

# Análisis estadístico con Jamovi

## Parte II: Estadística descriptiva

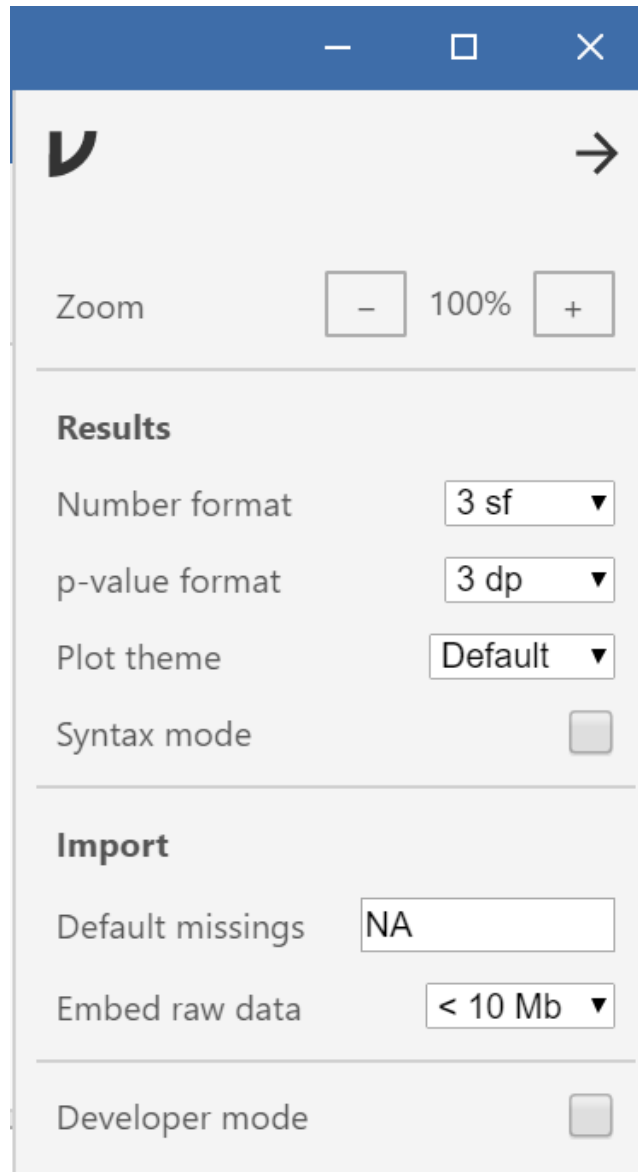
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Autonomous University of Barcelona (UAB)

<http://brge.isglobal.org>

# Output settings



A screenshot of the 'Output settings' window. The window has a blue title bar with standard Windows window controls (minimize, maximize, close). Below the title bar is a light gray header area containing a logo on the left and a right-pointing arrow on the right. The main content area is divided into sections by horizontal lines. The first section is 'Zoom', showing a minus button, '100%', and a plus button. The second section is 'Results', containing three dropdown menus: 'Number format' set to '3 sf', 'p-value format' set to '3 dp', and 'Plot theme' set to 'Default'. Below these is a 'Syntax mode' checkbox which is currently unchecked. The third section is 'Import', containing a 'Default missings' text input field with 'NA' entered, and an 'Embed raw data' dropdown menu set to '< 10 Mb'. At the bottom is a 'Developer mode' checkbox, also unchecked.

Zoom  100%

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**Results**

Number format

p-value format

Plot theme

Syntax mode ☐

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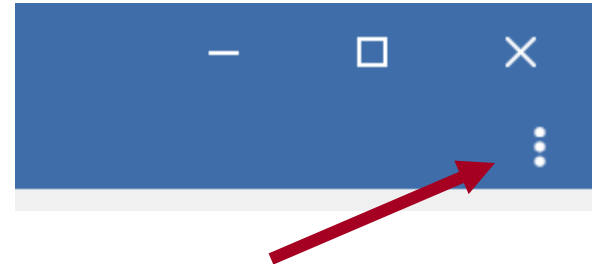
**Import**

Default missings

Embed raw data

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Developer mode ☐



¿cómo resumimos las variables  
recogidas en nuestro estudio?

- Resumen de variables **categóricas**
  - Tablas de frecuencias
  - Medidas de frecuencia de la enfermedad
  - Gráficos de barras y sectores
- Resumen de variables **numéricas**
  - Medidas de tendencia central
  - Medidas de posición relativa
  - Medidas de dispersión
  - Medidas de forma
  - Gráficos: histogramas y cajas
- Resumen de la **relación entre 2 variables**
  - Una numérica y una categórica:
    - resumen de la numérica por categorías
    - comparación de cajas
  - Dos categóricas:
    - tabla de frecuencias (contingencia)
    - gráfico de barras
  - Dos numéricas
    - Otros cursos de estadística ...

# Diferenciar por tipo de variable



Categóricas  
(Cualitativas)



Numéricas  
(Cuantitativas)

# Estadística descriptiva

ejemplo.txt

| <div> <div> <div></div> <div>Data</div> </div> <div> <div>Analyses</div> </div> </div> |       |  |      |   |          |  |
|--|-------|--|------|---|----------|--|
| <div> <div>Paste</div> <div>Clipboard</div> </div>                                     |       | <div> <div>Setup</div> <div>Variables</div> </div> |      | <div> <div>Filters</div> <div>Rows</div> </div> |          |  |
| 1  | Grupo | Altura   | Peso | Sexo  | Calorias |  |
| 2  | A     | 1.81   | 72   | Hombre  | 1890     |  |
| 3  | A     | 1.72   | 66   | Hombre  | 1345     |  |
| 4  | B     | 1.79   | 81   | Hombre  | 2345     |  |
| 5  | A     | 1.69   | 64   | Mujer   | 1678     |  |
| 6  | B     | 1.92   | 88   | Hombre  | 2100     |  |
| 7  | B     | 1.87   | 85   | Hombre  | 2091     |  |
| 8  | A     | 1.85   | 80   | Hombre  | 2243     |  |
| 9  | A     | 1.74   | 69   | Hombre  | 1890     |  |
| 10   | A     | 1.62   | 55   | Mujer   | 1789     |  |
| 11   | B     | 1.58   | 52   | Mujer   | 1901     |  |
| 12   | B     | 1.73   | 75   | Hombre  | 2034     |  |
| 13   | A     | 1.78   | 85   | Hombre  | 1999     |  |
| 14   | B     | 1.65   | 60   | Hombre  | 2045     |  |
| 15   | A     | 1.72   | 80   | Hombre  | 2230     |  |

