Count plots and bar plots

INTRODUCTION TO DATA VISUALIZATION WITH SEABORN

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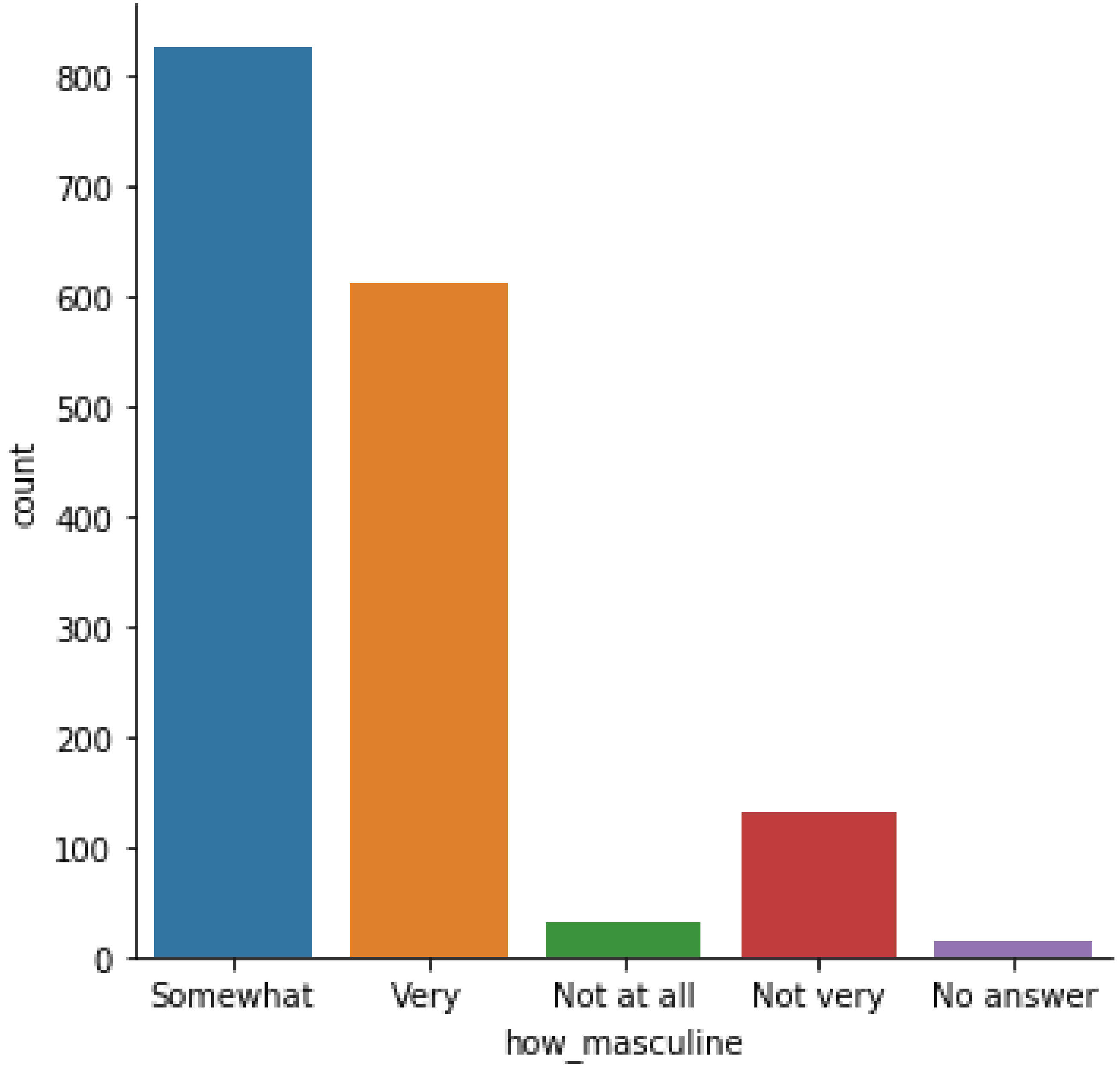
datacamp

Categorical plots

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

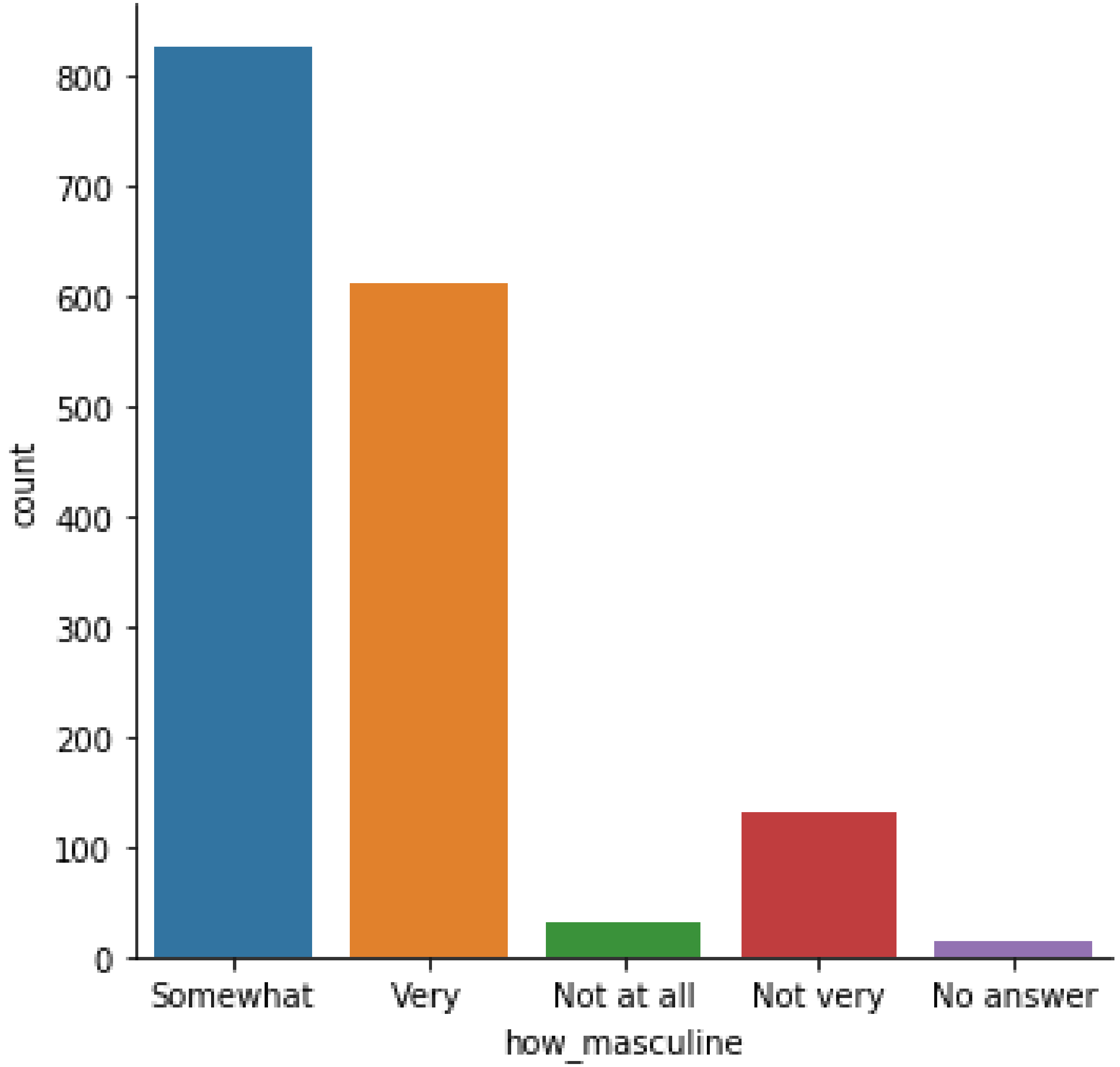


catplot()

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

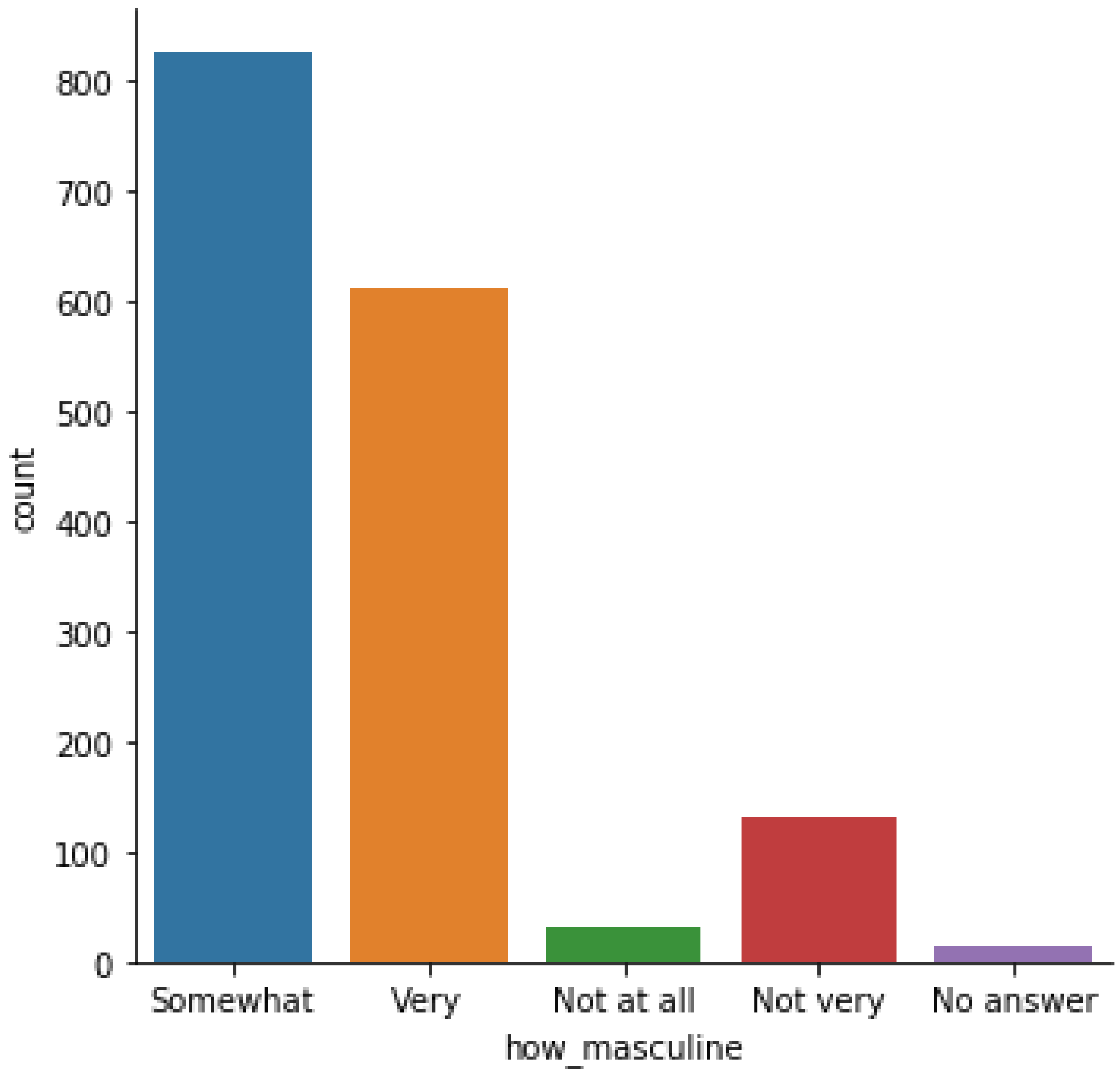
countplot() vs. catplot()

```
import matplotlib.pyplot as plt
import seaborn as sns

sns.countplot(x="how_masculine",
              data=masculinity_data)

plt.show()
```



