

Changing plot style and color

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Erin Case
Data Scientist

Why customize?

Reasons to change style:

- Personal preference
- Improve readability
- Guide interpretation

Changing the figure style

- Figure "style" includes background and axes
- 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()
```

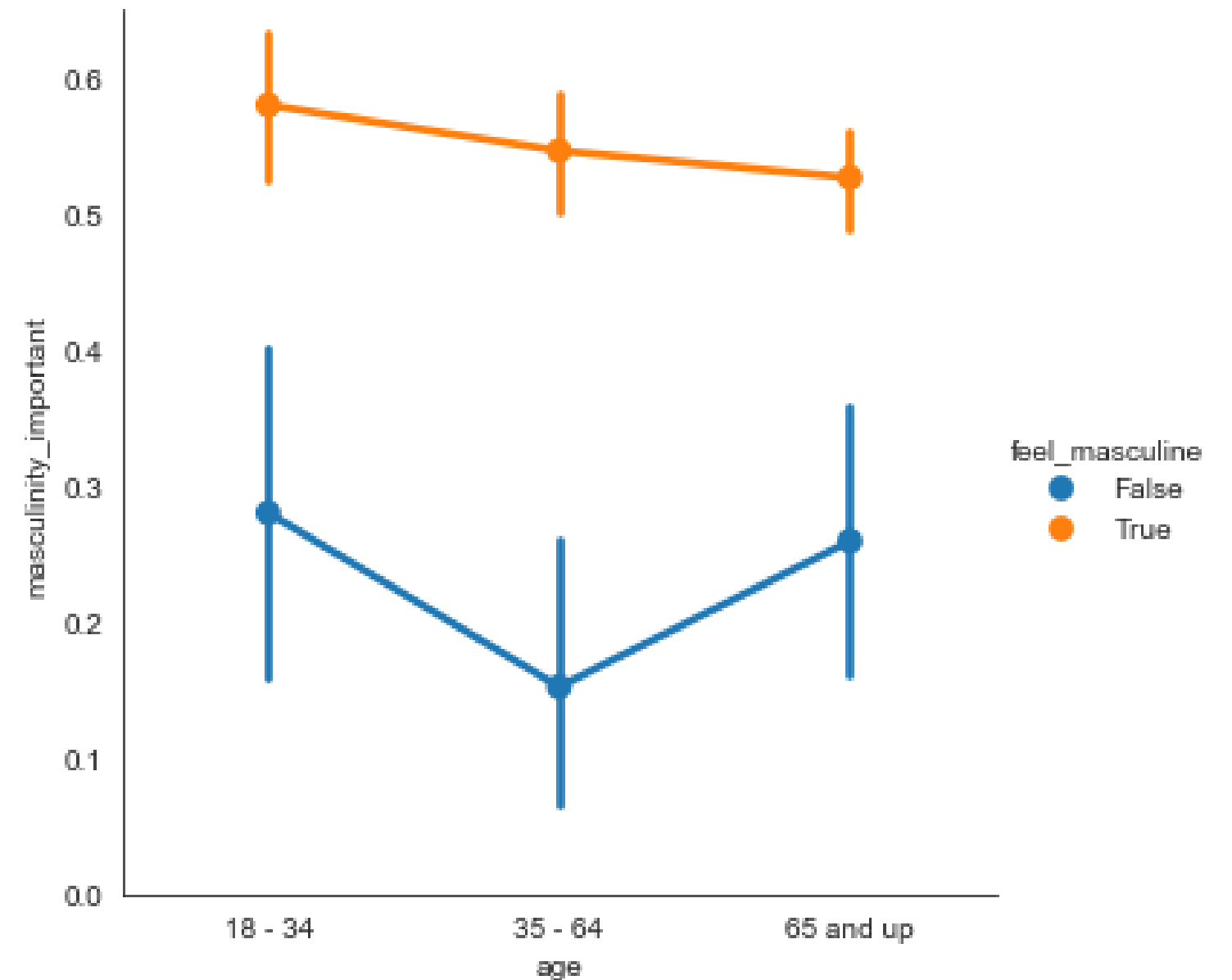
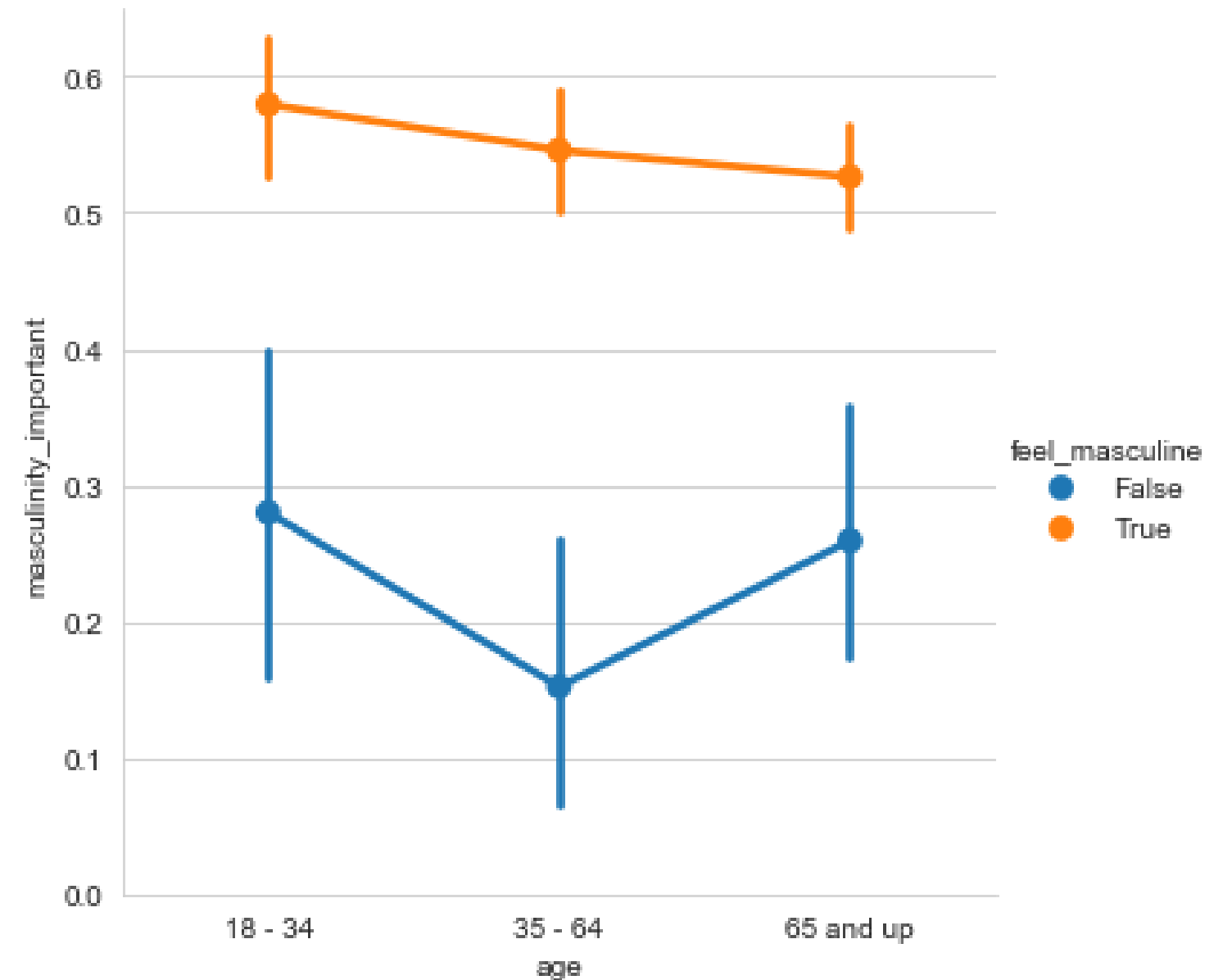


Figure style: "whitegrid"

```
sns.set_style("whitegrid")

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

plt.show()
```

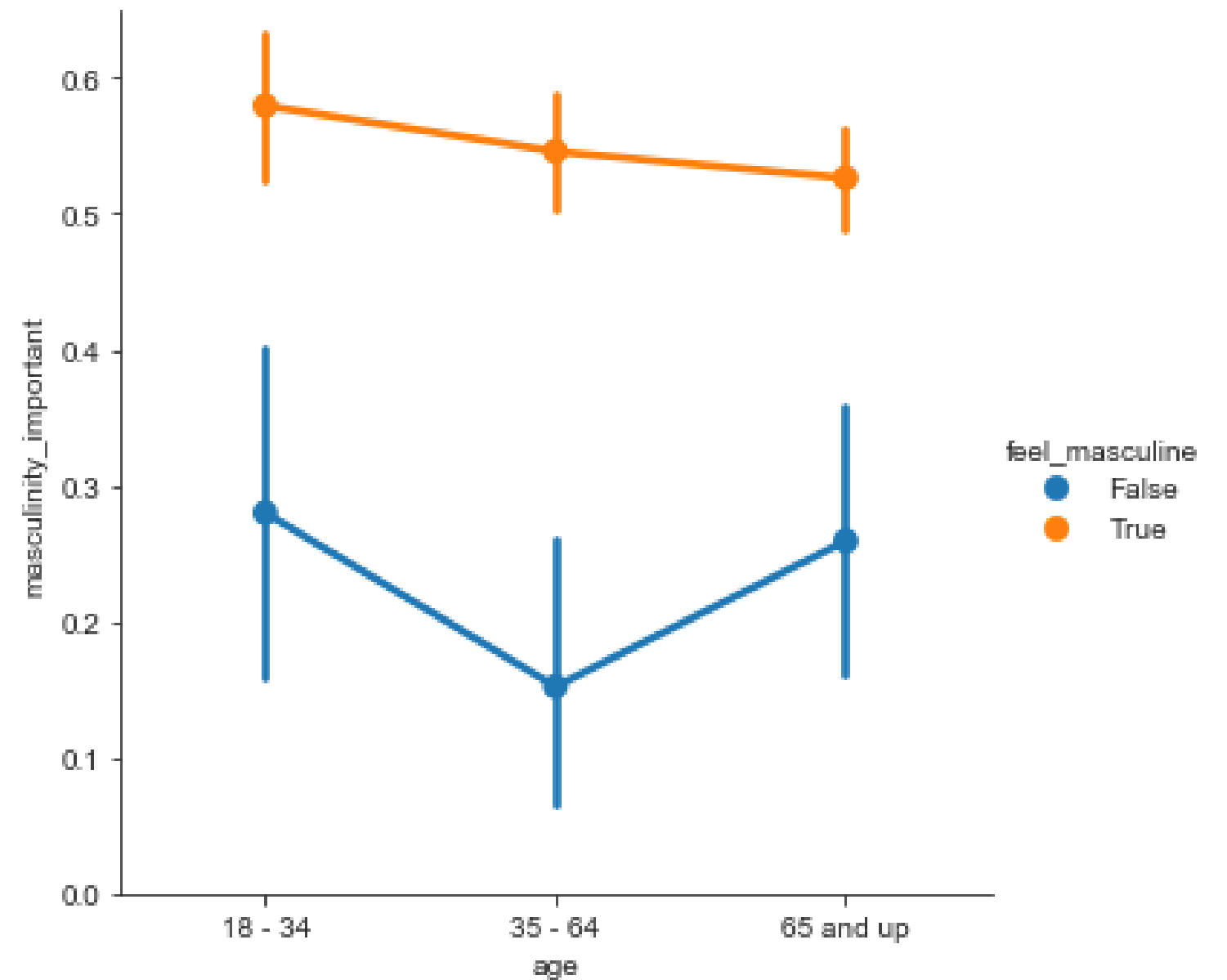


Other styles

```
sns.set_style("ticks")

