

# Customizing Seaborn Plots

## Changing plot style and color

### Why customize?

#### Reasons to change style:

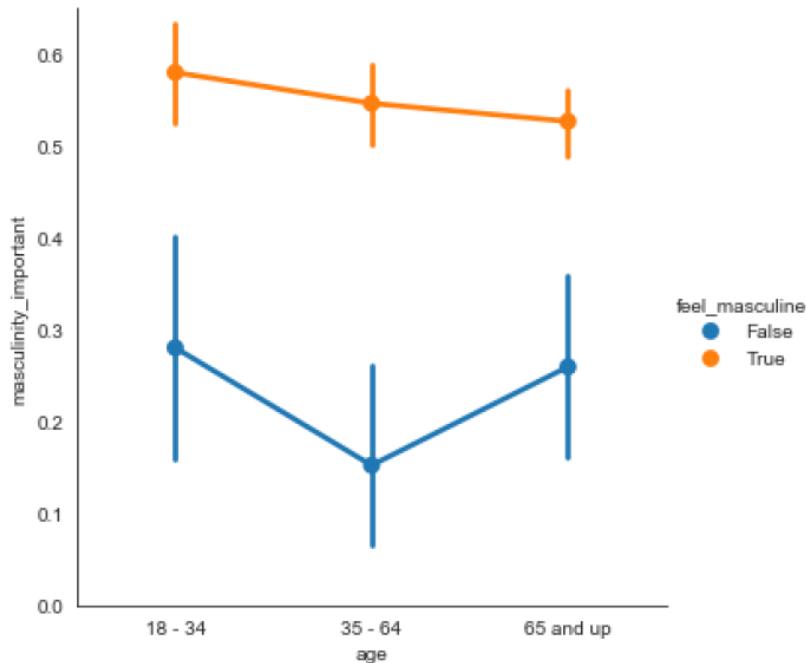
- Personal preference
- Improve readability
- Guide interpretation

### Changing the figure style

- Figure "style" includes background and axes
- 5 Preset options: "white", "dark", "whitegrid", "darkgrid", "ticks"
- `sns.set_style()`

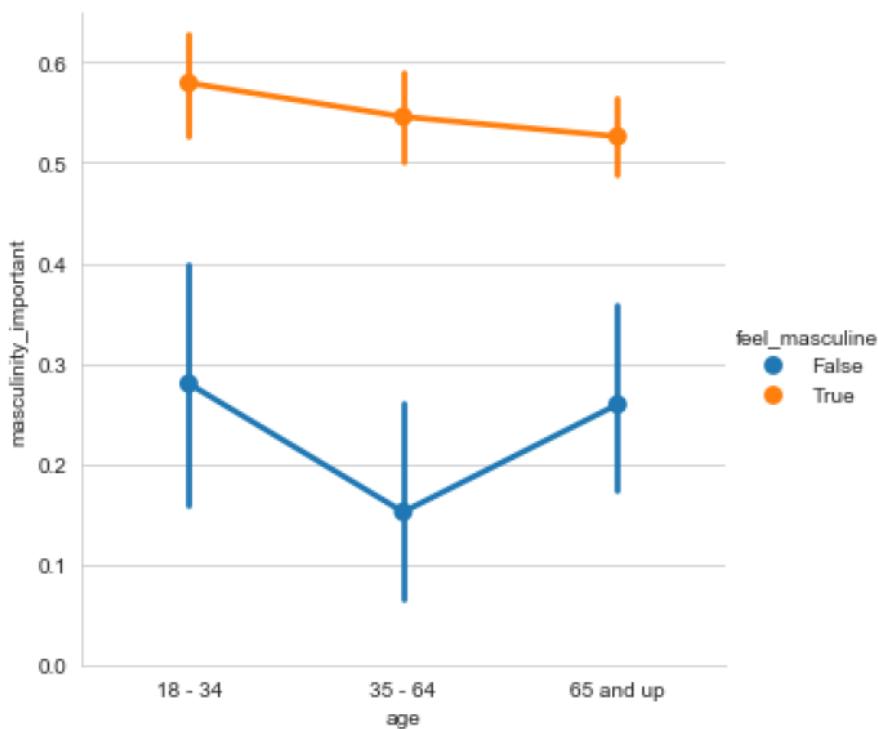
### Default figure style ("white")

```
sns.catplot(x="age",
             y="masculinity_important",
             data=masculinity_data,
             hue="feel_masculine",
             kind="point")
plt.show()
```



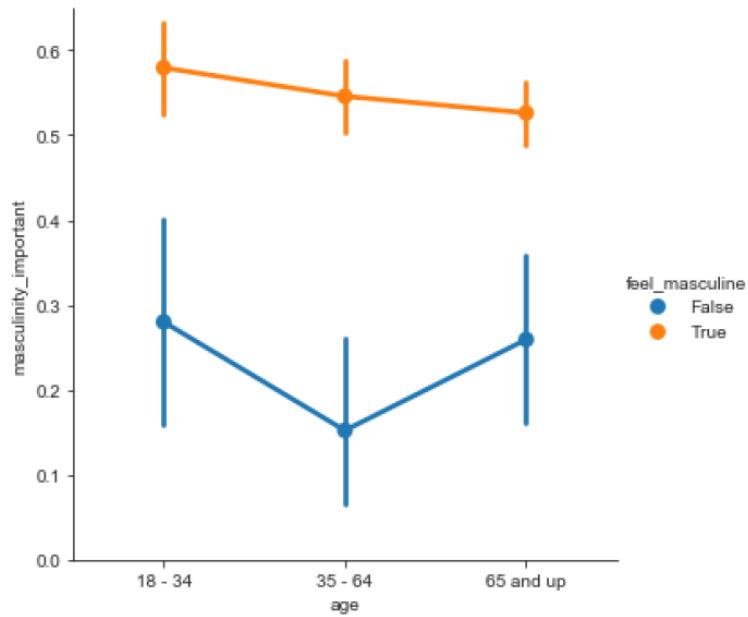
## Figure style: "whitegrid"

```
sns.set_style("whitegrid")
sns.catplot(x="age",
             y="masculinity_important",
             data=masculinity_data,
             hue="feel_masculine",
             kind="point")
plt.show()
```