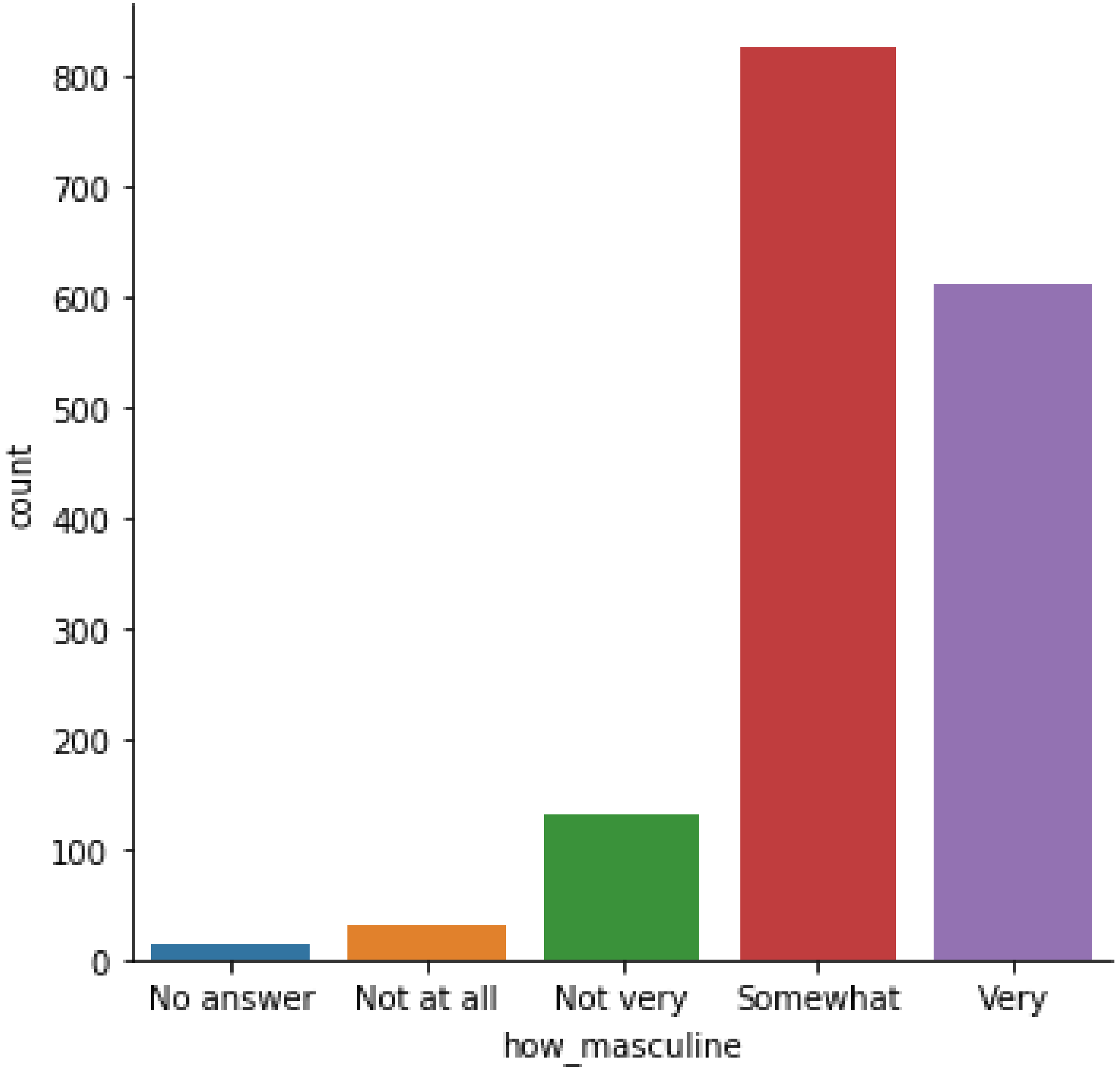
countplot() vs. catplot()

```
import matplotlib.pyplot as plt
import seaborn as sns

sns.catplot(x="how_masculine",
            data=masculinity_data,
            kind="count")

plt.show()
```



Changing the order

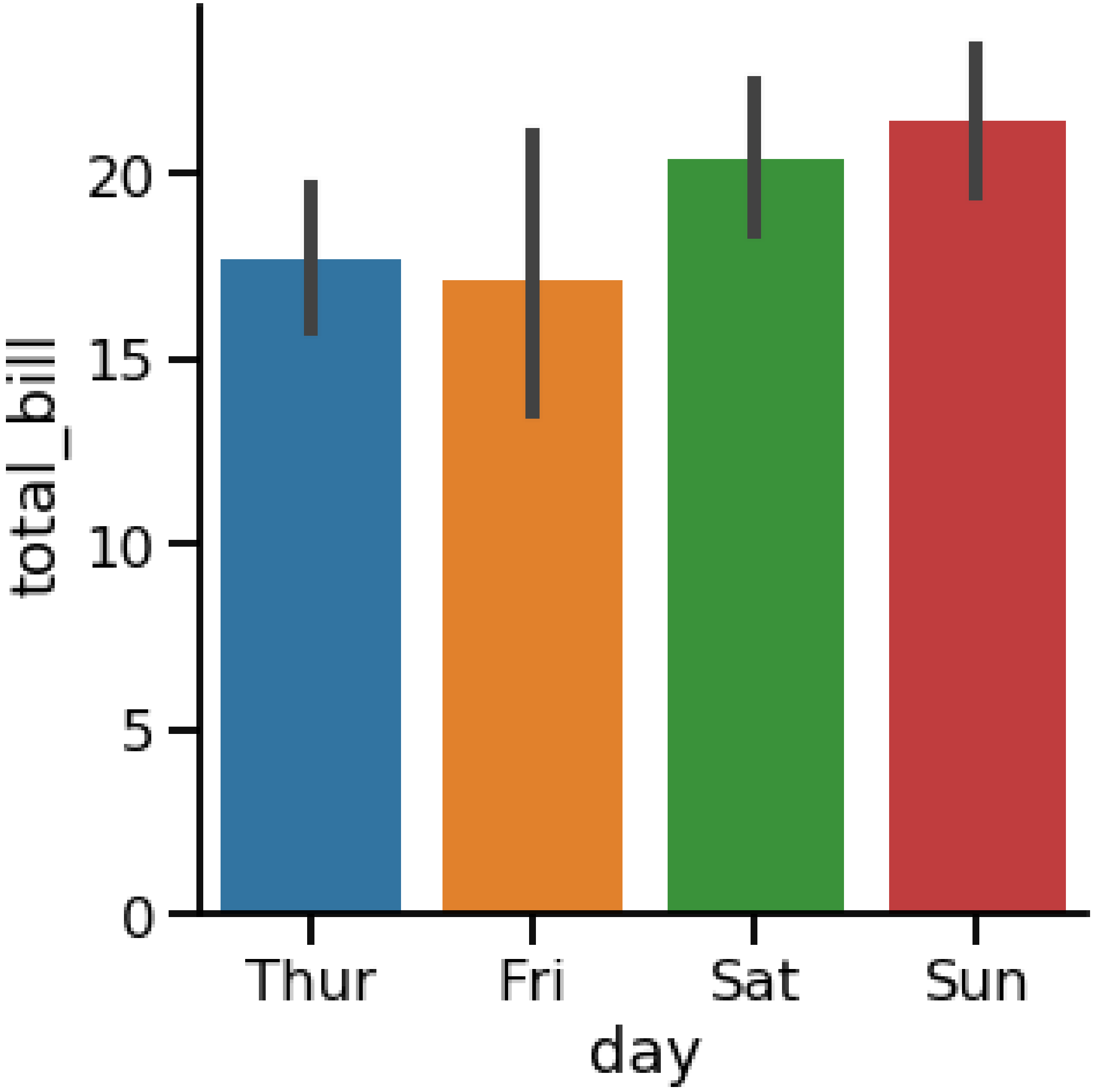
```python
import matplotlib.pyplot as plt
import seaborn as sns
category_order = ["No answer",
                  "Not at all",
                  "Not very",
                  "Somewhat",
                  "Very"]
sns.catplot(x="how_masculine",
            data=masculinity_data,
            kind="count",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



Bar plots

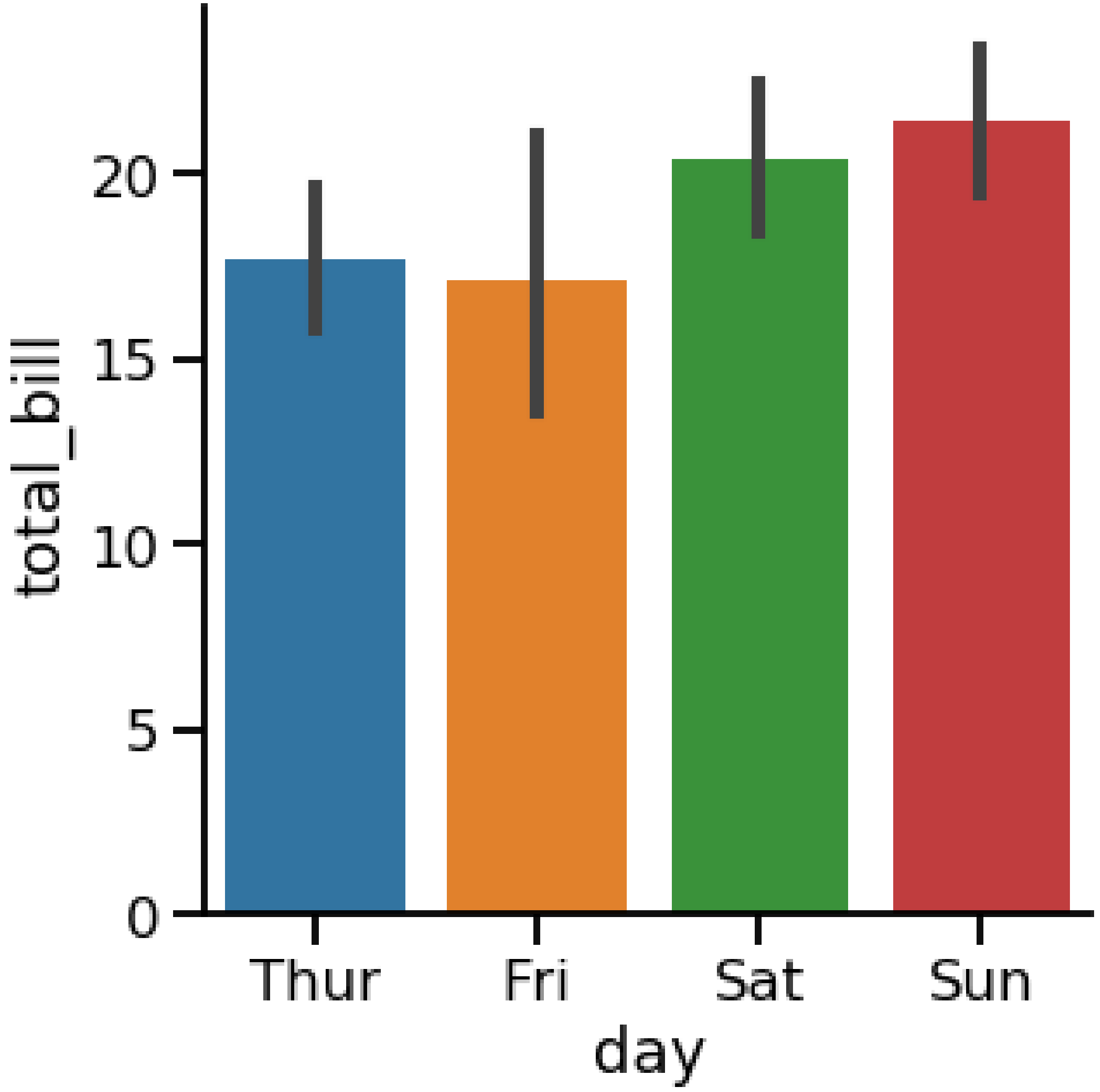
Displays mean of quantitative variable per category

