# Count plots and bar plots

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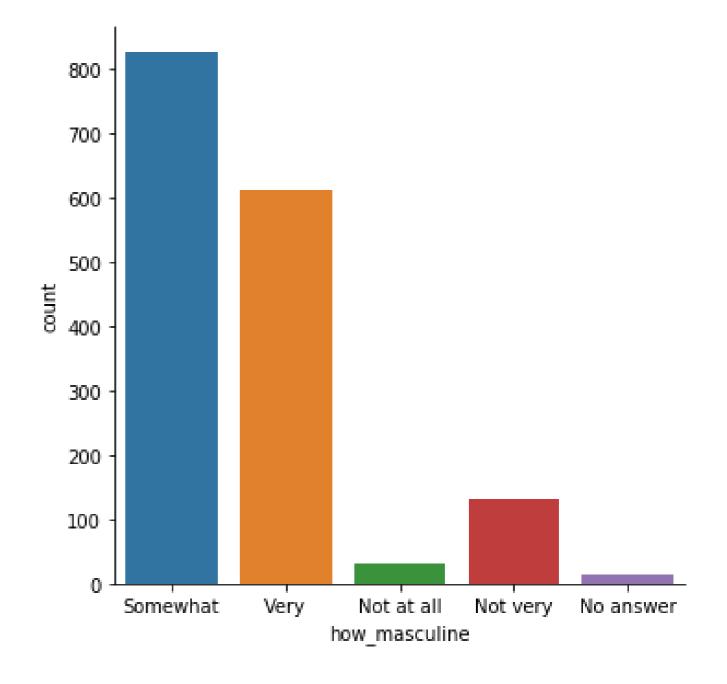


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### Categorical plots

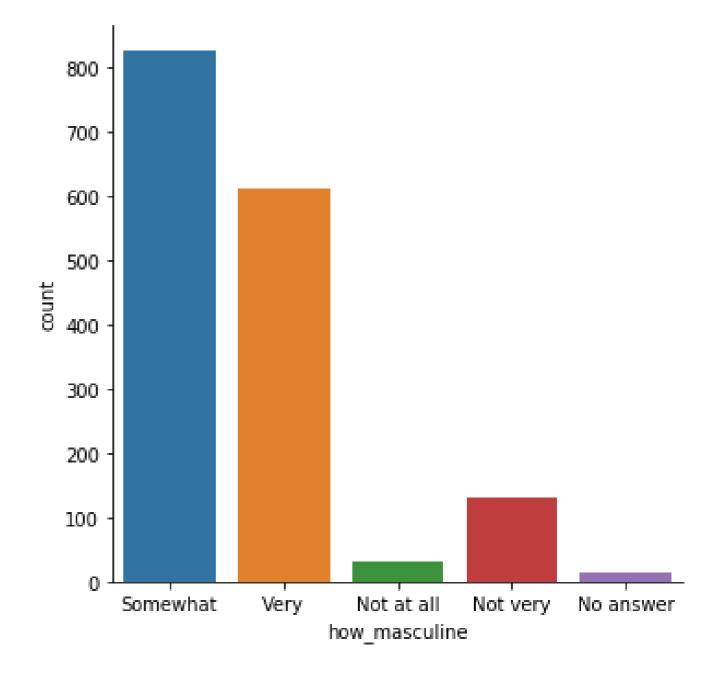
- Examples: count plots, bar plots
- Involve a categorical variable
- Comparisons between groups



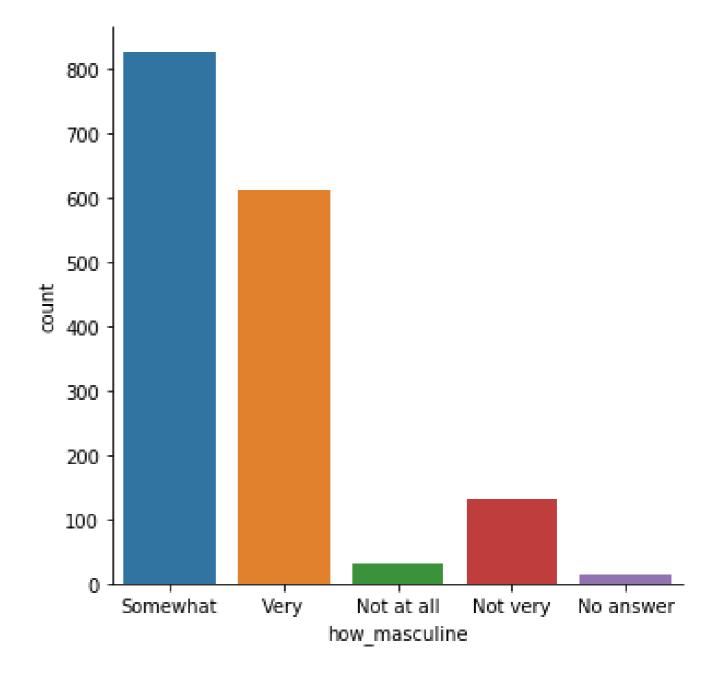
### catplot()

- Used to create categorical plots
- Same advantages of relplot()
- Easily create subplots with col= and row=