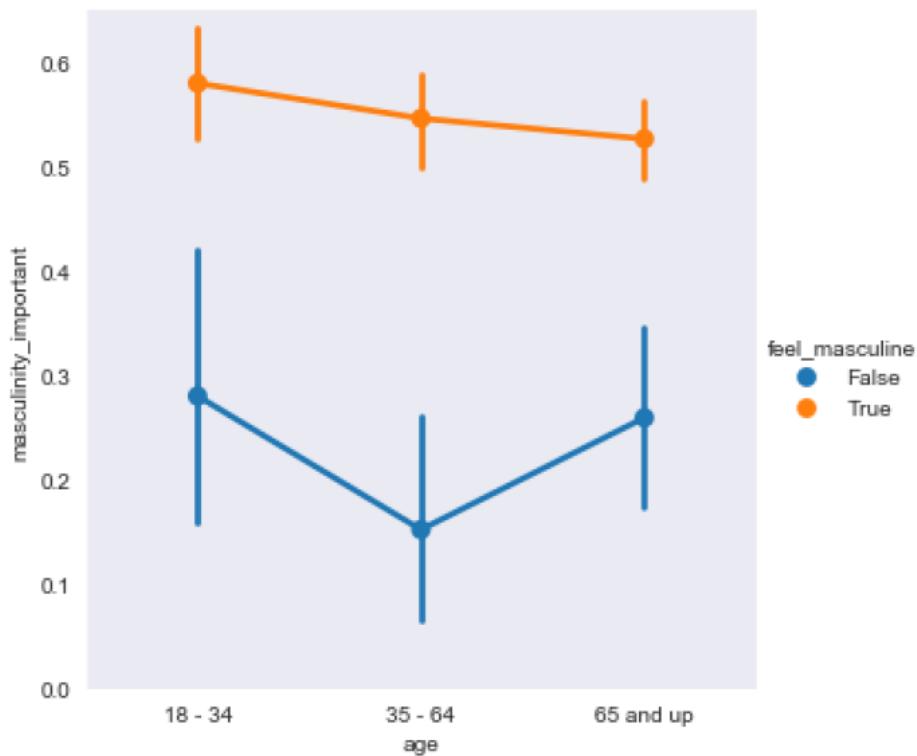
## Other Styles

```
sns.set_style("ticks")
sns.catplot(x="age",
            y="masculinity_important",
            data=masculinity_data,
            hue="feel_masculine",
            kind="point")
plt.show()
```

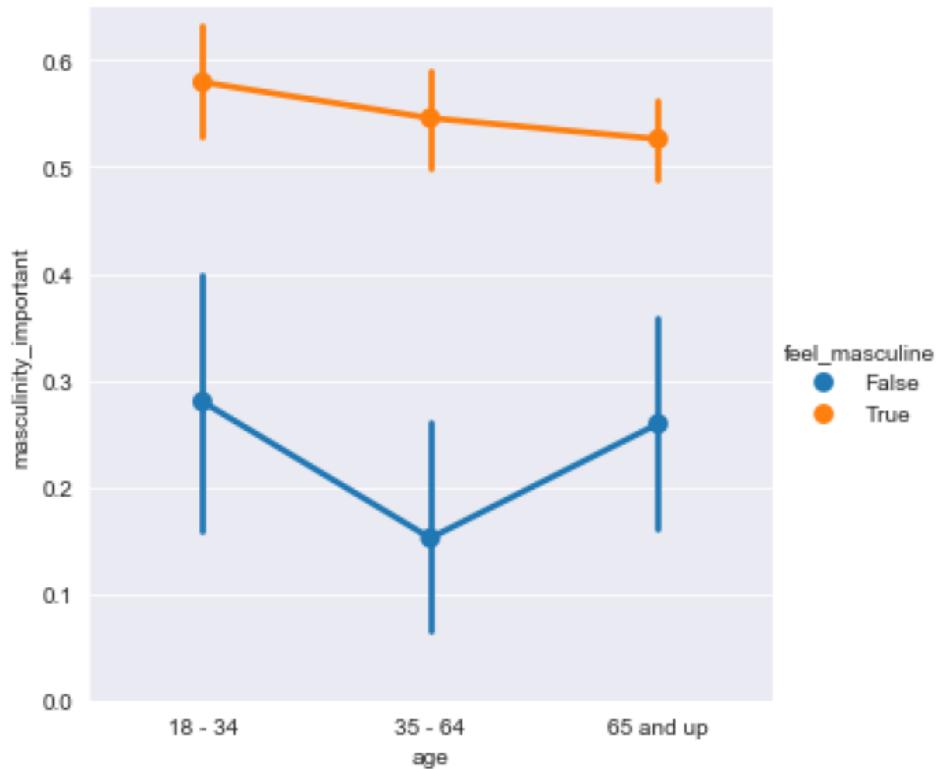


```
sns.set_style("dark")
sns.catplot(x="age",
            y="masculinity_important",
            data=masculinity_data,
            hue="feel_masculine",
            kind="point")

plt.show()
```



```
sns.set_style("darkgrid")
sns.catplot(x="age",
            y="mascinity_important",
            data=mascinity_data,
            hue="feel_masculine",
            kind="point")
plt.show()
```



## Changing the palette

- Figure “pallet” changes the color of main element of plot
- `sns.set_palette()`
- Use preset palette or create a custom palette.
- `sns.set_palette("tab10") #default color palette of Seaborn`