```
import matplotlib.pyplot as plt
import seaborn as sns

sns.catplot(x="day",
            y="total_bill",
            data=tips,
            kind="bar")

plt.show()
```



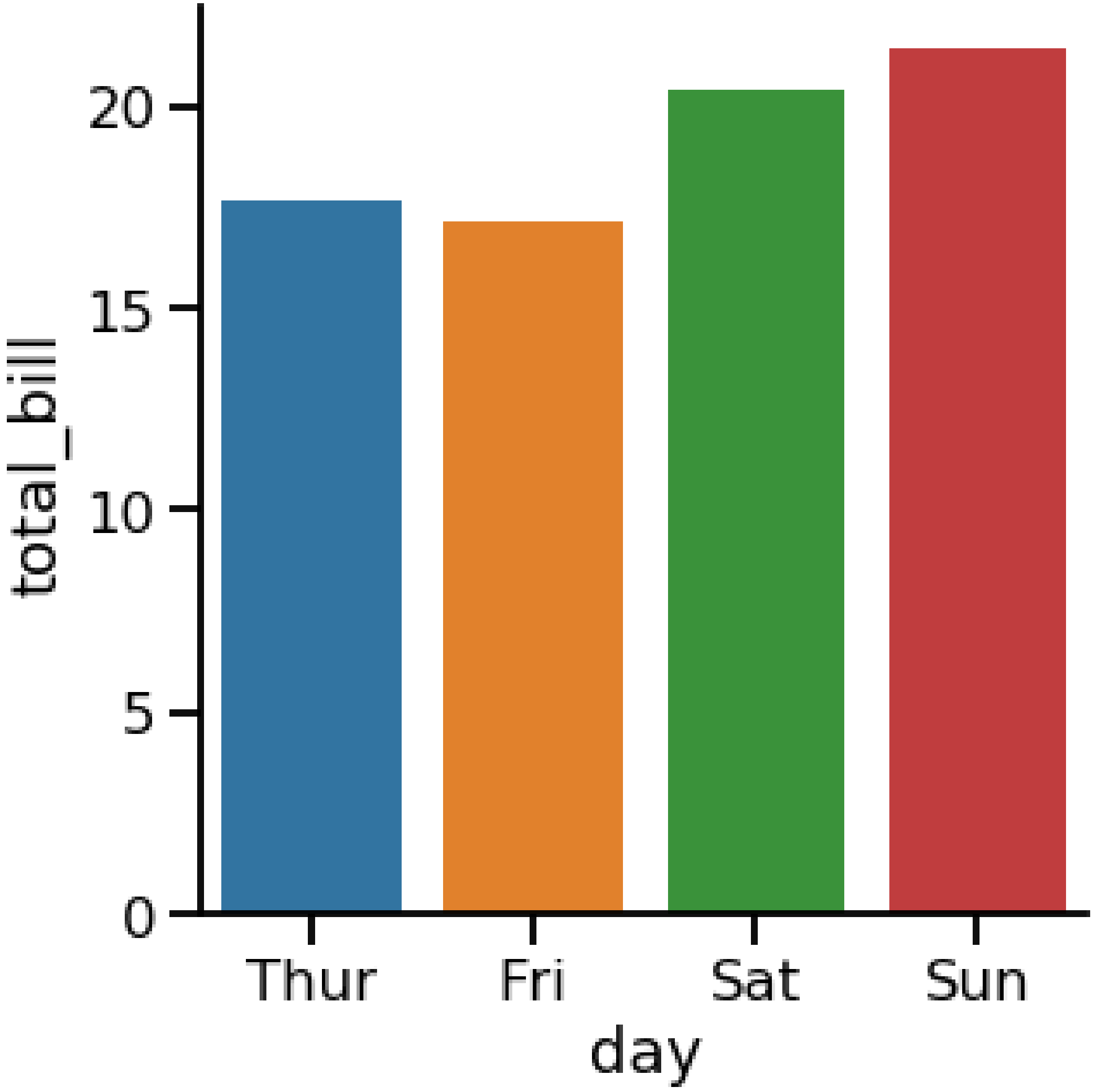
Confidence intervals

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



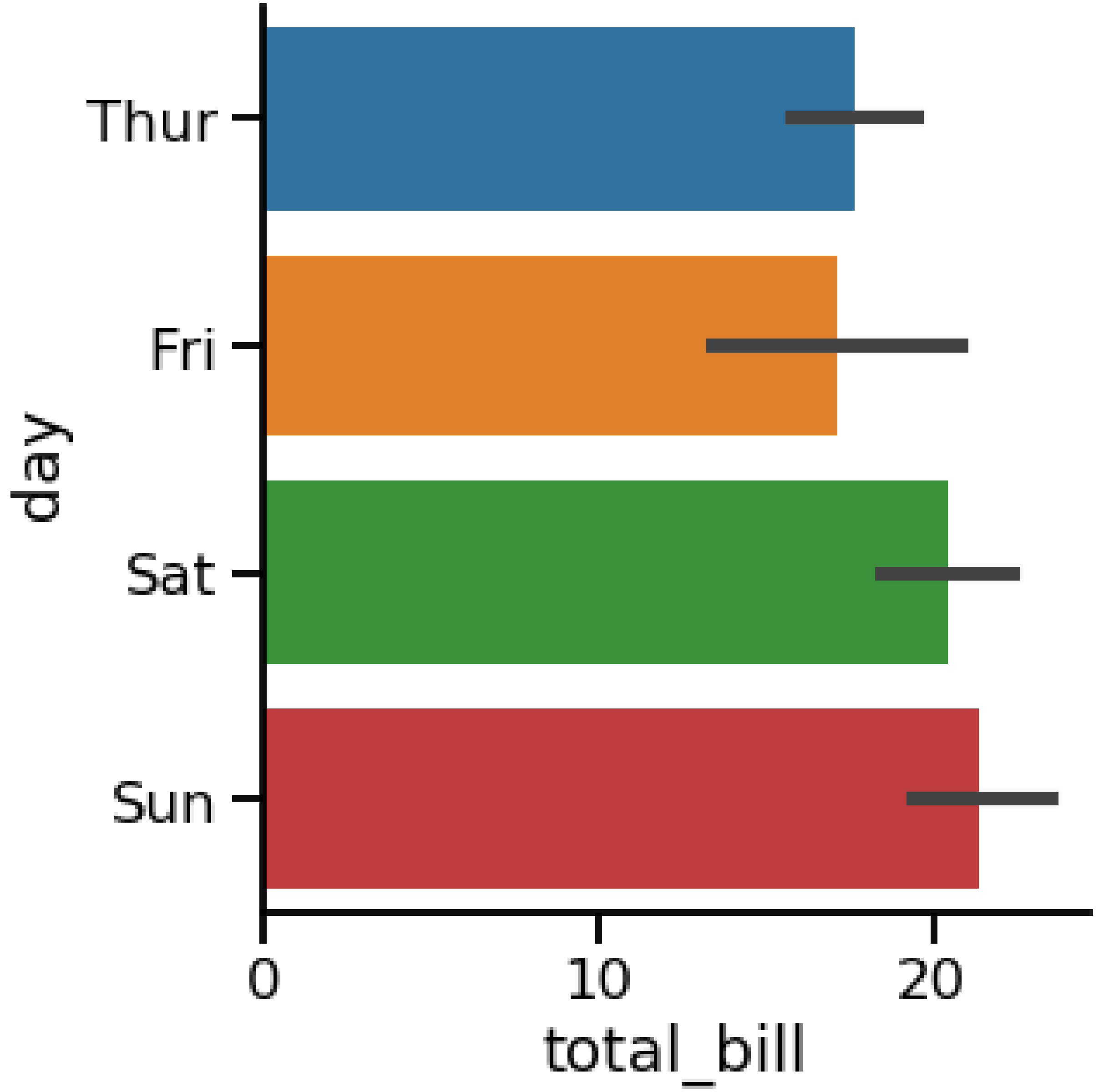
Turning off confidence intervals

```
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

```
import matplotlib.pyplot as plt
import seaborn as sns

sns.catplot(x="total_bill",
            y="day",
            data=tips,
            kind="bar")
plt.show()
```



Let's practice!

