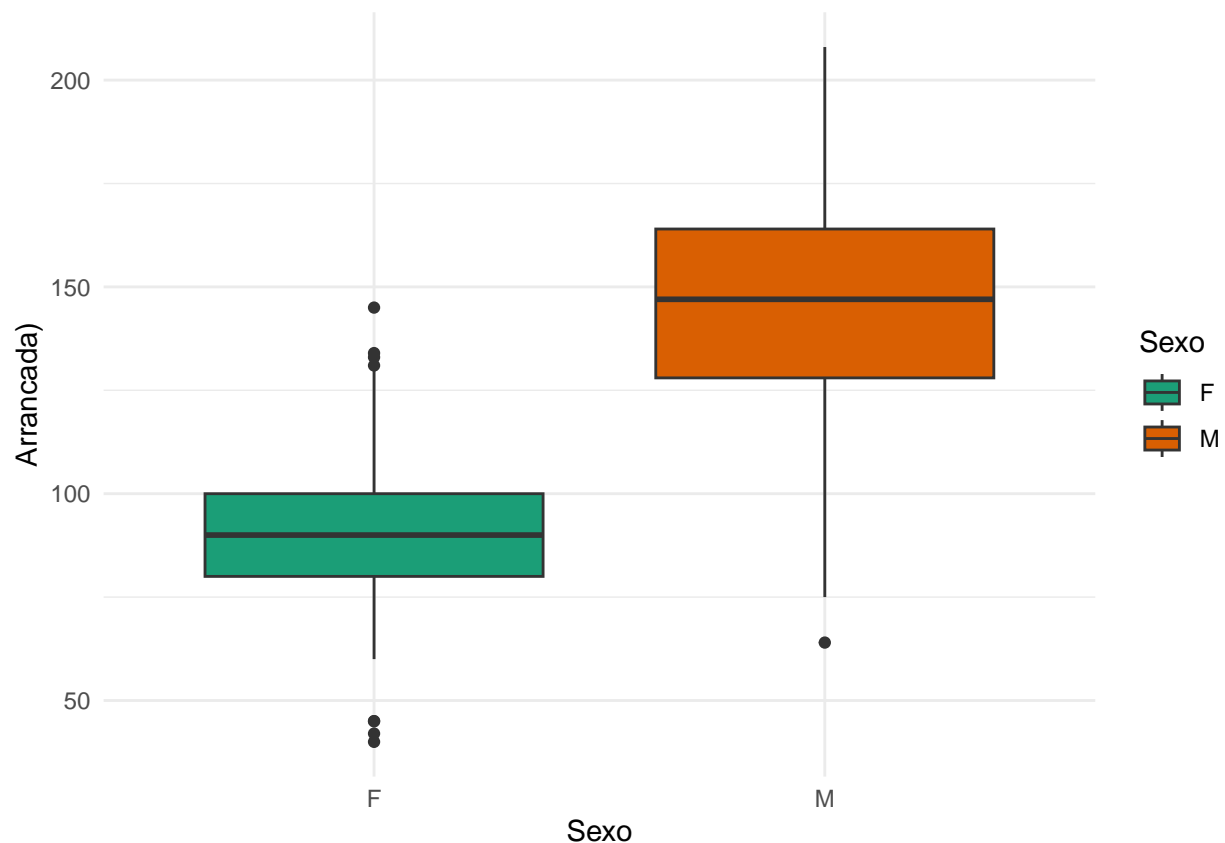
```
##      Sexo              Arrancada
##  Length:462         Min.   : 40.00
##  Class :character   1st Qu.: 94.25
##  Mode  :character   Median :121.00
##                     Mean   :123.16
##                     3rd Qu.:153.00
##                     Max.   :208.00
```

```r
#Realizamos ñps graficos con la nuevas herramientas
ggplot(Datos) +  aes(x = Sexo, y = Arrancada, fill = Sexo) +  geom_boxplot() +
  scale_fill_brewer(palette = "Dark2",direction = 1) +labs(x = "Sexo", y = "Arrancada)") +
  theme_minimal()
```



```r
#Res
Res1<-aov(Arrancada ~ Sexo, data = Datos)
library(report)
report(Res1)
```