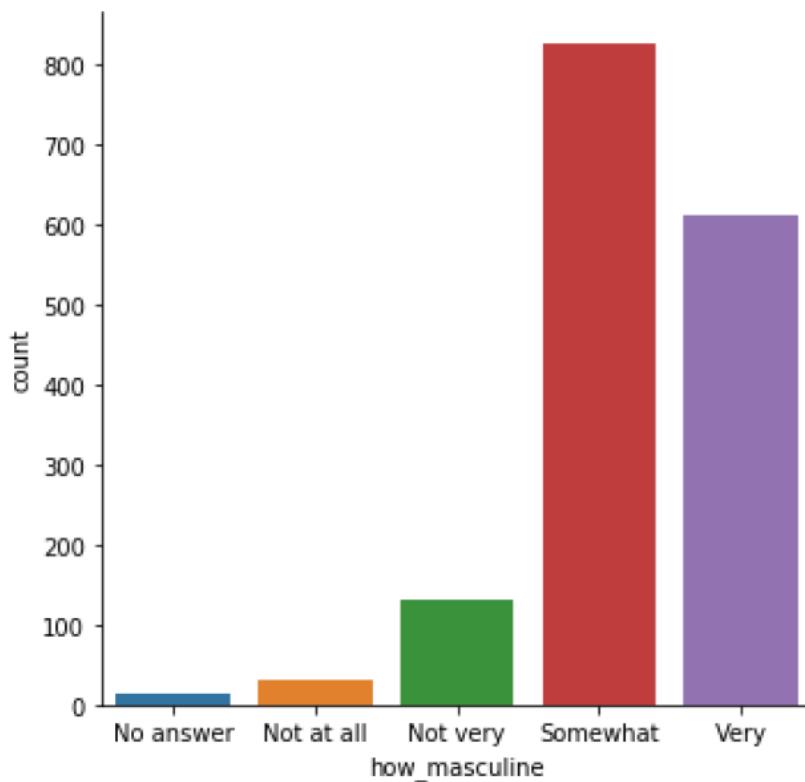
## Diverging palettes

\_r means reverse

“RdBu”	
“PRGn”	
“RdBu_r”	
“PRGn_r”	

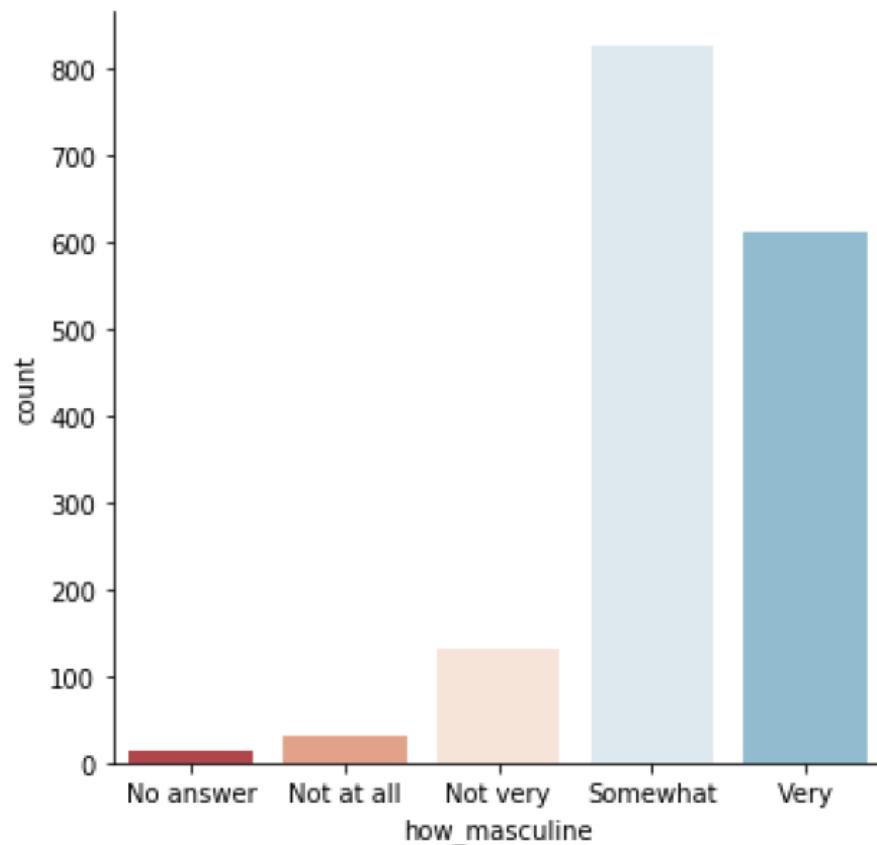
## Example (default palette)

```
category_order = ["No answer",
                  "Not at all",
                  "Not very",
                  "Somewhat",
                  "Very"]
sns.catplot(x="how_masculine",
             data=machismo_data,
             kind="count",
             order=category_order)
plt.show()
```



## Example (diverging palette)

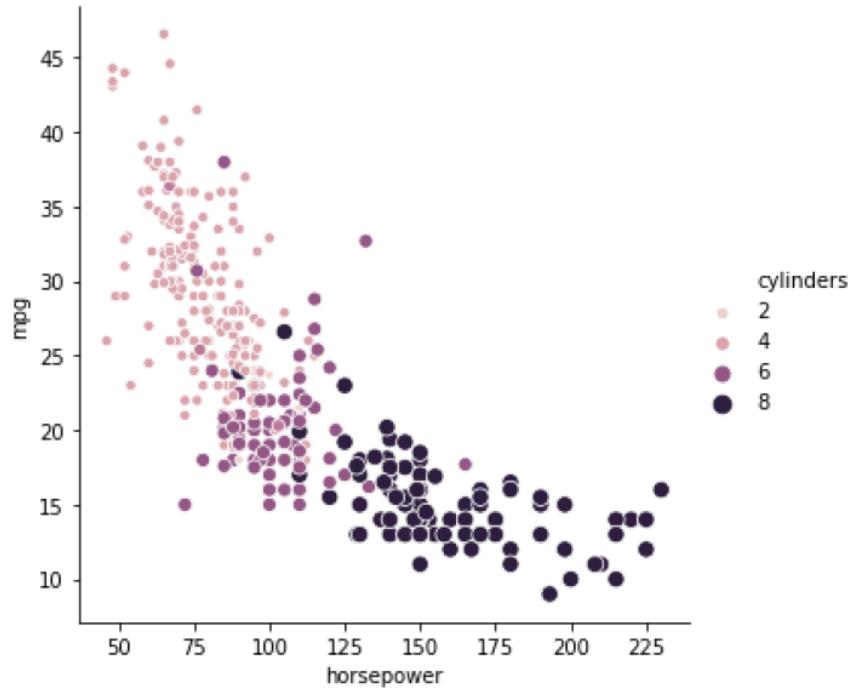
```
sns.set_palette("RdBu")
category_order = ["No answer",
                  "Not at all",
                  "Not very",
                  "Somewhat",
                  "Very"]
sns.catplot(x="how_masculine",
            data=masculinity_data,
            kind="count",
            order=category_order)
plt.show()
```



