

# Tarea Anova

Alfonso Fajardo ### ejercicio 8.2.4

Gold et al. (A-5) investigated the effectiveness on smoking cessation of a nicotine patch, bupropion SR, or both, when co-administered with cognitive-behavioral therapy. Consecutive consenting patients  $n = 164$  assigned themselves to one of three treatments according to personal preference: nicotine patch NTP;  $n = 13$ , bupropion SR B;  $n = 92$ , and bupropion SR plus nicotine patch BNTP;  $n = 59$ . At their first smoking cessation class, patients estimated the number of packs of cigarettes they currently smoked per day and the numbers of years they smoked. The “pack years” is the average number of packs the subject smoked per day multiplied by the number of years the subject had smoked. The results are shown in the following table.

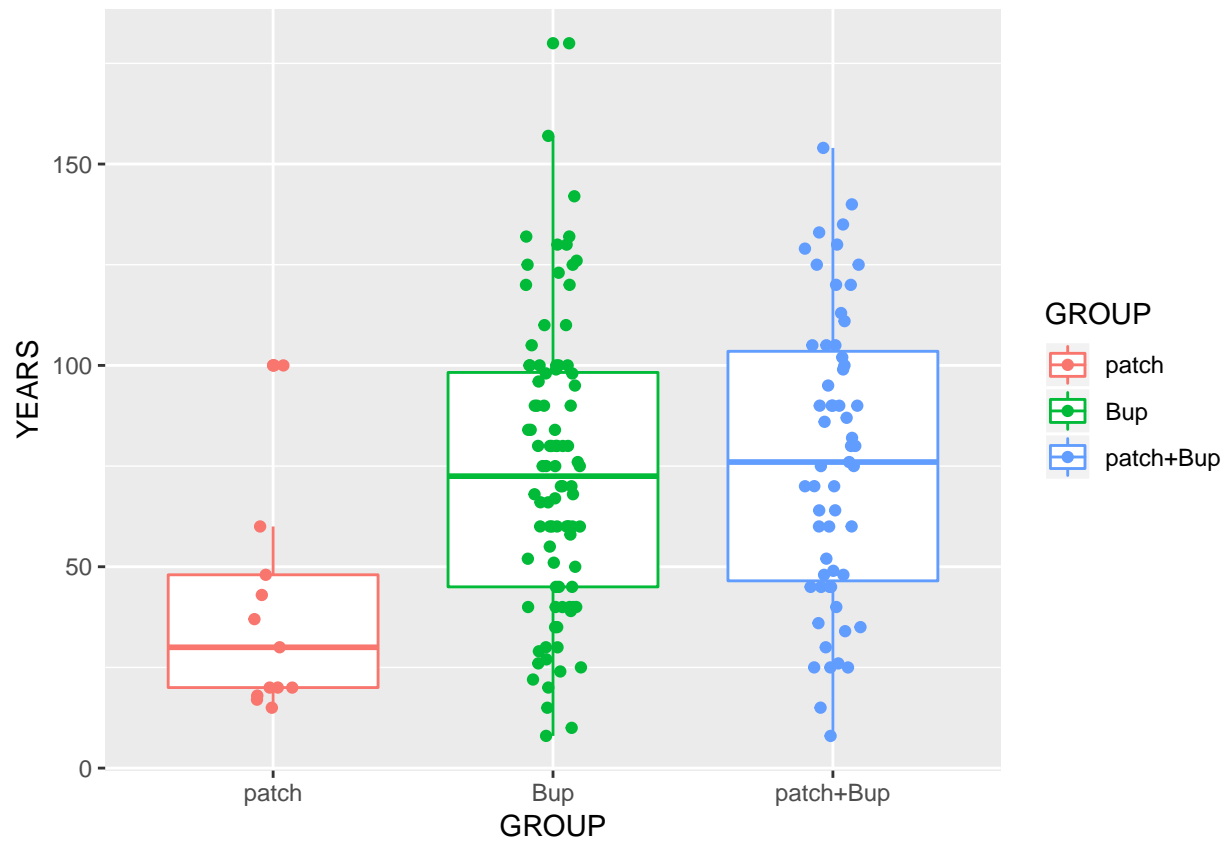
## importar los datos y asignar la variable en factor

```
smoke_data <- read.csv("ch08_all/EXR_C08_S02_04.csv")
smoke_data$GROUP <- as.factor(smoke_data$GROUP)
levels(smoke_data$GROUP) <- c("patch", "Bup", "patch+Bup")
```

