

2024 Data Festival

hosted by American Statistical Association

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Introduction: How to improve CourseKata

- **THEME:**

Examine the data and make suggestions to help CourseKata improve the student experience of learning statistics.

- **What I focus on:**

- **"Where"** should be improved from the CourseKata specifically?
- **"Why"** it should be improved?
- **"How"** it can be improved?

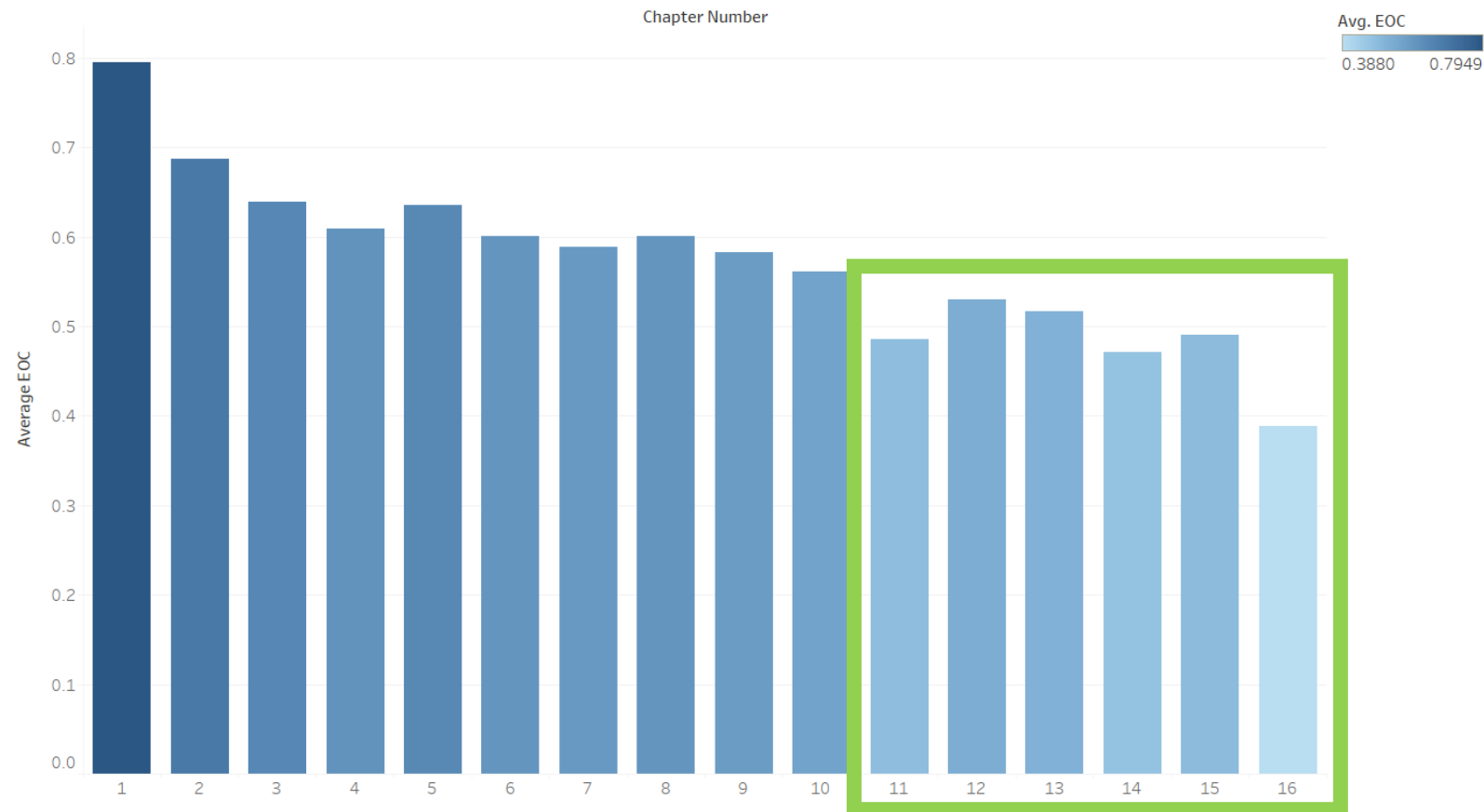
- **Conclusion:**

Ch (**"Where2"**) Section (**"Where3"**) from (**"Where1"**) should be improved because **"Why"** by **"How"**.