## Sequential palettes

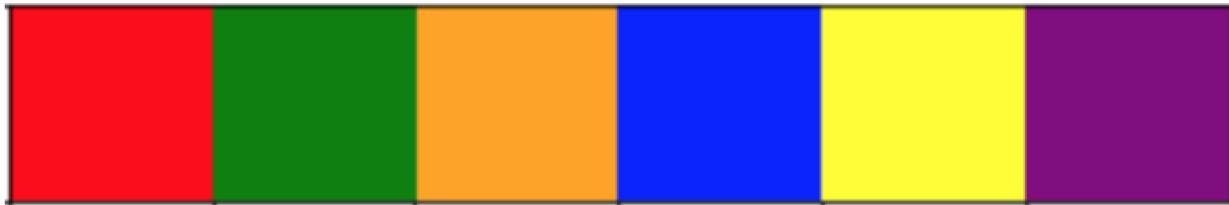
“Greys”	
“Blues”	
“PuRd”	
“GnBu”	

Example-

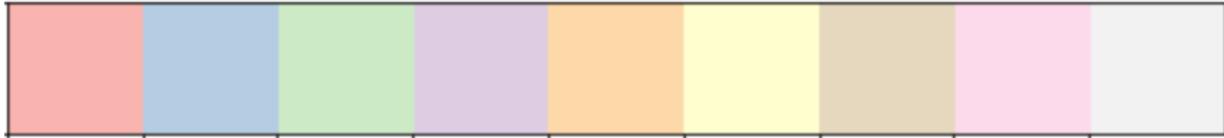


## Custom palettes

```
custom_palette = ["red", "green", "orange", "blue",
                  "yellow", "purple"]
sns.set_palette(custom_palette)
```



```
custom_palette = ['#FBB4AE', '#B3CDE3', '#CCEBC5',
                  '#DECBE4', '#FED9A6', '#FFFFCC',
                  '#E5D8BD', '#FDDAEC', '#F2F2F2']
sns.set_palette(custom_palette)
```

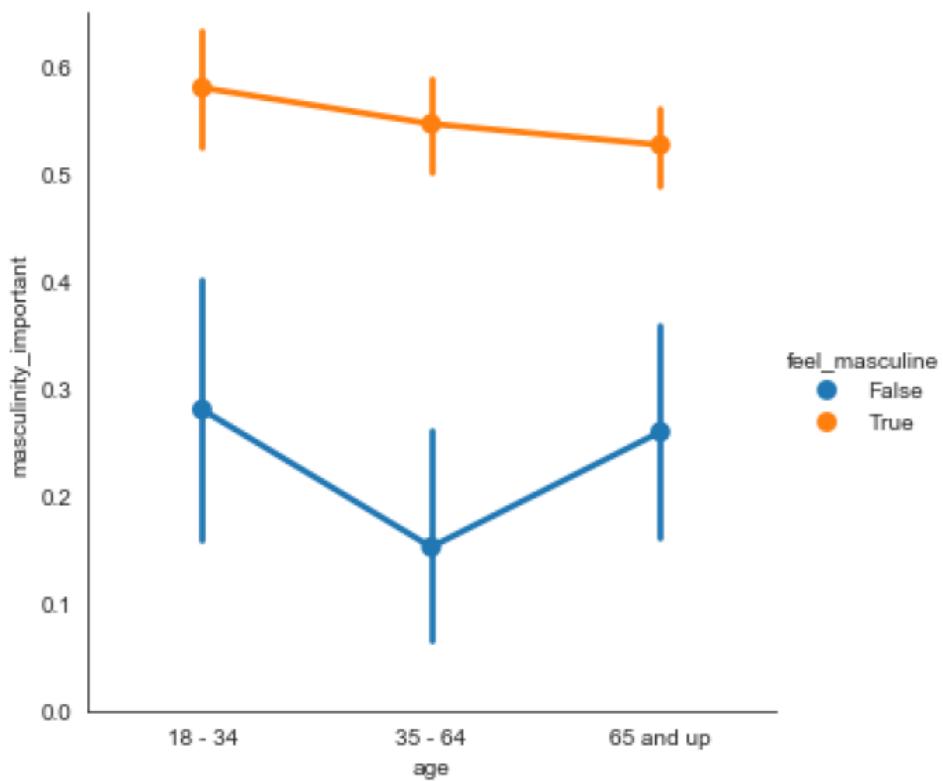


## Changing the scale

- Figure "context" changes the scale of the plot elements and labels
- `sns.set_context()`
- Smallest to largest: "paper", "notebook", "talk", "poster"