### countplot() vs. catplot()

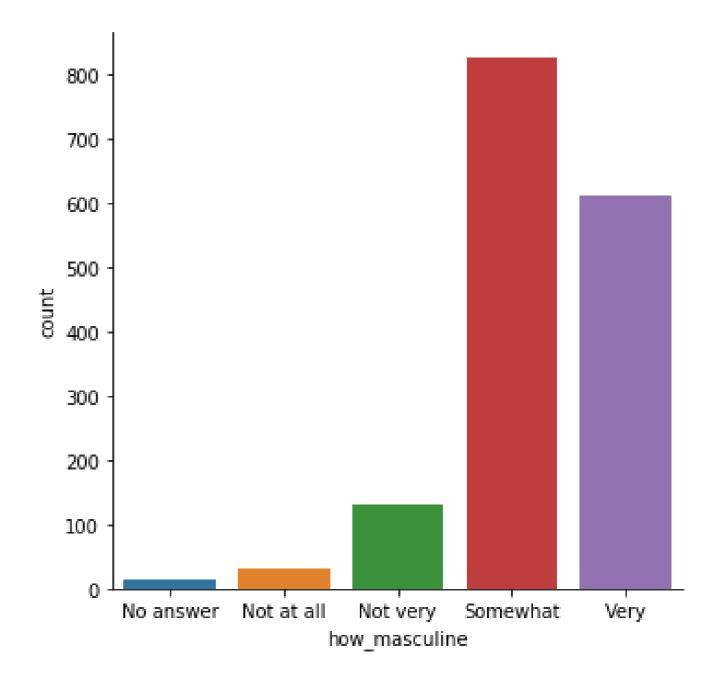


### countplot() vs. catplot()



### Changing the order

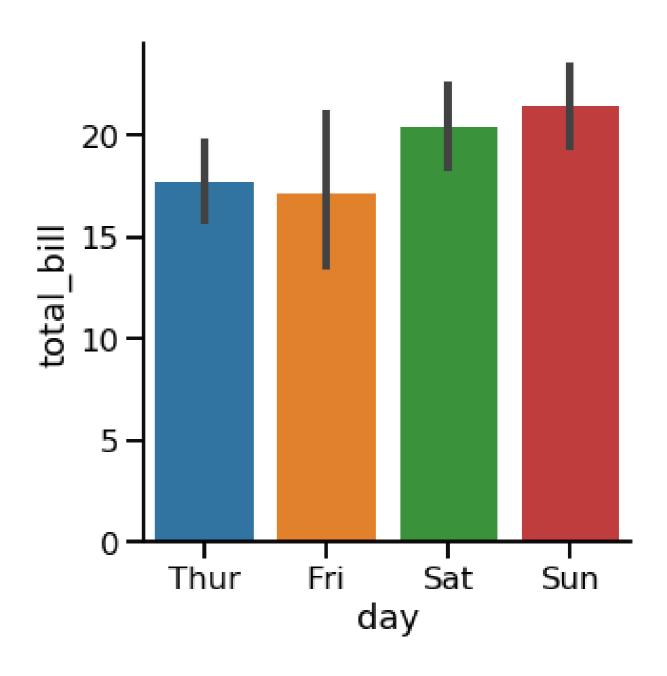
```
import matplotlib.pyplot as plt
import seaborn as sns
category_order = ["No answer",
                  "Not at all",
                  "Not very",
                  "Somewhat",
                  "Very"]
sns.catplot(x="how_masculine",
            data=masculinity_data,
            kind="count",
 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



### **Bar plots**

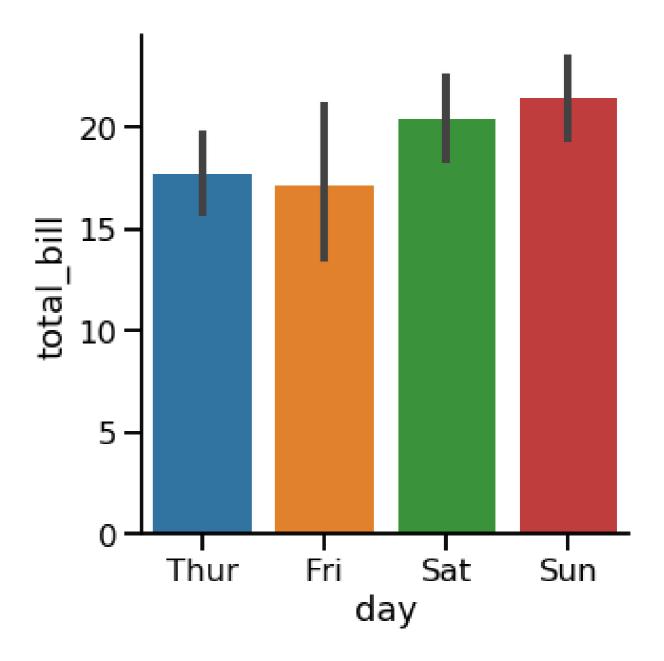
Displays mean of quantitative variable per category

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.catplot(x="day",
            y="total_bill",
            data=tips,
            kind="bar")
plt.show()
```