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

plt.show()
```

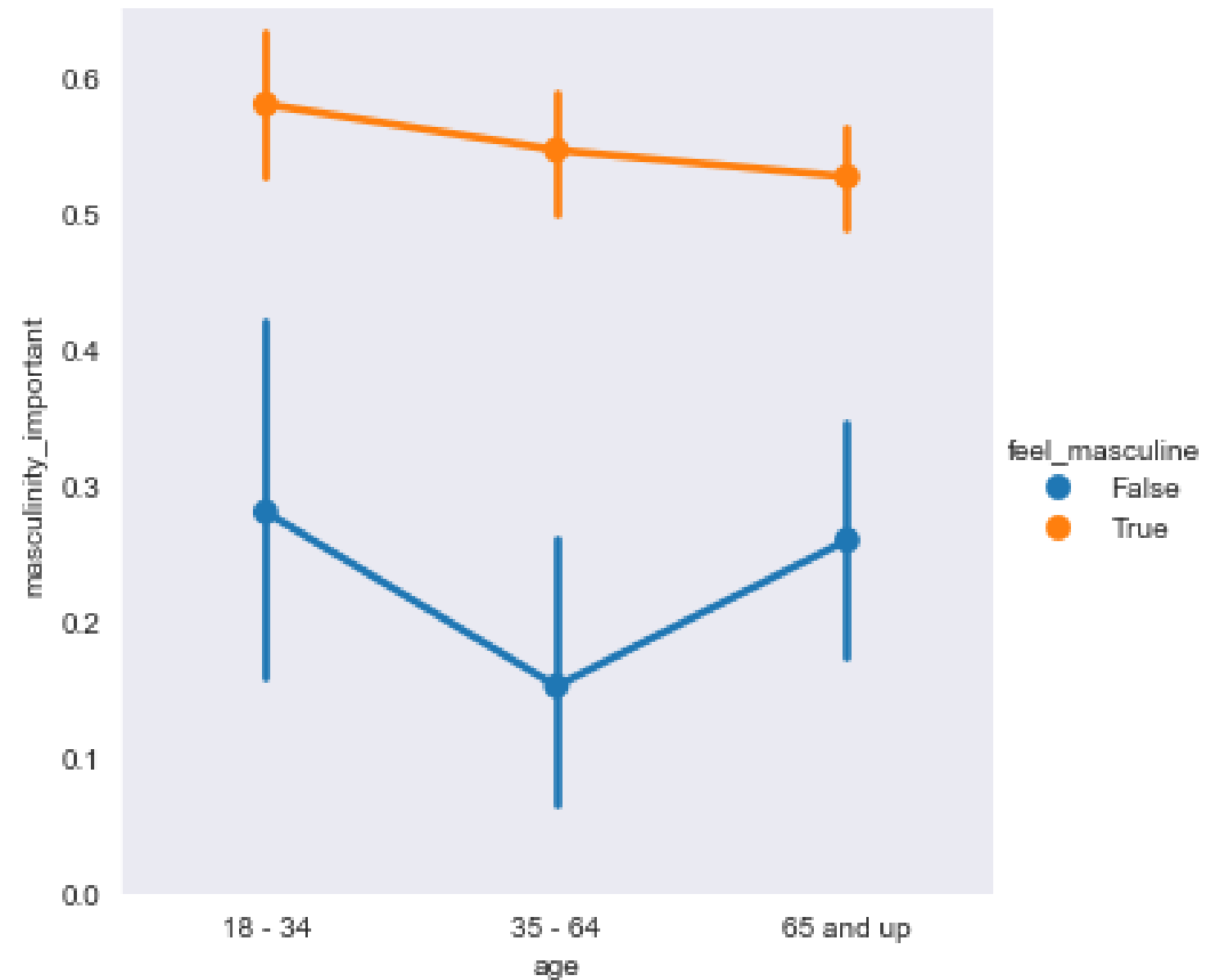


Other styles

```
sns.set_style("dark")

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

plt.show()
```

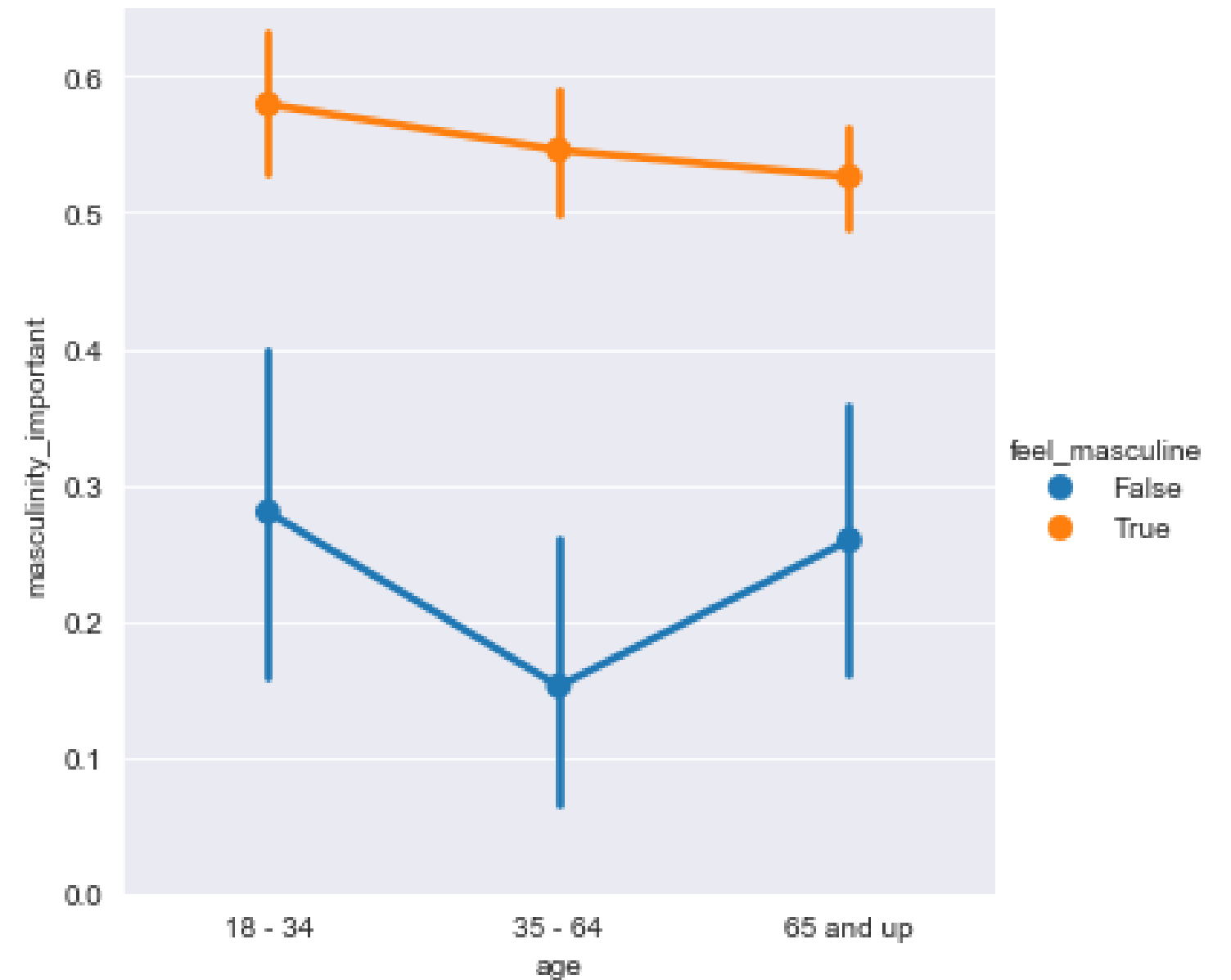


Other styles

```
sns.set_style("darkgrid")

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





plt.show()
```



Changing the palette

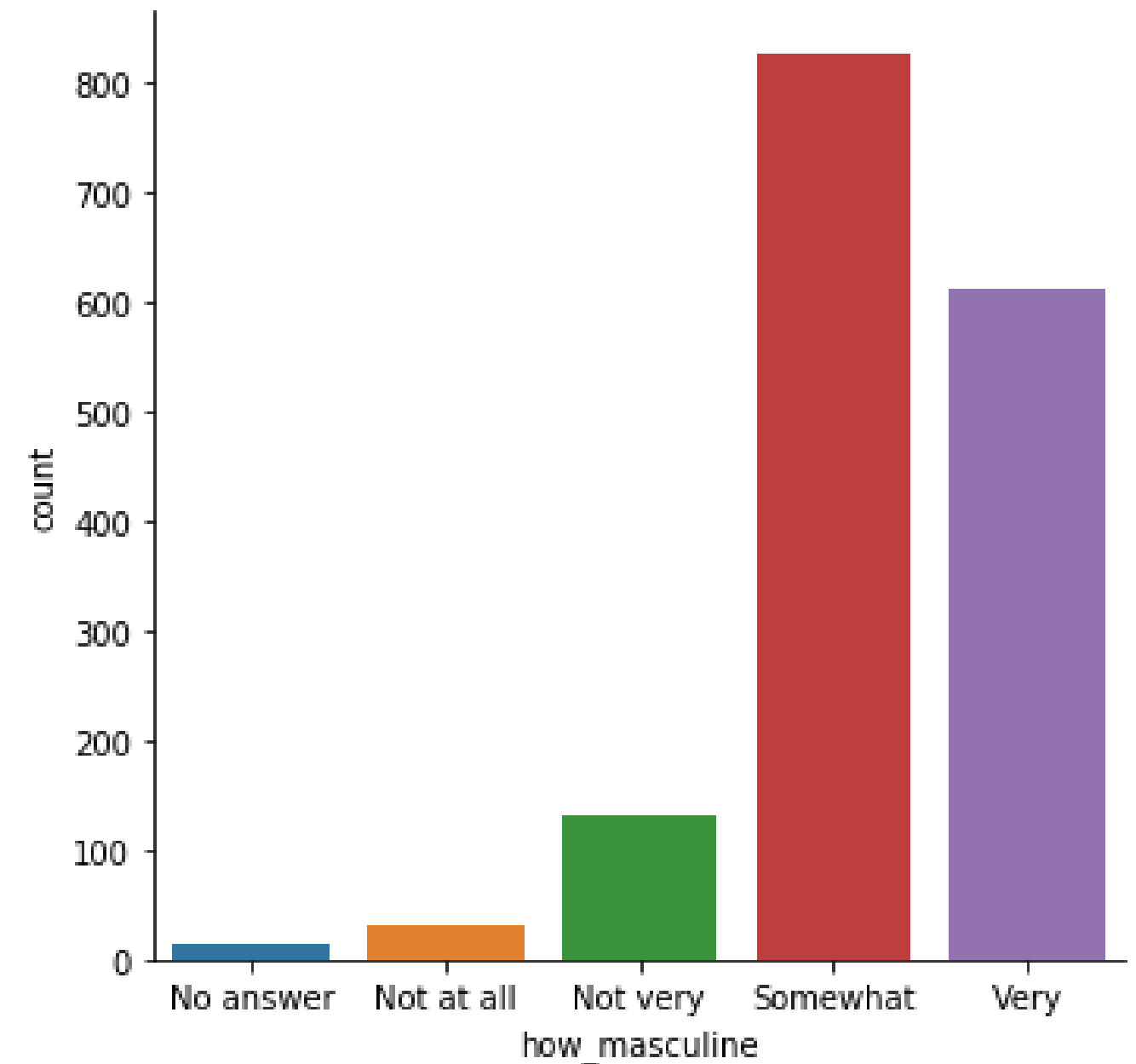
- Figure "palette" changes the color of the main elements of the plot
- `sns.set_palette()`
- Use preset palettes or create a custom palette

Diverging palettes

"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=masculinity_data,  
            kind="count",  
            order=category_order)  
  
plt.show()
```