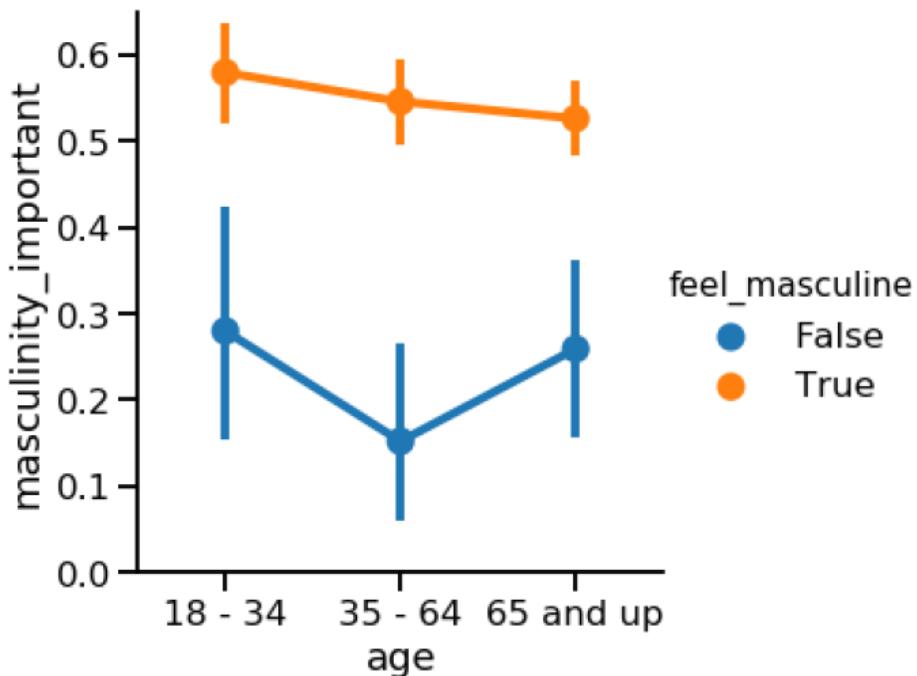
## Default context: "paper"

```
sns.catplot(x="age",
             y="masculinity_important",
             data=masculinity_data,
             hue="feel_masculine",
             kind="point")
plt.show()
```



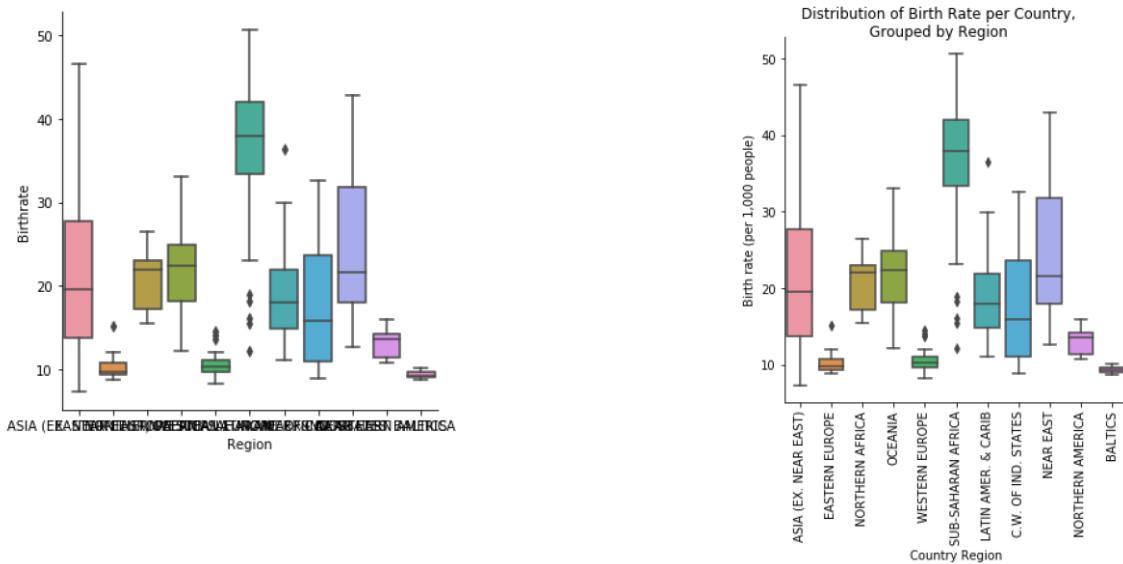
## Larger context: "talk"

```
sns.set_context("talk")
sns.catplot(x="age",
            y="masculinity_important",
            data=masculinity_data,
            hue="feel_masculine",
            kind="point")
plt.show()
```



## Adding titles and labels: Part 1

### Creating informative visualizations

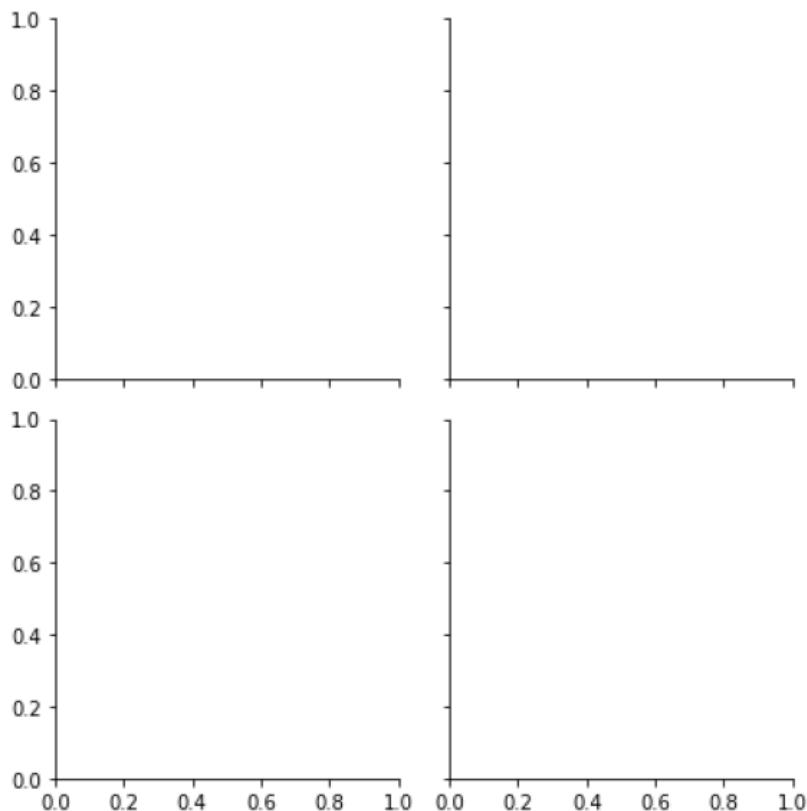


## FacetGrid vs. AxesSubplot objects

Seaborn plots create two different types of objects: FacetGrid and AxesSubplot.

```
g = sns.scatterplot(x="height", y="weight", data=df)
type(g)
> matplotlib.axes._subplots.AxesSubplot
```