1-1 Where, Why: Average of *EOC

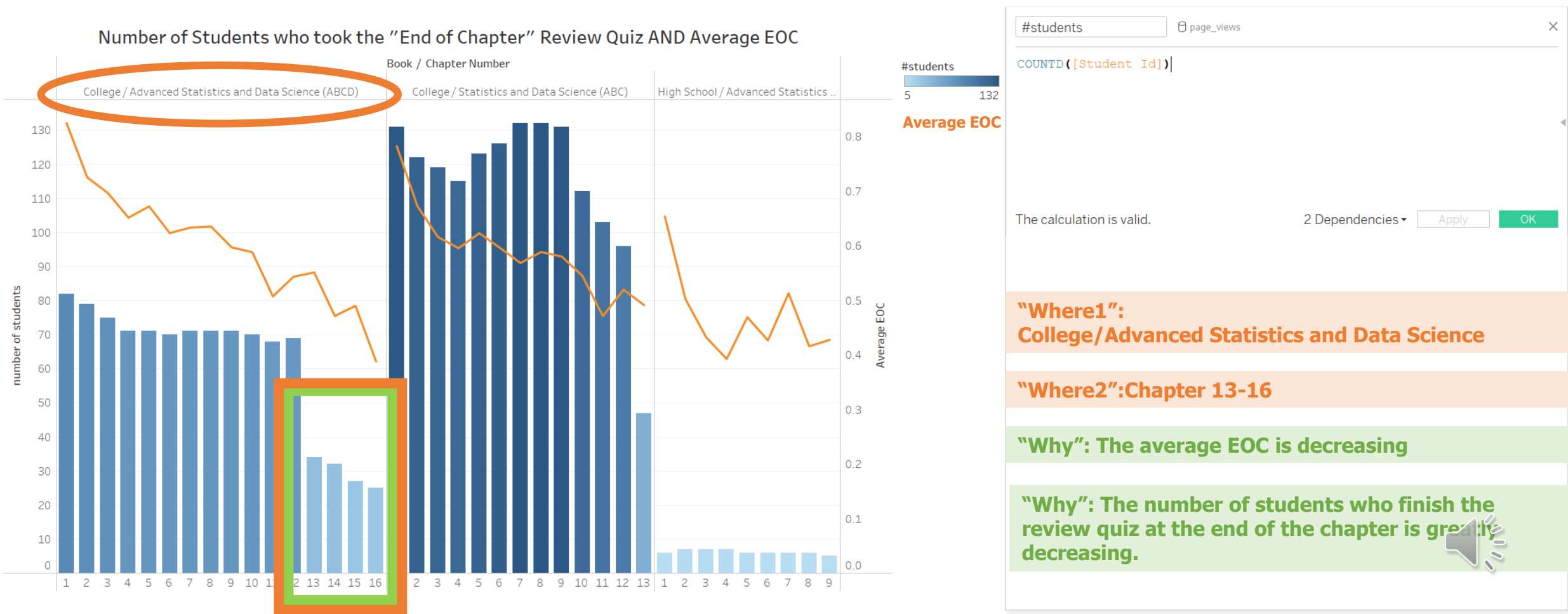
Bar graph of EOC for each Chapter



*EOC: proportion of correct answers for end of chapter questions for current chapter

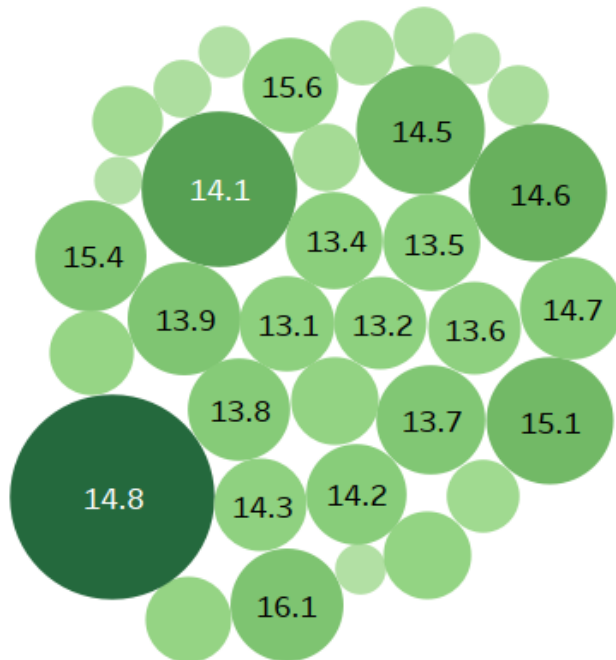
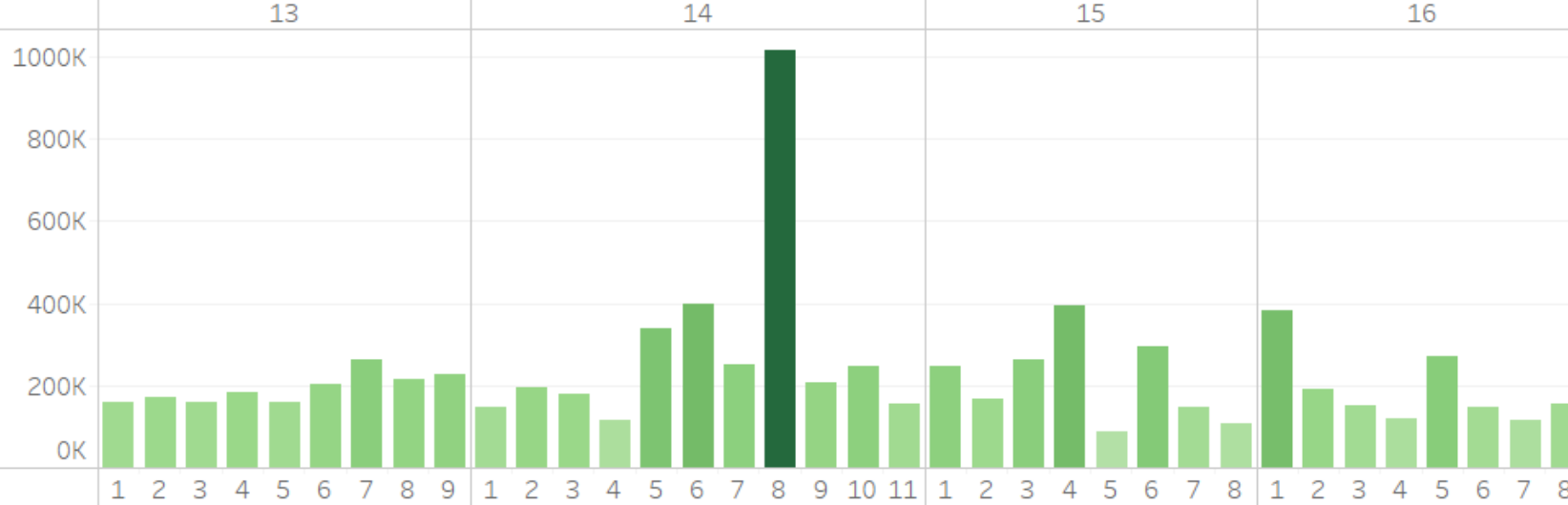