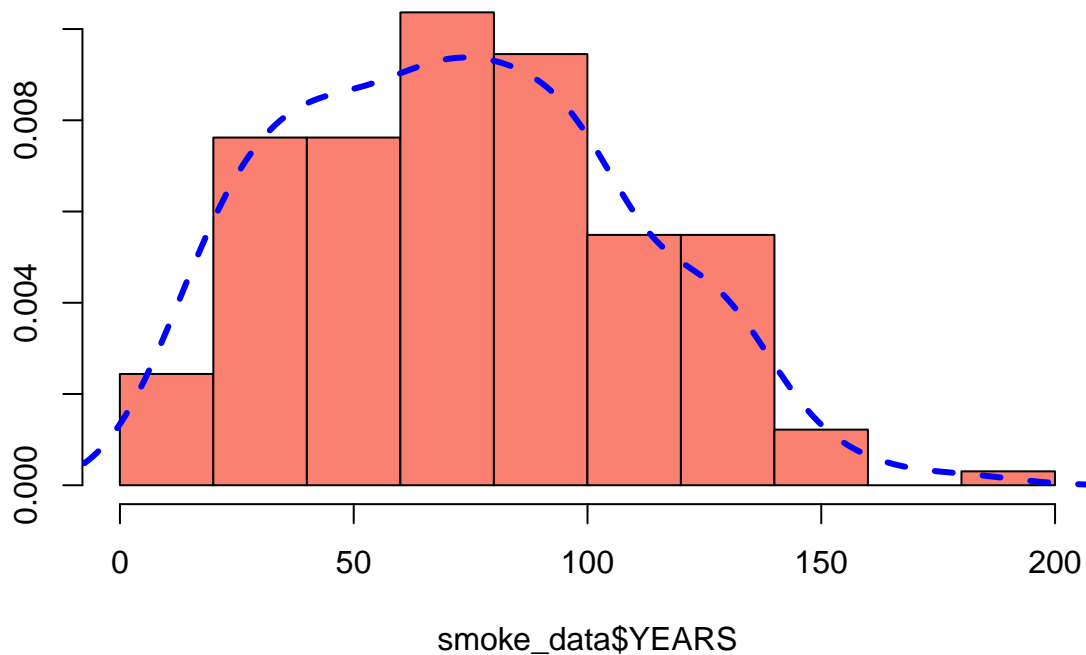
## boxplot

```
library("ggplot2")

ggplot(data = smoke_data, mapping = aes(x= GROUP, YEARS,col = GROUP))+
  geom_boxplot()+
  geom_jitter(height = 0.01,width = 0.1 )
```



```
library(MASS)
truehist(smoke_data$YEARS, nbins=9, col = "salmon")
lines(density(smoke_data$YEARS), lty=2, col="blue", lwd=3)
```



## Test de normalidad

```
shapiro.test(smoke_data$YEARS)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  smoke_data$YEARS
## W = 0.97829, p-value = 0.01115
```

## test de varianzas

```
library(car)
```

```
## Loading required package: carData
```

```
leveneTest(YEARS~GROUP,data = smoke_data)
```

```
## Levene's Test for Homogeneity of Variance (center = median)
##      Df F value Pr(>F)
## group  2  0.9289 0.3971
##      161
```

## Anova

```
lm_smoke<- lm(YEARS~GROUP, data = smoke_data)
aov_smoke <- aov(lm_smoke)
anova(aov_smoke)

## Analysis of Variance Table
##
## Response: YEARS
##           Df Sum Sq Mean Sq F value    Pr(>F)
## GROUP      2  14490   7244.8    5.8779 0.003437 **
## Residuals 161 198442   1232.6
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

## Poshoc

```
TukeyHSD(aov_smoke)

## Tukey multiple comparisons of means
## 95% family-wise confidence level
##
## Fit: aov(formula = lm_smoke)
##
## $GROUP
##           diff          lwr          upr      p adj
## Bup-patch    33.319398    8.711597  57.92720 0.0046464
## patch+Bup-patch 36.181226   10.735648  61.62680 0.0027514
## patch+Bup-Bup   2.861828  -10.990167  16.71382 0.8767658

plot(TukeyHSD(aov_smoke))
```