## An Empty FacetGrid

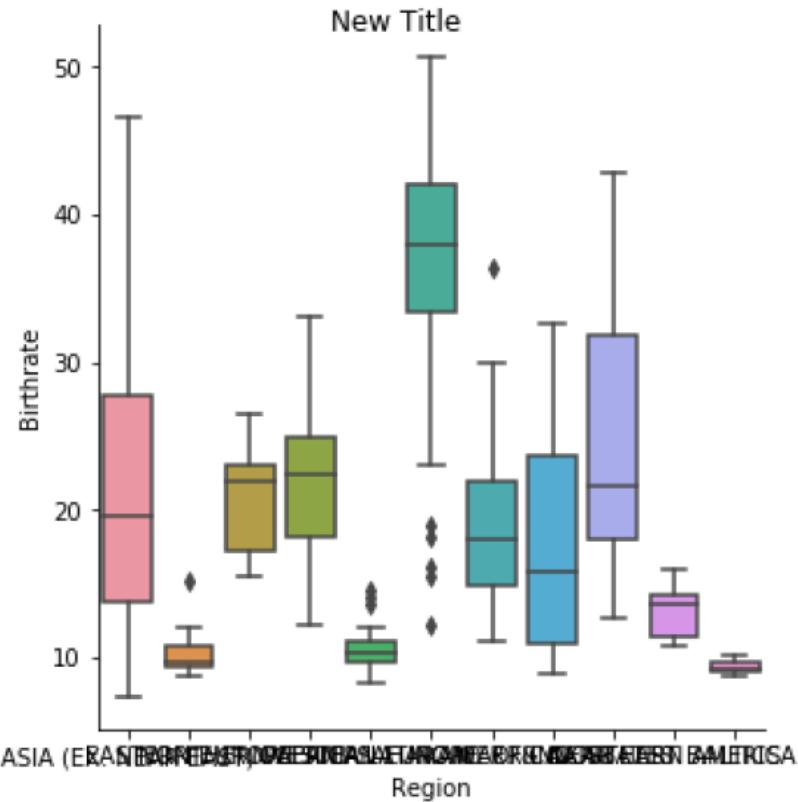


## FacetGrid vs. AxesSubplot objects

Object Type	Plot Types	Characteristics
FacetGrid	relplot() , catplot()	Can create subplots
AxesSubplot	scatterplot() , countplot() , etc.	Only creates a single plot

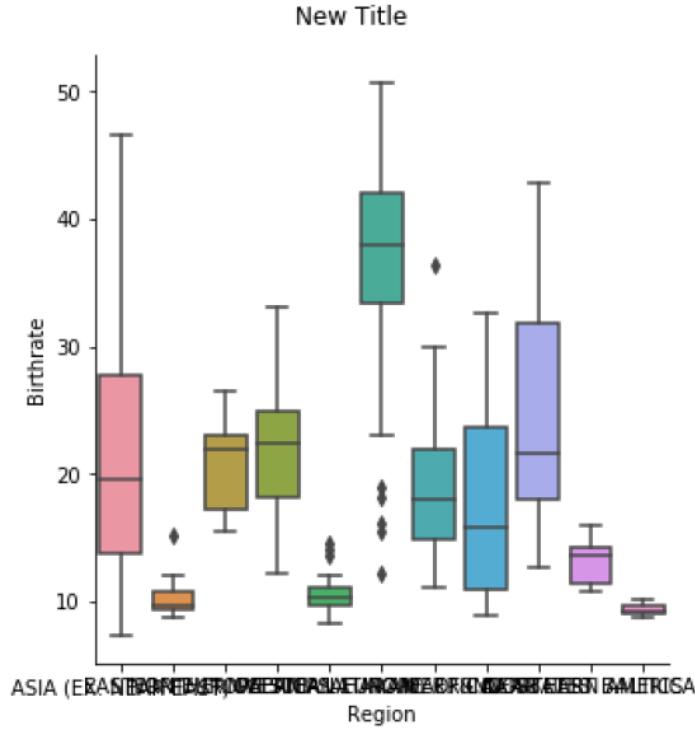
## Adding a title to FacetGrid

```
g = sns.catplot(x="Region",
                 y="Birthrate",
                 data=gdp_data,
                 kind="box")
g.fig.suptitle("New Title")
plt.show()
```



## Adjusting height of title in FacetGrid

```
g = sns.catplot(x="Region",
                 y="Birthrate",
                 data=gdp_data,
                 kind="box")
g.fig.suptitle("New Title",
               y=1.03)
plt.show()
```