```
## The ANOVA (formula: Arrancada ~ Sexo) suggests that:
##
##   - The main effect of Sexo is statistically significant and large (F(1, 460) =
## 720.93, p < .001; Eta2 = 0.61, 95% CI [0.57, 1.00])
##
## Effect sizes were labelled following Field's (2013) recommendations.
```

```r
report_parameters(Res1)
```

```
##   - The main effect of Sexo is statistically significant and large (F(1, 460) = 720.93, p < .001; Eta
```

```r
#Comprobación de supuestos
hist(Res1$residuals)
```
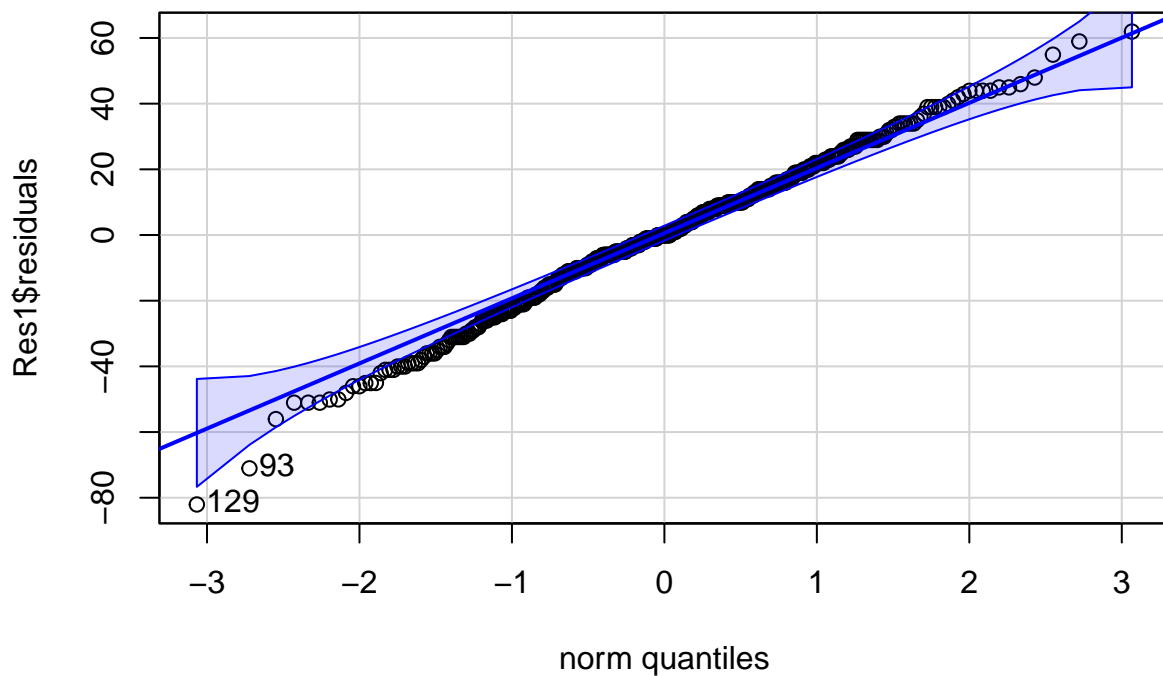
Histogram of Res1$residuals
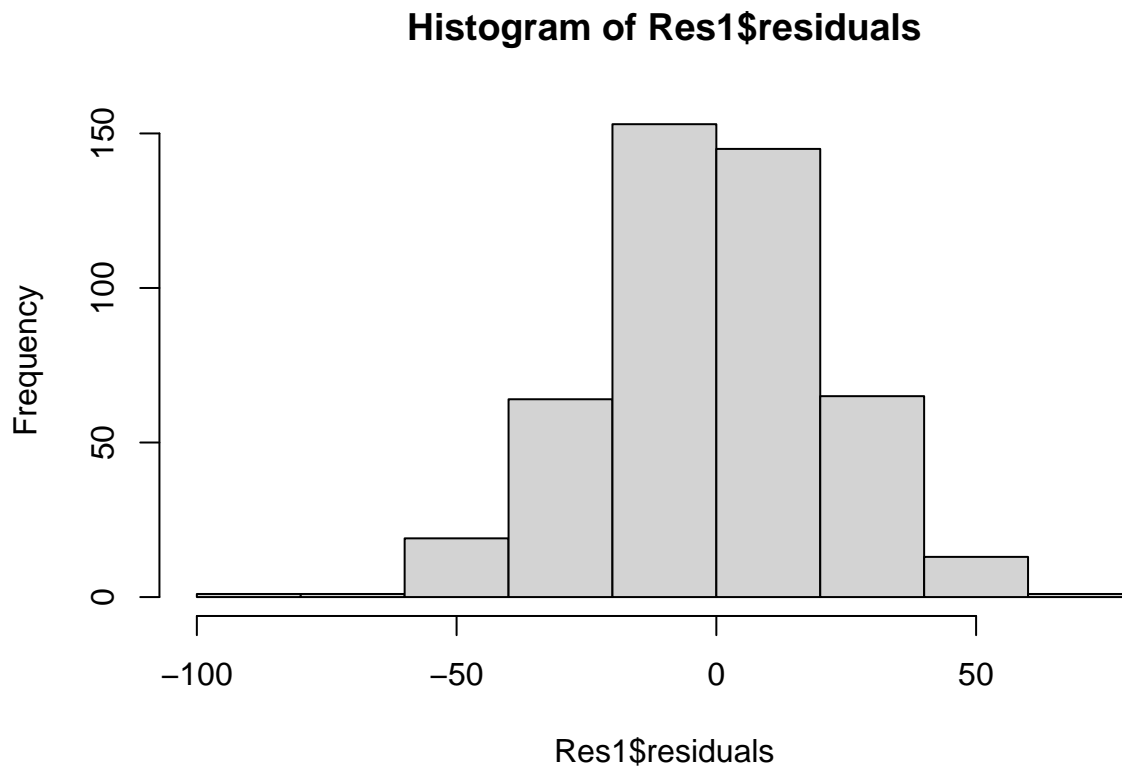

```r
#install.packages("car")
library(carData)
library(car)
```

```