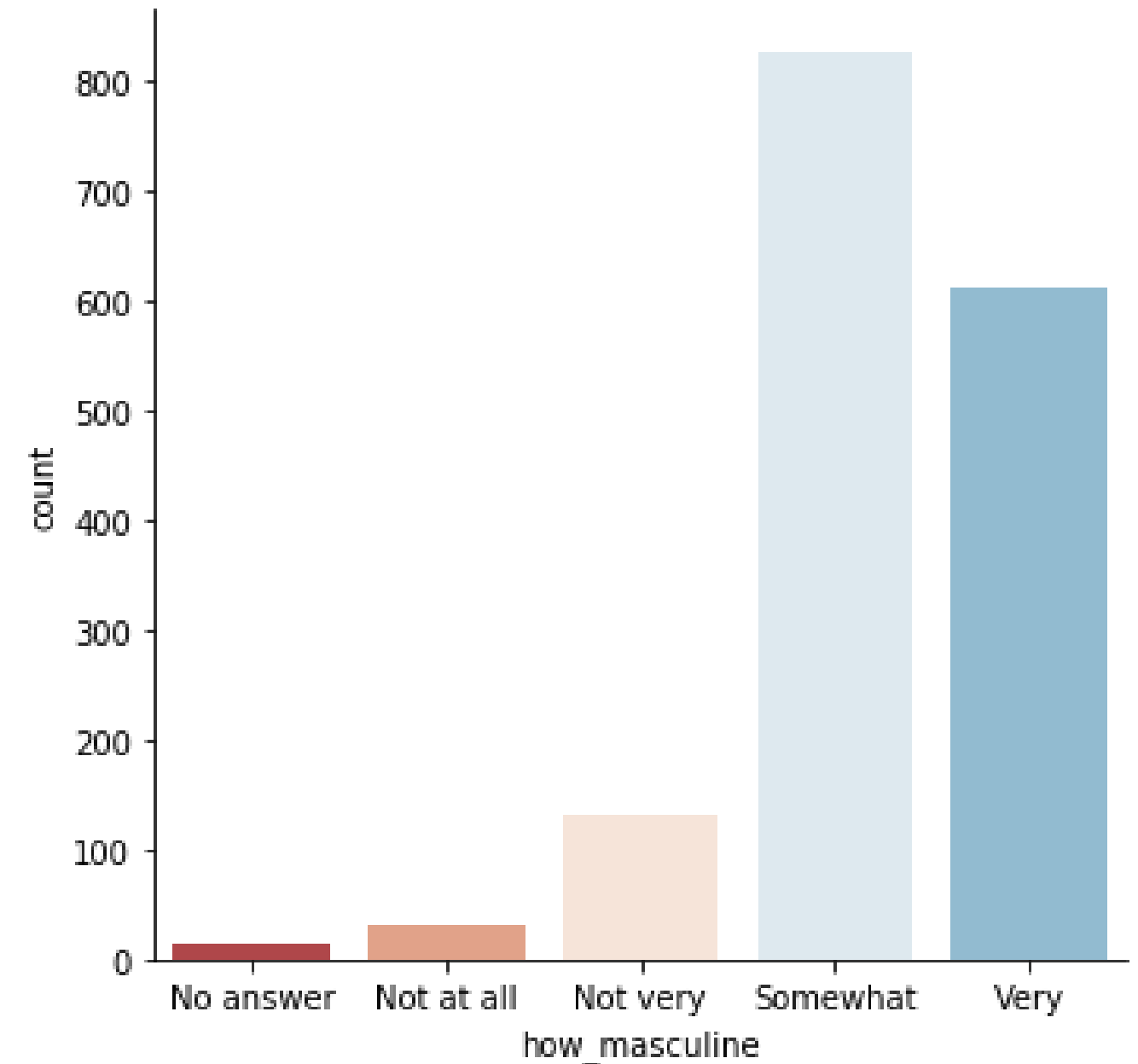
Example (diverging palette)

```
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)

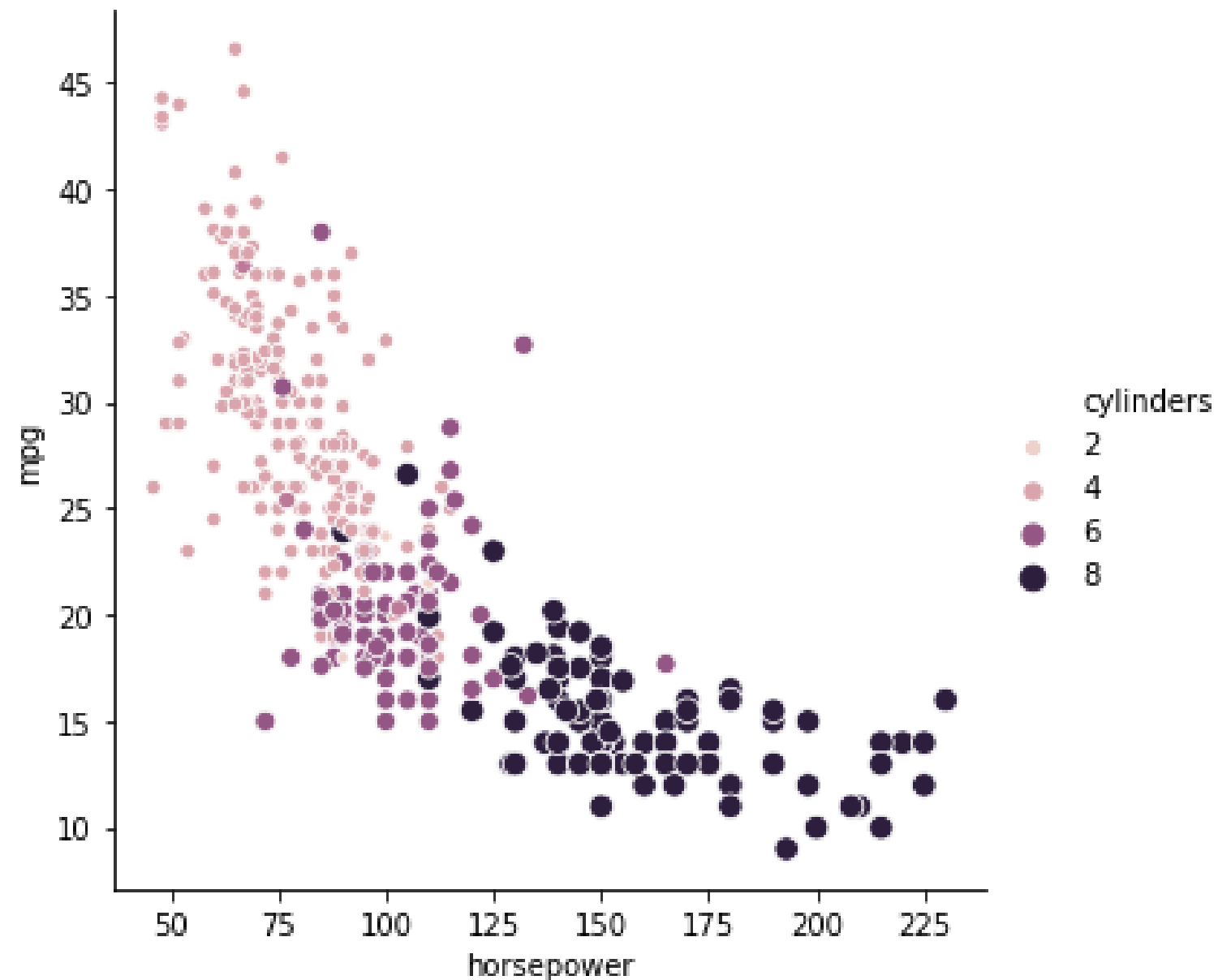
plt.show()
```



Sequential palettes

"Greys"	
"Blues"	
"PuRd"	
"GnBu"	

Sequential palette example

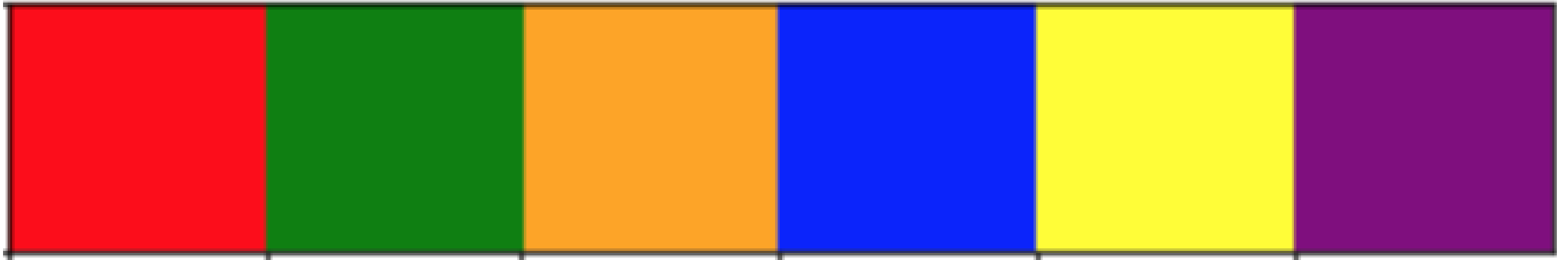


¹ Waskom, M. L. (2021). seaborn: statistical data visualization. <https://seaborn.pydata.org/>

Custom palettes

```
custom_palette = ["red", "green", "orange", "blue",  
                  "yellow", "purple"]
```

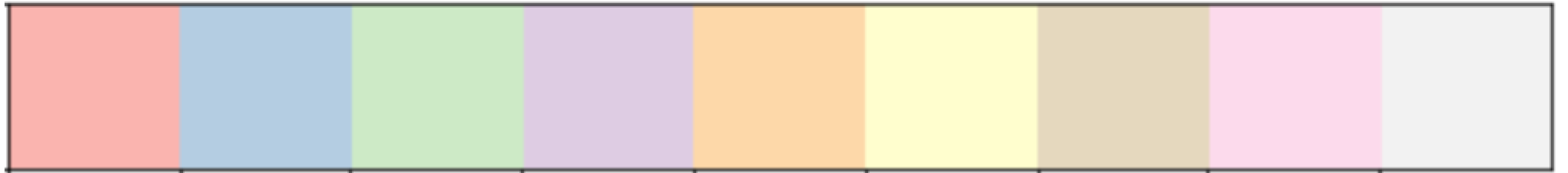
```
sns.set_palette(custom_palette)
```



Custom palettes

```
custom_palette = ['#FBB4AE', '#B3CDE3', '#CCEBC5',  
                  '#DECBE4', '#FED9A6', '#FFFFCC',  
                  '#E5D8BD', '#FDDAEC', '#F2F2F2']
```

```
sns.set_palette(custom_palette)
```