## Adding titles and labels: Part 2

### Adding a title to AxesSubplot

```
#Facetgrid
FacetGrid
g = sns.catplot(x="Region",
                 y="Birthrate",
                 data=gdp_data,
                 kind="box")
g.fig.suptitle("New Title",
               y=1.03)

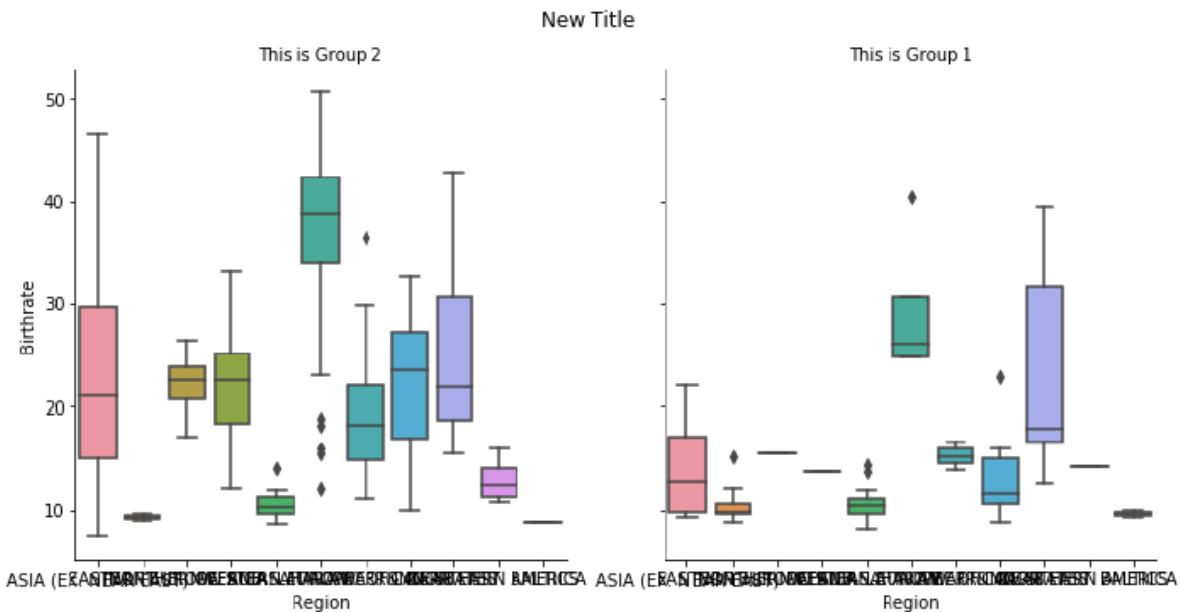
#AxesSubplot
g = sns.boxplot(x="Region",
                 y="Birthrate",
                 data=gdp_data)
g.set_title("New Title",
            y=1.03)
```

### Titles for subplots

```

g = sns.catplot(x="Region",
                 y="Birthrate",
                 data=gdp_data,
                 kind="box",
                 col="Group")
g.fig.suptitle("New Title",
                y=1.03)
g.set_titles("This is {col_name}")

```



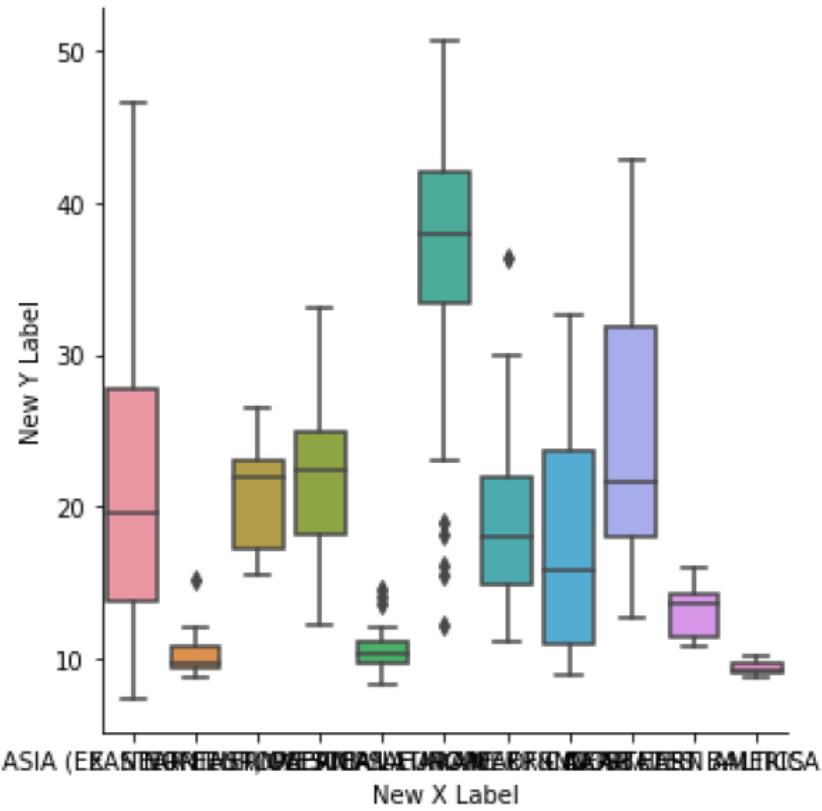
## Adding axis labels

This works for both FacetGrid and AxesSubplot objects.

```

g = sns.catplot(x="Region",
                 y="Birthrate",
                 data=gdp_data,
                 kind="box")
g.set(xlabel="New X Label",
      ylabel="New Y Label")
plt.show()

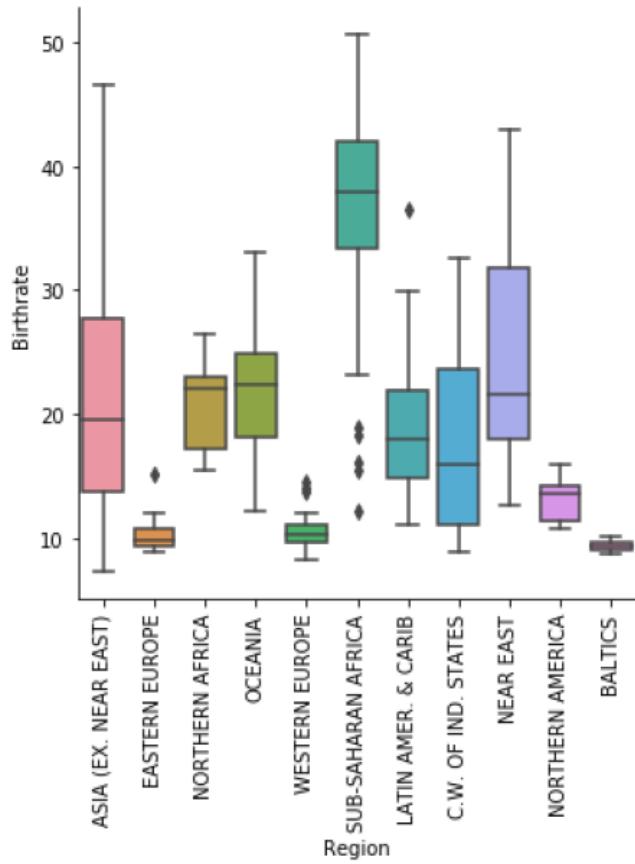
```