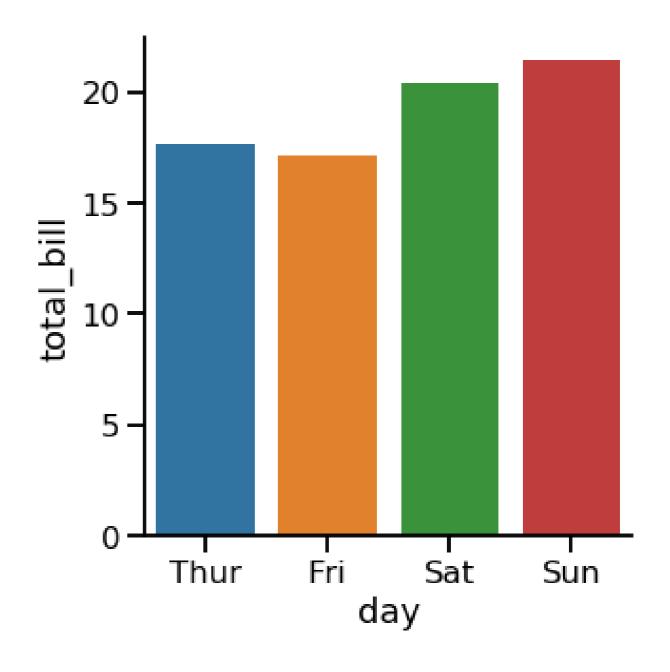
#### **Confidence intervals**

- Lines show 95% confidence intervals for the mean
- Shows uncertainty about our estimate
- Assumes our data is a random sample