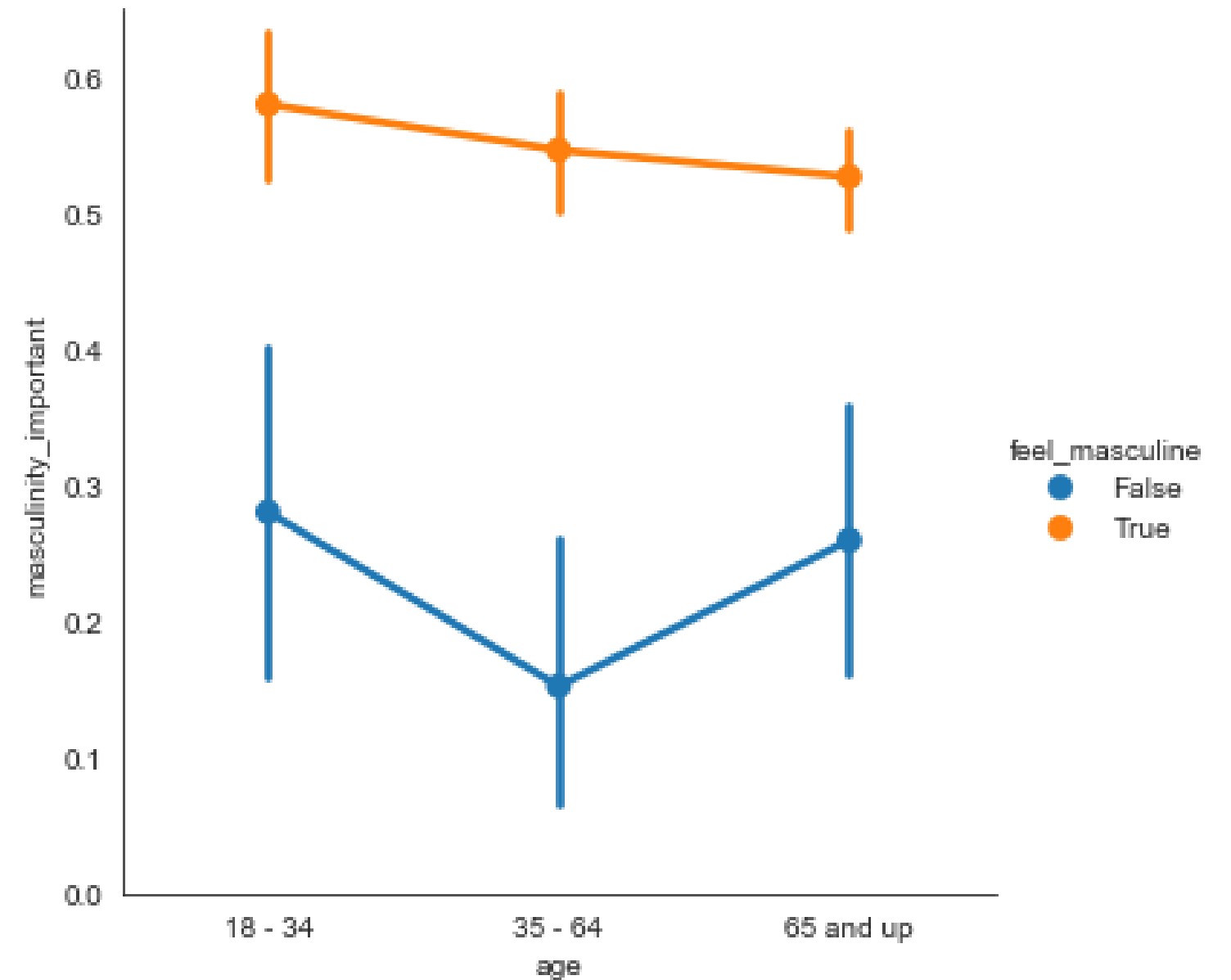


Changing the scale

- 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()
```

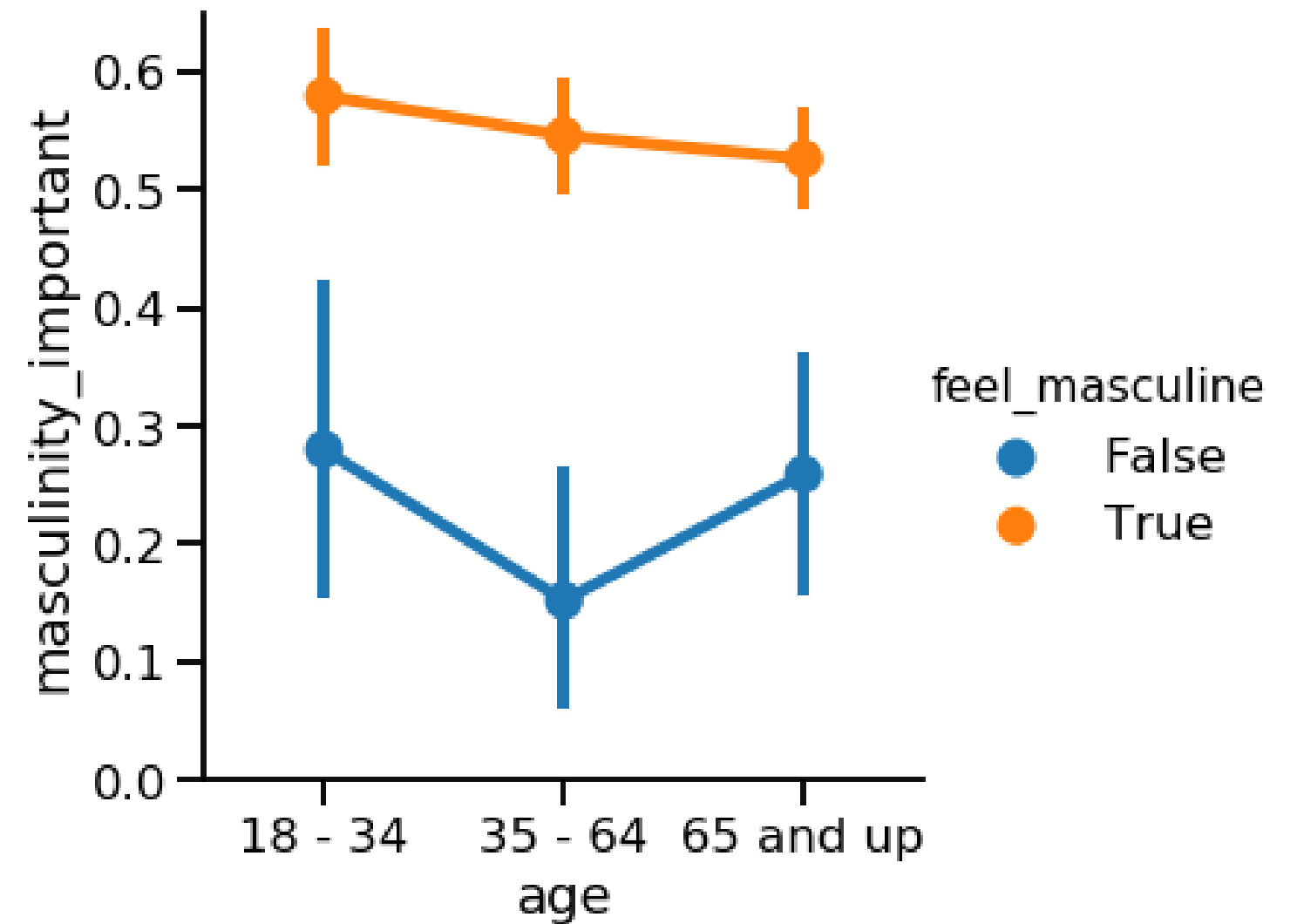


Larger context: "talk"

```
sns.set_context("talk")

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

plt.show()
```



Let's practice!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN

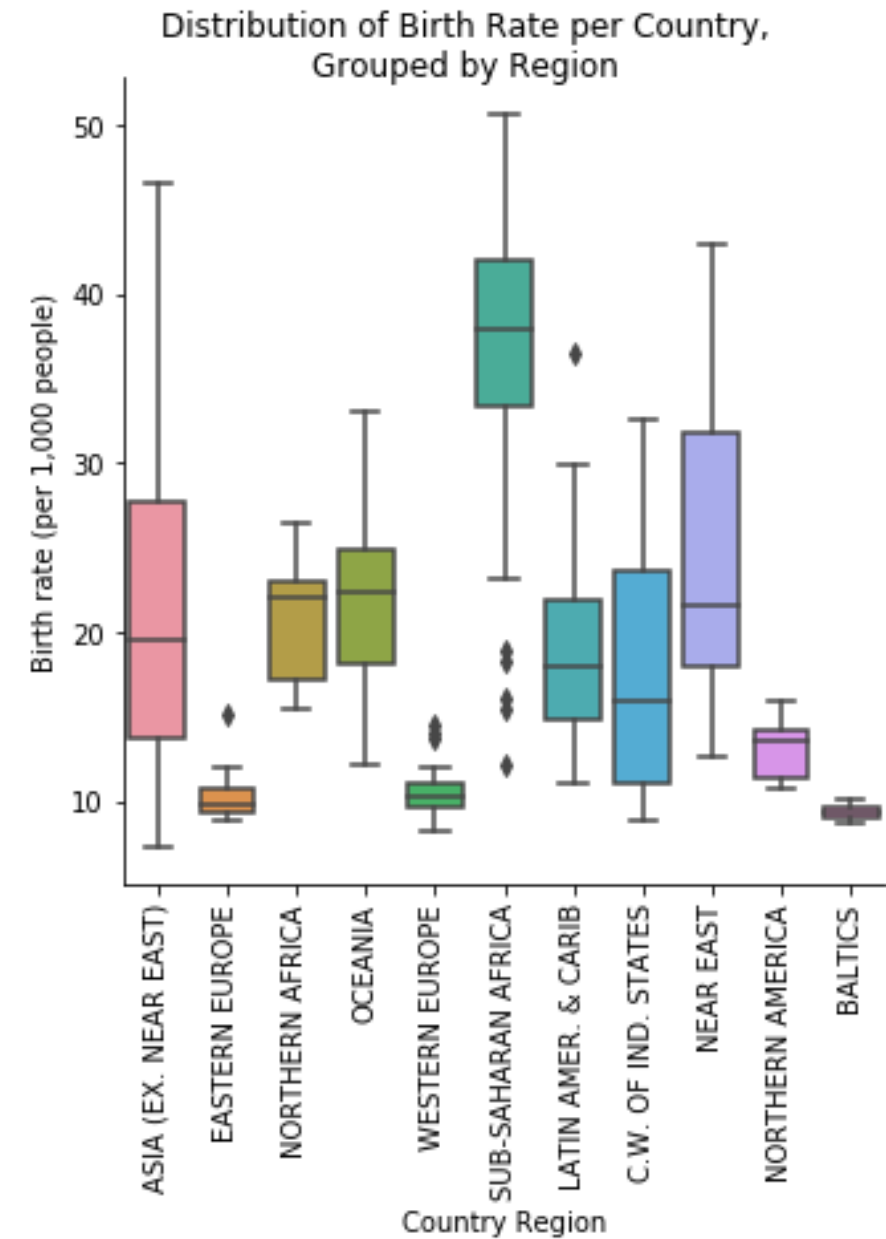
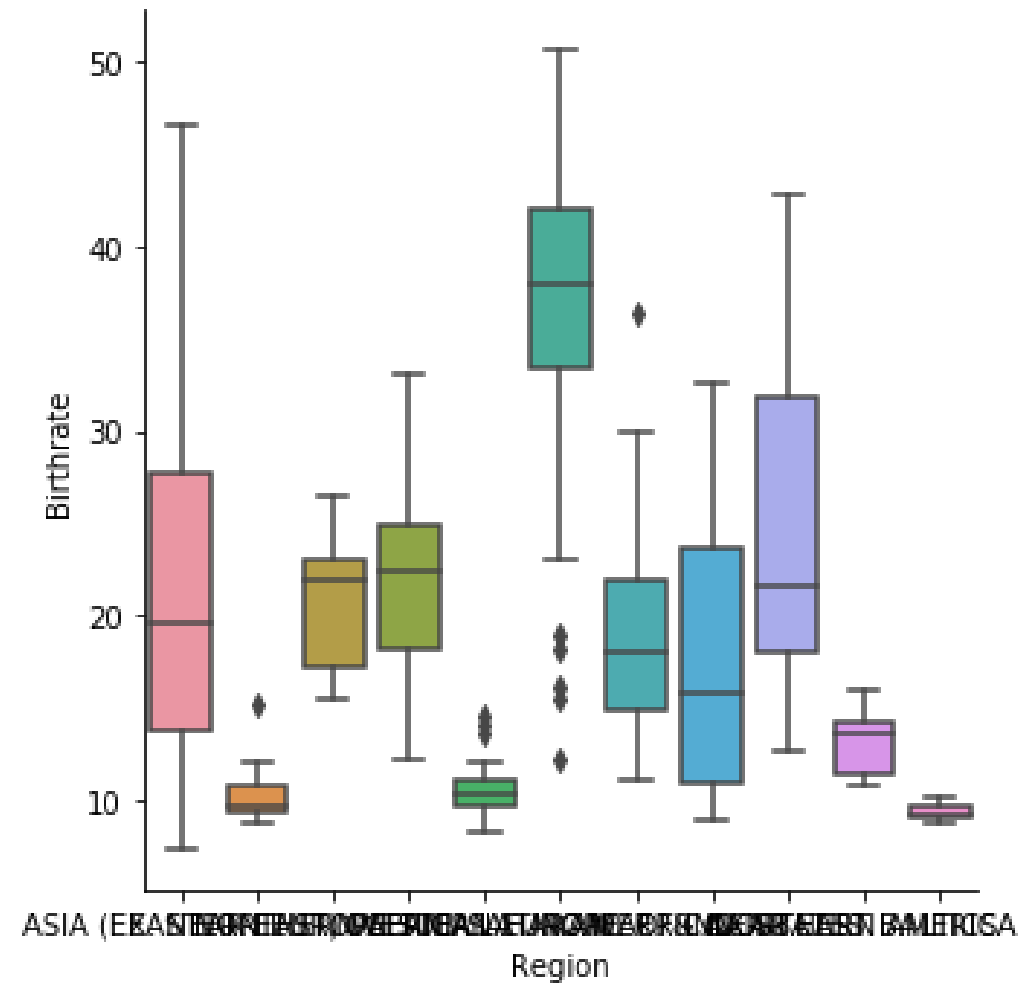
Adding titles and labels: Part 1

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Erin Case
Data Scientist

Creating informative visualizations



FacetGrid vs. AxesSubplot objects

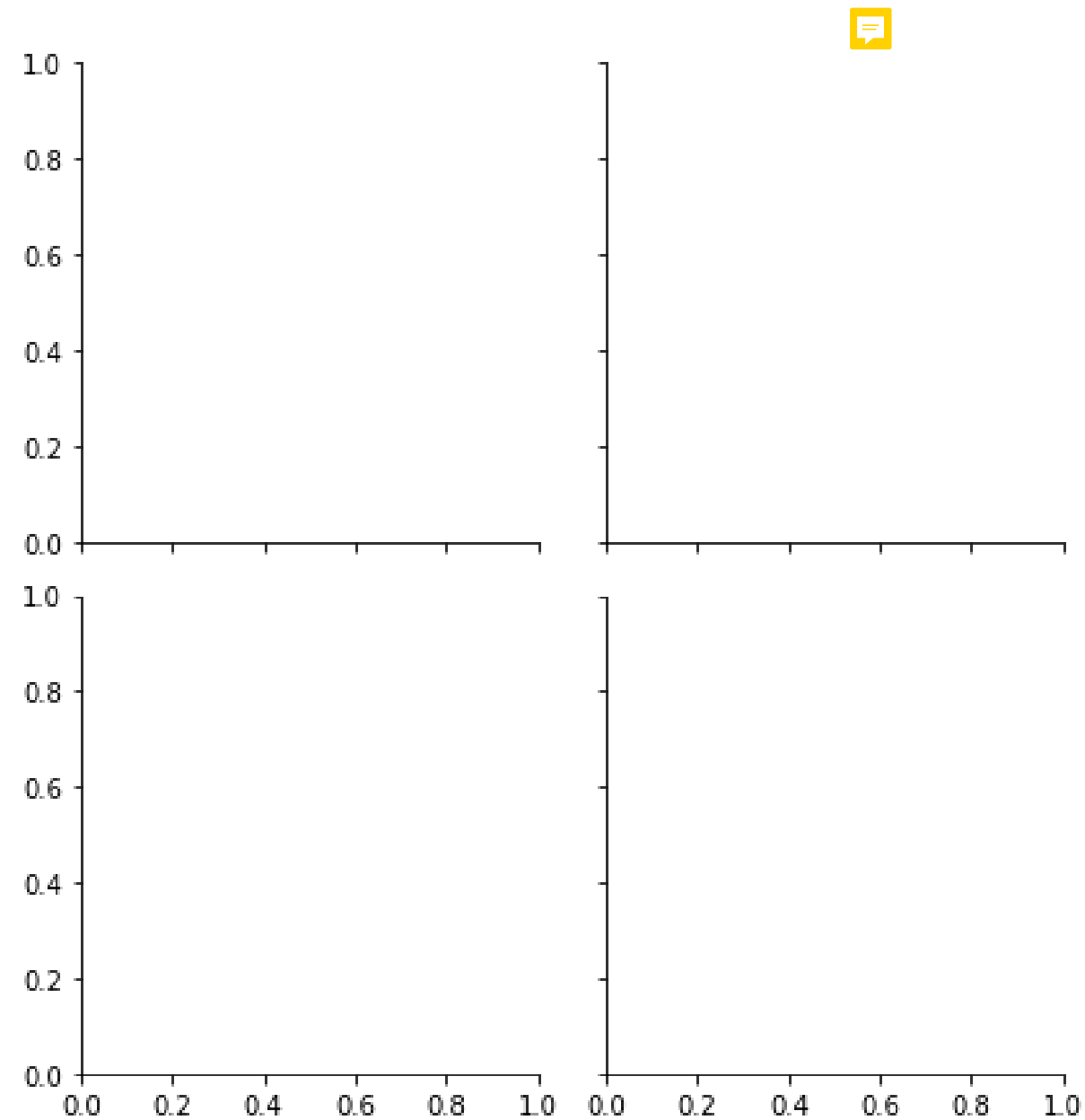
Seaborn plots create two different types of objects: `FacetGrid` and `AxesSubplot`