Creating a box plot

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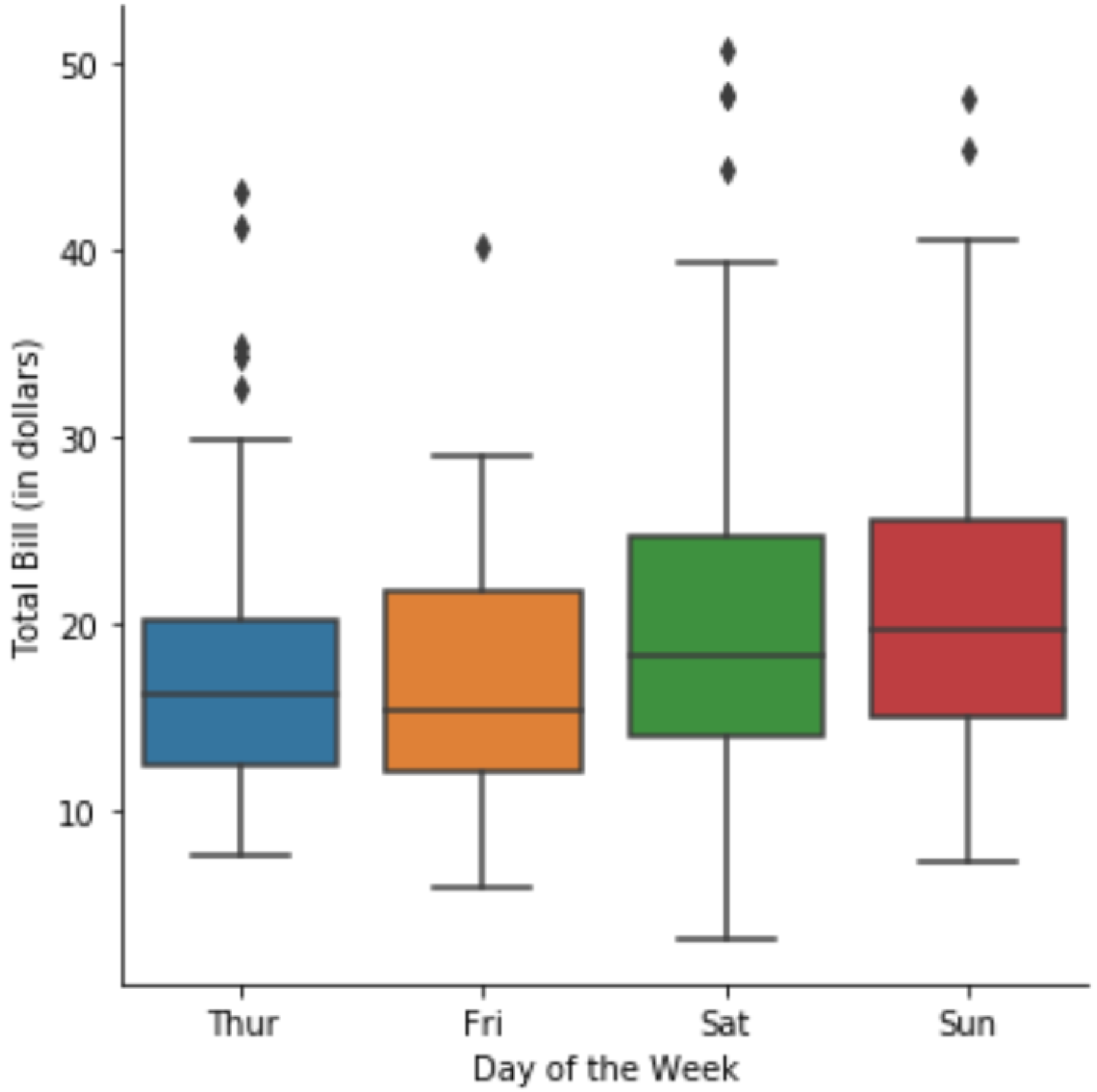
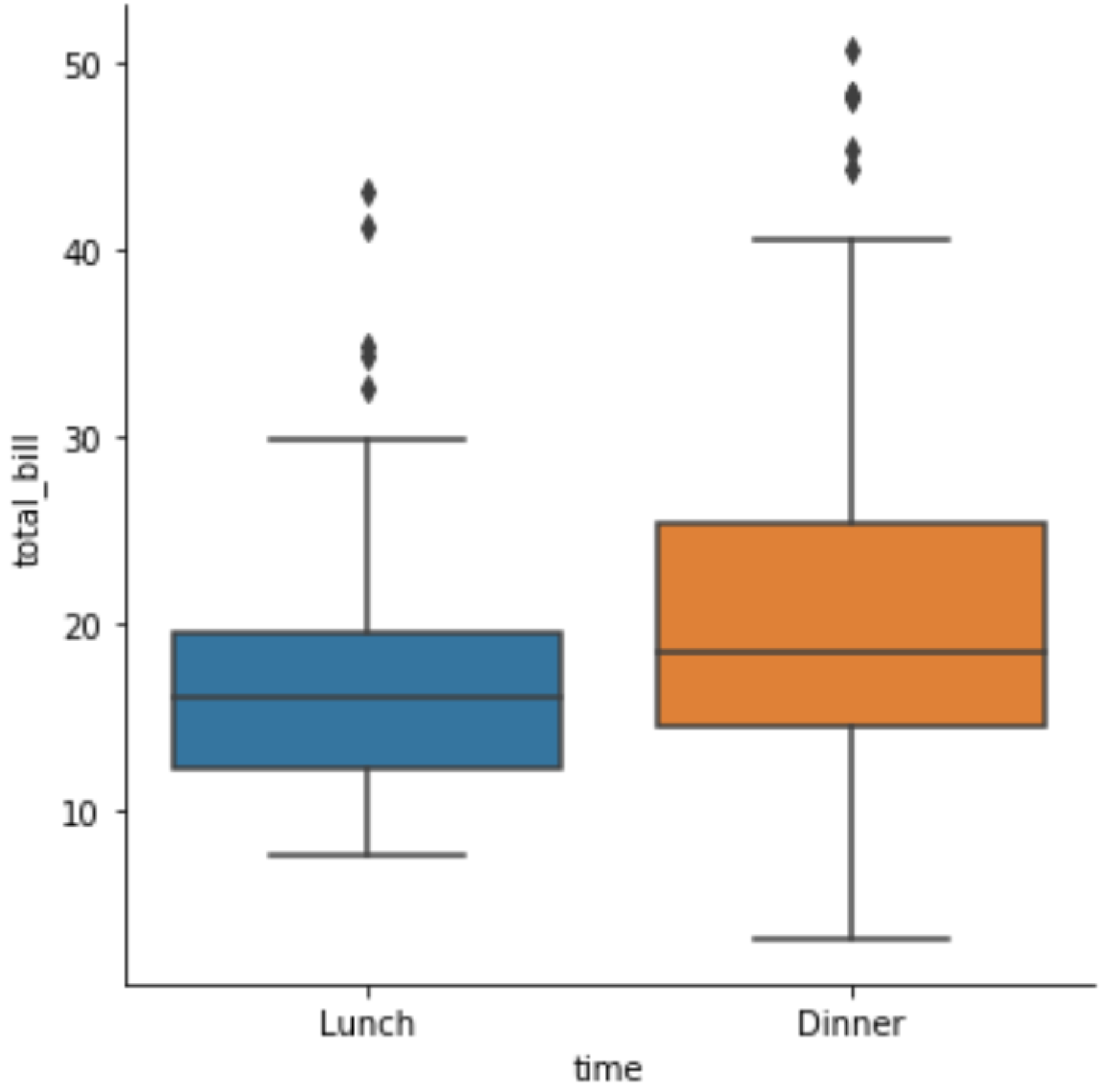
What is a box plot?

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



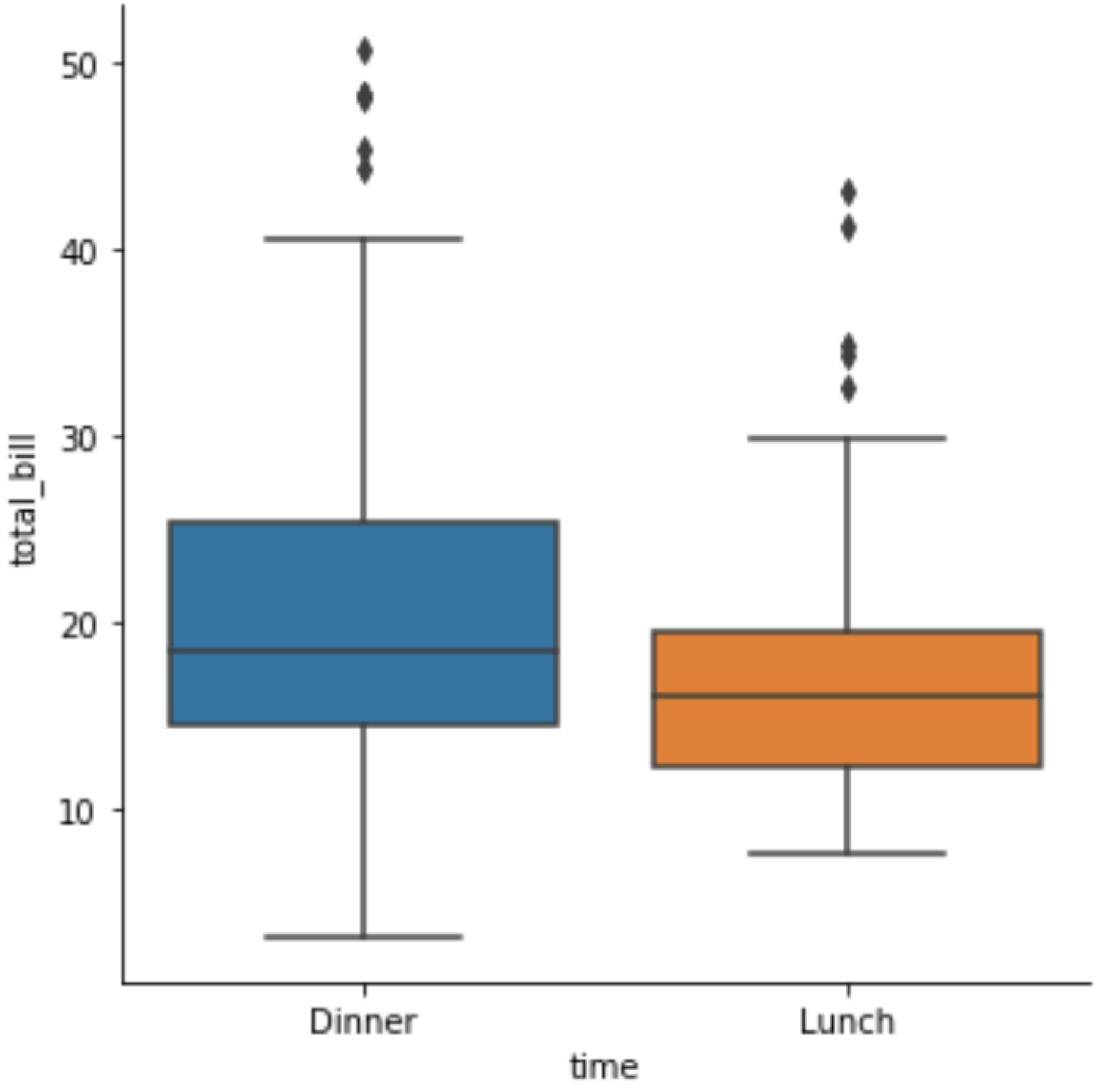
How to create a box plot

```python
import matplotlib.pyplot as plt
import seaborn as sns

g = sns.catplot(x="time",
                y="total_bill",
                data=tips,
                kind="box")
plt.show()
```



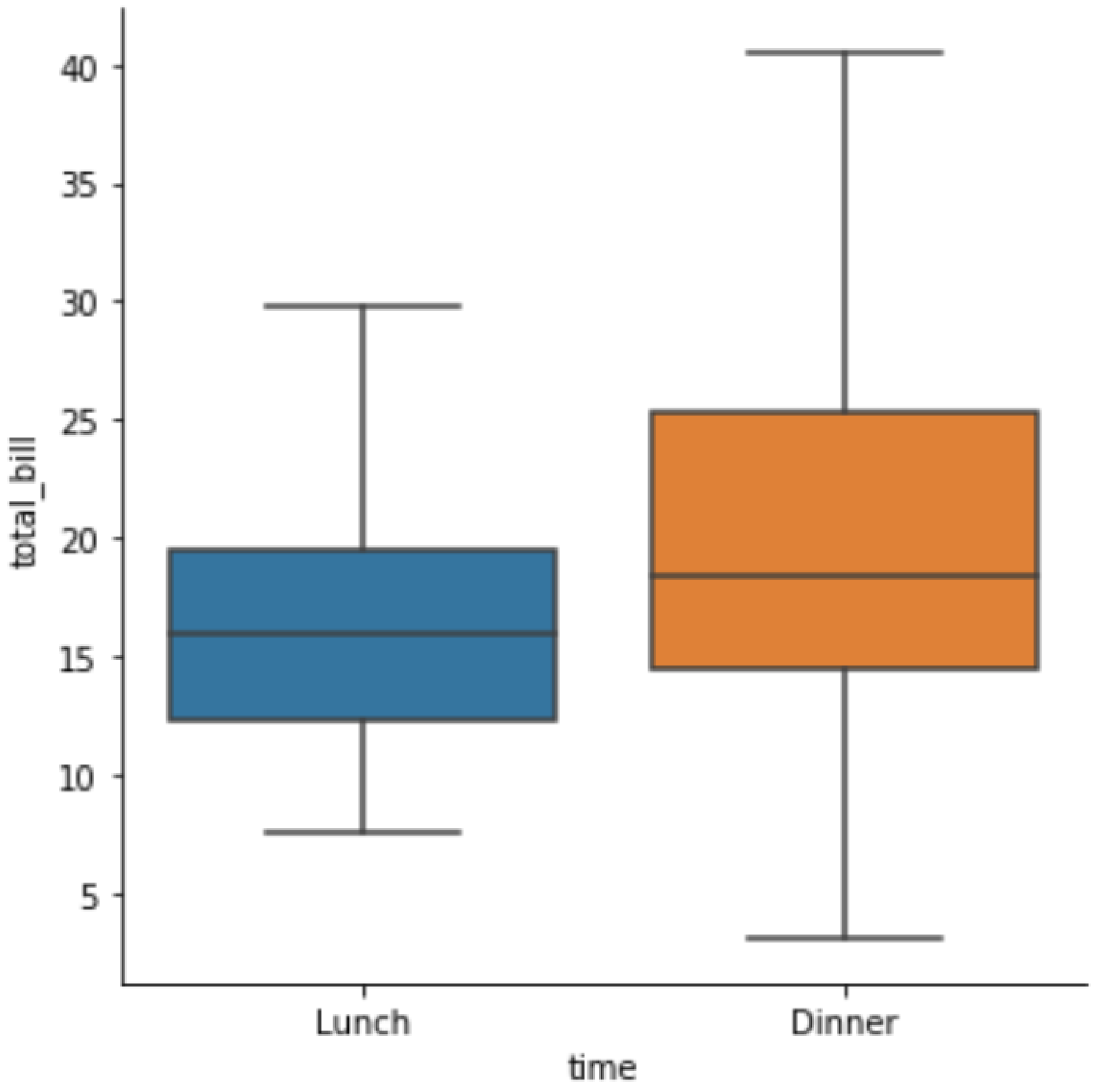
Change the order of categories

```
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()
```

