



Introduction to Inference Methods: Oh the Things you will see!

Brenda Gunderson



What's Ahead?

Learning how to use data to ...

- **estimate** parameters with *confidence*
- **test theories** about parameters

**Statistical
Inference**

Research Question:
What proportion
of all parents with toddlers
report they use a car seat
for all travel
with their toddler?



Research Question:
What proportion
of all parents with toddlers
report they use a car seat
for all travel
with their toddler?



Research Question:
What proportion
of all parents with toddlers
report they use a car seat
for all travel
with their toddler?



Estimate a Population Proportion
with Confidence

Research Question:
What is the average
cartwheel distance
for all adults?



Research Question:
**What is the average
cartwheel distance
for all adults?**

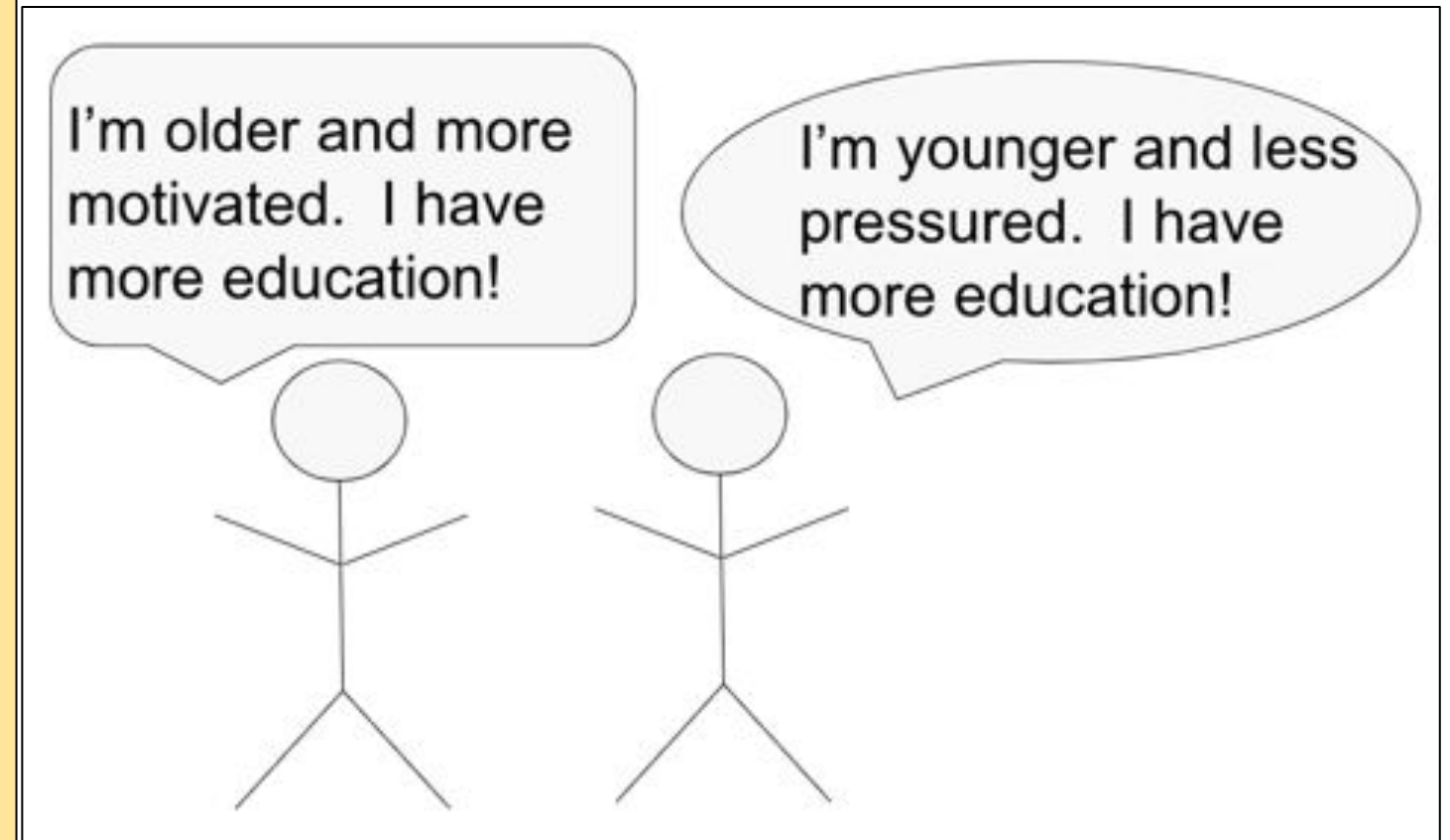


Research Question:
**What is the average
cartwheel distance
for all adults?**

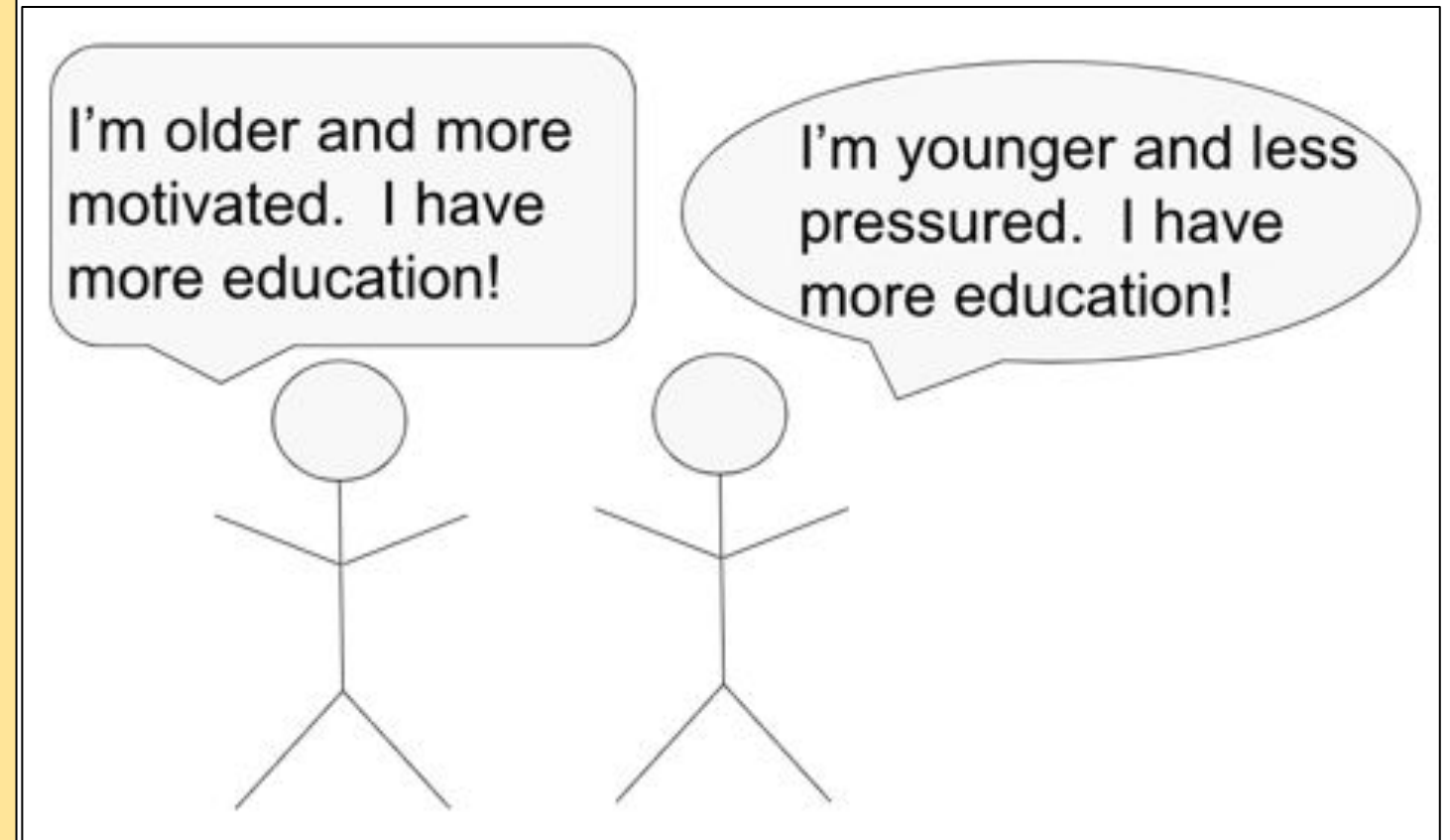


**Estimate a Population Mean
with Confidence**

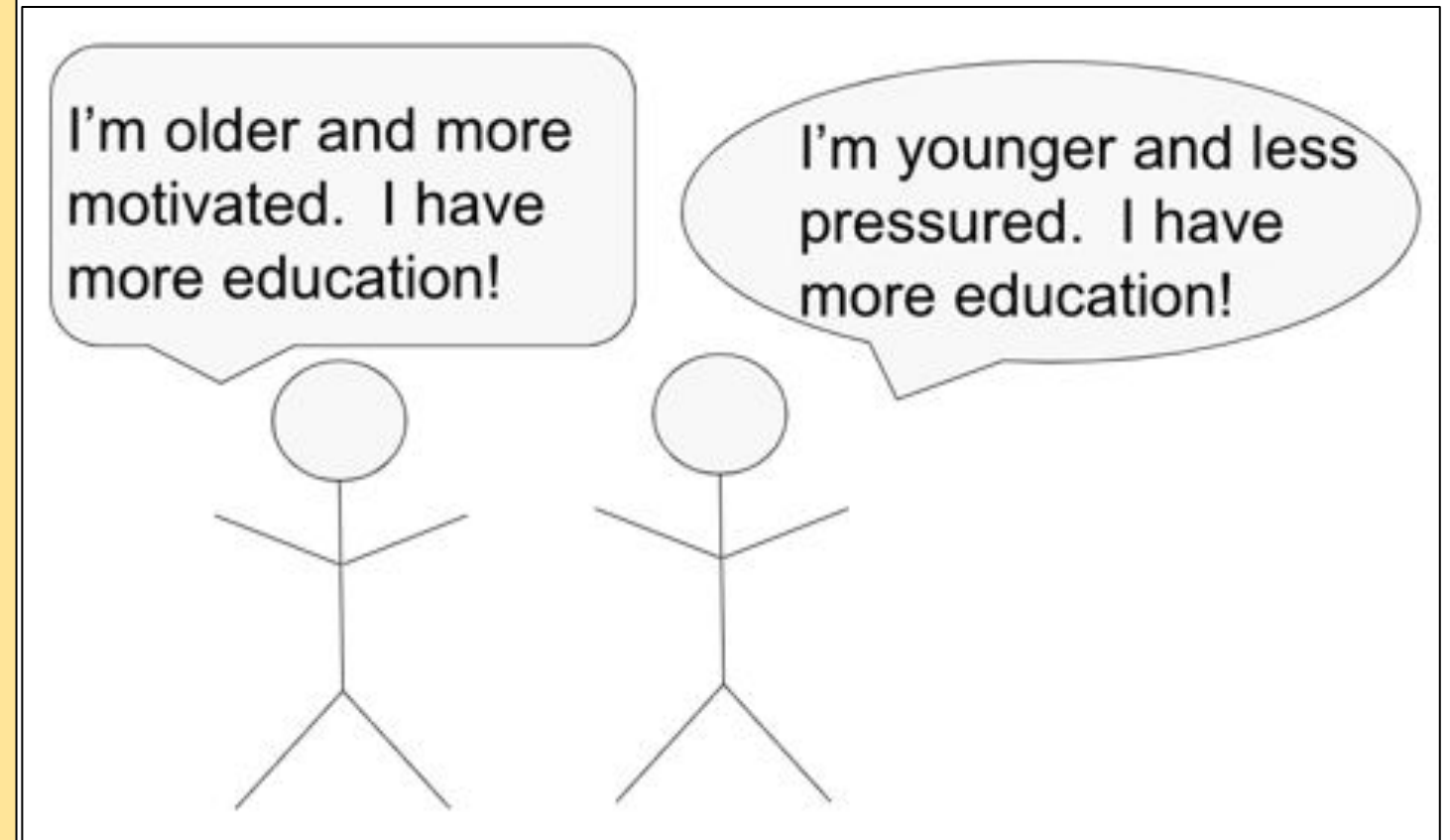
Research Question:
**What is the
average difference
in self-reported education
between older twin
and younger twin?**



Research Question:
What is the
average difference
in self-reported education
between older twin
and younger twin?

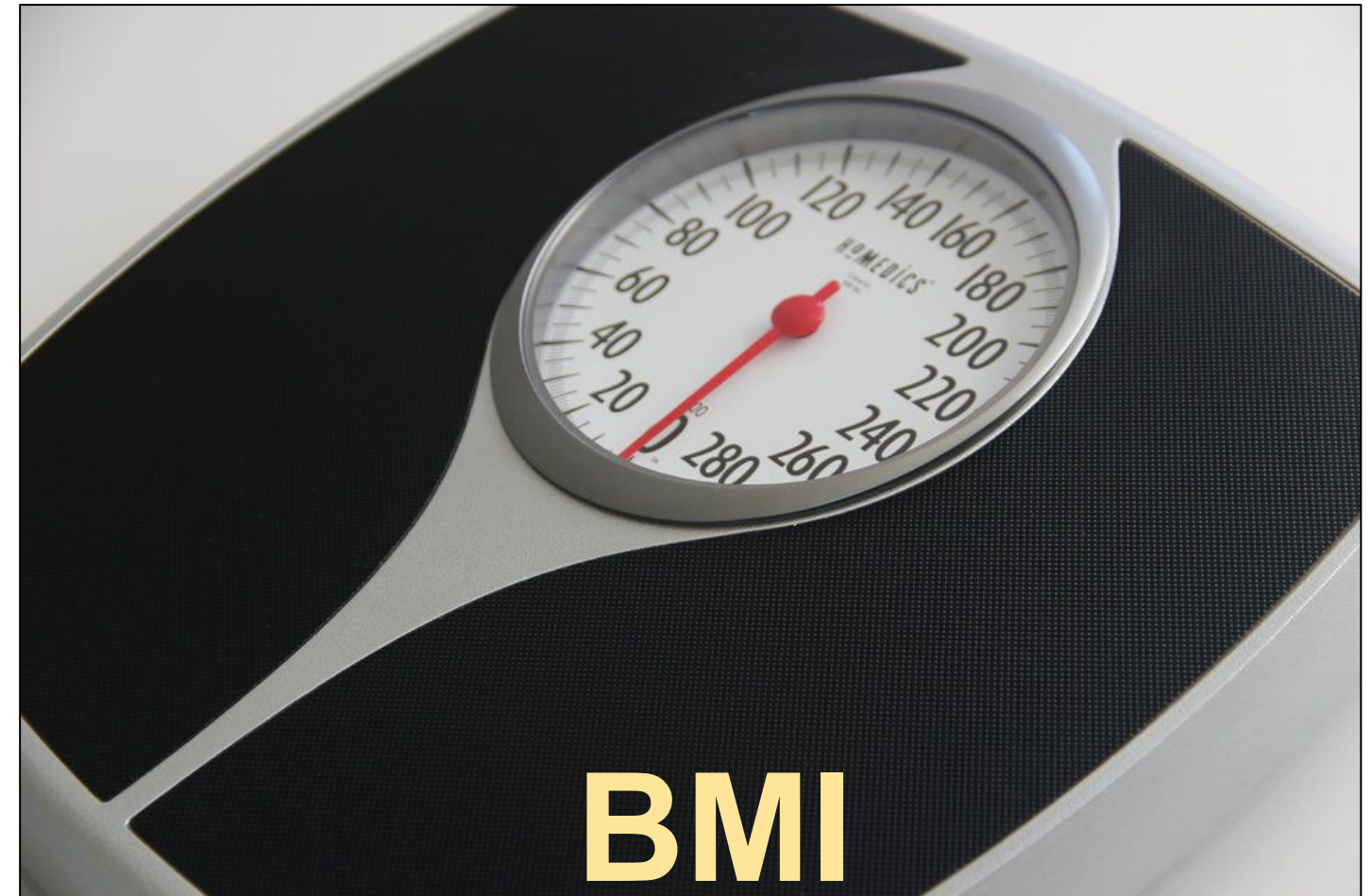


Research Question:
What is the
average difference
in self-reported education
between older twin
and younger twin?

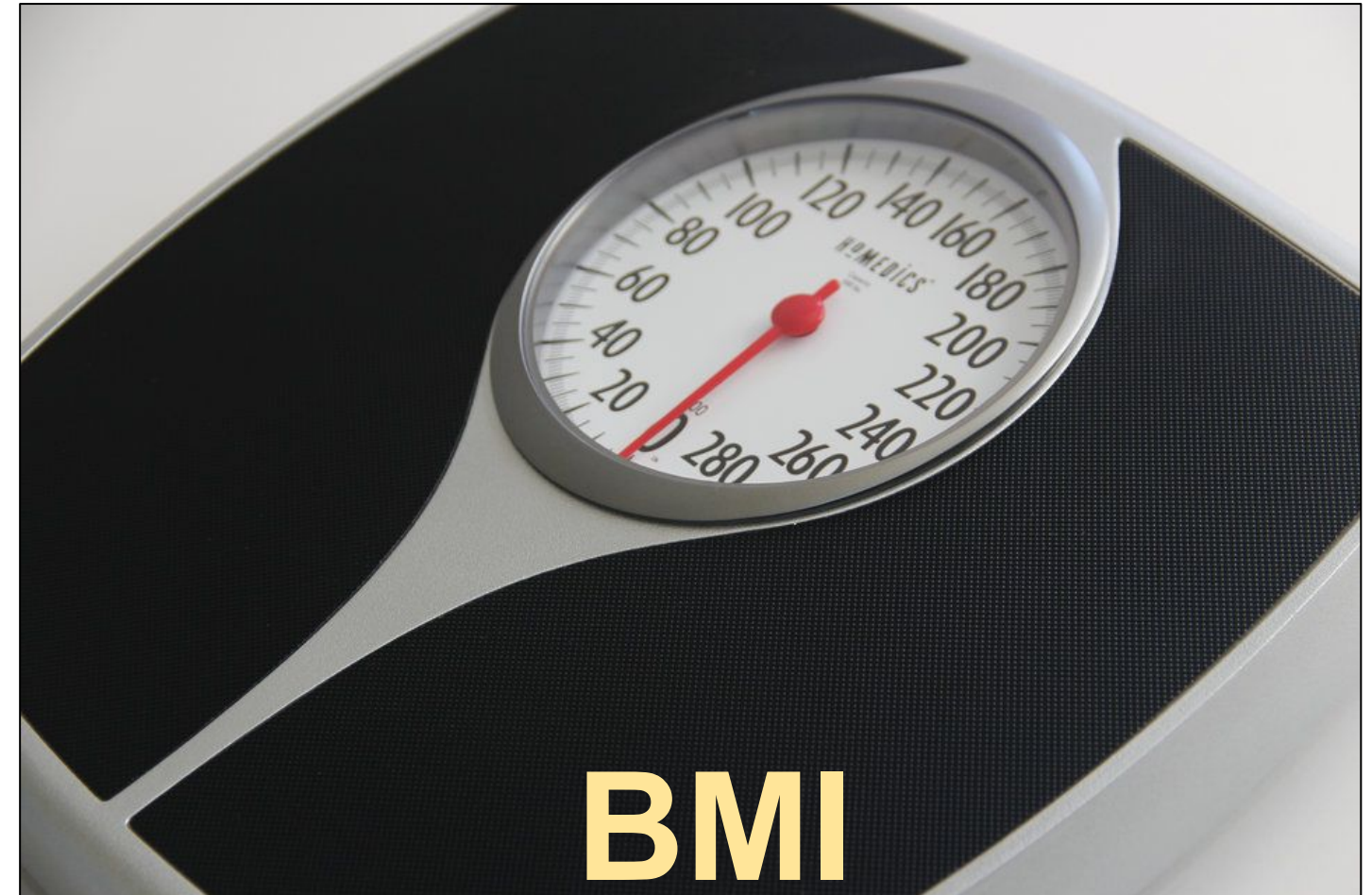


Estimate a Population Mean Difference
with Confidence

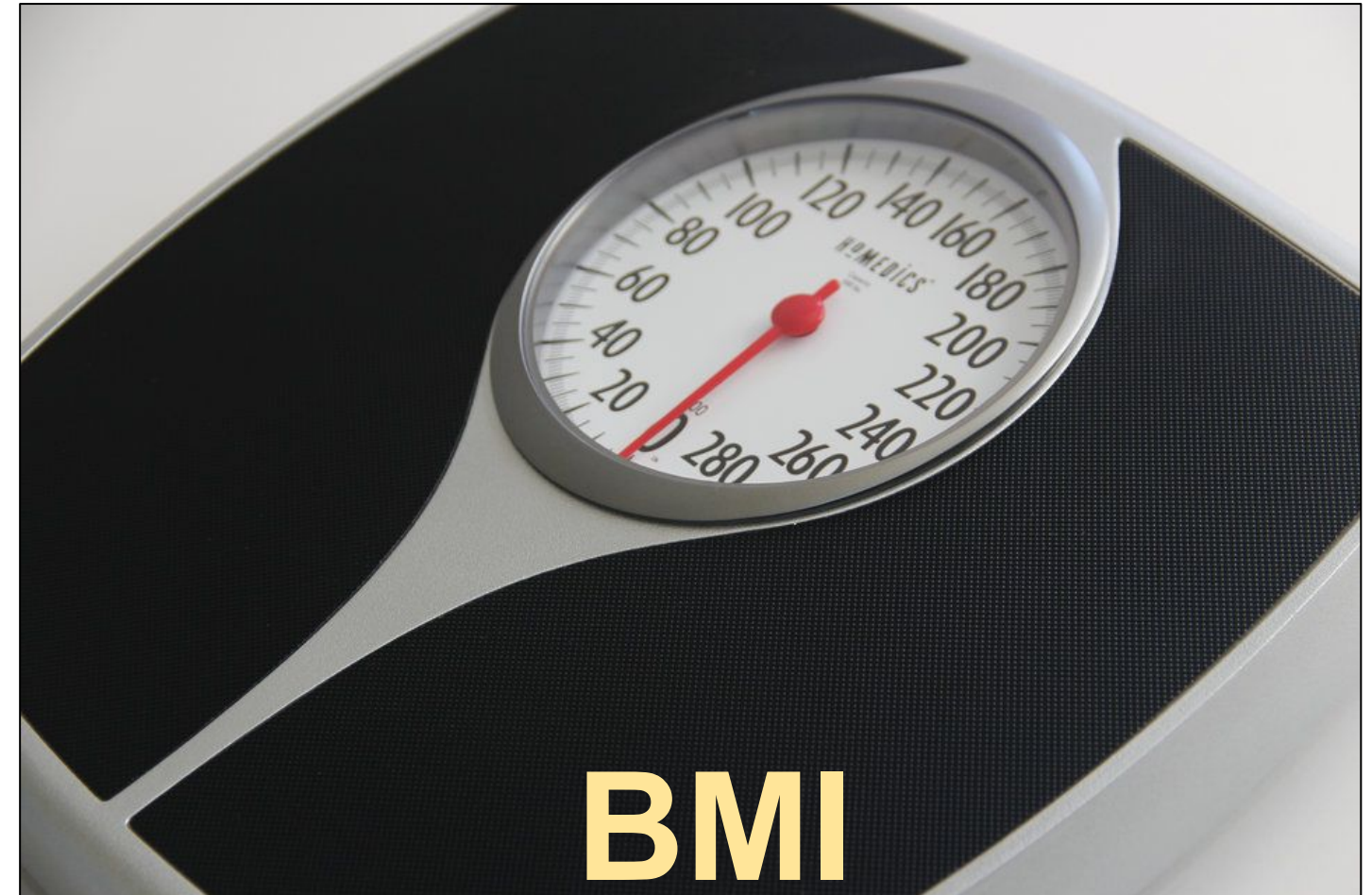
Research Question:
Considering Mexican-American
adults (ages 18 - 29)
living in the United States,
do males have a significantly
higher mean Body Mass Index
than females?



Research Question:
Considering Mexican-American
adults (ages 18 - 29)
living in the United States,
do males have a significantly
higher mean Body Mass Index
than females?



Research Question:
Considering Mexican-American
adults (ages 18 - 29)
living in the United States,
do males have a significantly
higher mean Body Mass Index
than females?



Test a Theory
about Two Population Means

Research Question:

In previous years 52% of parents believed electronics and social media was cause of teenager's lack of sleep.

Do more parents today believe that their teenager's lack of sleep is caused due to electronics and social media?



Research Question:

In previous years 52% of parents believed electronics and social media was cause of teenager's lack of sleep.

Do more parents today believe that their teenager's lack of sleep is caused due to electronics and social media?



Research Question:

In previous years 52% of parents believed electronics and social media was cause of teenager's lack of sleep.

Do more parents today believe that their teenager's lack of sleep is caused due to electronics and social media?



**Test a Theory
about a Population Proportion**

Get Excited for What is Ahead!

Learning how to use data to ...

- **estimate** parameters with *confidence*
- **test theories** about parameters

**Statistical
Inference**