```
g = sns.scatterplot(x="height", y="weight", data=df)
type(g)
```



```
> matplotlib.axes._subplots.AxesSubplot
```

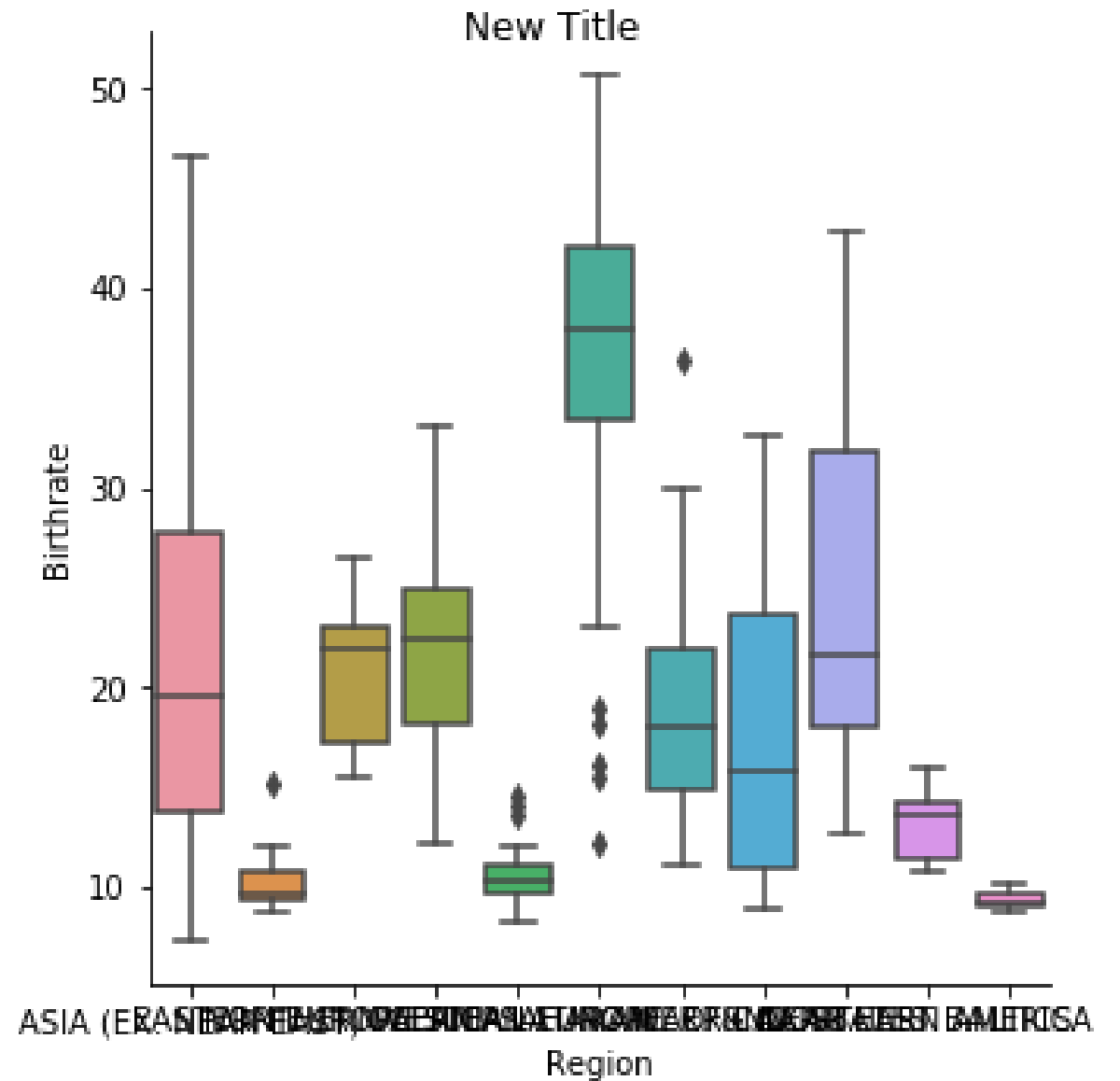
An Empty FacetGrid



FacetGrid vs. AxesSubplot objects

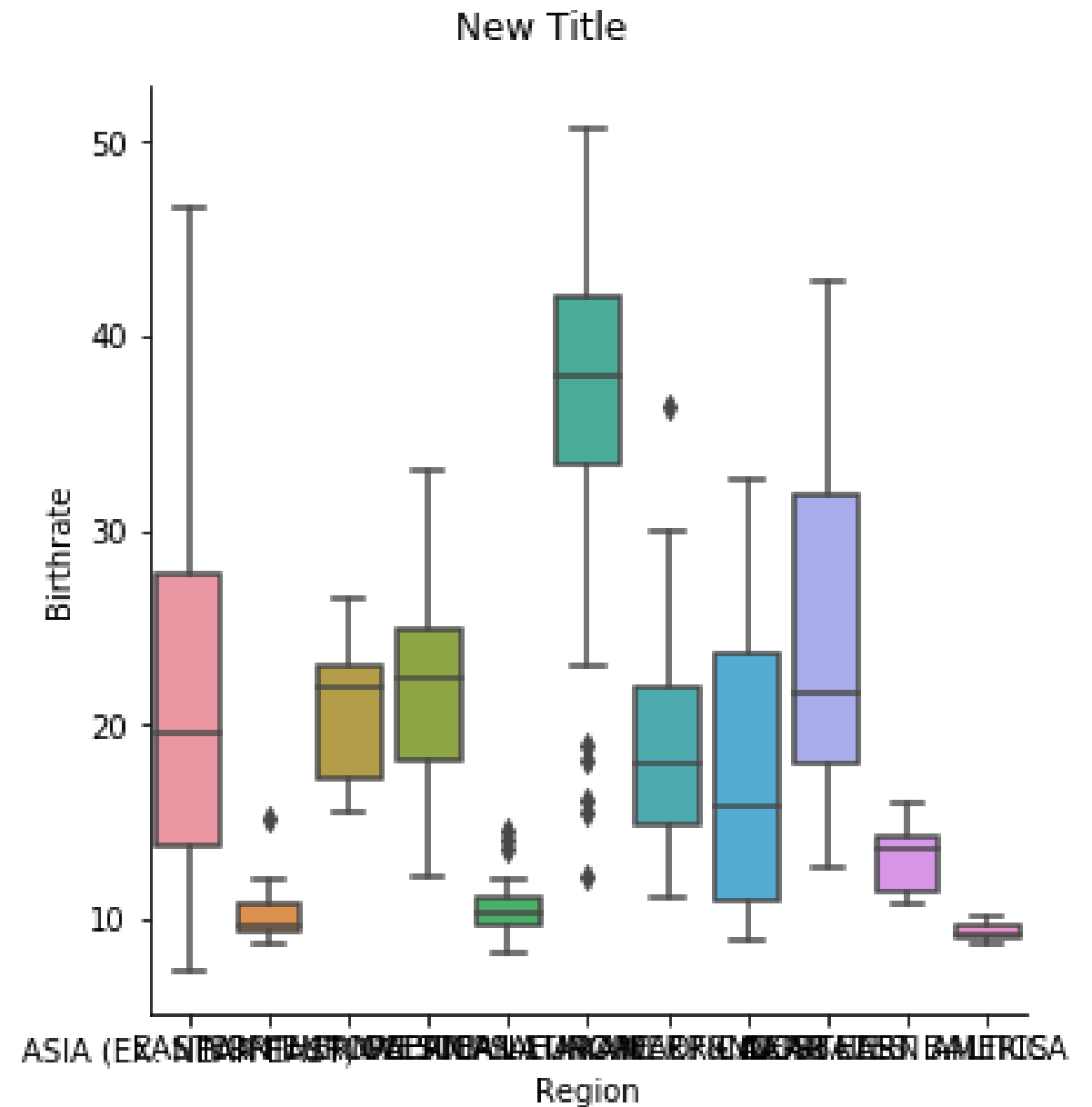
Object Type	Plot Types	Characteristics
FacetGrid	relplot() , catplot()	Can create subplots
AxesSubplot	scatterplot() , countplot() , etc.	Only creates a single plot

Adding a title to FacetGrid



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()
```