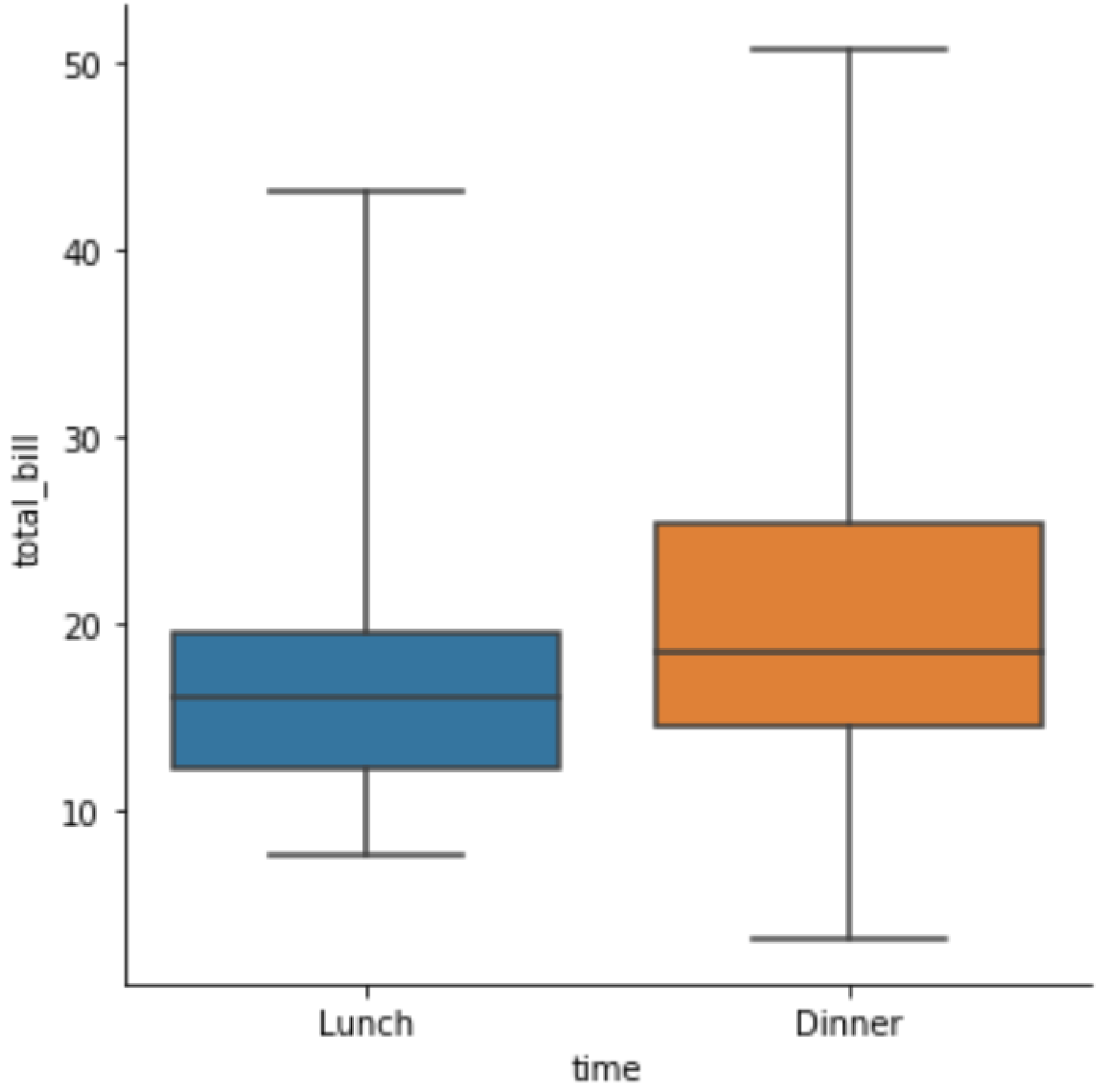


Changing the whiskers using `whis`

- 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()
```



Let's practice!

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Point plots

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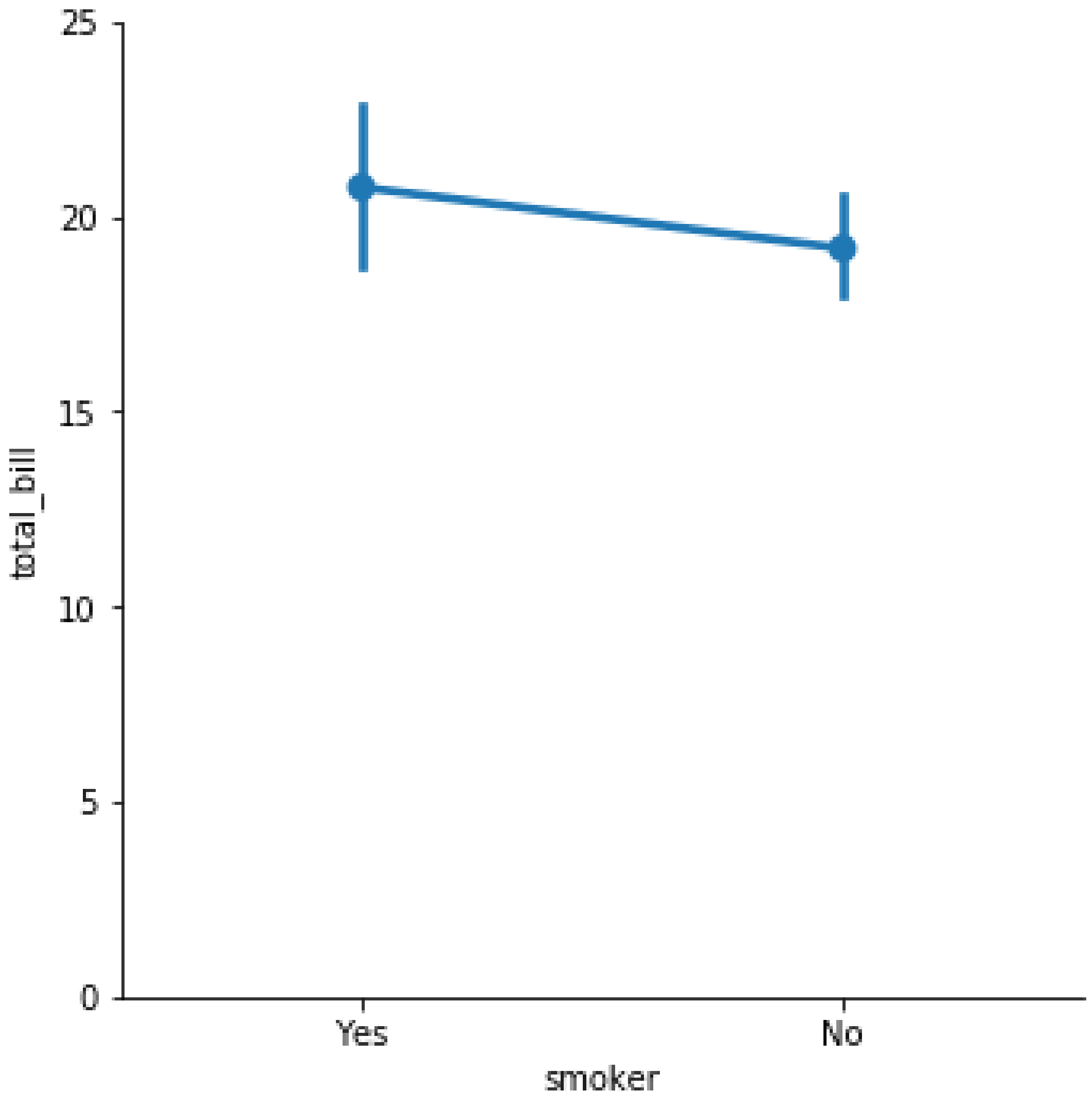
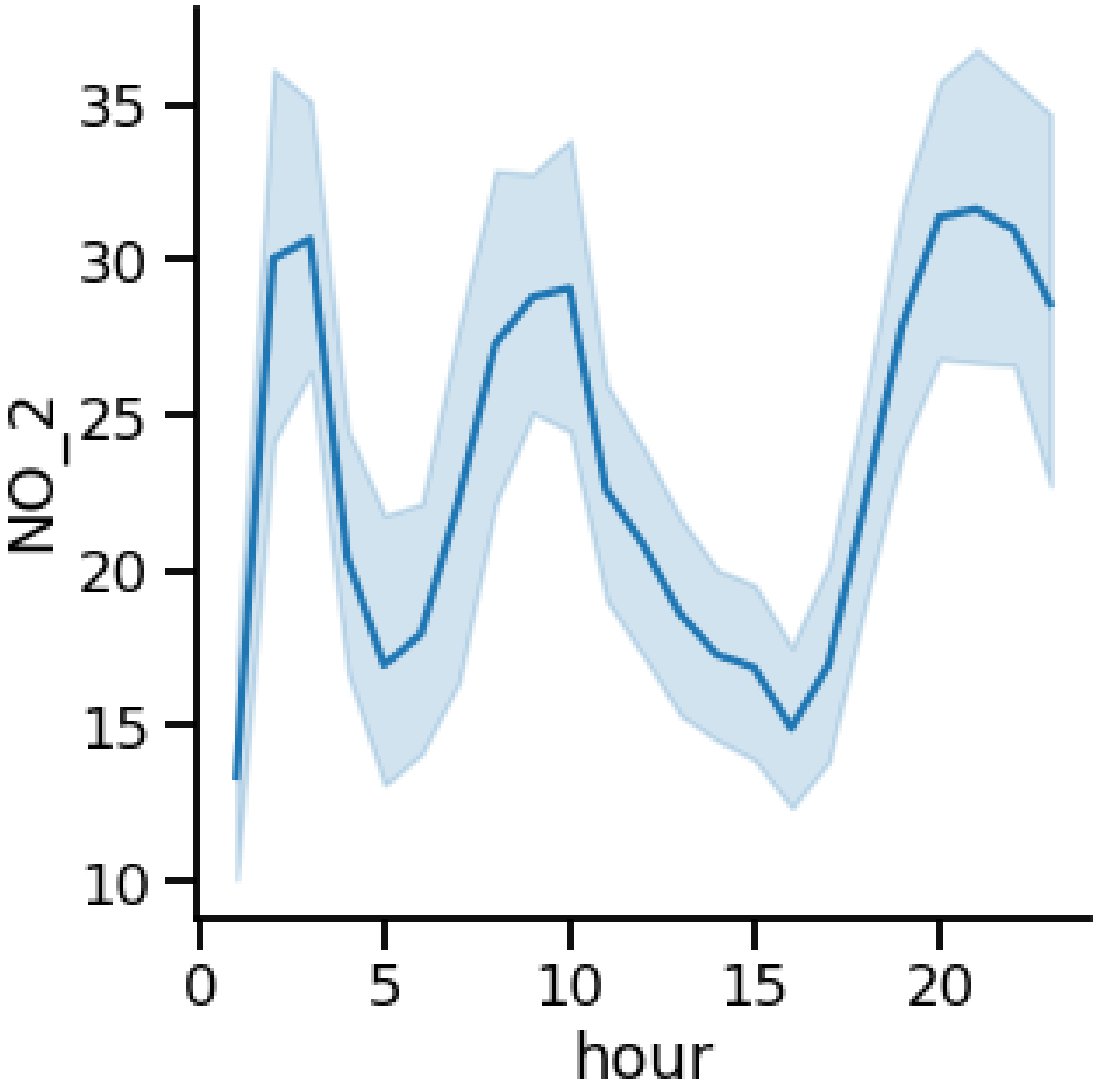
What are point plots?

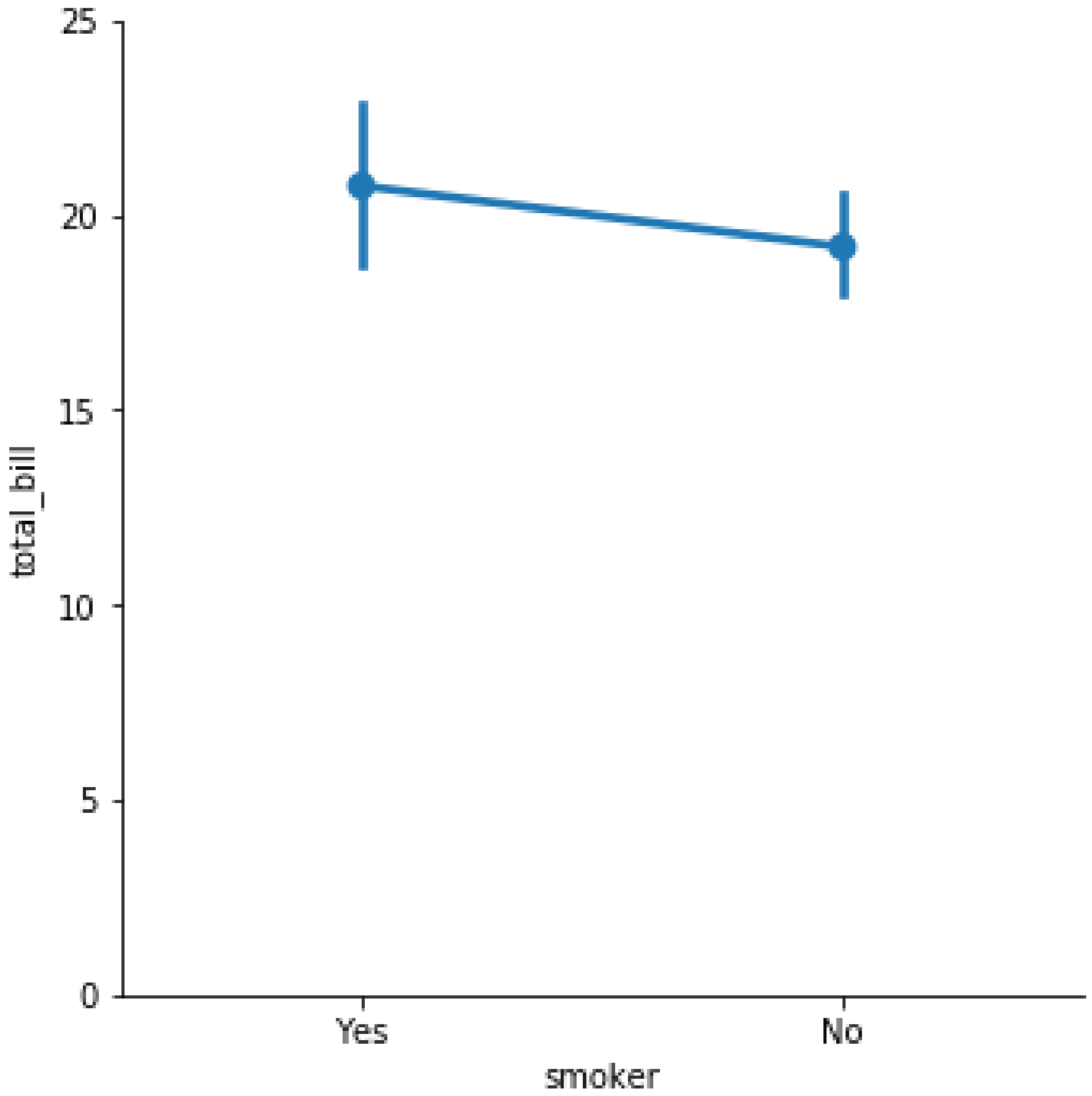
- Points show mean of quantitative variable
- Vertical lines show 95% confidence intervals