# Resumen de variable continua

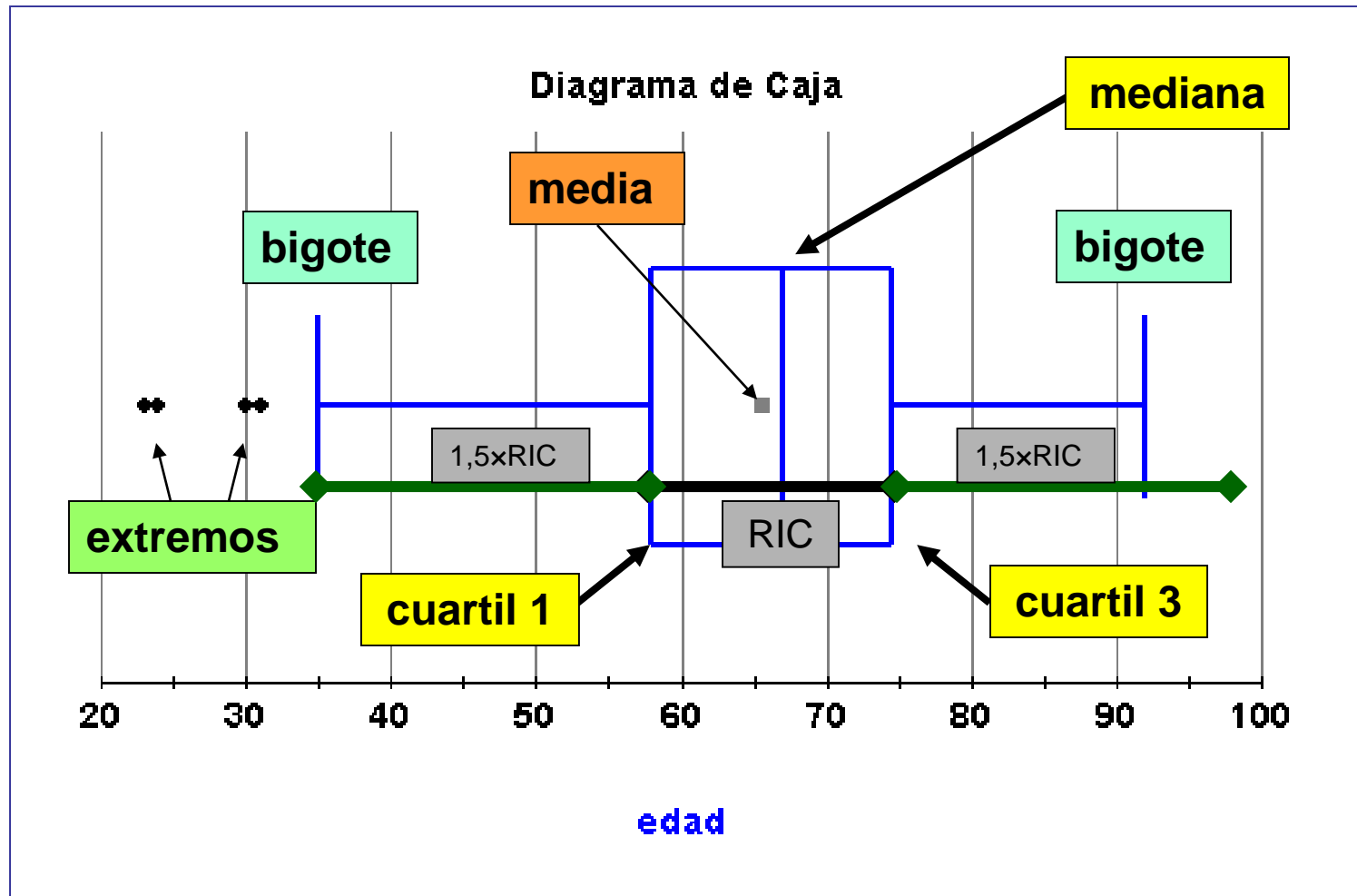
- **Tendencia central**
  - Media, mediana
- **Dispersión**
  - Desviación típica, varianza, rango, rango intercuartílico, coeficiente de variación
- **Posición**
  - Percentiles, terciles, cuartiles, quintiles
- **Forma**
  - Asimetría

# Visualización de variable continua

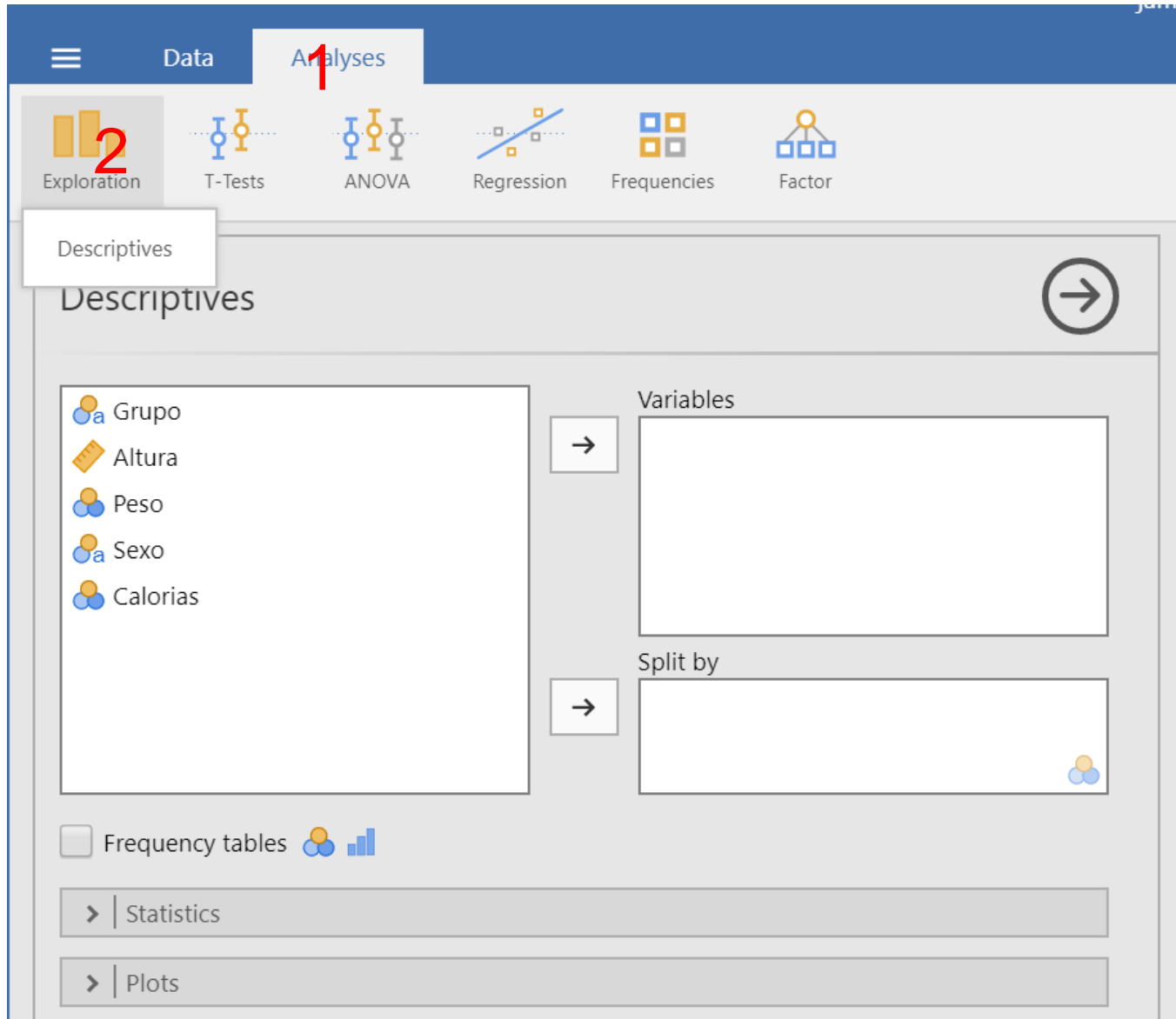
- **Histograma**
- **Boxplot**
  - Media, mediana, RIQ, ...
- **Violin plot**
  - Densidad de datos
- **Dotplot**



# Boxplot



# Estadística descriptiva



The image shows the SPSS 'Descriptives' dialog box. At the top, the 'Analyses' tab is selected, indicated by a red '1'. Below the tabs, the 'Exploration' icon is highlighted with a red '2'. The 'Descriptives' dialog box itself has a title bar with a right arrow icon. On the left, a list of variables includes 'Grupo', 'Altura', 'Peso', 'Sexo', and 'Calorias'. To the right of this list are two empty boxes labeled 'Variables' and 'Split by', each with a right arrow button. At the bottom left, there is a checkbox for 'Frequency tables' which is currently unchecked. Below this are two expandable sections: 'Statistics' and 'Plots', each with a right arrow icon.