##
## Attaching package: 'car'
##
## The following object is masked from 'package:purrr':
##
##     some
```

```
##
## The following objects are masked from 'package:mosaic':
##
##     deltaMethod, logit
##
## The following object is masked from 'package:dplyr':
##
##     recode
```

```r
qqPlot(Res1$residuals)
```



```
## [1] 129  93
```

```r
#Prueba de "Shapiro"
shapiro.test(Res1$residuals)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  Res1$residuals
## W = 0.99503, p-value = 0.144
```

```
#Prueba "Levene"
library(reshape2)
```
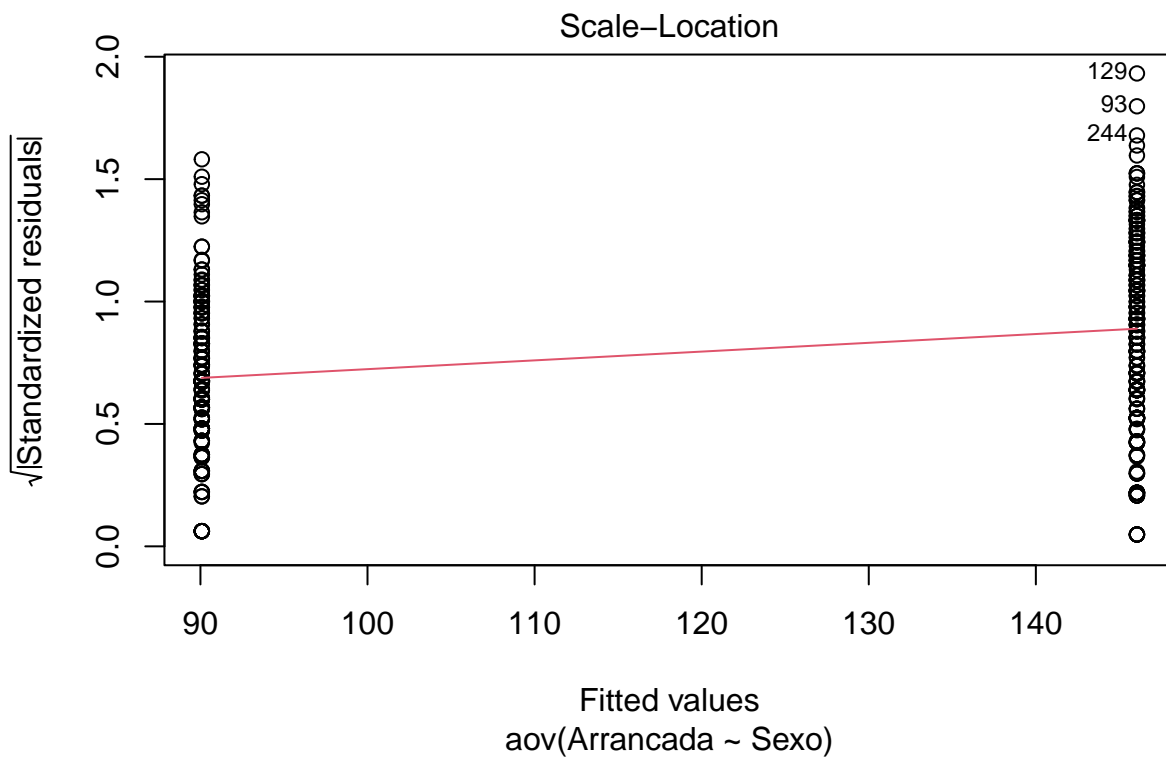
```
##
## Attaching package: 'reshape2'
##
## The following object is masked from 'package:tidyr':
##
##     smiths
```

```
leveneTest(Arrancada ~ Sexo, data = Datos)