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:

ALSO ON Y-AXIS

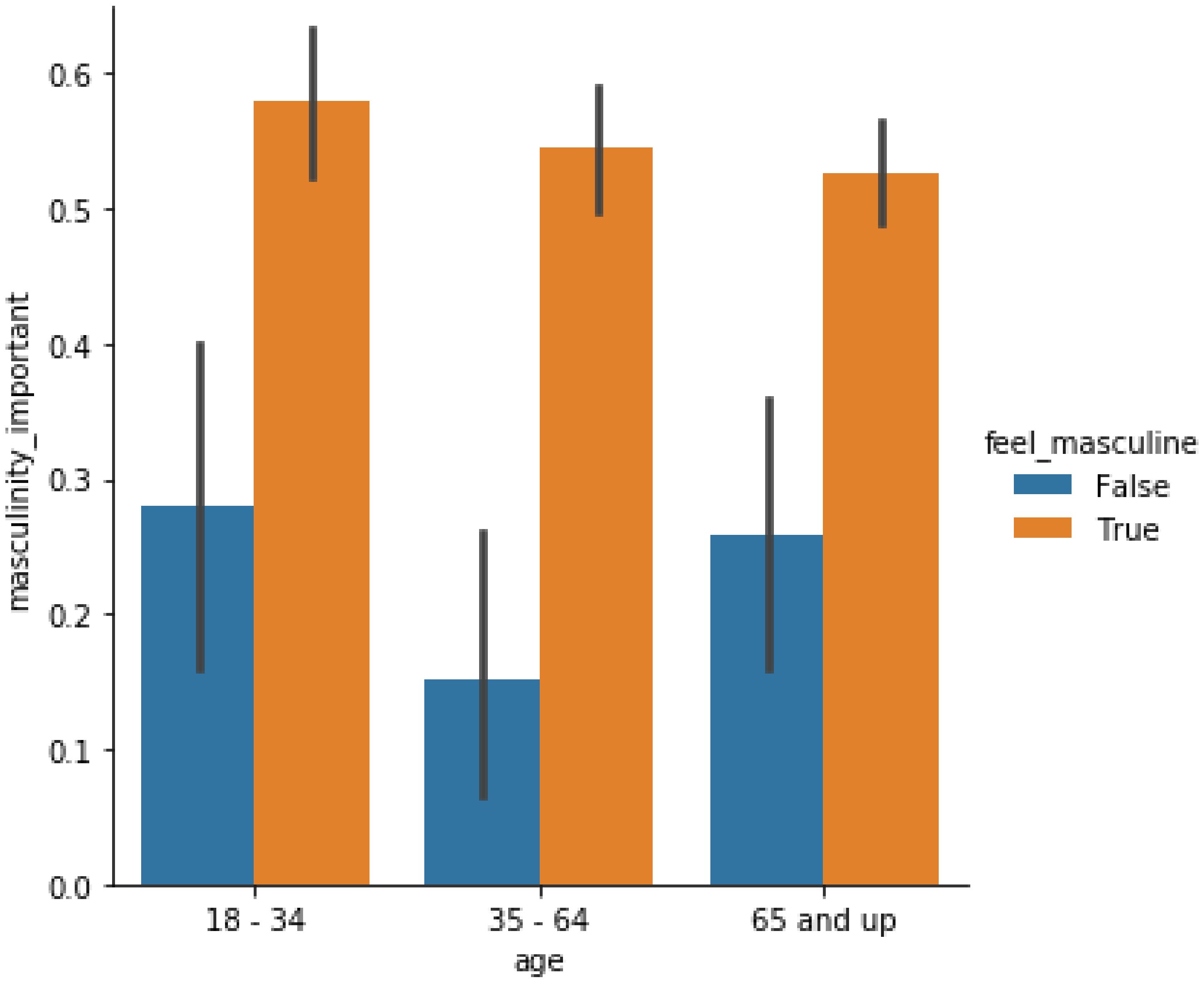
- Line plot has **quantitative** variable (usually time) on x-axis
- Point plot has **categorical** variable on x-axis → QUANTITATIVE ON Y-AXIS

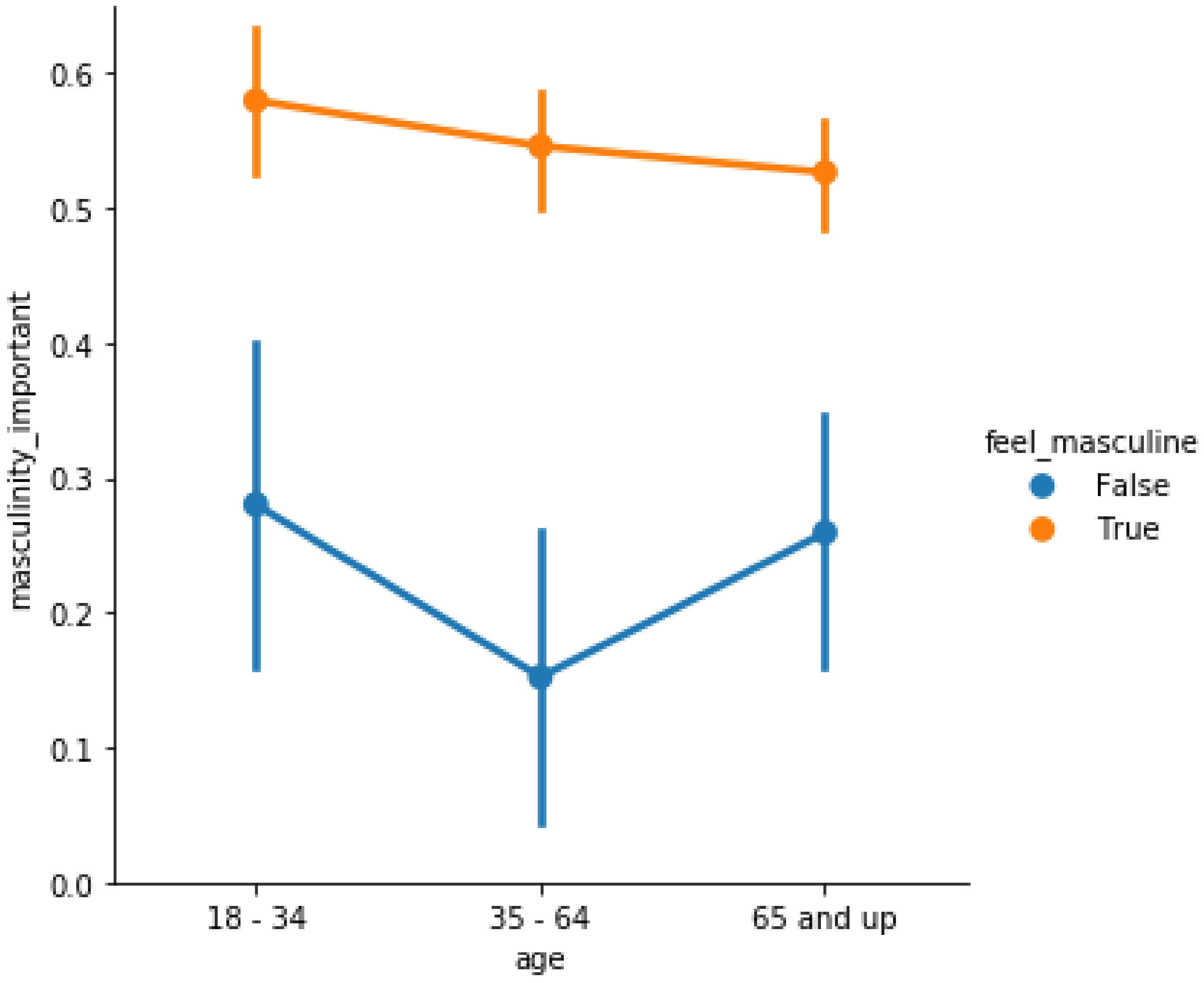
Point plots vs. bar plots

Both show:

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

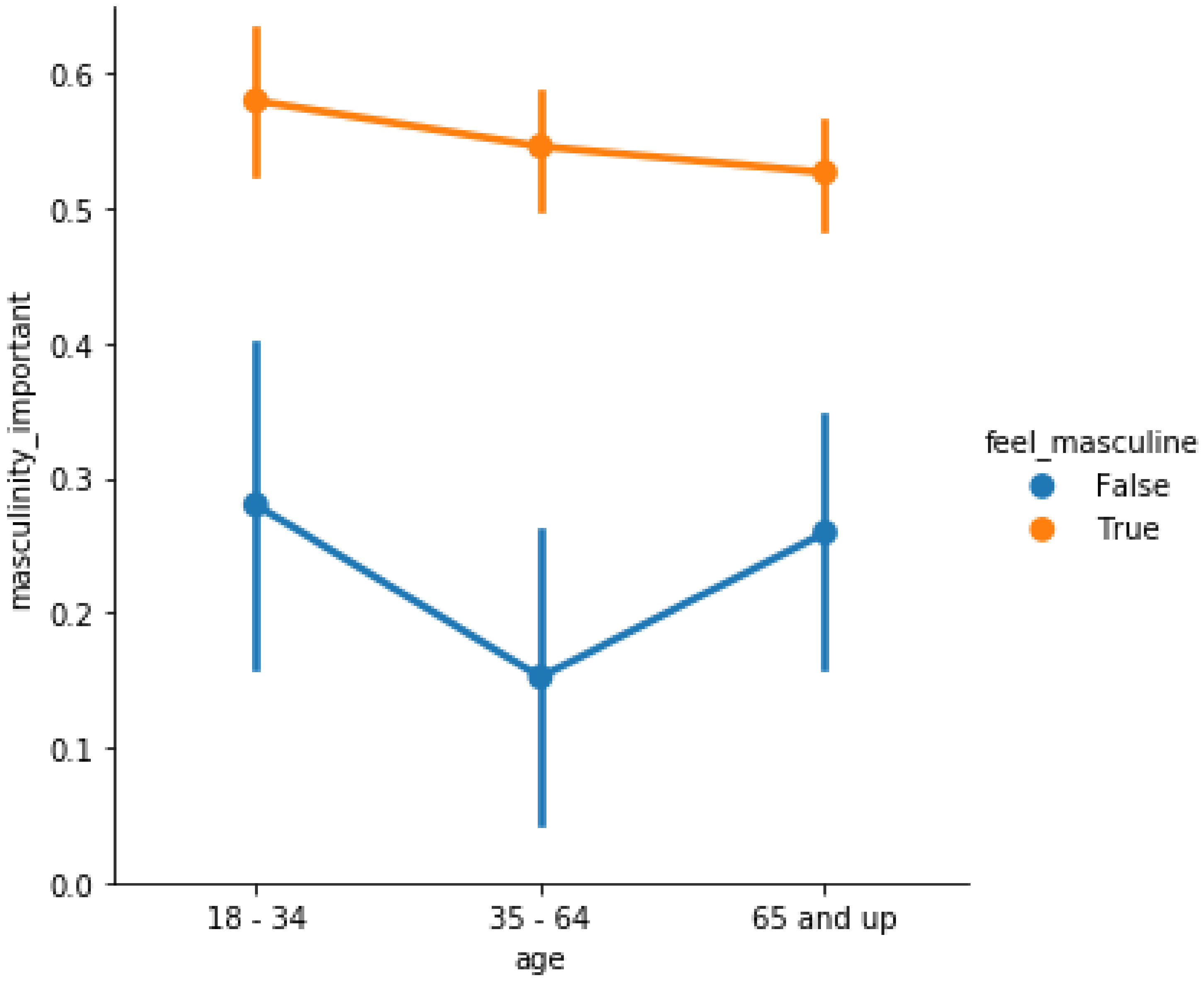
Point plots vs. bar plots





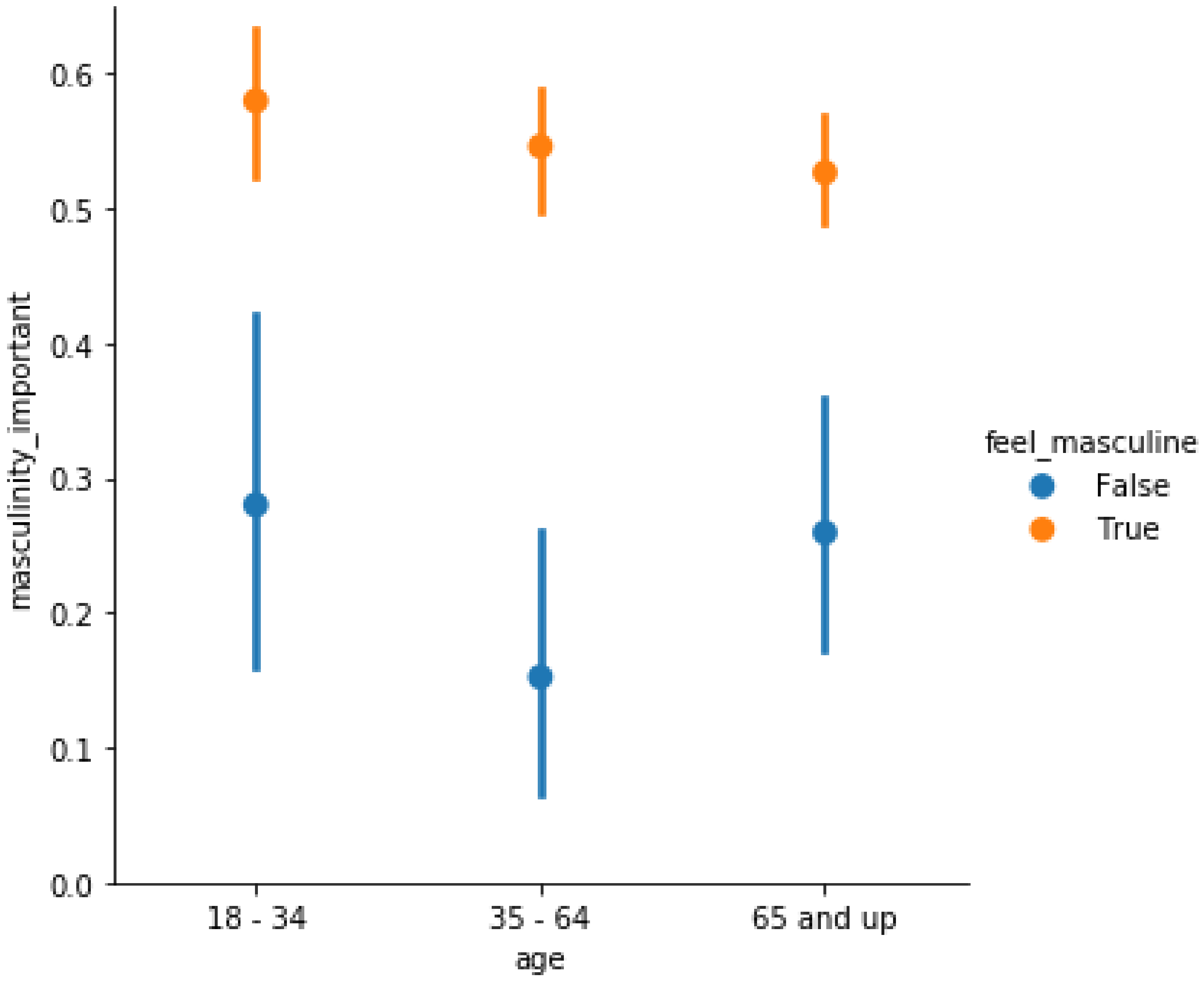
Creating a point plot