Analyses

Exploration

T-Tests

ANOVA

Regression

Frequencies

Factor

Descriptives

Descriptives

Grupo

Altura

Peso

Sexo

Calorias

Variables

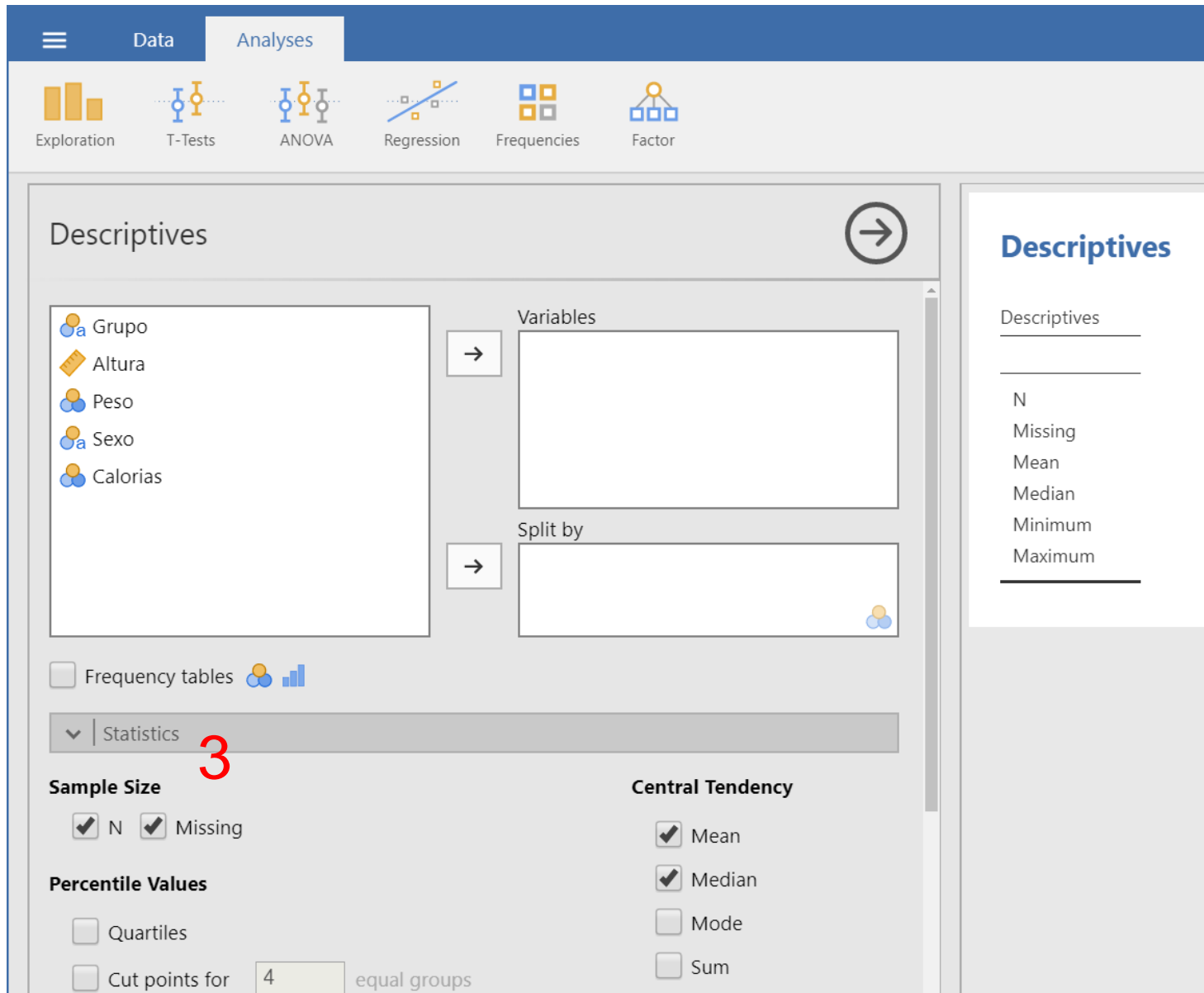
Split by

☐ Frequency tables

> Statistics

> Plots

# Variables continuas



The screenshot shows the SPSS 'Descriptives' dialog box. The 'Data' tab is selected. The 'Analyses' section includes icons for Exploration, T-Tests, ANOVA, Regression, Frequencies, and Factor. The 'Descriptives' section is active, showing a list of variables on the left: Grupo, Altura, Peso, Sexo, and Calorias. The 'Variables' box is empty, and the 'Split by' box is also empty. Below the variable list, there is a checkbox for 'Frequency tables' and a 'Statistics' dropdown menu. The 'Statistics' dropdown is expanded, showing a list of statistical measures: N, Missing, Mean, Median, Minimum, and Maximum. The 'Sample Size' section has checkboxes for 'N' and 'Missing', both of which are checked. The 'Central Tendency' section has checkboxes for 'Mean', 'Median', 'Mode', and 'Sum', all of which are checked. The 'Percentile Values' section has a checkbox for 'Quartiles' and a checkbox for 'Cut points for' followed by a text box containing the number '4' and the text 'equal groups'.

**Data** **Analyses**

Exploration T-Tests ANOVA Regression Frequencies Factor

**Descriptives** →

Grupo  
Altura  
Peso  
Sexo  
Calorias

→ Variables

→ Split by

☐ Frequency tables

Statistics

**Sample Size**

☒ N ☒ Missing

**Percentile Values**

☐ Quartiles

☐ Cut points for 4 equal groups

**Central Tendency**

☒ Mean  
☒ Median  
☐ Mode  
☐ Sum

**Descriptives**


Descriptives


N  
Missing  
Mean  
Median  
Minimum  
Maximum


# Variables continuas


Data


Analyses


Exploration

T-Tests


ANOVA


Regression


Frequencies


Factor

Descriptives

 Grupo


 Peso

 Sexo

 Calorias

→


Variables

 Altura

4

Split by

→

☐ Frequency tables 

▼

 Statistics

Sample Size

☒ N ☒ Missing

Percentile Values

Central Tendency

☒ Mean ☒ Median

Descriptives

Descriptives

|         | Altura |
|---------|--------|
| N       | 14     |
| Missing | 0      |
| Mean    | 1.75   |
| Median  | 1.73   |