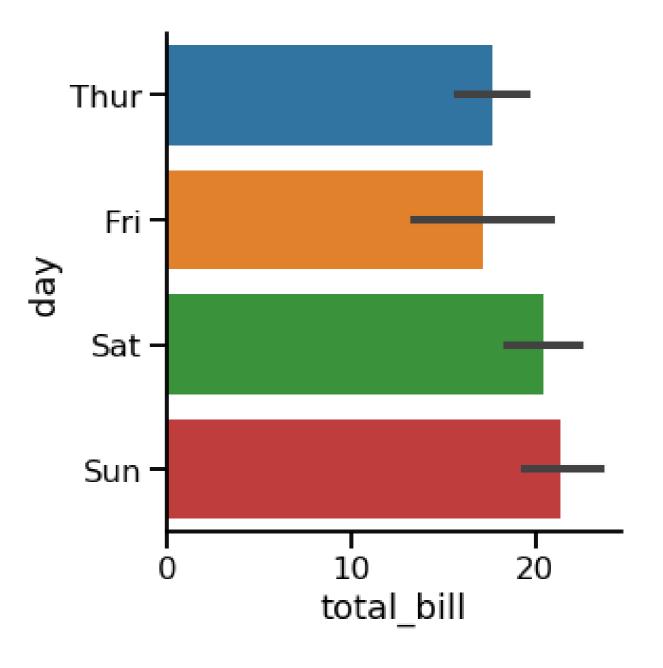


### Turning off confidence intervals

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.catplot(x="day",
            y="total_bill",
            data=tips,
            kind="bar",
            ci=None)
plt.show()
```



### Changing the orientation



# Let's practice!

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# Creating a box plot

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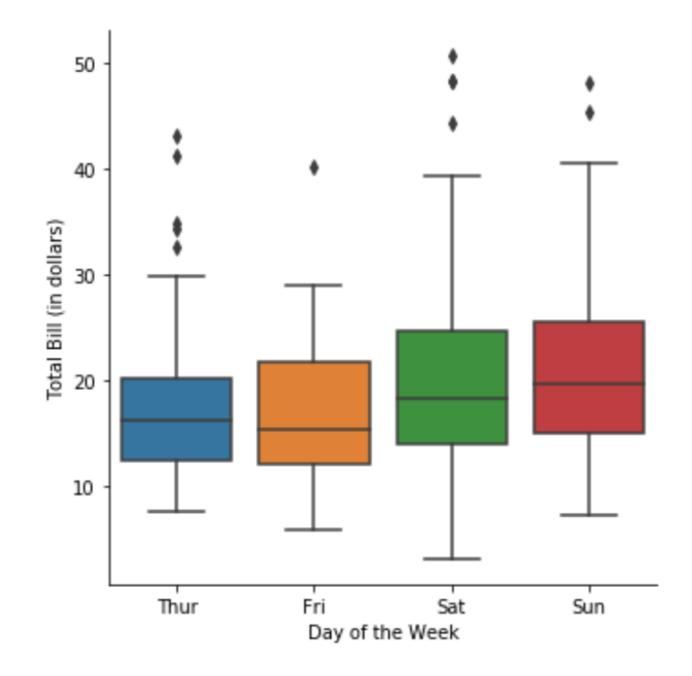


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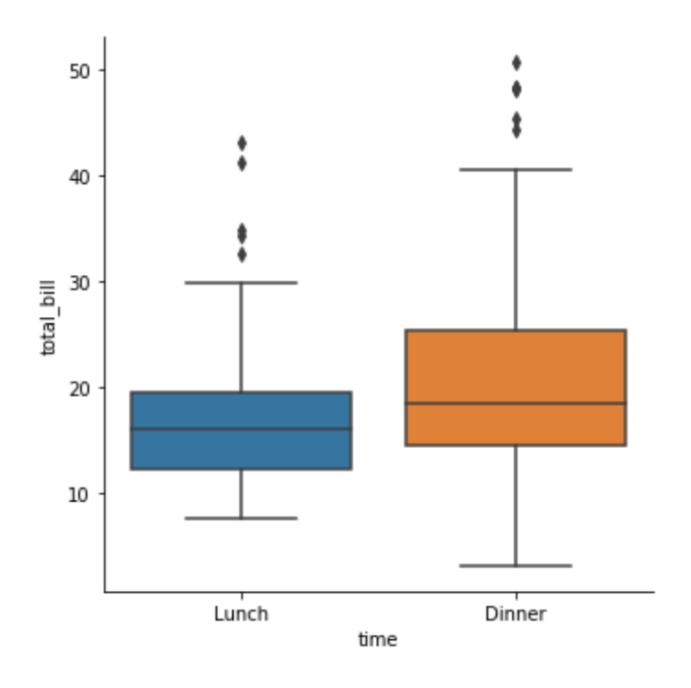


### What is a box plot?

- Shows the distribution of quantitative data
- See median, spread, skewness, and outliers
- Facilitates comparisons between groups

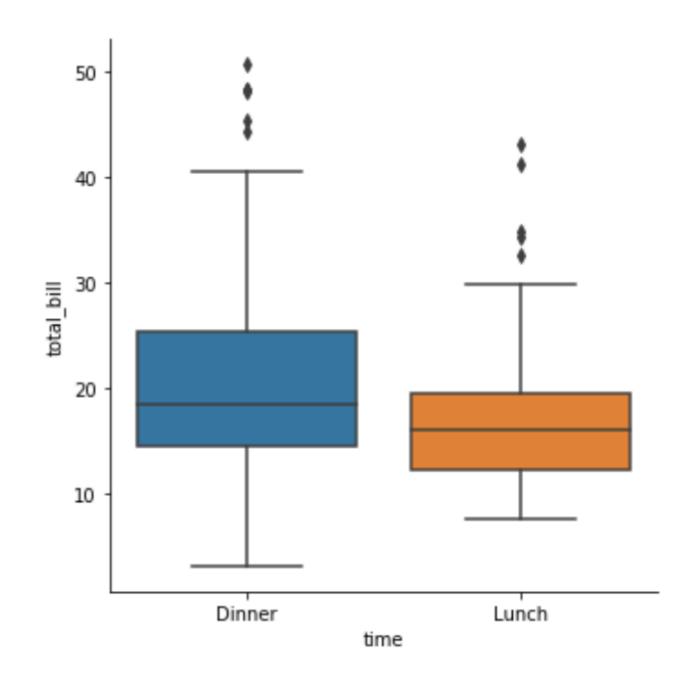


### How to create a box plot



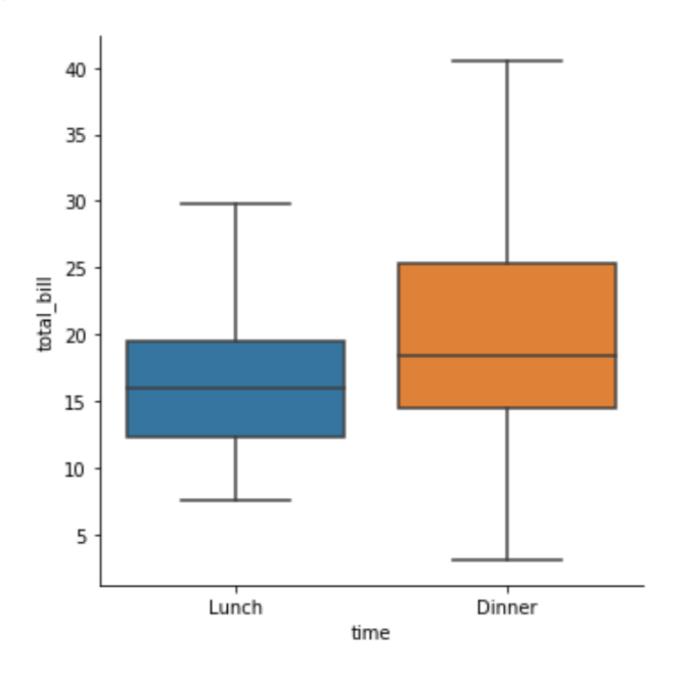
### Change the order of categories

```
import matplotlib.pyplot as plt
import seaborn as sns
g = sns.catplot(x="time",
                y="total_bill",
                data=tips,
                kind="box",
                order=["Dinner",
                        "Lunch"])
plt.show()
```



### Omitting the outliers using `sym`