Let's practice!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN

Adding titles and labels: Part 2

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Erin Case
Data Scientist

Adding a title to AxesSubplot

FacetGrid

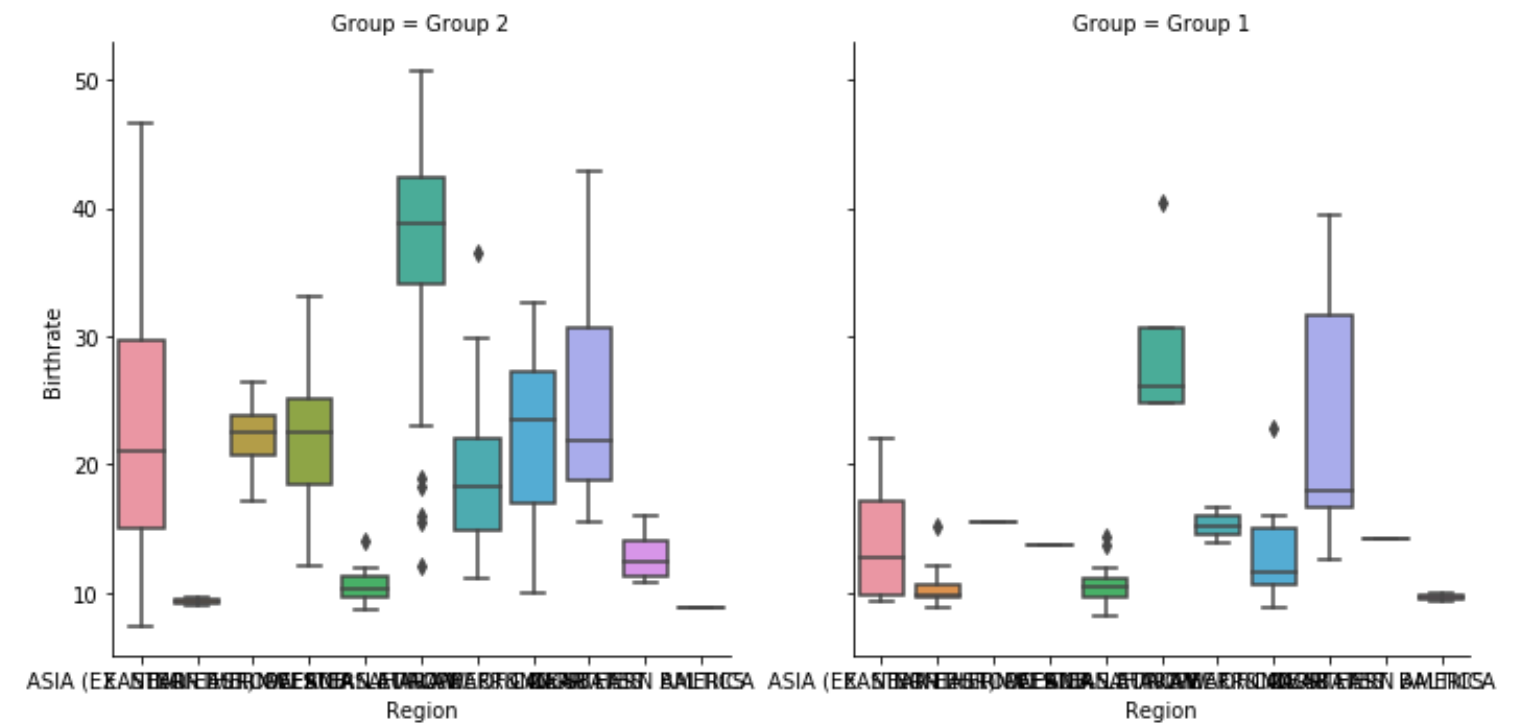
```
g = sns.catplot(x="Region",  
                y="Birthrate",  
                data=gdp_data,  
                kind="box")  
  
g.fig.suptitle("New Title",  
               y=1.03)
```

AxesSubplot

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

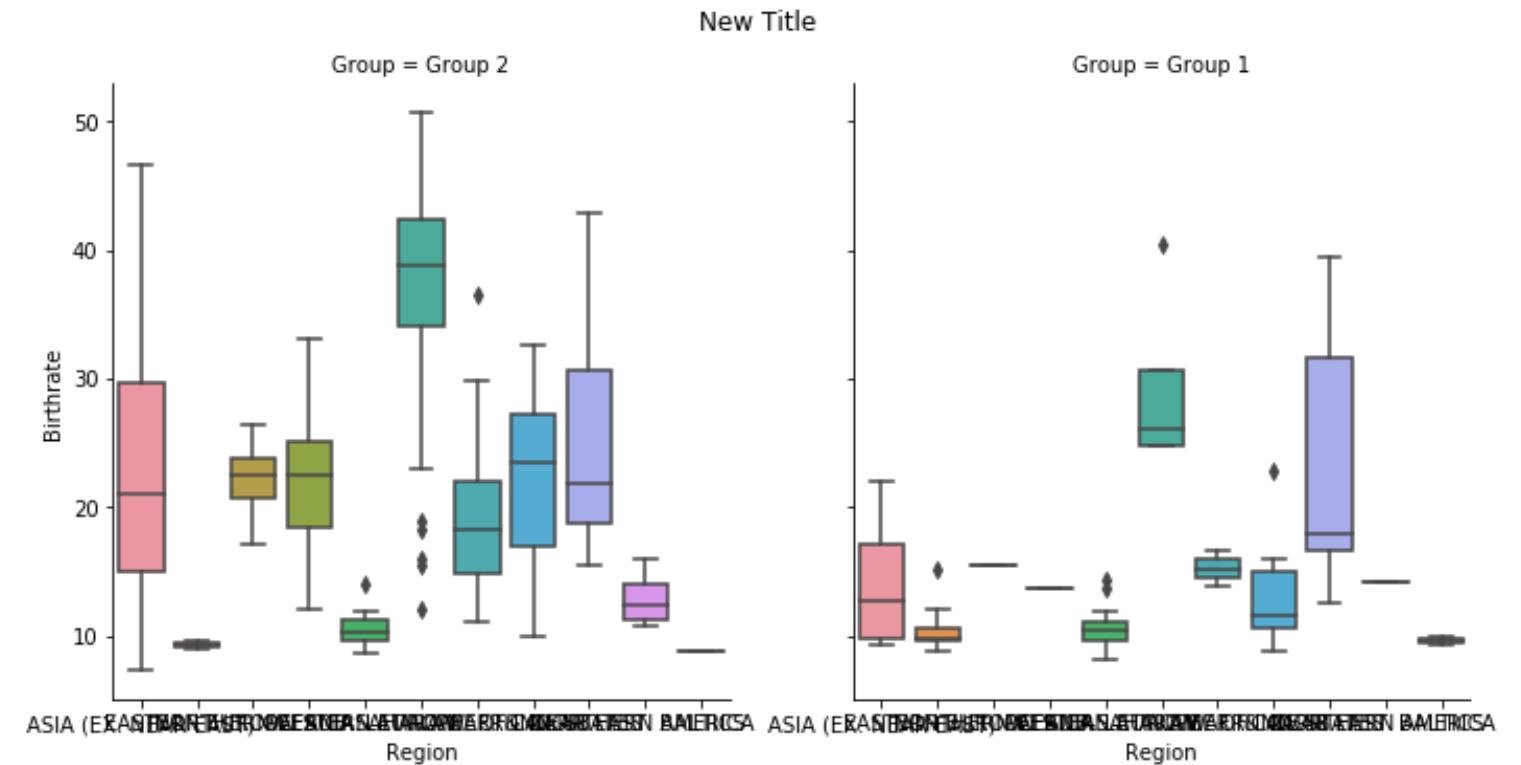
Titles for subplots

```
g = sns.catplot(x="Region",  
                y="Birthrate",  
                data=gdp_data,  
                kind="box",  
                col="Group")
```