# Variables continuas

jamovi

Data Analyses

Exploration T-Tests ANOVA Regression Frequencies Factor

## Descriptives

Grupo  
Peso  
Sexo  
Calorias

Variables  
Altura

Split by

☐ Frequency tables

> Statistics

▼ Plots

**Histograms**  
☐ Histogram  
☐ Density

**Box Plots**  
☒ Box plot  
☐ Violin  
☐ Data

**Bar Plots**  
☐ Bar plot

## Descriptives

### Plots

Altura

Altura


1.9  
1.8  
1.7  
1.6


# Variables continuas


≡


Data


Analyses


 Exploration

 T-Tests


 ANOVA


 Regression


 Frequencies


 Factor

Descriptives

 Grupo


 **Peso**

 Sexo

 Calorias


→

Variables

 **Altura**


→

Split by

☐ Frequency tables 


> | Statistics

▼ | Plots

**Histograms** 

☐ Histogram


☐ Density

**Box Plots** 

☒ Box plot

☐ Violin

☒ Data

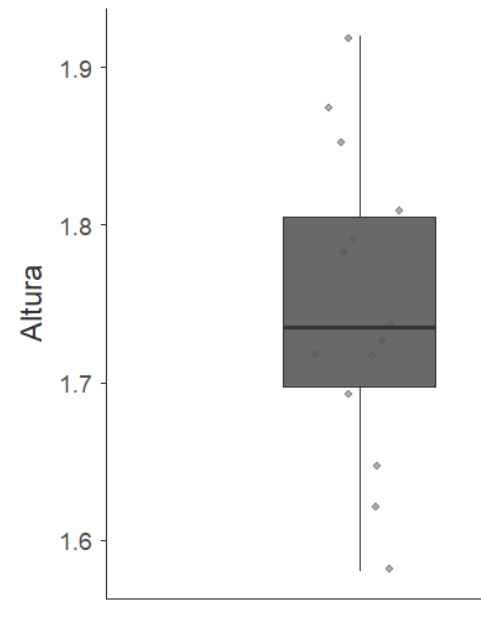
**Bar Plots** 

☐ Bar plot

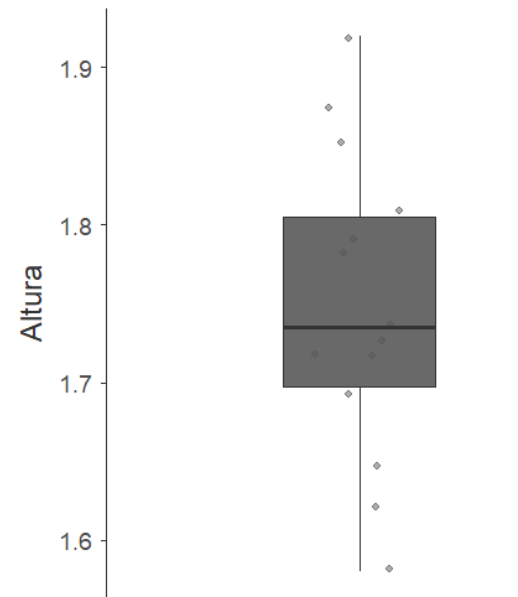
Descriptives

Plots

**Altura**



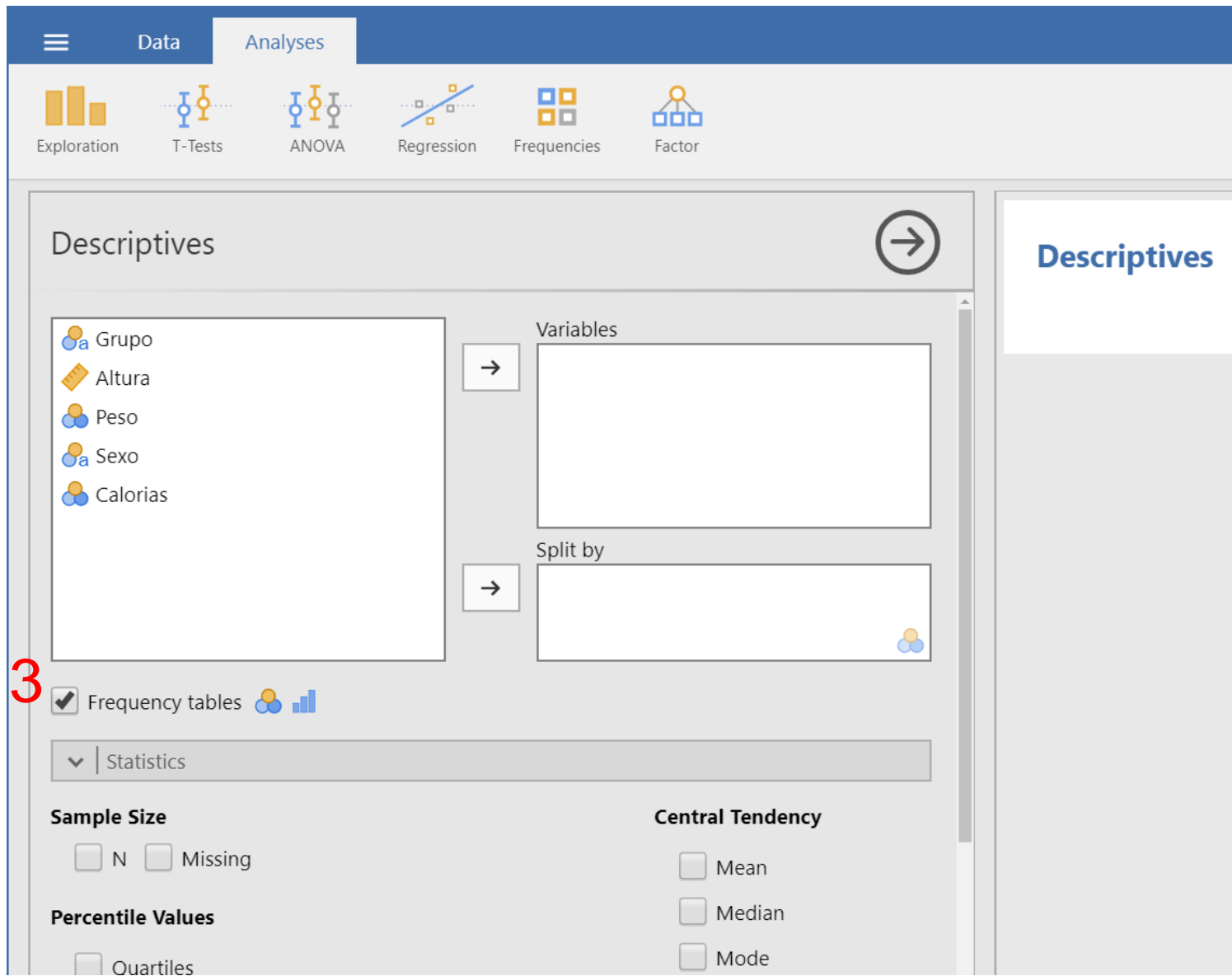
5



# Variables categóricas

- **Resumen**
  - Frecuencias absolutas
  - Frecuencias relativas
- **Visualización**
  - Gráfico de barras
  - Gráfico de sectores (pie chart)

# Categóricas



The image shows the SPSS 'Descriptives' dialog box. The 'Data' tab is selected. The 'Variables' list on the left contains 'Grupo', 'Altura', 'Peso', 'Sexo', and 'Calorias'. The 'Variables' box on the right is empty. The 'Split by' box is also empty. A red number '3' is next to the 'Frequency tables' checkbox, which is checked. The 'Statistics' section is expanded, showing options for 'Sample Size' (N, Missing), 'Percentile Values' (Quartiles), and 'Central Tendency' (Mean, Median, Mode).