```
import matplotlib.pyplot as plt
import seaborn as sns
g = sns.catplot(x="time",
                y="total_bill",
                data=tips,
                kind="box",
                sym="")
plt.show()
```

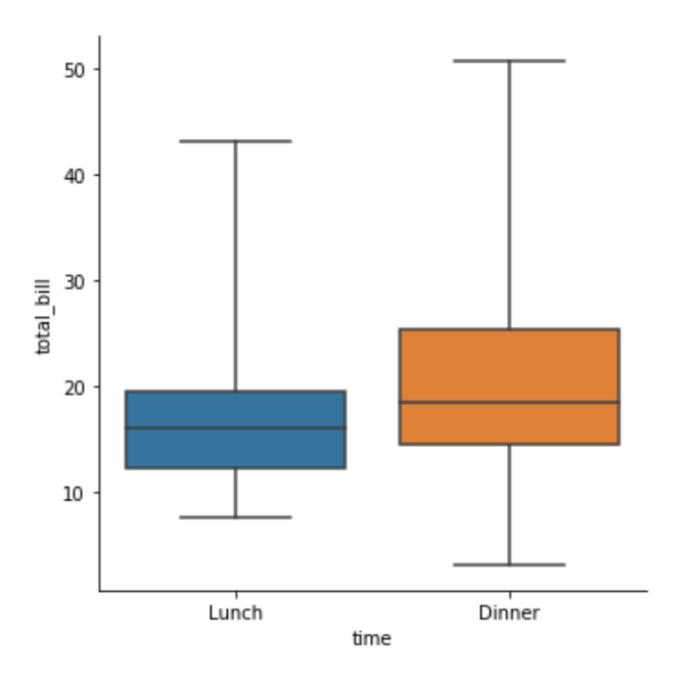


### Changing the whiskers using `whis`

- By default, the whiskers extend to 1.5 \* the interquartile range
- Make them extend to 2.0 \* IQR: whis=2.0
- Show the 5th and 95th percentiles: whis=[5, 95]
- Show min and max values: whis=[0, 100]

### Changing the whiskers using `whis`