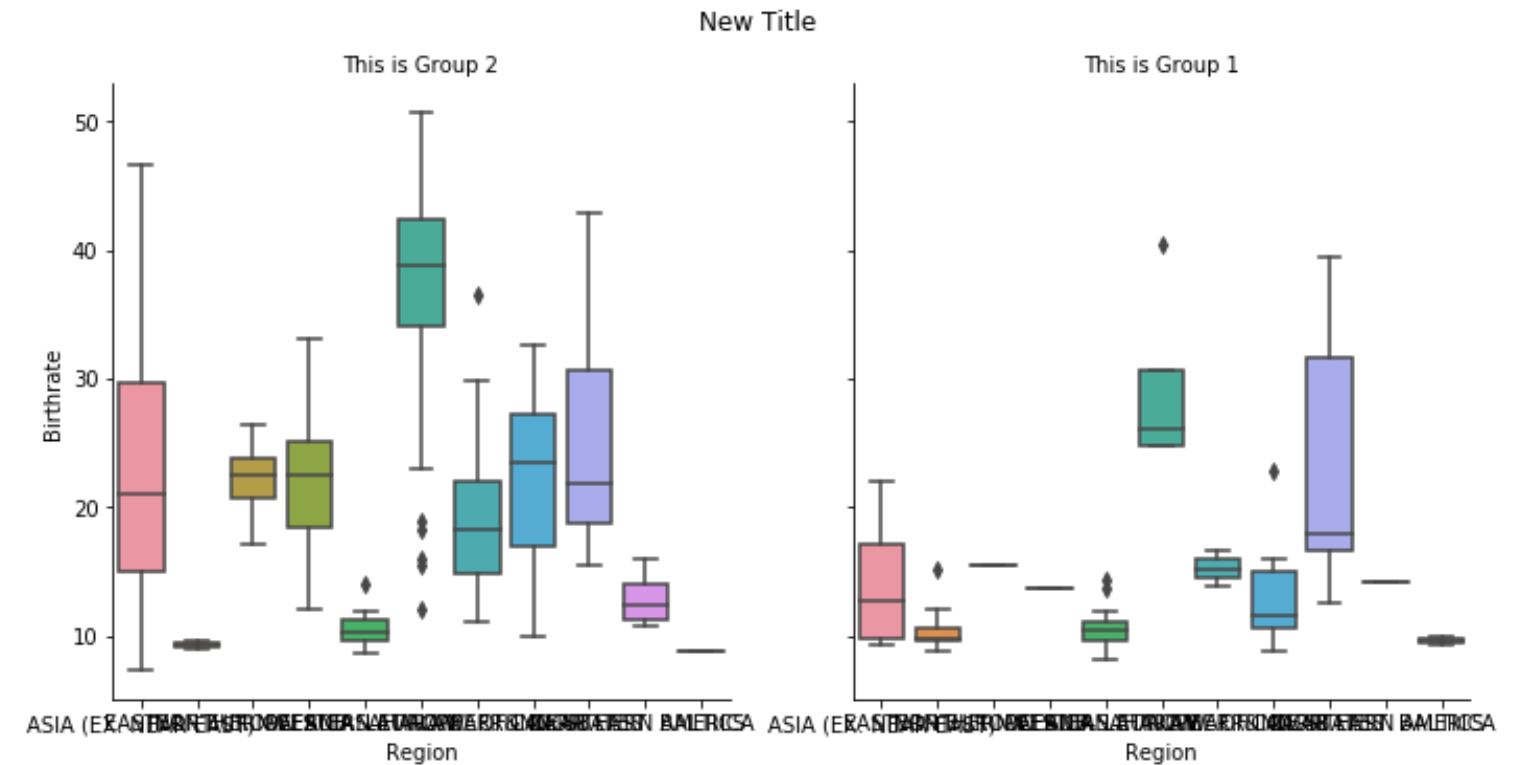
Titles for subplots

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



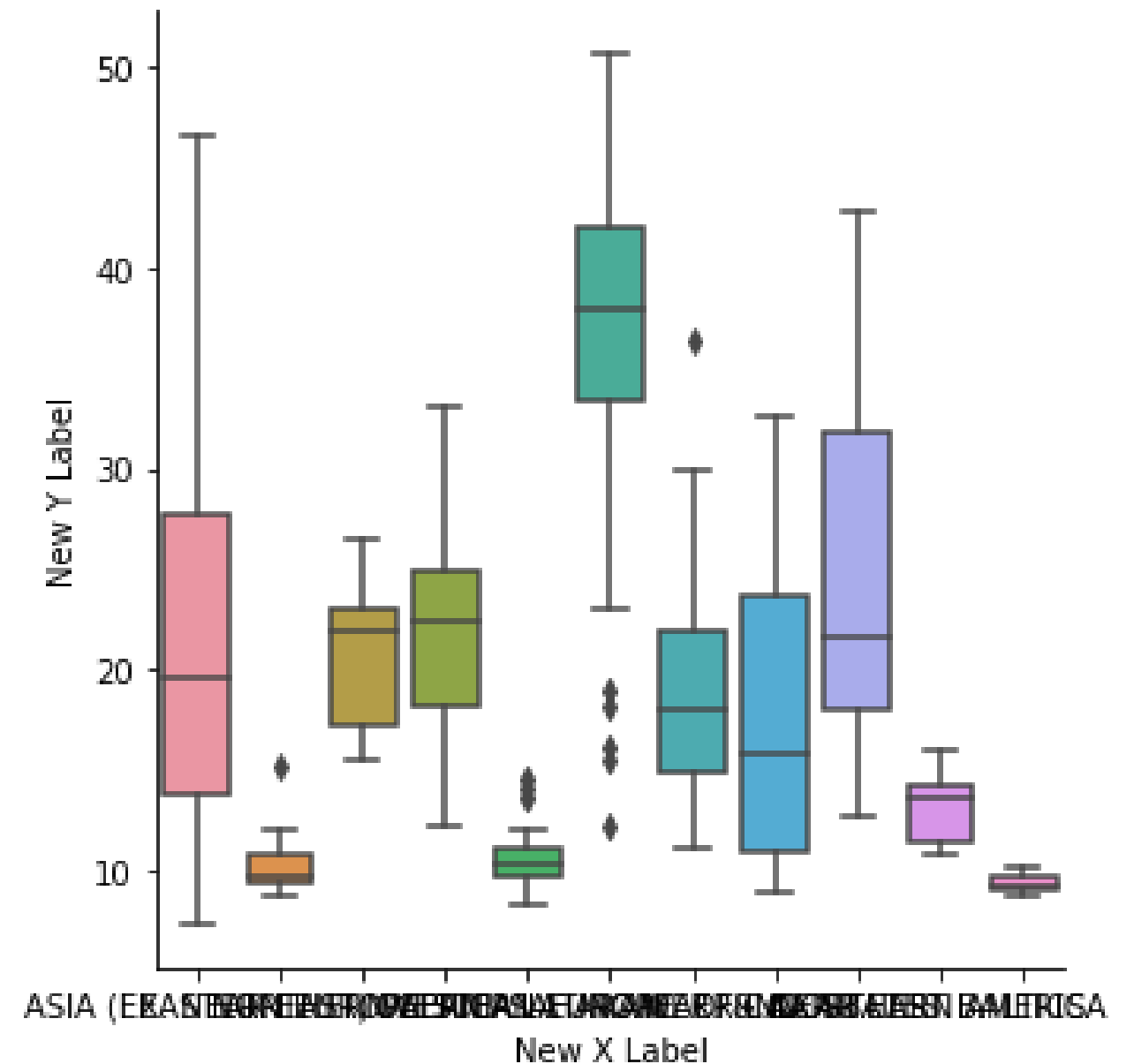
Titles for subplots

```
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}")
```



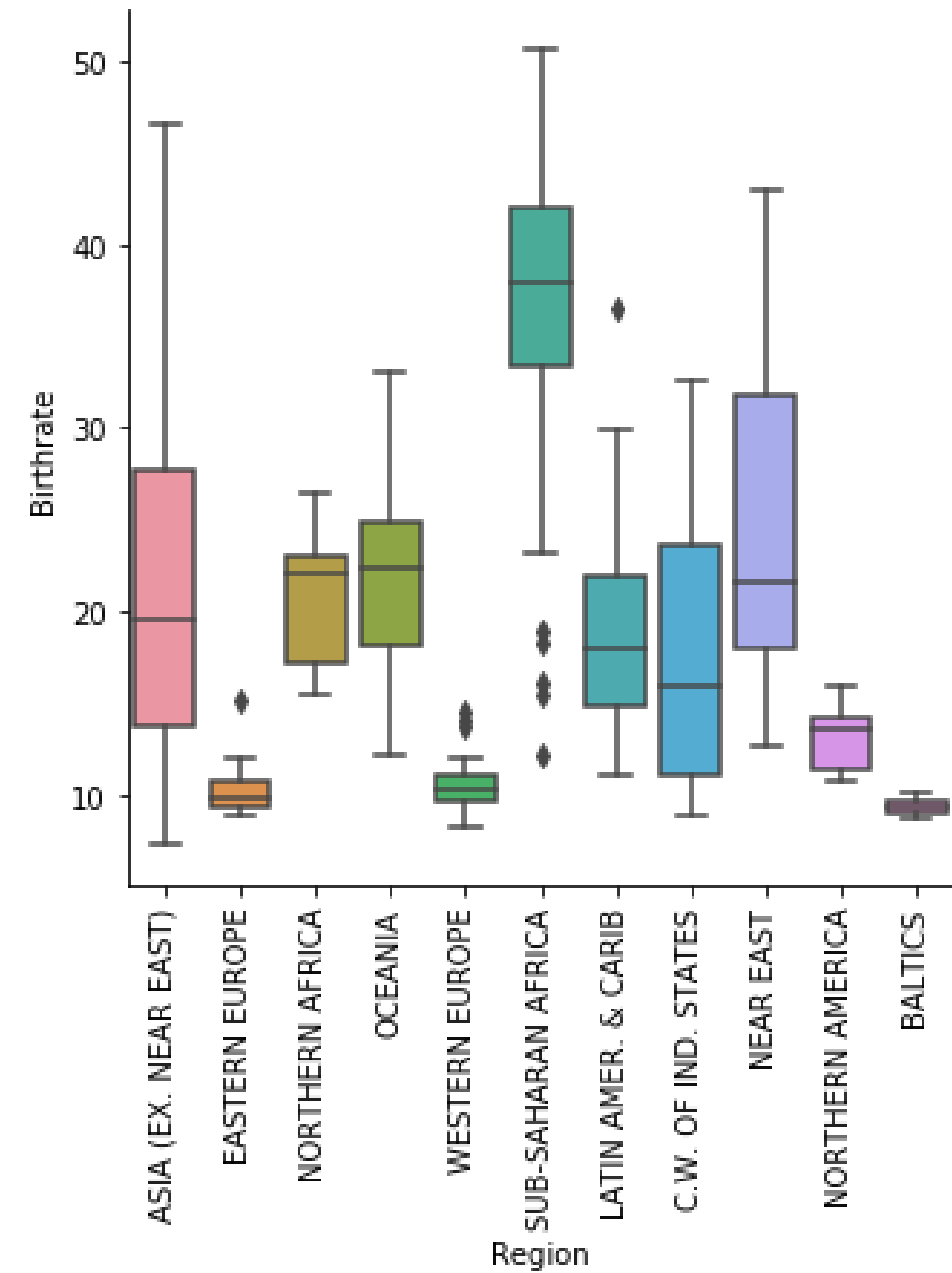
Adding axis labels

```
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

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



Let's practice!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN

Putting it all together

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN



Erin Case
Data Scientist

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")
```

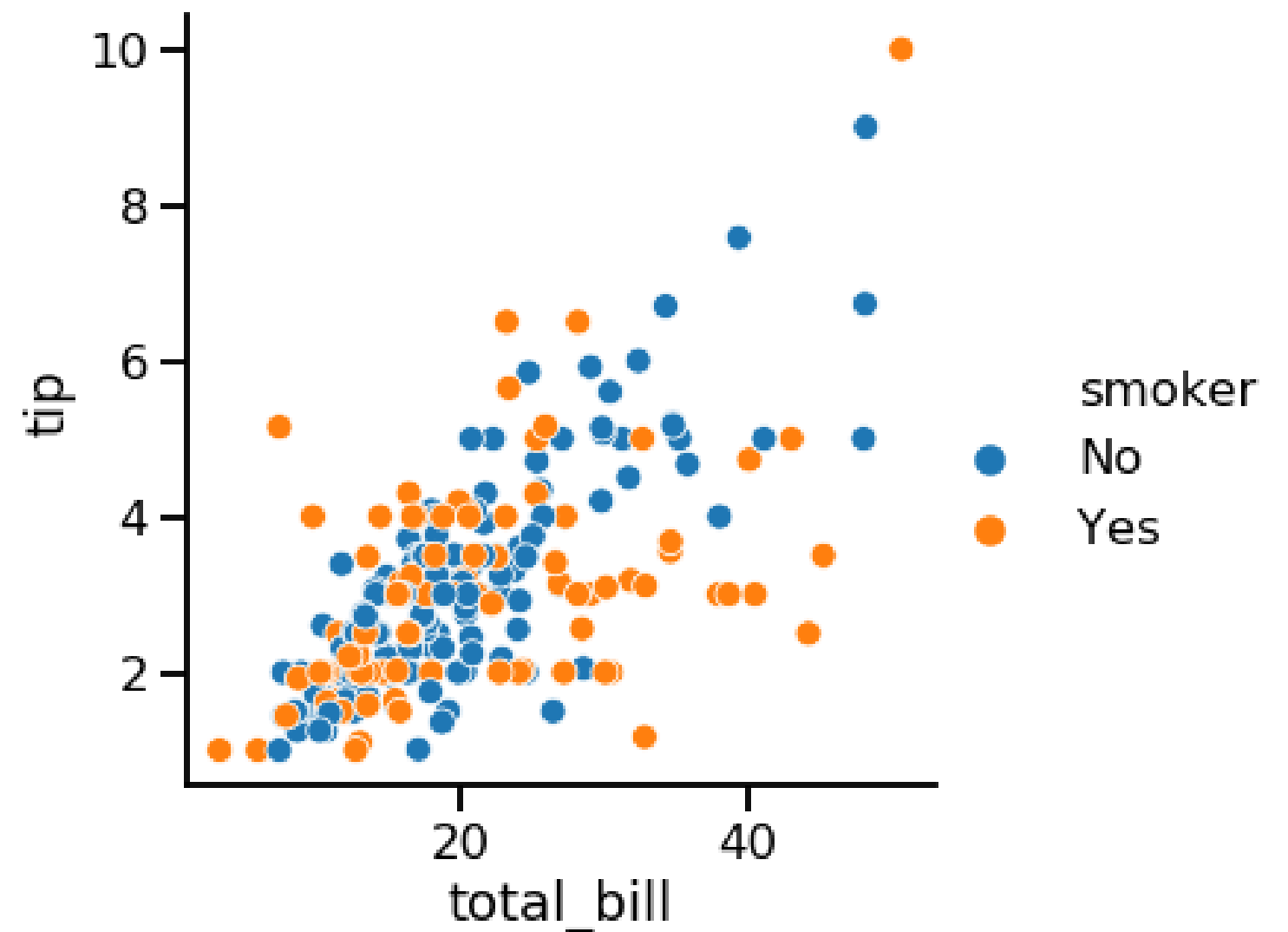
Categorical plots

- 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)

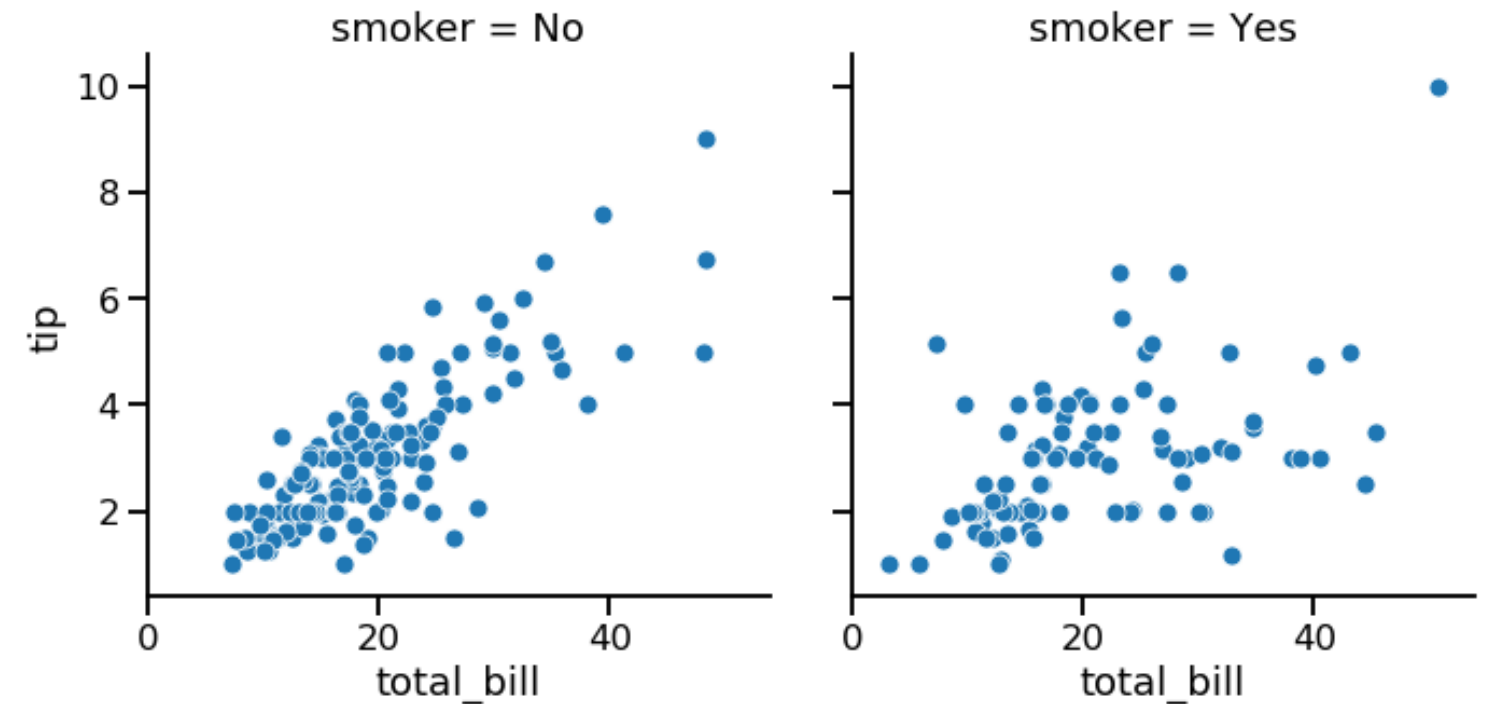
Setting `hue` will create subgroups that are displayed as different colors on a single plot.