**Descriptives**

Variables

Split by

3 ☒ Frequency tables

Statistics

**Sample Size**

☐ N ☐ Missing

**Percentile Values**

☐ Quartiles

**Central Tendency**

☐ Mean  
☐ Median  
☐ Mode





# Categóricas


≡


Data


Analyses


 Exploration

 T-Tests


 ANOVA


 Regression


 Frequencies


 Factor

Descriptives


 Grupo

 Altura

 Peso

 Calorias


→


 Sexo

4

→

Split by



☒ Frequency tables 

▼

 Statistics

Sample Size

☐ N ☐ Missing

Central Tendency

☐ Mean

Descriptives

Frequencies

Frequencies of Sexo

| Levels | Counts | % of Total | Cumulative % |
|--------|--------|------------|--------------|
| Hombre | 11     | 78.6 %     | 78.6 %       |
| Mujer  | 3      | 21.4 %     | 100.0 %      |

# Categóricas

☰

Data

Analyses

Exploration

T-Tests

ANOVA

Regression

Frequencies

Factor

Descriptives

→

Grupo

Altura

Peso

Calorias

→

Variables

Sexo

Split by

☐ Frequency tables

Statistics

Plots

Histograms

Box Plots

Bar Plots

☐ Histogram

☐ Density

☐ Box plot

☐ Violin

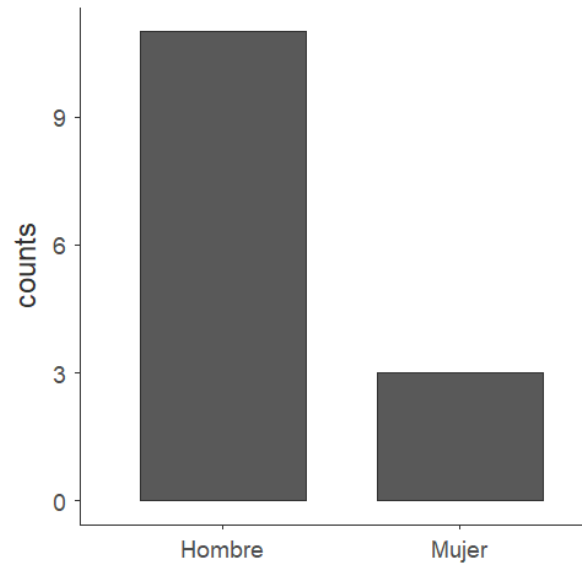
☐ Data

☒ Bar plot

Descriptives

Plots

Sexo



| Sexo   | counts |
|--------|--------|
| Hombre | 10     |
| Mujer  | 3      |

5

# **Descriptiva bivariante**

Cómo estudiar la relación  
entre 2 variables

# Diferenciar por tipo de variable



**Categóricas**  
(Cualitativas)



**Numéricas**  
(Cuantitativas)

Definen **grupos**  
a comparar

# Variables categórica y numérica

¿Es cierto que los individuos del grupo A tienen un mayor consumo de calorías?

# Variables categórica y numérica

**Analyses -> Exploration -> Descriptives**

The screenshot shows the SPSS 'Descriptives' dialog box. On the left, a list of variables includes 'Altura', 'Peso', and 'Sexo'. The 'Variables' box on the right contains 'Calorias'. The 'Split by' box contains 'Grupo', which is highlighted by a red arrow. At the bottom, there are checkboxes for 'Frequency tables', 'Statistics', and 'Plots'. To the right of the dialog box, a preview of the output table is shown.

**Descriptives**

|         | Grupo | Calorias |
|---------|-------|----------|
| N       | A     | 8        |
|         | B     | 6        |
| Missing | A     | 0        |
|         | B     | 0        |
| Mean    | A     | 1883     |
|         | B     | 2086     |
| Median  | A     | 1890     |
|         | B     | 2068     |
| Minimum | A     | 1345     |
|         | B     | 1901     |
| Maximum | A     | 2243     |
|         | B     | 2345     |

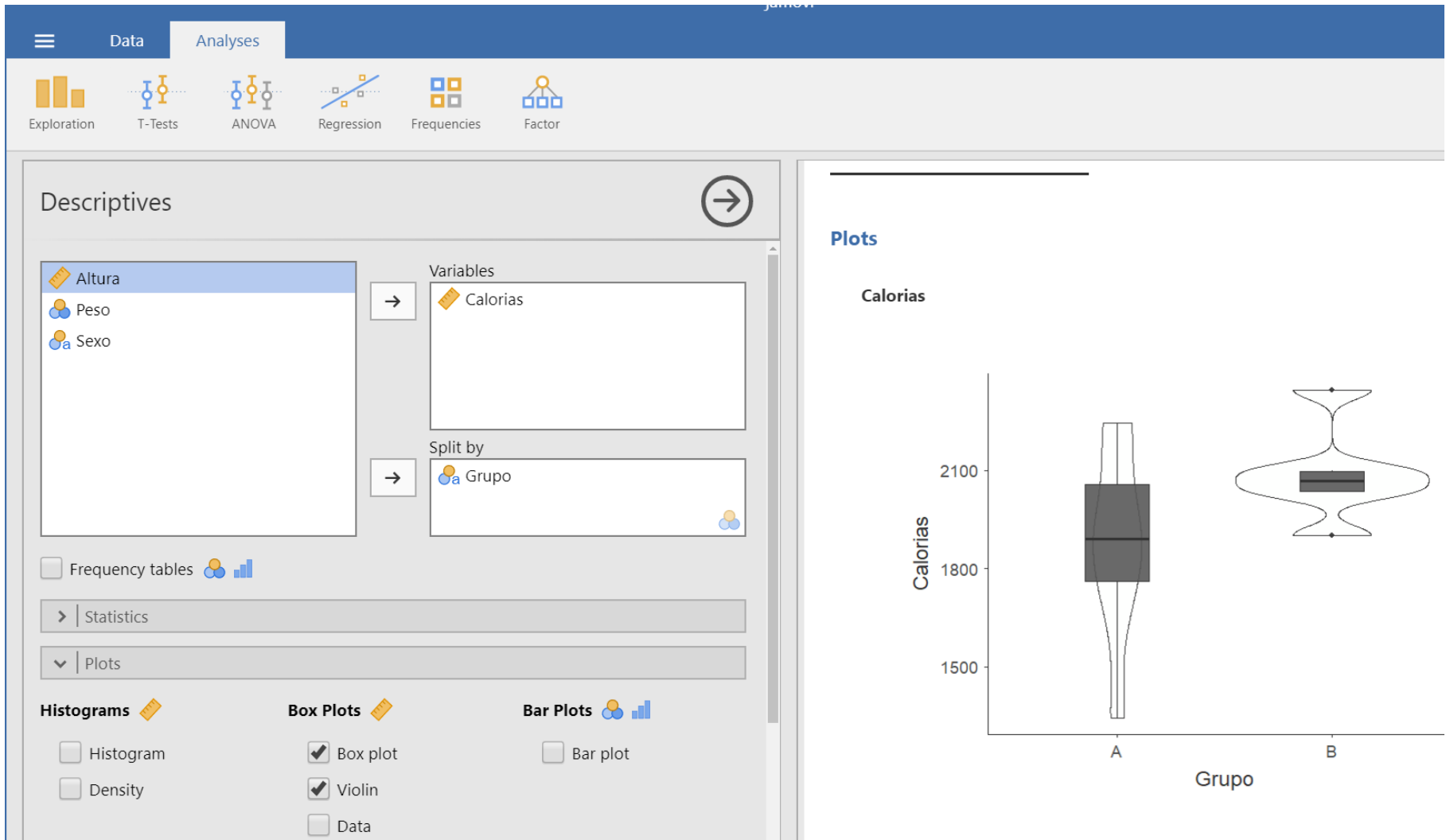
# Variables categórica y numérica

**Sólo las variables continuas pueden visualizarse con boxplots**

The screenshot shows a software interface with a top navigation bar containing 'Data' and 'Analyses' tabs. Below this is a toolbar with icons for 'Paste', 'Clipboard', 'Setup', 'Compute', 'Variables', 'Filters', and 'Rows'. The main workspace is titled 'DATA VARIABLE' and shows the variable 'Calorias' with a description field. Below the variable name, there are radio buttons for 'Continuous' (selected), 'Ordinal', 'Nominal', and 'Nominal Text'. To the right of these is a 'Levels' list containing the values 1345, 1678, 1789, 1890, and 1901. At the bottom of the workspace is a checkbox labeled 'Retain unused levels'. Below the workspace is a data table with columns: Grupo, Altura, Peso, Sexo, and Calorias. The 'Calorias' column is highlighted. To the right of the table is a 'Descriptives' panel.