```
import matplotlib.pyplot as plt
import seaborn as sns
g = sns.catplot(x="time",
                y="total_bill",
                data=tips,
                kind="box",
                whis=[0, 100])
plt.show()
```



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# Point plots

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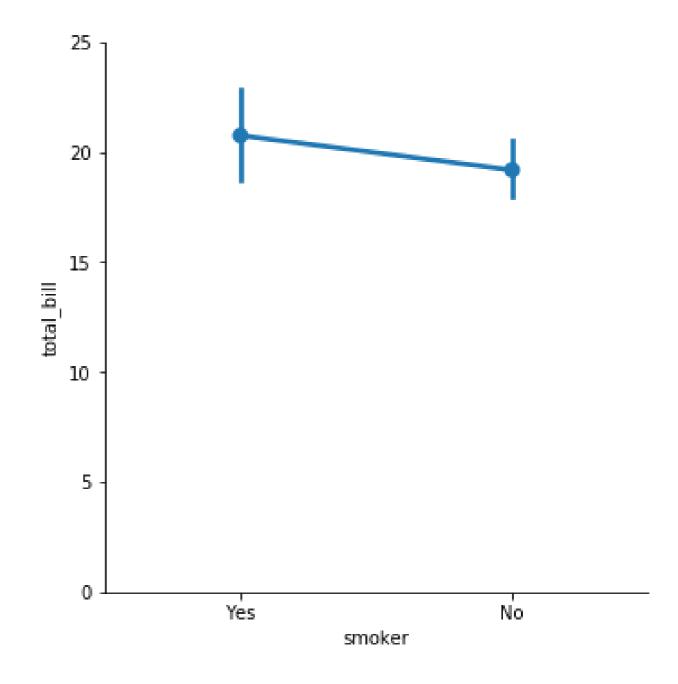


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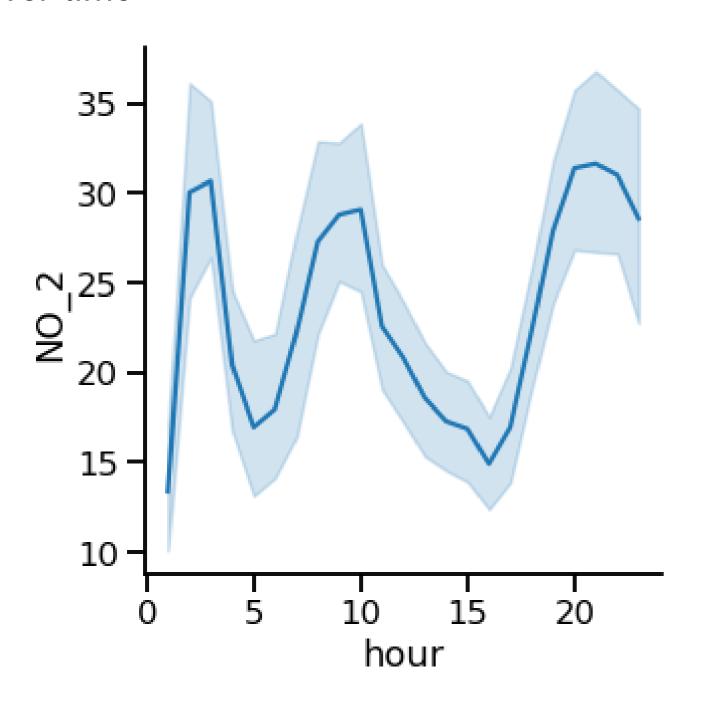


### What are point plots?

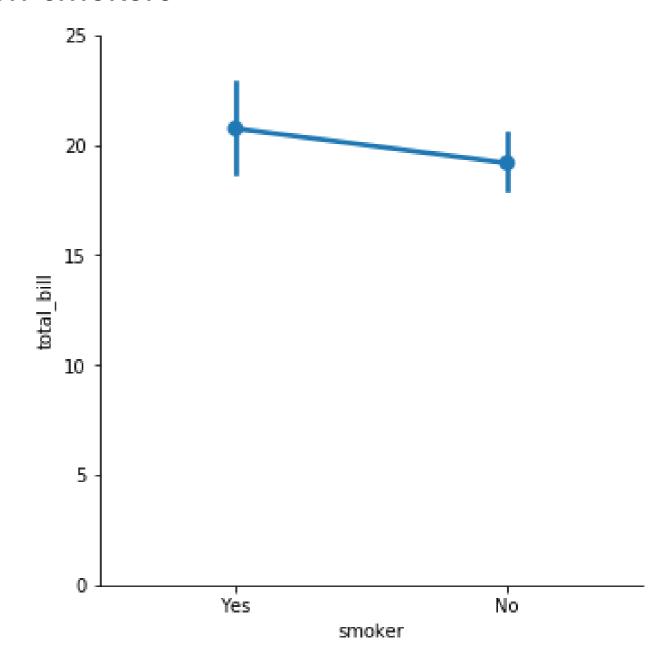
- Points show mean of quantitative variable
- Vertical lines show 95% confidence intervals



Line plot: average level of nitrogen dioxide over time



Point plot: average restaurant bill, smokers vs. non-smokers



### Point plots vs. line plots

#### Both show:

- Mean of quantitative variable
- 95% confidence intervals for the mean