```python
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()
```



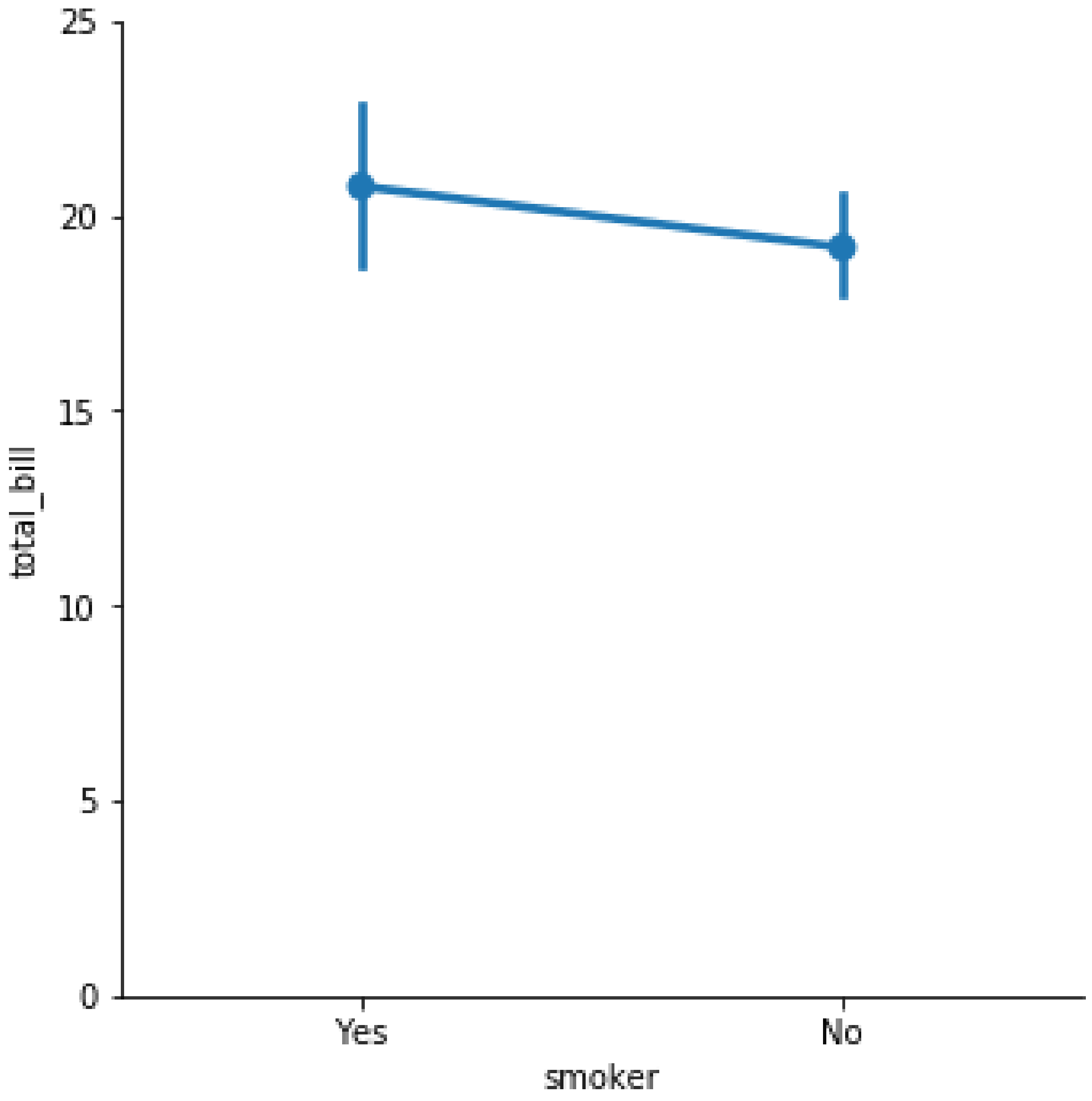
Disconnecting the points