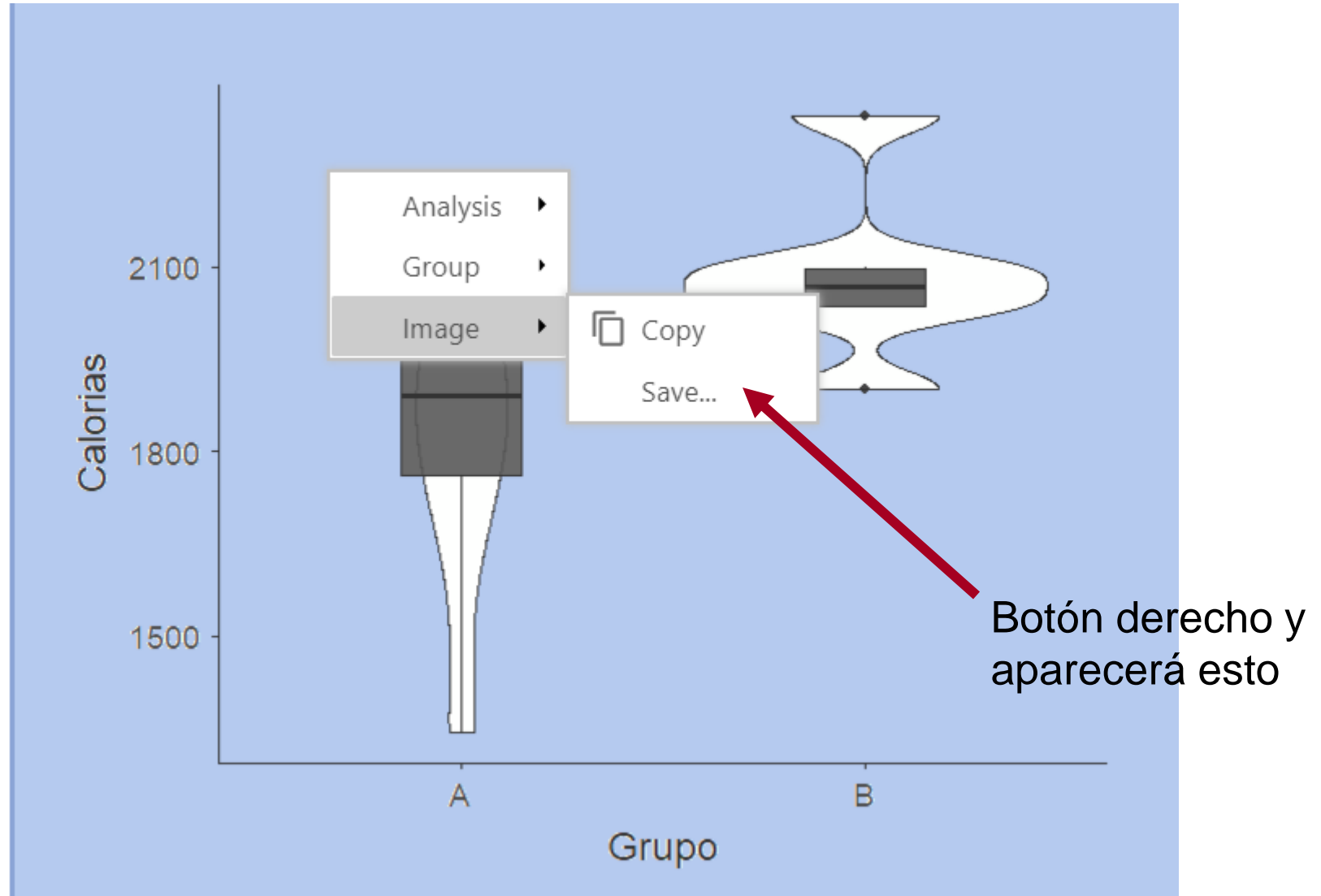
|   | Grupo | Altura | Peso | Sexo   | Calorias |
|---|-------|--------|------|--------|----------|
| 1 | A     | 1.81   | 72   | Hombre | 1890     |
| 2 | A     | 1.72   | 66   | Hombre | 1345     |
| 3 | B     | 1.79   | 81   | Hombre | 2345     |

# Variables categórica y numérica





# Guardar/copiar plots

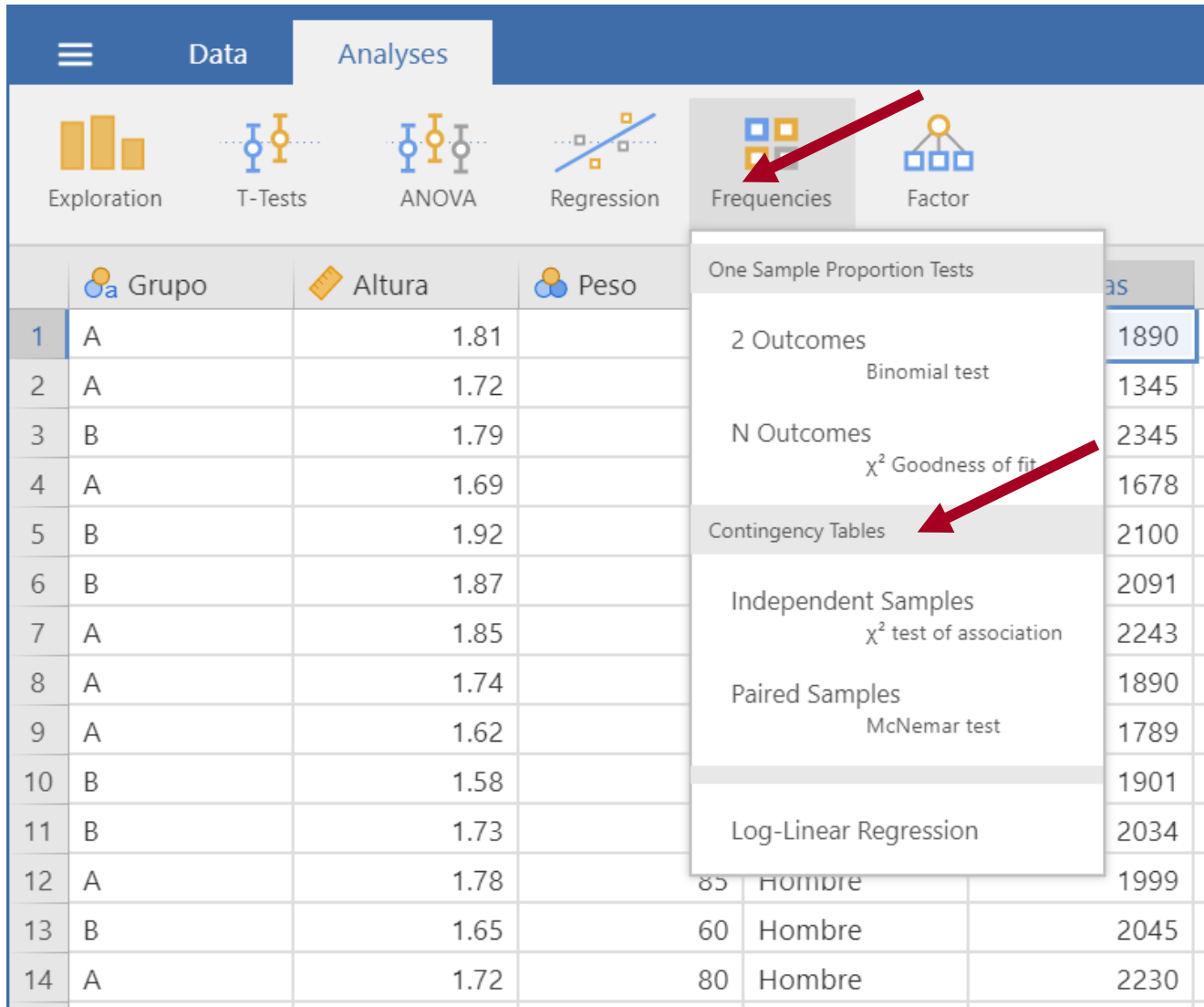


# 2 variables categóricas

- Como las 2 pueden definir grupos, hay que elegir una como más importante y describir la distribución de la 2ª en cada categoría de la 1ª
  - % de grupo A y B en hombres y mujeres
- **Tabla de frecuencias (o contingencia)**
  - Filas x Columnas