1-2 Where, Why: #Students VS Average EOC



Engaging Time

Chapter Number / Section Number



Page

14.8 Models with Multiple Categorical Predictors
 14.6 Using `shuffle()` for Targeted Model Comparisons (Part 2)
 14.5 Using `shuffle()` for Targeted Model Comparisons (Part 1)
 15.1 Dogs in the Emergency Room
 16.1 Interactions with Two Quantitative Predictors
 13.9 Using the Sampling Distribution of F
 15.4 Interpreting Parameter Estimates for the Interaction Model
 13.7 Using Venn Diagrams to Conceptualize Sums of Squares, PR
 14.10 Models with Multiple Quantitative Predictors
 13.8 The Logic of Inference with the Multivariate Model
 14.7 Deciding Which Predictors to Include in a Model
 14.2 Sums of Squares for Targeted Model Comparisons
 13.4 Interpreting the Parameter Estimates for a Multivariate Mo
 13.5 Predictions from the Multivariate Model
 15.6 Centering a Quantitative Predictor at 0
 13.1 Models with Two Explanatory Variables

#2-1 Where, Why: *Engage Time

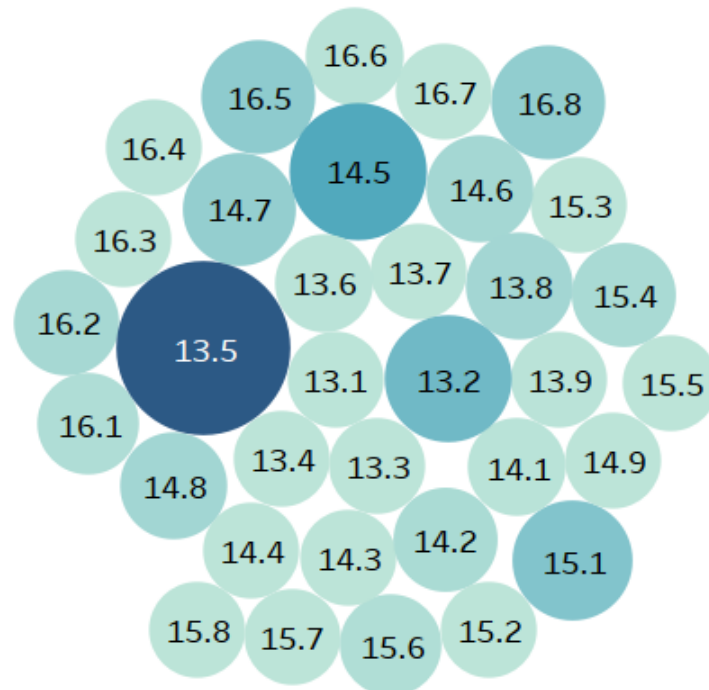
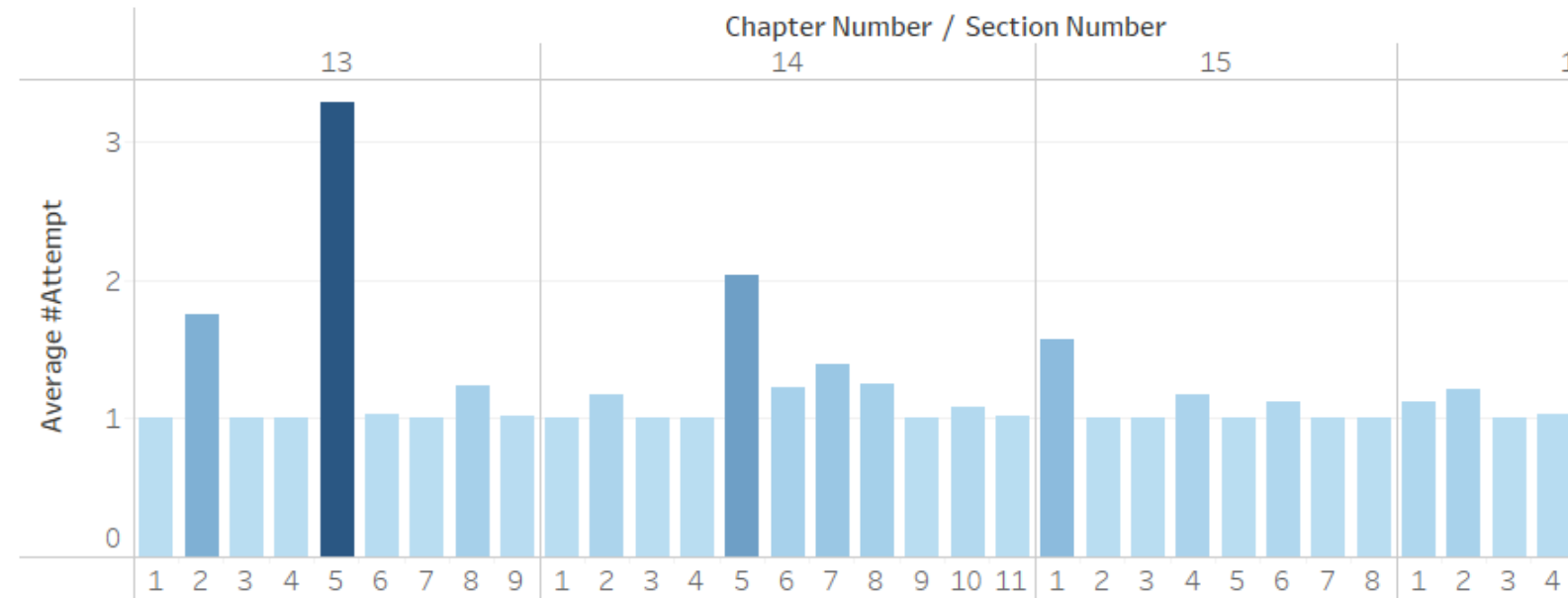
- *Engage:

The amount of time the user was considered "engaged", in milliseconds, in the material.

To maintain engagement, the user must do something on the page (click, mouse movement, scroll, etc.) at least every 2 minutes.