```python
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

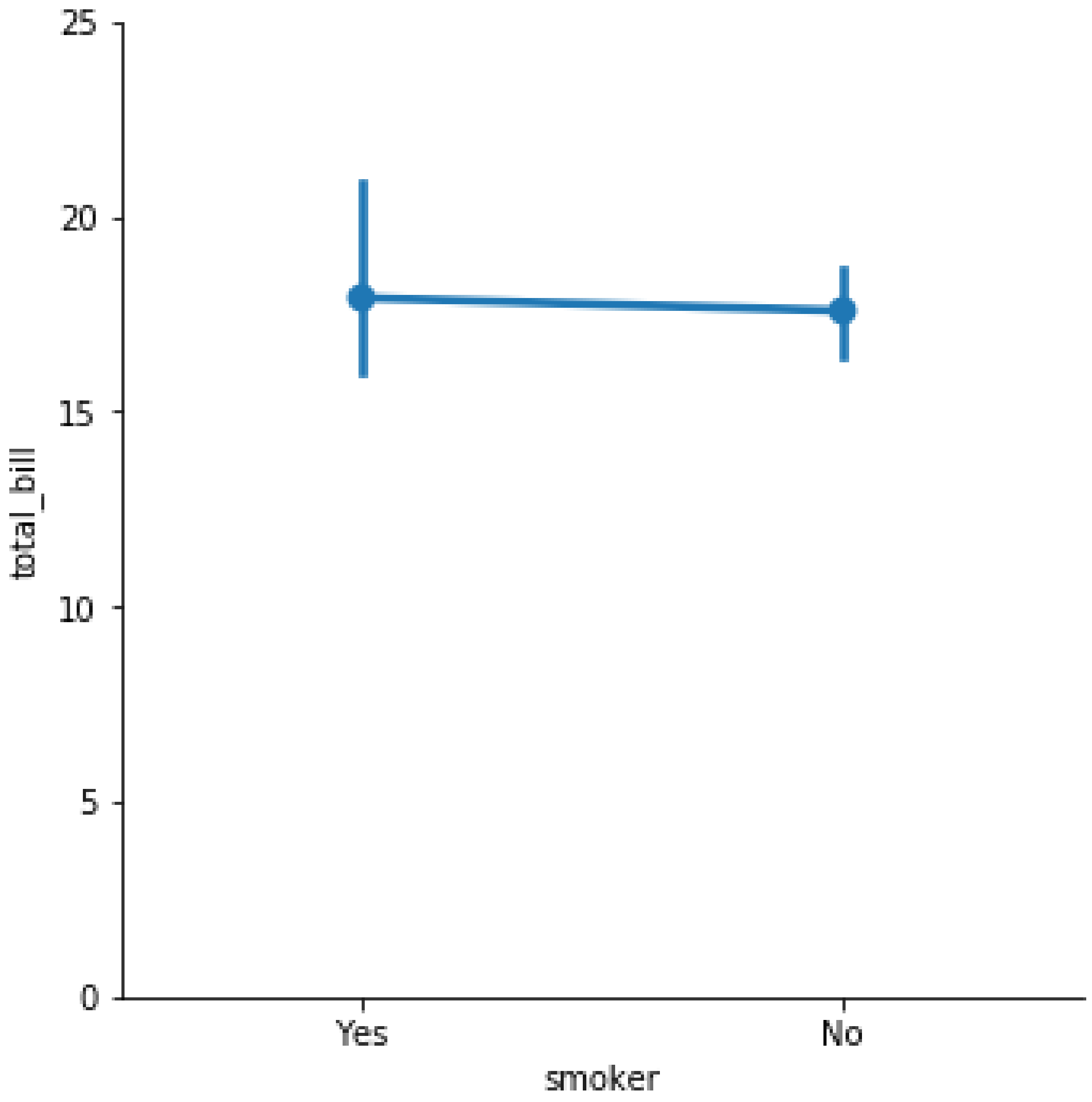
```
import matplotlib.pyplot as plt
import seaborn as sns

sns.catplot(x="smoker",
            y="total_bill",
            data=tips,
            kind="point")

plt.show()
```



Displaying the median

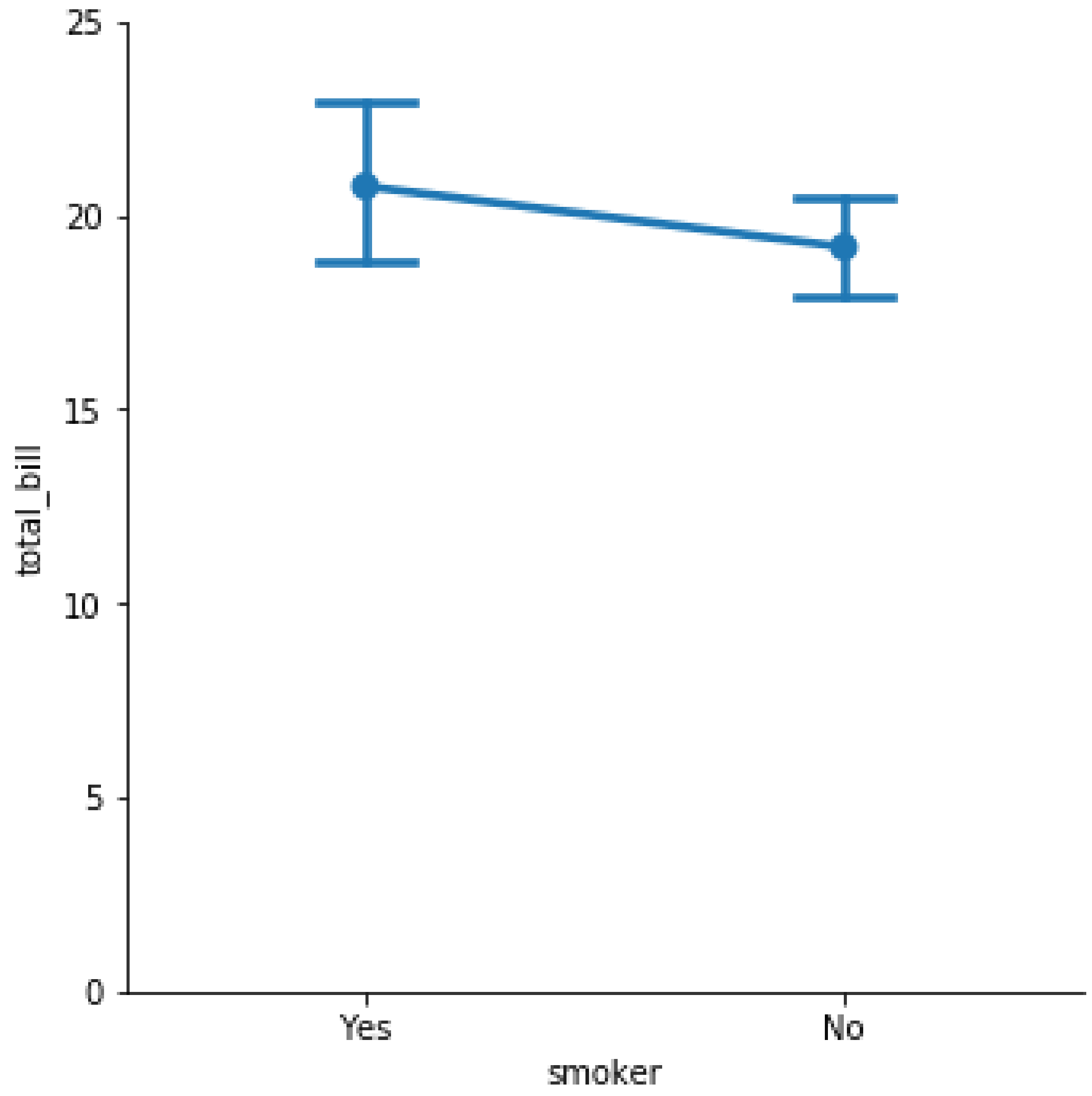
INSTEAD OF MEAN

```
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()
```



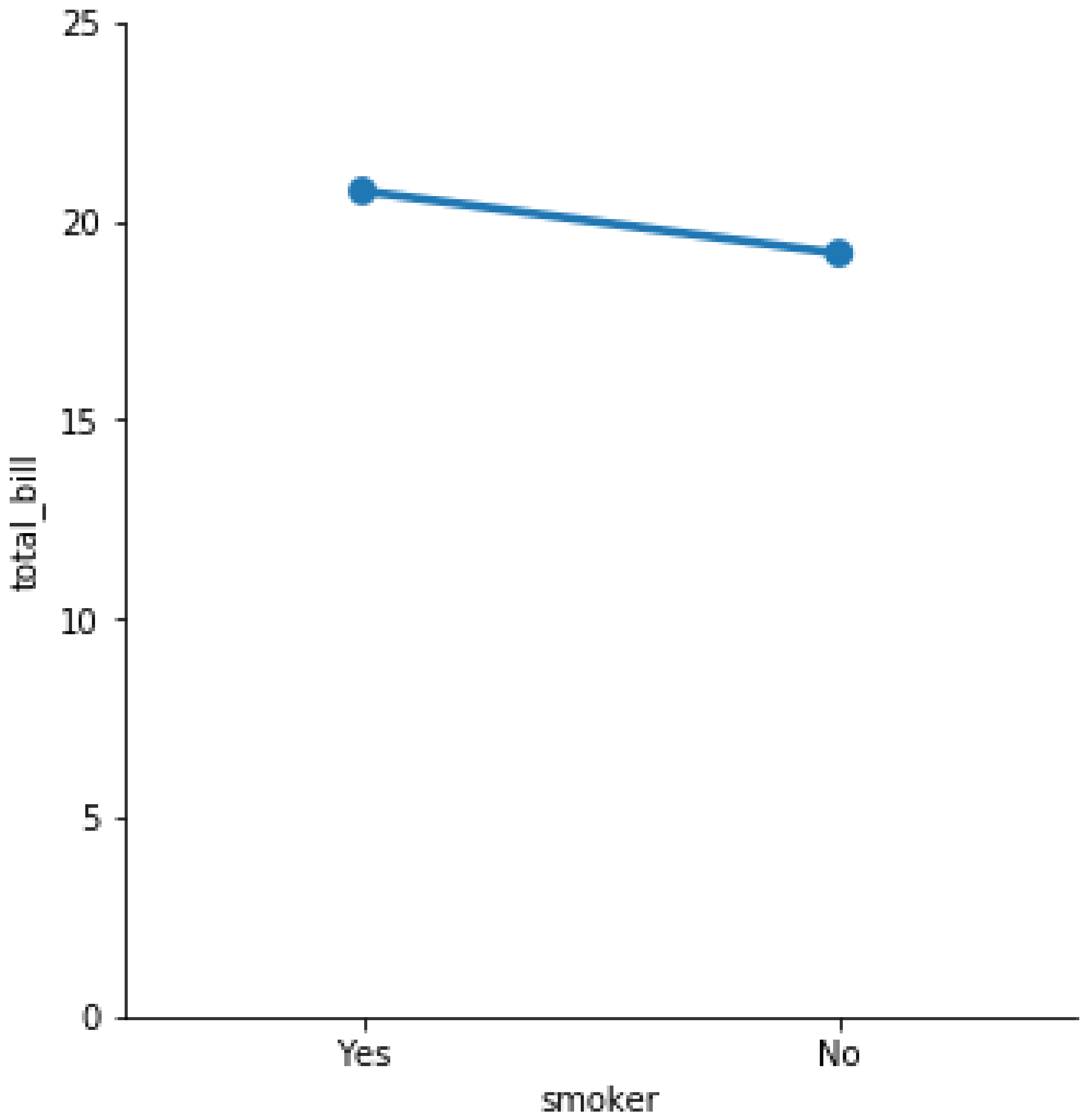
Customizing the confidence intervals

```
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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