```
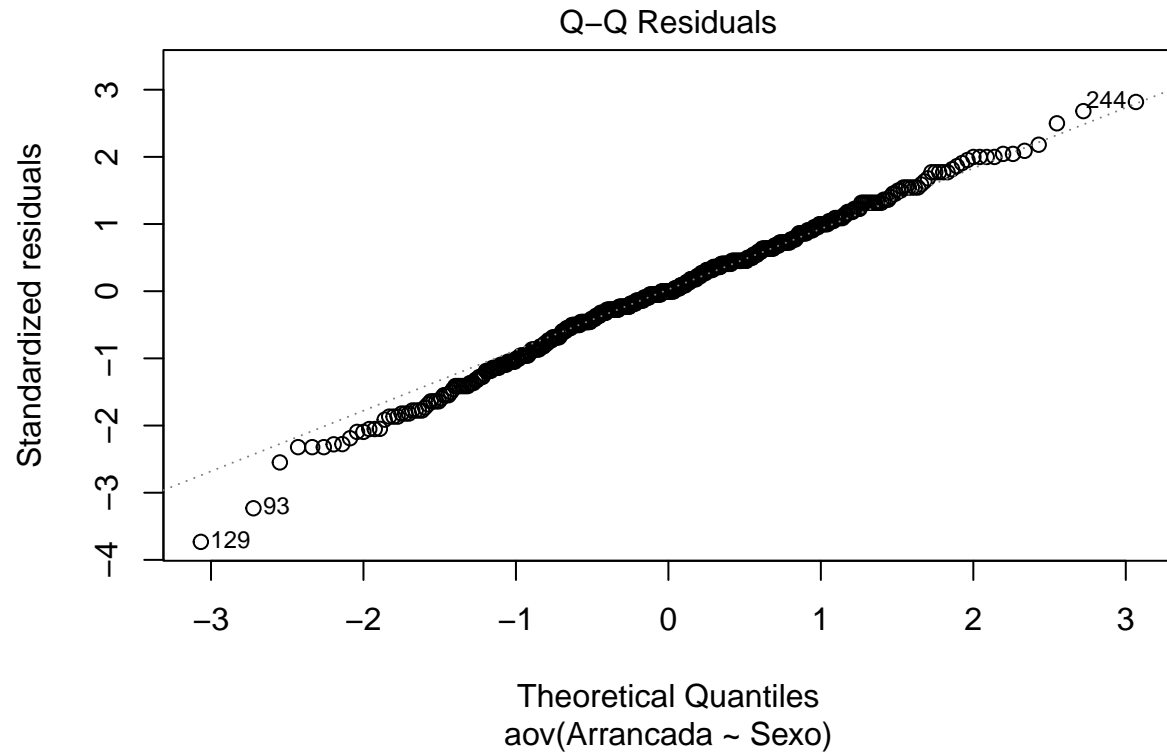
```
## Warning in leveneTest.default(y = y, group = group, ...): group coerced to
## factor.
```

```
## Levene's Test for Homogeneity of Variance (center = median)
##        Df F value    Pr(>F)
## group   1  34.244 9.245e-09 ***
##       460
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
plot(Res1, which =3)
```

```
plot(Res1, 2)
```

Q–Q Residuals
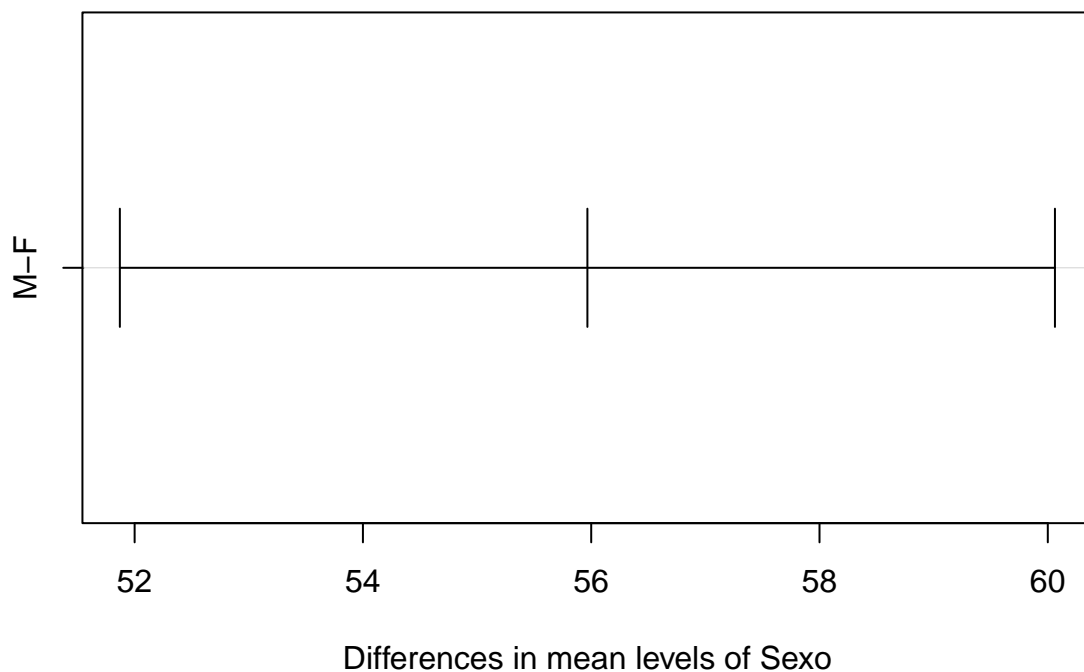

Theoretical Quantiles
aov(Arrancada ~ Sexo)

```
library(dplyr)
group_by(.data = Datos, Sexo) %>%
  summarise( Media = mean (Arrancada, na.rm = T),DS = sd(Arrancada, na.rm =T))
```

```
## # A tibble: 2 x 3
##   Sexo  Media    DS
##   <chr> <dbl> <dbl>
## 1 F      90.1  16.8
## 2 M     146.   25.0
```

```
#Prueba "Tukey"
Tukey<-TukeyHSD(Res1)
plot(Tukey)
```

95% family–wise confidence level

M–F

| 52 | 54 | 56 | 58 | 60 |

Differences in mean levels of Sexo

```r
#ggplot
library(ggstatsplot)
```

```
## You can cite this package as:
##      Patil, I. (2021). Visualizations with statistical details: The 'ggstatsplot' approach.
##      Journal of Open Source Software, 6(61), 3167, doi:10.21105/joss.03167
```

```r
ggbetweenstats(data = Datos, x= Sexo, y = Arrancada,type = "parametric", var.equal = T, plot.type = "bo:
```

$t_{\text{Student}}(460) = -26.85$, $p = 3.16\mathrm{e}{-96}$, $\widehat{g}_{\text{Hedges}} = -2.62$, $\text{CI}_{95\%}$ [-2.87, -2.38], $n_{\text{obs}} = 462$