The number of attempts that student tried to solve the Questions



Page

13.5 Predictions from the Multivariate Model
 14.5 Using `shuffle()` for Targeted Model Compariso
 13.2 Visualizing Price = Home Size + Neighborhood
 15.1 Dogs in the Emergency Room
 16.5 Interactions with Two Categorical Predictors
 16.8 Thinking of Factorial Models in Terms of Interce
 14.7 Deciding Which Predictors to Include in a Model
 14.8 Models with Multiple Categorical Predictors
 13.8 The Logic of Inference with the Multivariate Moc
 14.6 Using `shuffle()` for Targeted Model Compariso
 16.2 Fitting and Visualizing an Interaction Model with
 15.4 Interpreting Parameter Estimates for the Intera
 14.2 Sums of Squares for Targeted Model Compariso
 16.1 Interactions with Two Quantitative Predictors
 15.6 Centering a Quantitative Predictor at 0
 14.10 Models with Multiple Quantitative Predictors

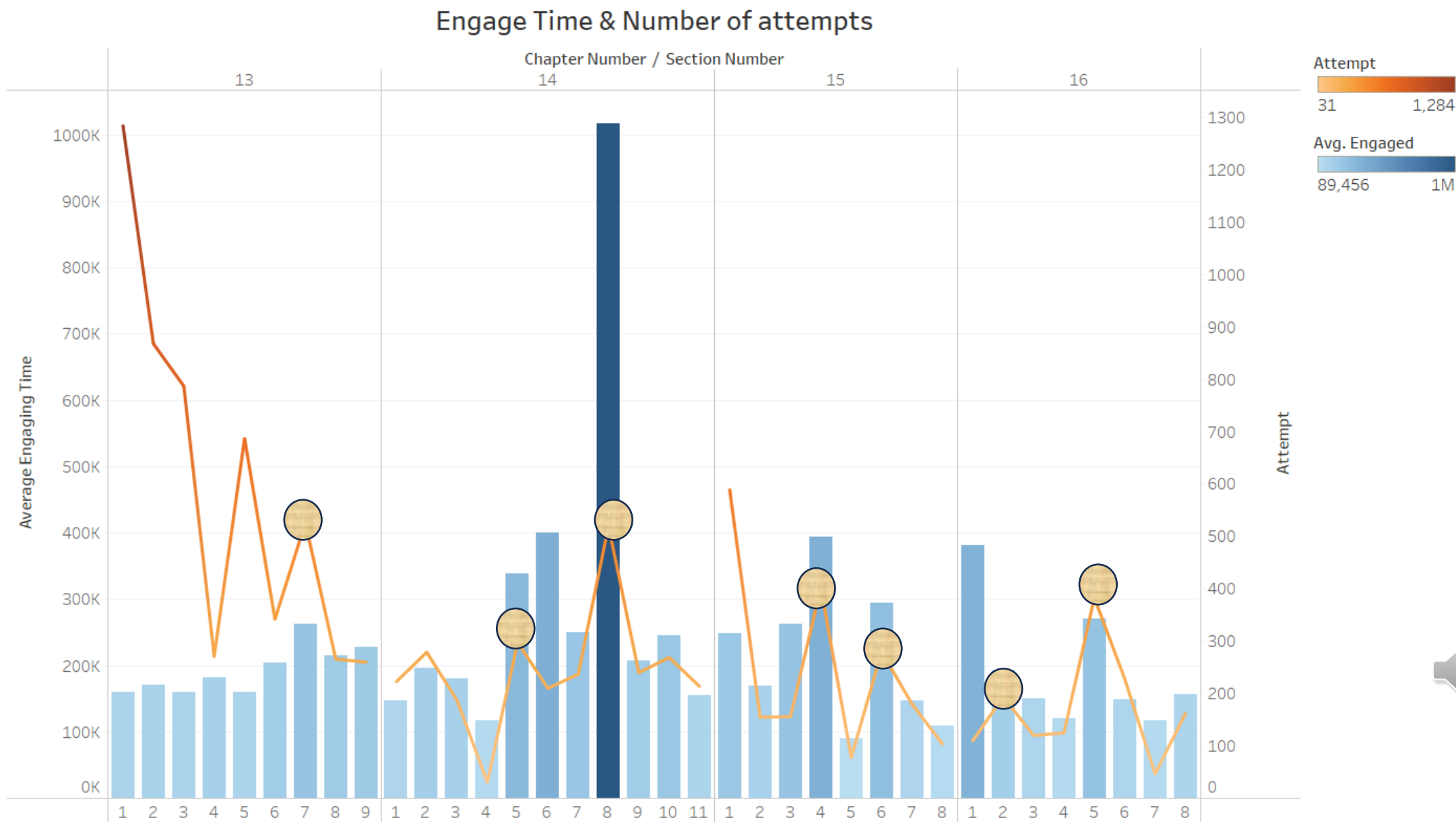
#2-2: Where, Why Number of *attempts

- *attempt

the number of times the question has been attempted, including the current attempt



#2-3 Where, Why: Engage Time & #attempts



#2-3 Where, Why: Engage Time & #attempts

- "Where2,3":