#### Differences:

- Line plot has quantitative variable (usually time) on x-axis
- Point plot has categorical variable on x-axis

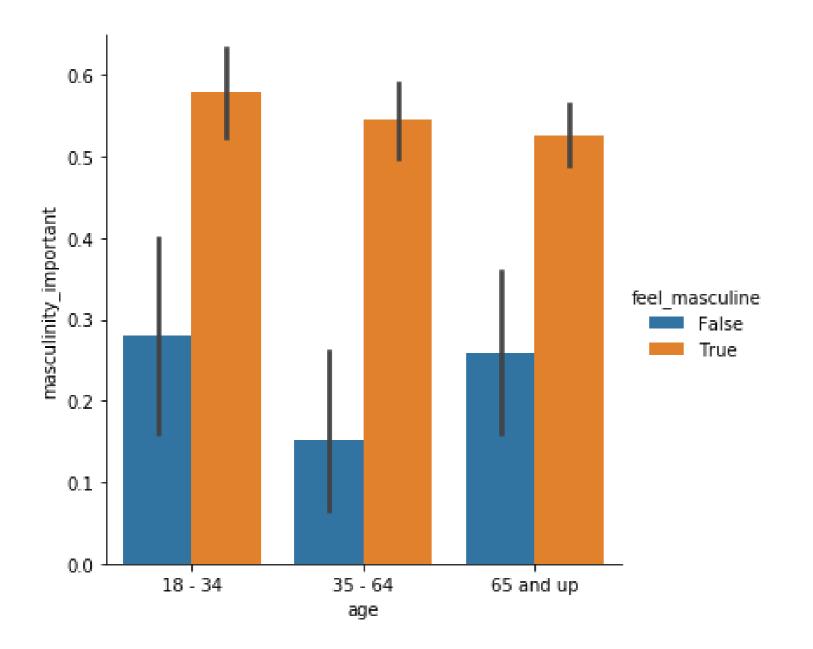
### Point plots vs. bar plots

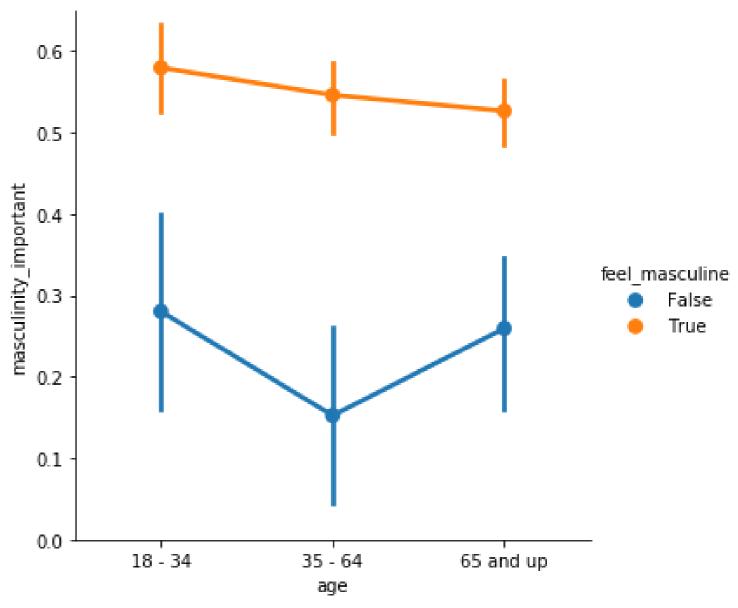
#### Both show:

- Mean of quantitative variable
- 95% confidence intervals for the mean



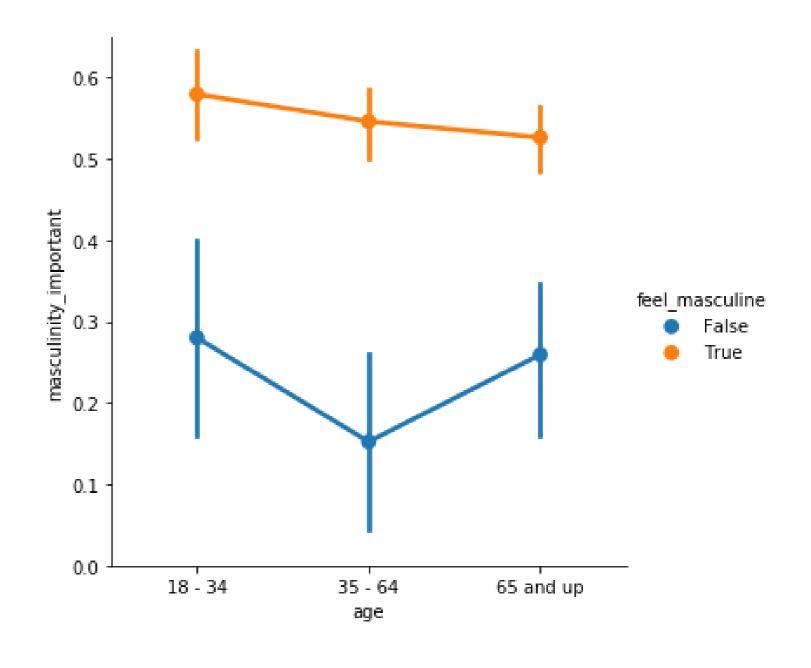
### Point plots vs. bar plots





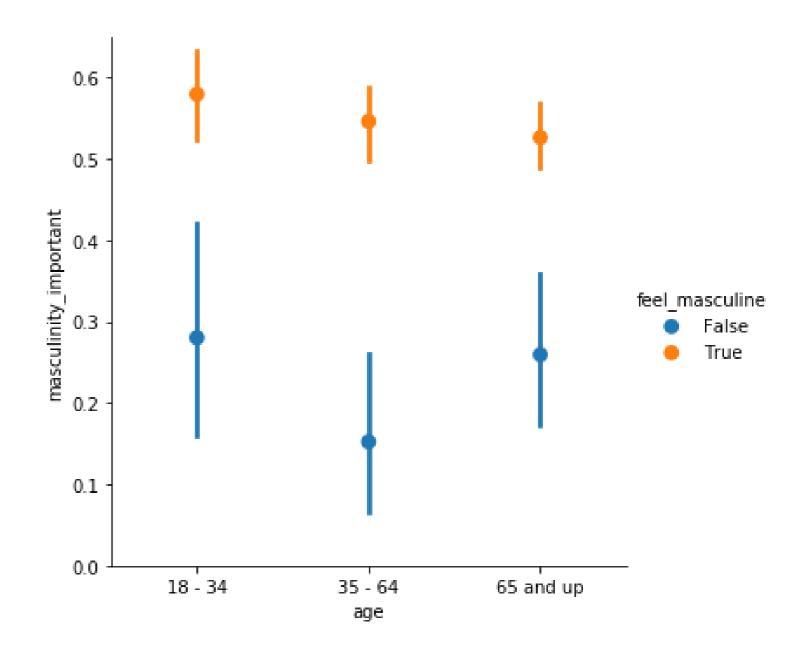
### Creating a point plot

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



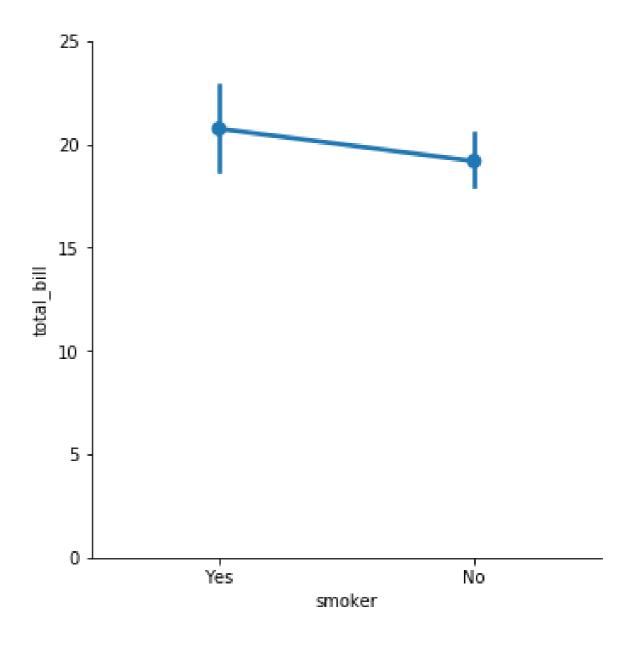
### Disconnecting the points

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.catplot(x="age",
            y="masculinity_important",
            data=masculinity_data,
            hue="feel_masculine",
            kind="point",
            join=False)
plt.show()
```