## Rotating x-axis tick labels

This works for both FacetGrid and AxesSubplot objects.

```
g = sns.catplot(x="Region",
                 y="Birthrate",
                 data=gdp_data,
                 kind="box")
plt.xticks(rotation=90) #a matplotlib function
plt.show()
```



# Putting it all together

## Getting started

```
#To import Seaborn:  
import seaborn as sns  
#To import Matplotlib:  
import matplotlib.pyplot as plt  
#To show a plot:  
plt.show()
```

## Relational plots

Show the relationship between two quantitative variables

Examples: scatter plots, line plots

```
sns.relplot(x="x_variable_name",
             y="y_variable_name",
             data=pandas_df,
             kind="scatter")
```

## Categorical plots

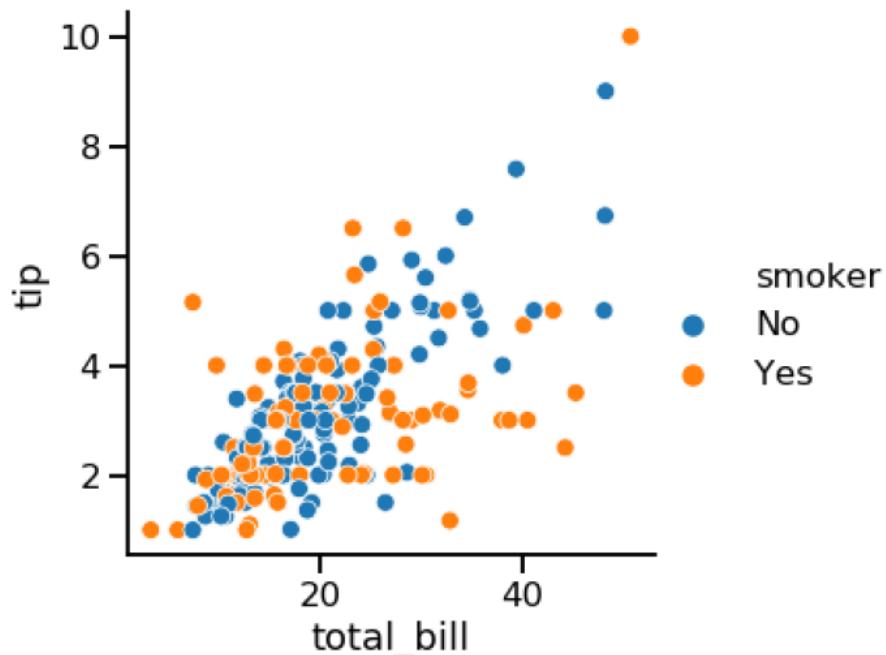
Show the distribution of a quantitative variable within categories defined by a categorical variable

Examples: bar plots, count plots, box plots, point plots

```
sns.catplot(x="x_variable_name",
             y="y_variable_name",
             data=pandas_df,
             kind="bar")
```

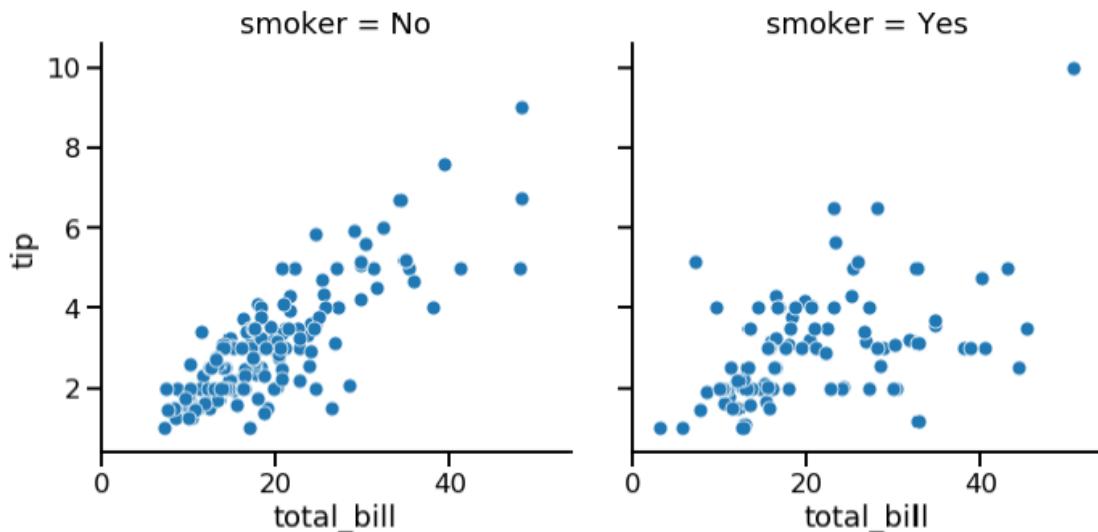
## Adding a third variable (hue)

Setting `hue` will create subgroups that are displayed as different colors on a single plot.



## Adding a third variable (row/col)

Setting `row` and/or `col` in `relplot` or `catplot` will create subgroups that are displayed on separate subplots.



## Customization

- Change the background: `sns.set_style()`
- Change the main element colors: `sns.set_palette()`
- Change the scale: `sns.set_context()`

## Adding a title

Object Type	Plot Types	How to Add Title
FacetGrid	<code>relplot()</code> , <code>catplot()</code>	<code>g.fig.suptitle()</code>
AxesSubplot	<code>scatterplot()</code> , <code>countplot()</code> , etc.	<code>g.set_title()</code>

## Final touches

### Add x- and y-axis labels:

```
g.set(xlabel="new x-axis label",
      ylabel="new y-axis label")
```

**Rotate x-tick labels:**

```
plt.xticks(rotation=90)
```

## What's Next

<https://s3-us-west-2.amazonaws.com/secure.notion-static.com/363dc0f5-d33f-4b6b-ac41-925cac90e73c/chapter4.pdf>