13.7: Using the Venn Diagrams to conceptualize Sums of Squares, PRE, and F

14.5: Using 'shuffle()' for targeted Model Comparisons

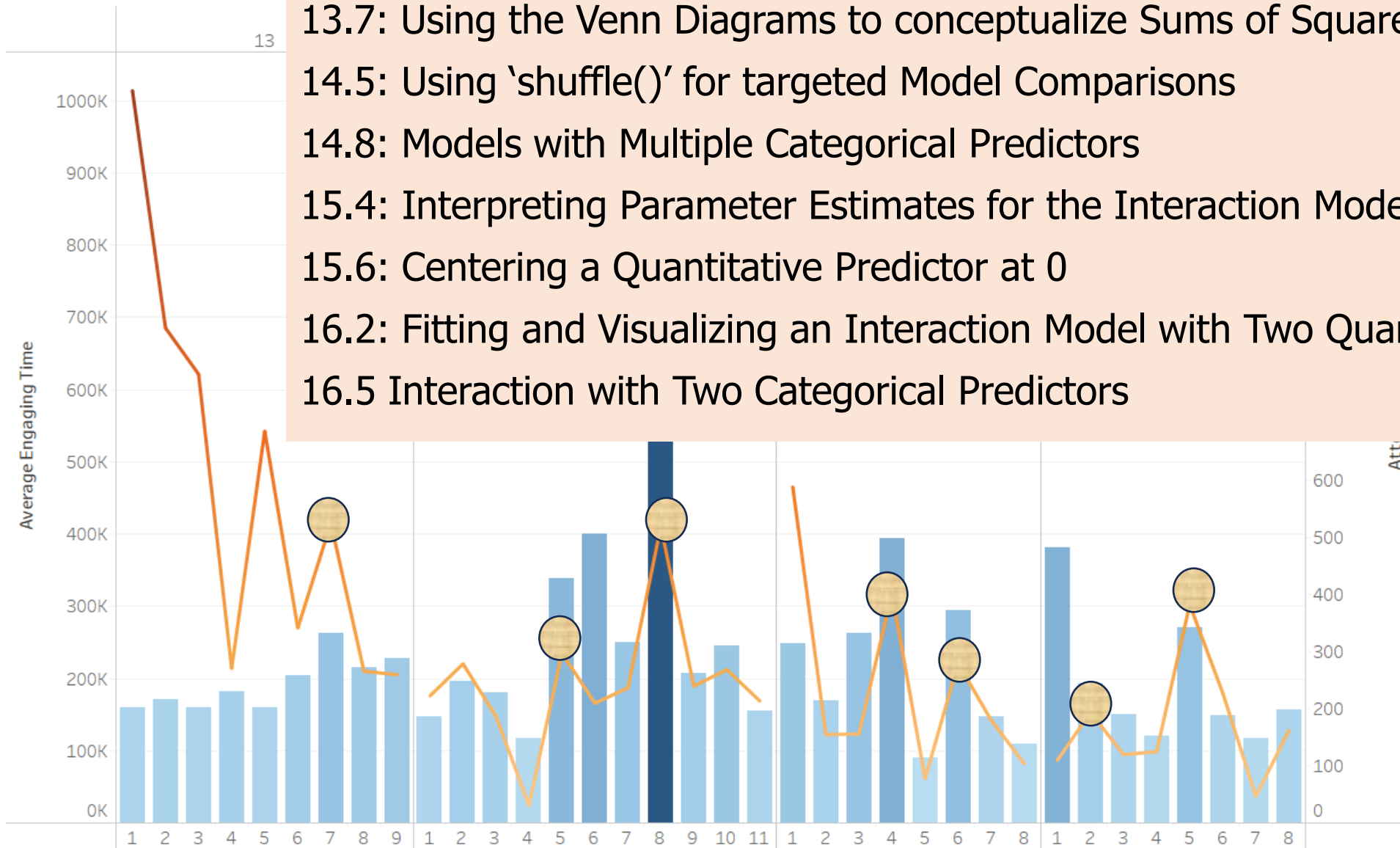
14.8: Models with Multiple Categorical Predictors

15.4: Interpreting Parameter Estimates for the Interaction Model

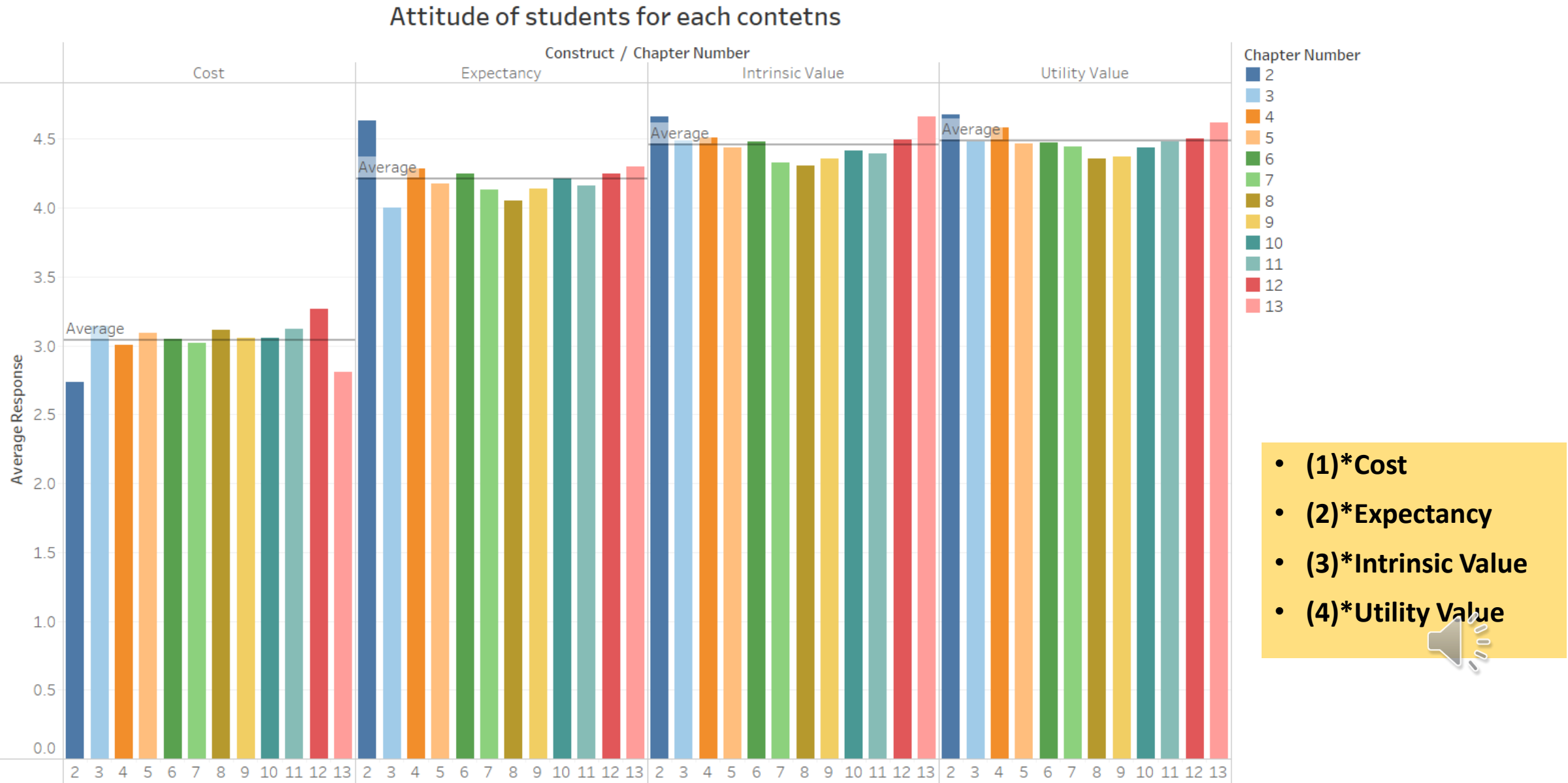
15.6: Centering a Quantitative Predictor at 0

16.2: Fitting and Visualizing an Interaction Model with Two Quantitative Predictors

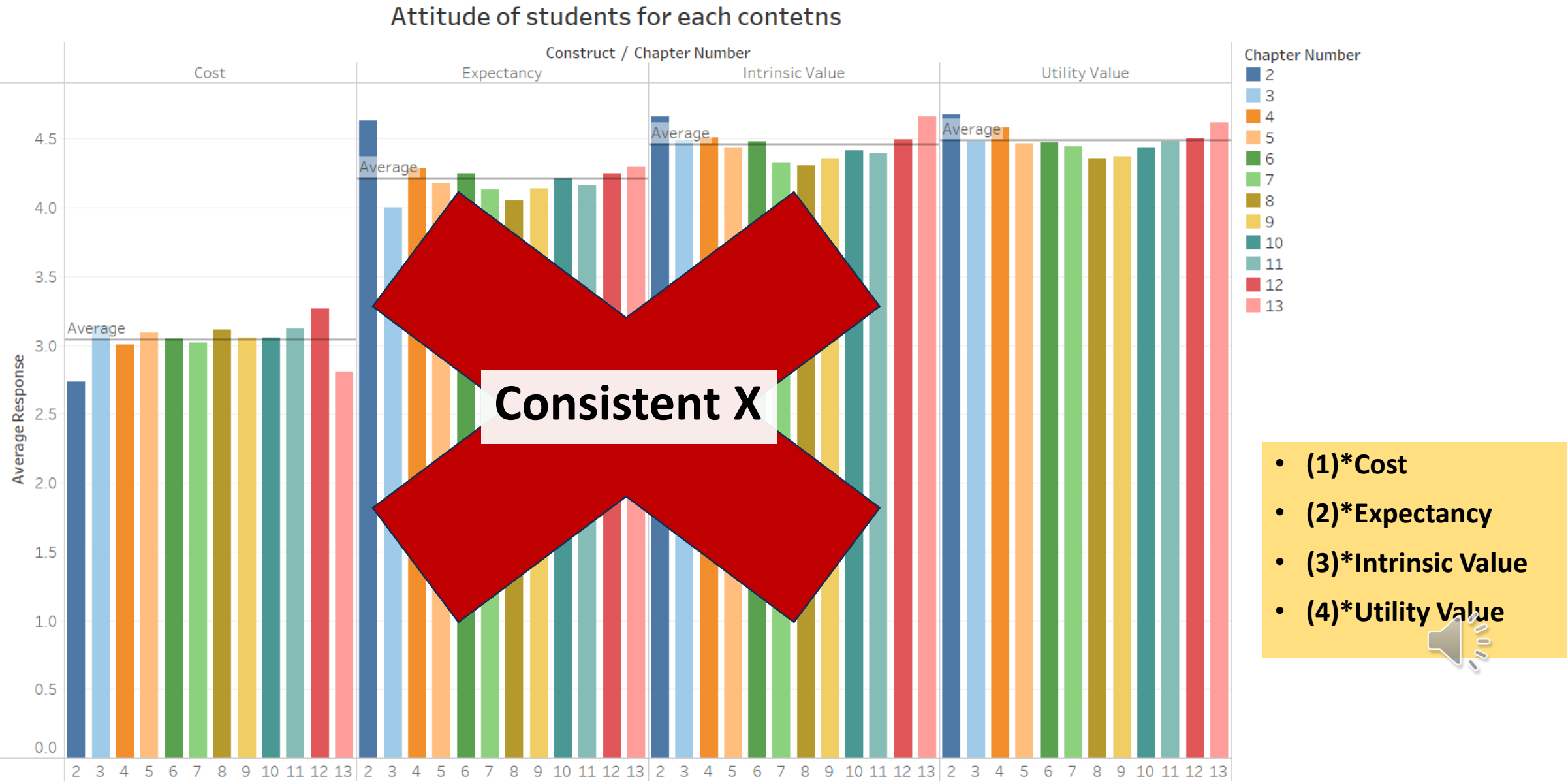
16.5 Interaction with Two Categorical Predictors



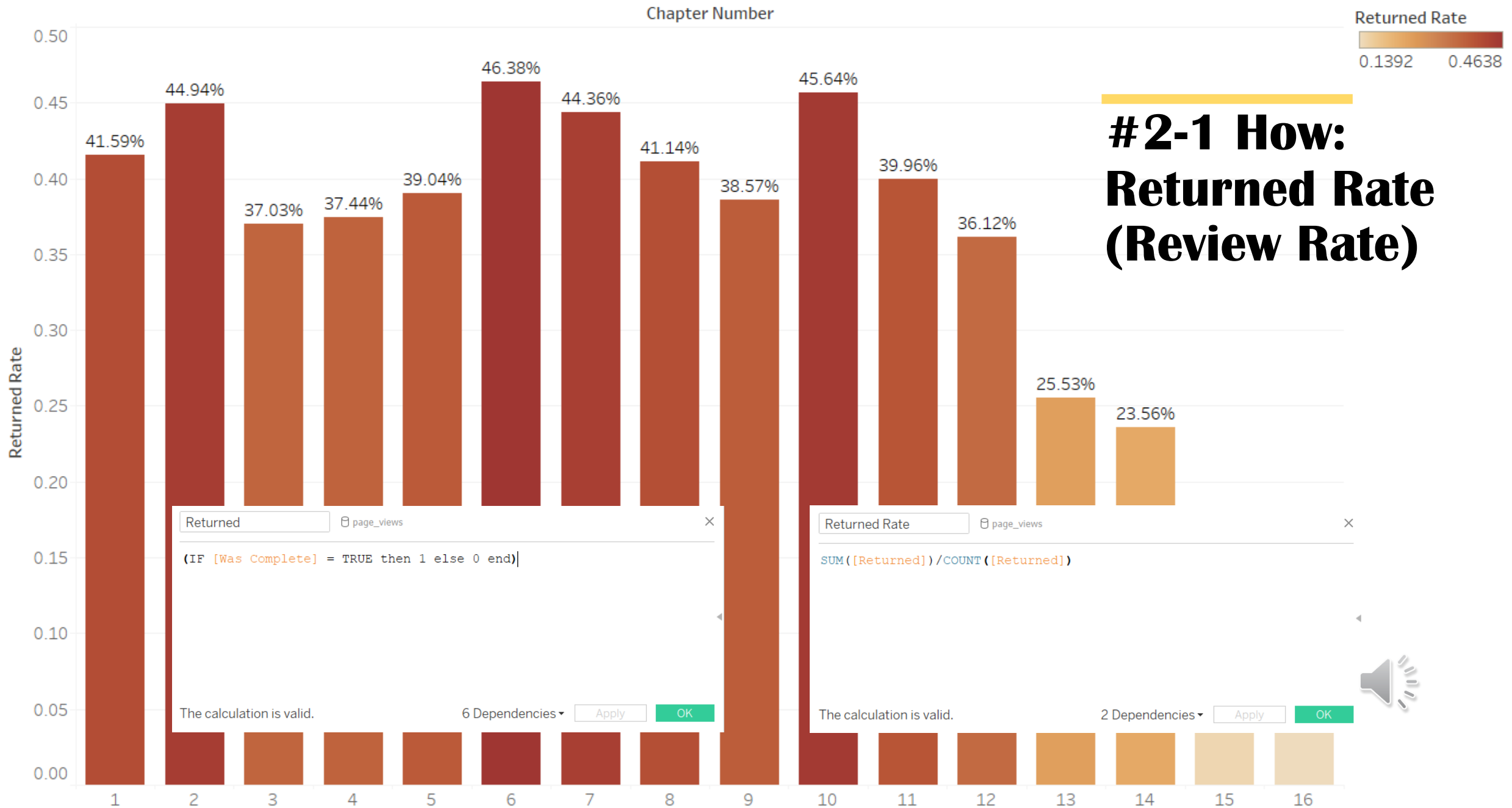
#1 How: Student Attitude about the contents



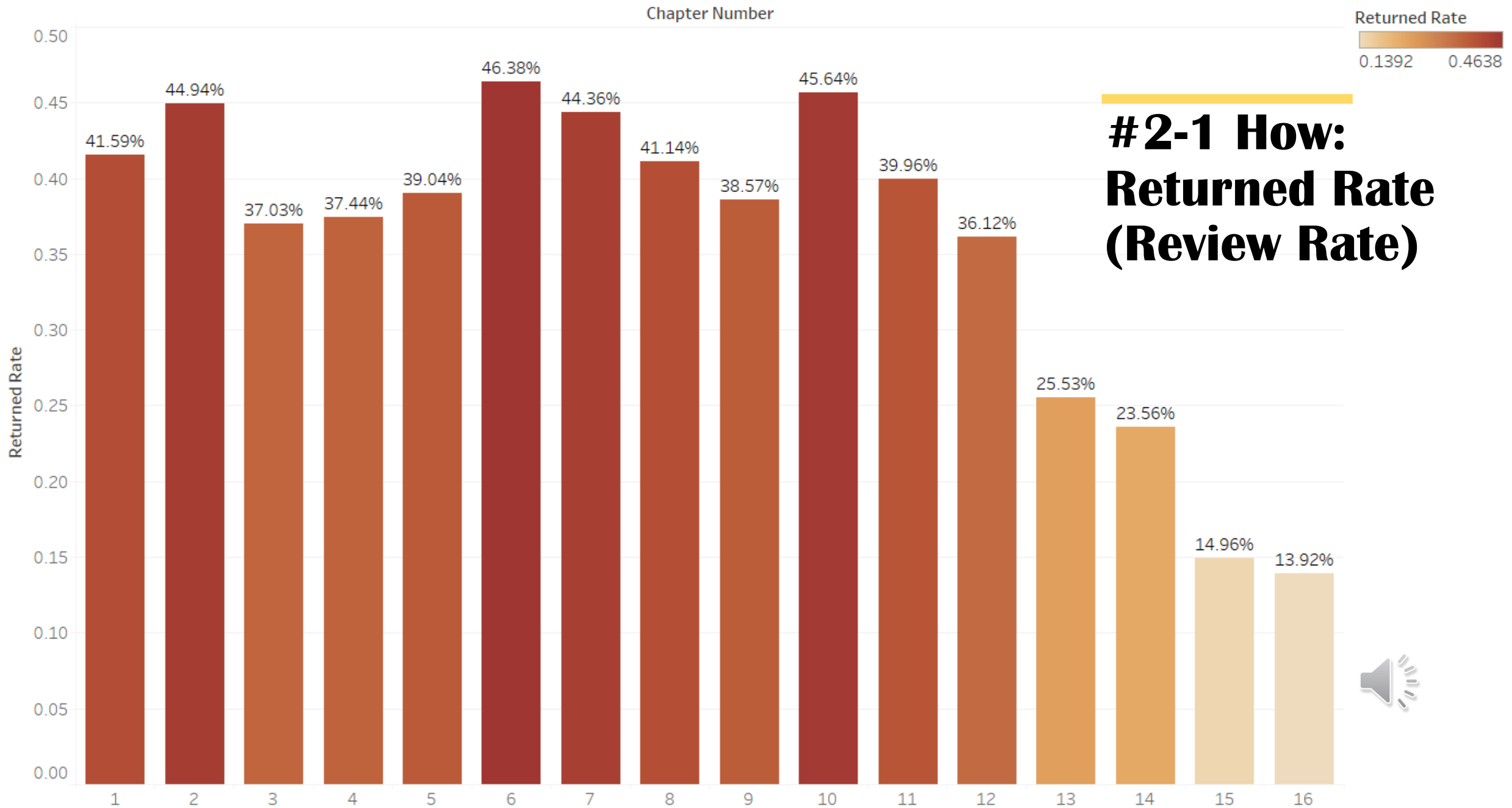
#1 How: Student Attitude about the contents



Returned Rate for each Chapter

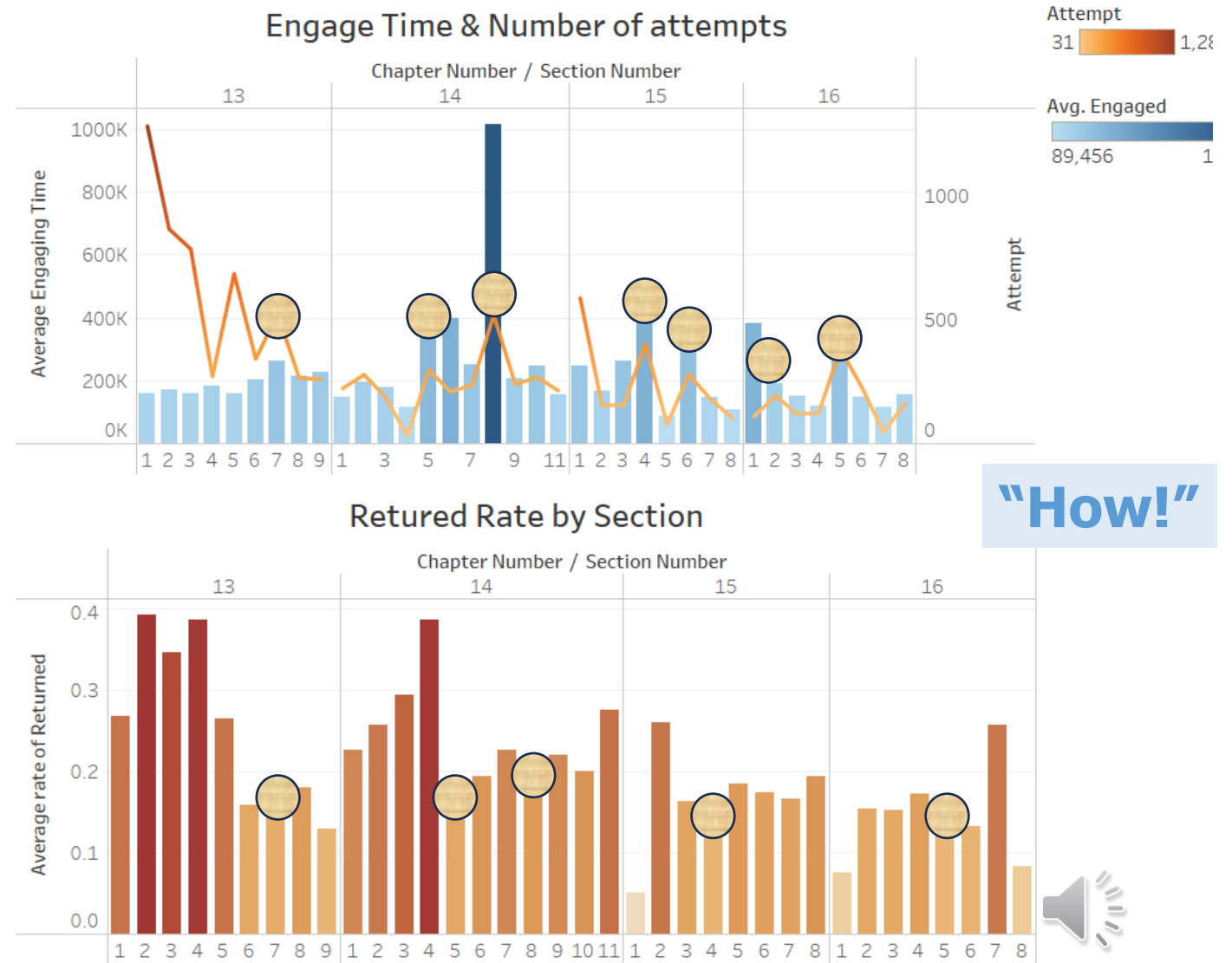


Returned Rate for each Chapter



#2-2 How: Improved by returned rate

- **13.7: Using the Venn Diagrams to conceptualize Sums of Squares, PRE, and F**
- **14.5: Using 'shuffle()' for targeted Model Comparisons**
- **14.8: Models with Multiple Categorical Predictors**
- **15.4: Interpreting Parameter Estimates for the Interaction Model**
- **15.6: Centering a Quantitative Predictor at 0**
- **16.2: Fitting and Visualizing an Interaction Model with Two Quantitative Predictors**
- **16.5 Interaction with Two Categorical Predictors**



Conclusion (Results)

- Ch “13” Section “7” from “Advanced Statistics and Data Science”
- Ch “14” Section “5” from “Advanced Statistics and Data Science”
- Ch “14” Section “8” from “Advanced Statistics and Data Science”
- Ch “15” Section “4” from “Advanced Statistics and Data Science”
- Ch “16” Section “5” from “Advanced Statistics and Data Science”

should be improved because

- “Students tend to cannot catch up from the chapter 13 to the end with lower average EOC and decreasing number of students who finish the review quiz at the end of the chapter”

by

- “adding more interactive contents/questions to make students remind what they learned from previous section for overall better understanding for each chapter.”