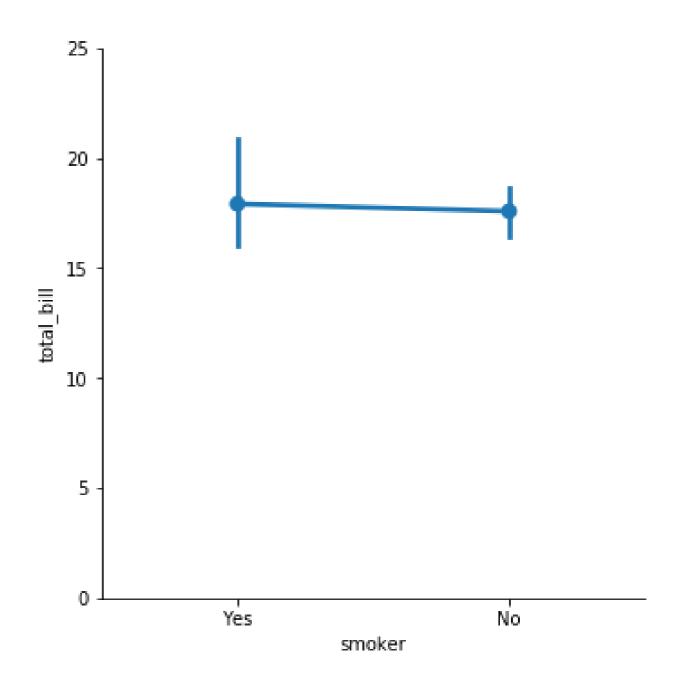
### Displaying the median

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.catplot(x="smoker",
            y="total_bill",
            data=tips,
            kind="point")
plt.show()
```



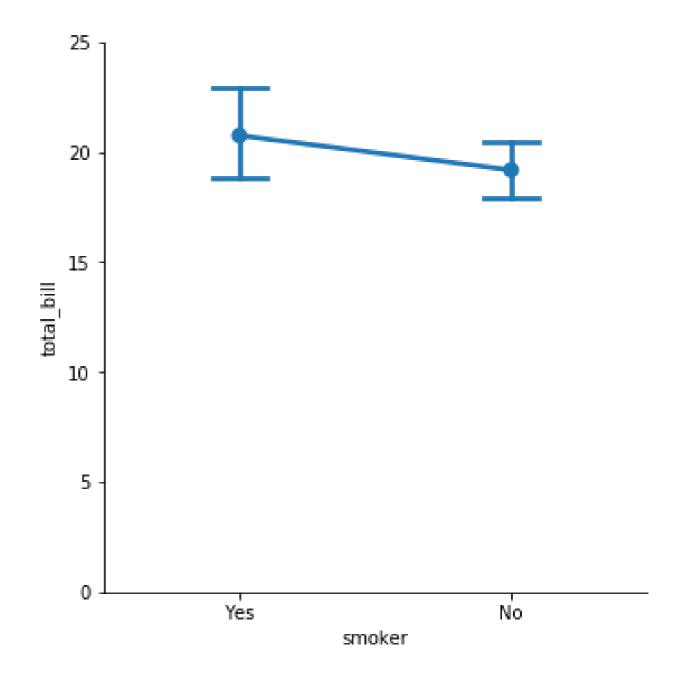
### Displaying the median

```
import matplotlib.pyplot as plt
import seaborn as sns
from numpy import median
sns.catplot(x="smoker",
            y="total_bill",
            data=tips,
            kind="point",
            estimator=median)
plt.show()
```



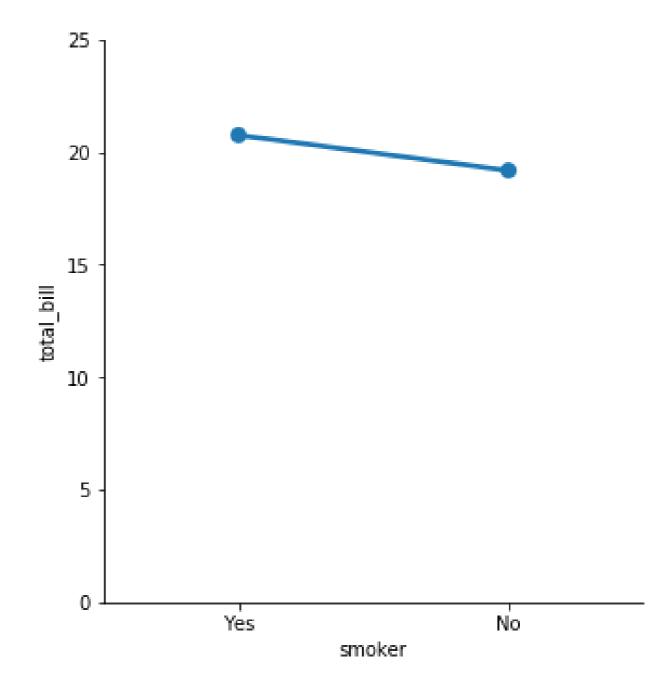
### Customizing the confidence intervals

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.catplot(x="smoker",
            y="total_bill",
            data=tips,
            kind="point",
            capsize=0.2)
plt.show()
```



### Turning off confidence intervals

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.catplot(x="smoker",
            y="total_bill",
            data=tips,
            kind="point",
            ci=None)
plt.show()
```



# Let's practice!

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