Es recomendable elegir la variable a comparar en filas

# 2 variables categóricas



The screenshot displays the SPSS software interface. The 'Analyses' menu is open, and the 'Frequencies' option is selected, indicated by a red arrow. The dropdown menu for 'Frequencies' is visible, showing options such as 'One Sample Proportion Tests', '2 Outcomes', 'N Outcomes', 'Contingency Tables', 'Independent Samples', 'Paired Samples', and 'Log-Linear Regression'. A second red arrow points to the 'Contingency Tables' option. The background shows a data table with columns 'Grupo', 'Altura', and 'Peso'.


|    | Grupo | Altura | Peso |
|----|-------|--------|------|
| 1  | A     | 1.81   |      |
| 2  | A     | 1.72   |      |
| 3  | B     | 1.79   |      |
| 4  | A     | 1.69   |      |
| 5  | B     | 1.92   |      |
| 6  | B     | 1.87   |      |
| 7  | A     | 1.85   |      |
| 8  | A     | 1.74   |      |
| 9  | A     | 1.62   |      |
| 10 | B     | 1.58   |      |
| 11 | B     | 1.73   |      |
| 12 | A     | 1.78   |      |
| 13 | B     | 1.65   |      |
| 14 | A     | 1.72   |      |


# 2 variables categóricas


≡


Data


Analyses


Exploration

T-Tests


ANOVA


Regression


Frequencies

Factor

## Contingency Tables

Altura

Peso

Calorias

→

Sexo

→

Grupo

→


Counts (optional)

→

Layers

> | Statistics

> | Cells



1500

A

Gr

### Contingency Tables

Contingency Tables

| Sexo   | Grupo |   | Total |
|--------|-------|---|-------|
|        | A     | B |       |
| Hombre | 6     | 5 | 11    |
| Mujer  | 2     | 1 | 3     |
| Total  | 8     | 6 | 14    |

$\chi^2$  Tests

|          | Value | df | p     |
|----------|-------|----|-------|
| $\chi^2$ | 0.141 | 1  | 0.707 |
| N        | 14    |    |       |

# Porcentajes

- Elegir los % de fila o columna, en función de cómo sea más fácil la interpretación
  - Sexo está en filas y Grupo en columnas
  - Si queremos **comparar grupo** (entre hombres y mujeres), elegir los porcentajes que suman **100 en cada sexo** → filas
- Los porcentajes totales no sirven para comparar

# 2 variables categóricas

jamovi

Menu: Data, Analyses

Icons: Exploration, T-Tests, ANOVA, Regression, Frequencies, Factor

## Contingency Tables

Rows: Grupo

Columns: Sexo

Counts (optional):

Layers:

Statistics

Cells

Counts

Percentages

Expected

Row

Column

### Contingency Tables

Contingency Tables

| Grupo | Sexo   |       | Total |
|-------|--------|-------|-------|
|       | Hombre | Mujer |       |
| A     | 6      | 2     | 8     |
| B     | 5      | 1     | 6     |
| Total | 11     | 3     | 14    |

$\chi^2$  Tests

|          | Value | df | p     |
|----------|-------|----|-------|
| $\chi^2$ | 0.141 | 1  | 0.707 |
| N        | 14    |    |       |

# 2 variables categóricas

Contingency Tables

Altura  
Peso  
Calorias

Rows  
Sexo

Columns  
Grupo

Counts (optional)

Layers

Statistics

Cells

Counts  
☐ Expected

Percentages  
☒ Row

Contingency Tables

Sexo

Grupo

|        |              | Grupo  |        |       |
|--------|--------------|--------|--------|-------|
| Sexo   |              | A      | B      | Total |
| Hombre | Observed     | 6      | 5      | 11    |
|        | % within row | 54.5 % | 45.5 % |       |
| Mujer  | Observed     | 2      | 1      | 3     |
|        | % within row | 66.7 % | 33.3 % |       |
| Total  | Observed     | 8      | 6      | 14    |
|        | % within row | 57.1 % | 42.9 % |       |

$\chi^2$  Tests

|          | Value | df | p     |
|----------|-------|----|-------|
| $\chi^2$ | 0.141 | 1  | 0.707 |
| N        | 14    |    |       |

# 2 variables numéricas

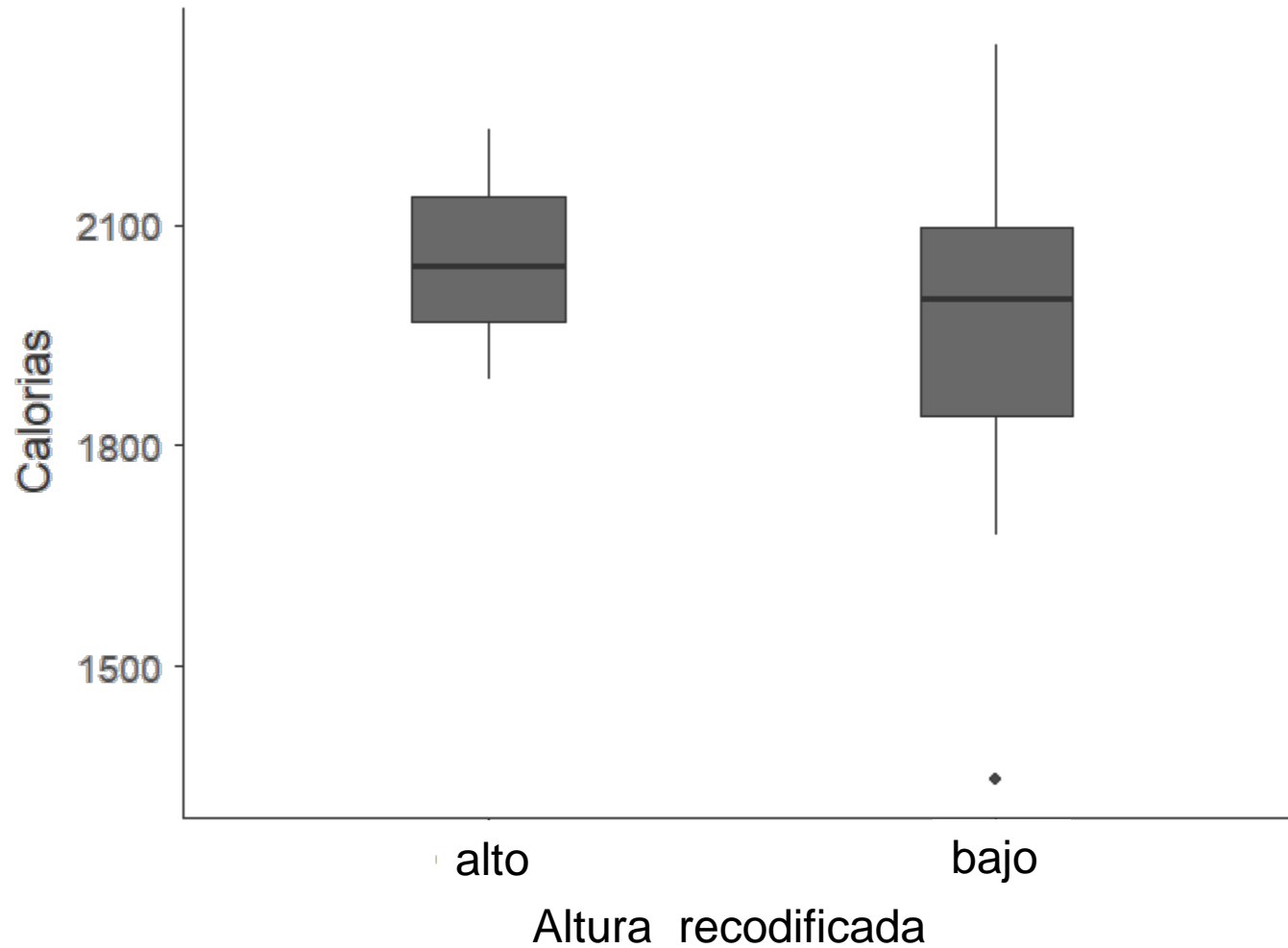
¿Consumen más **calorías** las personas con mayor **altura**?