¹ Waskom, M. L. (2021). seaborn: statistical data visualization. <https://seaborn.pydata.org/>

Adding a third variable (row/col)

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



¹ Waskom, M. L. (2021). seaborn: statistical data visualization. <https://seaborn.pydata.org/>

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	relplot() , catplot()	g.fig.suptitle()
AxesSubplot	scatterplot() , countplot() , etc.	g.set_title()

Final touches

Add x- and y-axis labels:

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

Rotate x-tick labels:

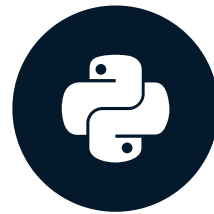
```
plt.xticks(rotation=90)
```

Let's practice!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN

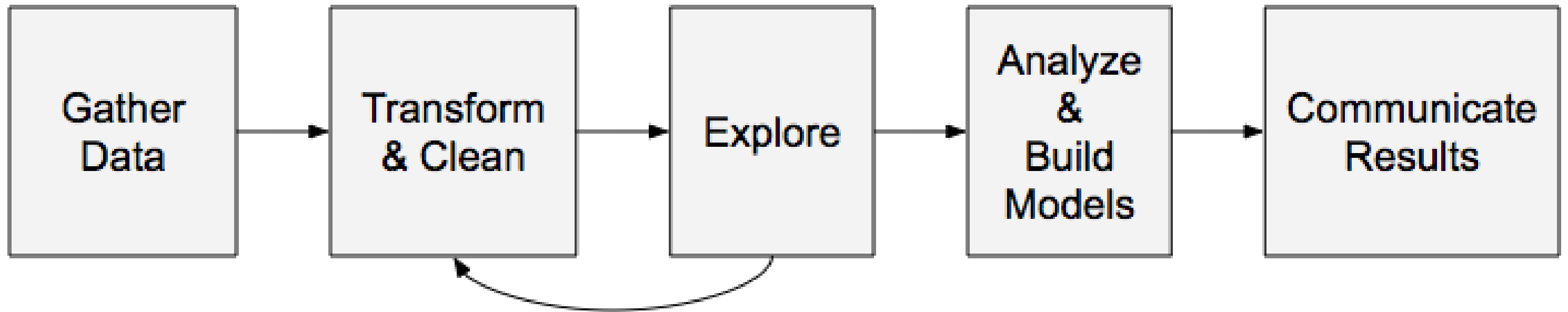
Well done! What's next?

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN

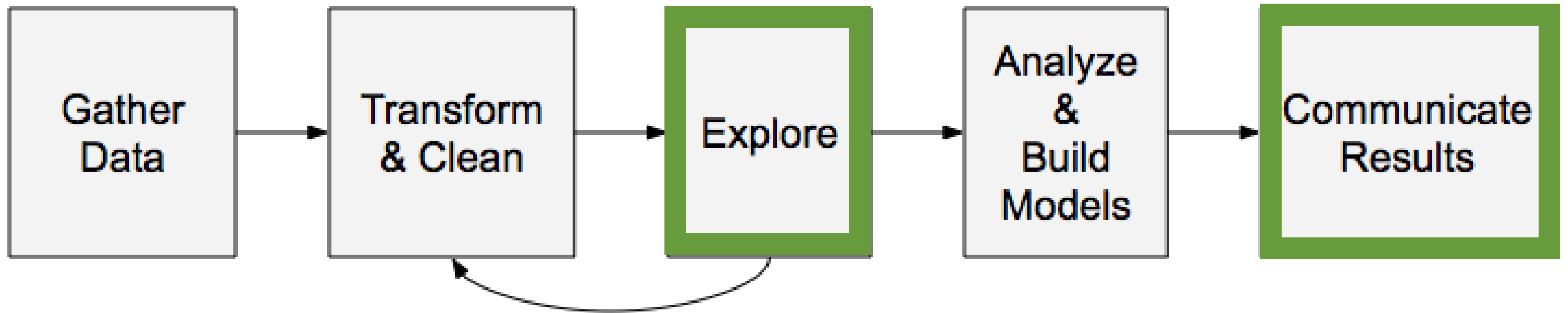


Erin Case
Data Scientist

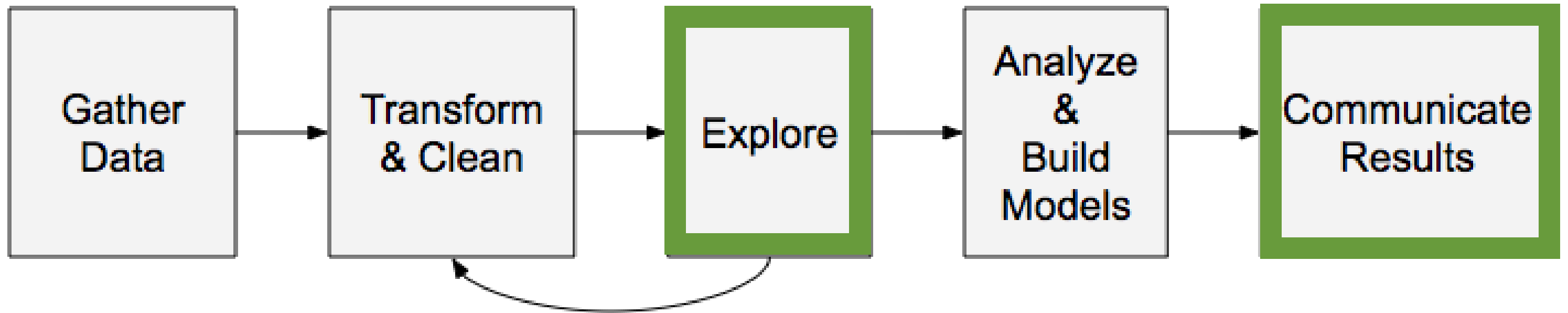
Where does Seaborn fit in?



Where does Seaborn fit in?



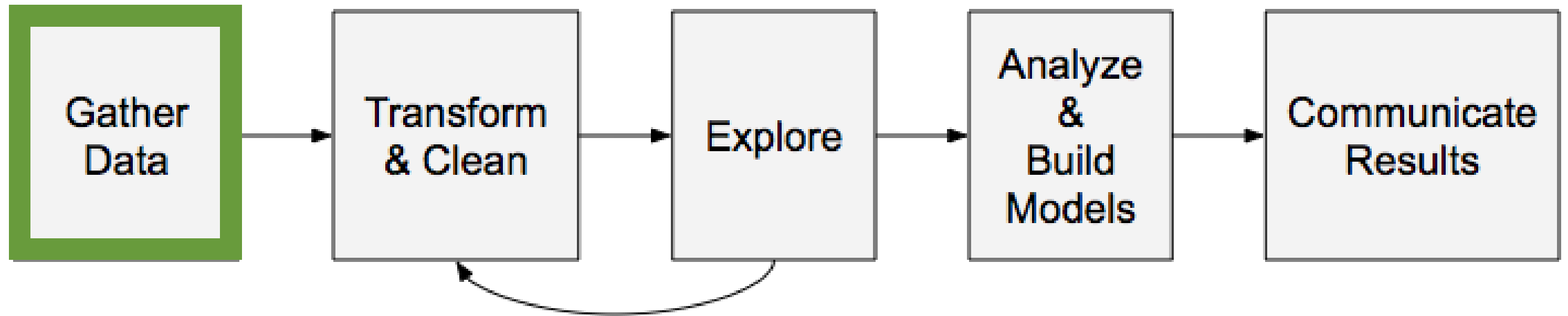
Next Steps: Explore and communicate results



Next steps:

- Seaborn advanced visualizations
- Matplotlib advanced customizations

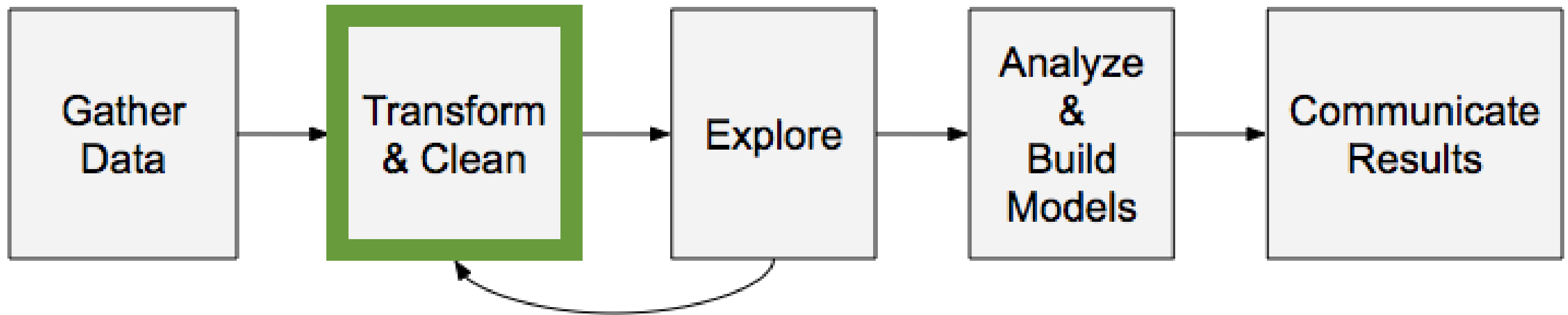
Next steps: Gather data



Next steps:

- Python
- SQL

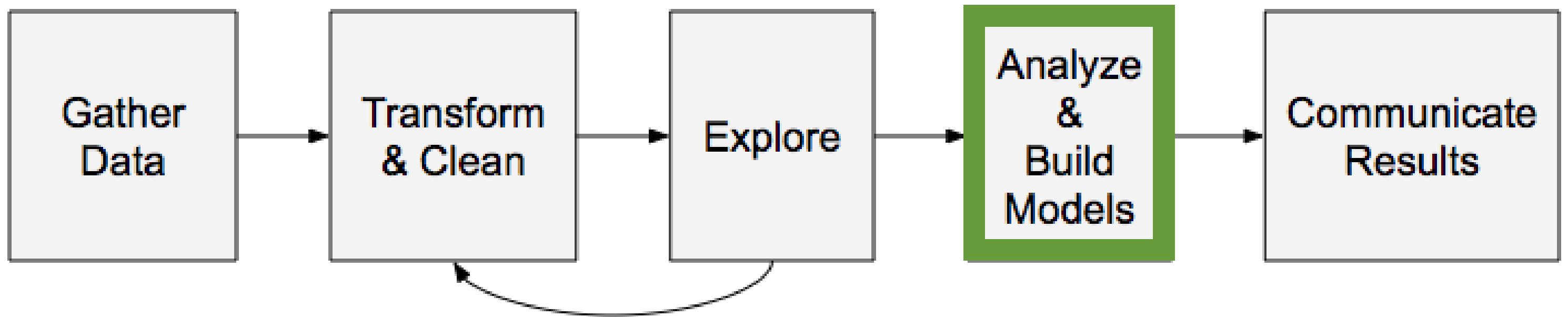
Next steps: Transform and clean



Next steps:

- Getting data into pandas DataFrames
- Cleaning data
- Transforming into tidy format

Next steps: Analyze and build models



Next steps:

- Statistical analysis
- Calculating and interpreting confidence intervals

Congratulations!

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN