CLICKERS IN PUBLIC HEALTH BIOSTATISTICS

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What is Public Health Biostatistics?

- Relatively large class (~170 students)

- Focused on quantitative methods for public health research
  - Required course for all Public Health majors
  - Can feel intimidating due to mathematical content

- Instead of a textbook, we require students to watch short videos prior to class meetings
We use clickers for every class meeting

Daily uses:
- **Warm-up questions** to check in with previous concepts
- Questions to check **comprehension**
- Answers from daily questions used to keep track of **attendance**

Occasional uses:
- **Data entry** for class activities
Warm-up questions for YOU

Q1. How often do you use clickers in your class?
A. Daily
B. Occasionally
C. Never

Q2. If you use clickers, what do you use them for?
A. Attendance
B. Measuring conceptual understanding
C. Both A and B
D. To fill class time
E. None of the above
Warm up: Child heights

```r
summary(lm(child~parent, data=PearsonLee))
```

Coefficients:

```
            Estimate Std. Error t value  Pr(>|t|)  
(Intercept)  41.06911   2.41880  16.980 <2e-16 ***
 parent       0.38422   0.03711  10.360 <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Q 5.8: What height do we estimate for a child whose parent is 69 inches tall?

A. 41.7 inches
B. 67.6 inches
C. 68.1 inches
D. 72.5 inches
Warm up: Child heights

```
summary(lm(child~parent, data=PearsonLee))

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 41.06911   2.41880  16.98  < 2e-16 ***
parent      0.38422   0.03711  10.36  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Q 5.8: What height do 69 inches tall?

A. 41.7 inches
B. 67.6 inches
C. 68.1 inches
D. 72.5 inches
Warm up: Child heights

linear model: find a line to show relationship between parent and child height

\[ E(\text{child} | \text{parent}) = \beta_0 + \beta_1 \cdot \text{parent} \]

```r
summary(lm(child~parent, data=PearsonLee))
```

| Coefficients: | Estimate | Std. Error | t value | Pr(>|t|) |
|---------------|----------|------------|---------|----------|
| (Intercept)   | 41.06911 | 2.41880    | 16.98   | <2e-16   *** |
| parent        | 0.38422  | 0.03711    | 10.36   | <2e-16   *** |

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Q 5.8: What height do we estimate for a child whose parent is 69 inches tall?

\[ E(\text{child} | \text{parent}=69) = 41.1 + 0.38 \cdot 69 \]

\[ = 67.6 \]

A. 41.7 inches  
B. 67.6 inches  
C. 68.1 inches  
D. 72.5 inches  

Given an input value of parent height, what we have calculated here is called the predicted value or the fitted value.
Evaluating weather predictions

Q 5.22. The weatherperson predicts there is a 80% chance of rain in Baltimore tomorrow at 12 noon. How do you evaluate her?

A. She is correct if it is raining at 12 noon somewhere in Baltimore City since she gave 80% chance this would happen.
B. She is correct if it is not raining at 12 noon somewhere in Baltimore City since she gave 20% chance this would happen.
C. She is correct if it is raining in 80% of Baltimore City.
D. She is unbiased if, on the many occasions she gave 80% chance of rain, it did rain at the indicated location 80% of the time.
E. She is unbiased if, on the many occasions she gave 80% chance (greater than 50%), it rained more often that not.
Evaluating weather predictions

Q 5.22. The weatherperson predicts there is a 80% chance of rain in Baltimore tomorrow at 12 noon. How do you evaluate her?

A. She is correct if it is raining at 12 noon somewhere in Baltimore City since she gave 80%
B. She is correct if it is not raining in Baltimore City since she gave 80%
C. She is correct if it is raining
D. She is unbiased if, on the average, the number of days of rain, it did rain at the index
E. She is unbiased if, on the average, it rained (greater than 50%), it rained...
Dynamic classroom interactions

• Ability to assess understanding “in real time” can guide the pace/emphasis of the lecture
• For a large classroom setting, provides fodder for interaction between nearby students
Dynamic classroom interactions
Dynamic classroom interactions

Clickers in Public Heath Biostatistics
Dynamic classroom interactions
Flexibility for recording attendance

Changes to Scoring settings do not apply to sessions you've held in the past. You can make scoring adjustments to past sessions in the Gradebook.

**Participation points**

Session participation points: 1.00

To earn participation points students must respond to:

- 100% of questions
- all but one question
- at least 75% of the questions
- at least 50% of the questions

**Performance points**

Points for responding: 0.00

Points for correct response: 0.00

Limit the total performance points earned in a session to a maximum of: 0.00
Data entry using clickers

Cocoa Content in Chocolate Tasting Trial (C³T²)

Case Report Form

The purpose of this study is to determine whether chocolate with increasing percentages of cocoa content provides the same or different degrees of self-reported pleasure to a convenient (but elite) sample of Johns Hopkins undergraduates with the good taste to study public health biostatistics. Please DO NOT TASTE if you are ALLERGIC to chocolate or nuts – see instructor to get participation credit.

1. Taster’s sex:  male___(A)___ female___(B)___
2. Taster’s **math** SAT score (200-800): <700___(A)___ >=700___(B)___
3. Taster’s **prior** chocolate preference: hate it___(A)___ tolerate it___(B)___ like it___(C)___ love it___(D)___

For each of the 2 tastings below, score your reaction to the chocolate’s taste (ordered worst to best):

- A – Disagreeable; B – Neutral; C – Pleasant; D – Pleasurable; E – Ecstatic

**Tasting # 1:**
4. Chocolate envelope number (circle one):
   1 ___(A)___ 2 ___(B)___ 3 ___(C)___
5. Taster’s score (circle one)

**Tasting # 2**
6. Chocolate envelope number (circle one):
   1 ___(A)___ 2 ___(B)___ 3 ___(C)___
7. Taster’s score (circle one):

Hate it → ------------------------------- → Ecstatic
Questions?