## 2 numéricas

- Necesitamos estudiar la correlación
- Se podría categorizar una de ellas y comparar las medias de la otra
  - Medias de calorías x obesidad

# 2 numéricas



Categorizar supone perder mucha información

# 2 numéricas

Analyses -> regression -> correlation matrix

The screenshot displays a statistical software interface with a top navigation bar containing 'Data' and 'Analyses' tabs. Below the tabs is a toolbar with icons for 'Exploration', 'T-Tests', 'ANOVA', 'Regression', 'Frequencies', and 'Factor'. The main window is titled 'Correlation Matrix' and features a list of variables on the left: 'Peso', 'Grupo', and 'Sexo'. A right arrow points to a list of selected variables: 'Altura' and 'Calorias'. Below the variable lists are two sections: 'Correlation Coefficients' and 'Additional Options'. The 'Correlation Coefficients' section includes checkboxes for 'Pearson' (checked), 'Spearman', and 'Kendall's tau-b'. The 'Additional Options' section includes checkboxes for 'Report Significance' (checked), 'Flag significant correlations', and 'Confidence intervals'. Below these is an 'Interval' field set to '95 %'. At the bottom left, the 'Hypothesis' section has a radio button for 'Correlated'. The 'Plot' section has a checkbox for 'Correlation matrix' which is checked and highlighted by a red arrow. To the right of the dialog box is a scatter plot titled 'Altura' showing a positive linear relationship between 'Altura' (X-axis, ranging from 1.6 to 1.9) and 'Calorias' (Y-axis, ranging from 1500 to 2500). The plot includes a regression line and a shaded confidence interval.

Correlation Matrix

Peso  
Grupo  
Sexo

Altura  
Calorias

**Correlation Coefficients**

- ☒ Pearson
- ☐ Spearman
- ☐ Kendall's tau-b

**Additional Options**

- ☒ Report Significance
- ☐ Flag significant correlations
- ☐ Confidence intervals

Interval 95 %

**Hypothesis**

- ☐ Correlated

**Plot**

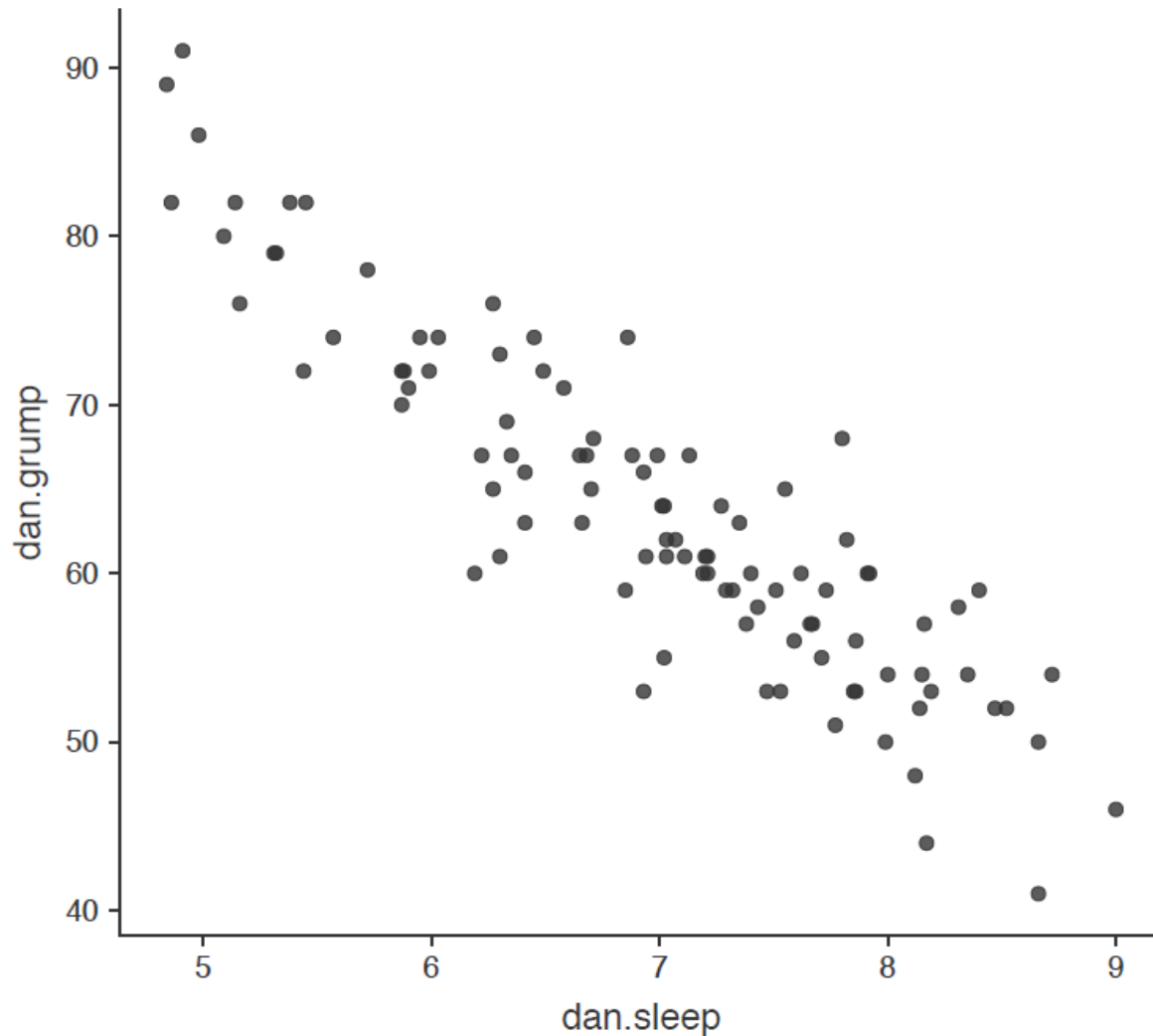
- ☒ Correlation matrix

Altura

Scatter plot showing the relationship between Altura (X-axis) and Calorias (Y-axis). The plot includes a regression line and a shaded confidence interval.

# 2 numéricas

La visualización se puede mejorar con el módulo 'scatr'



# Descriptiva bivariante

| <b>Tipo</b>       | <b>Categórica</b>                | <b>Numérica</b>             |
|-------------------|----------------------------------|-----------------------------|
| <b>Categórica</b> | Tablas de frecuencia<br>(barras) | Medias por grupo<br>(cajas) |
| <b>Numérica</b>   | Medias por grupo<br>(cajas)      | (Dispersión)                |