

## Chapter 9 Investigation Guide

### Before you begin the written report:

- 1.) Choose an athlete or team for whom you can estimate their overall ability and compare their ability in two different contexts.
- 2.) Choose a categorical variable or a numerical variable that you will use to estimate the overall ability (and difference in ability) of the athlete or team that you chose in step 1. For example, you could estimate a batter's ability to get a hit and then compare his or her ability to get a hit at home and on the road. Or, you could estimate a basketball player's ability to score after a day off and not after a day off.
- 3.) Find the relevant data on the internet or another source. Do not include playoff games in the data, as these games are played in different circumstances than regular season games.

### To complete the written report:

- 1.) Write an introduction which states the question of interest and briefly describes the context of the athlete or team's performances, including noteworthy accomplishments that year and why you chose to use a particular variable to measure the performances. Describe how and where you obtained your data and summarize the data in a two-way table (for categorical data) or list the raw data from both contexts (for numerical data).
- 2.) Make a single graph that summarizes the entire set of performances and another graph that compares the performances from each context. *Make sure to consider if you are using categorical or numerical data!* Compare the graphs in detail and include appropriate summary statistics. Give a preliminary answer to the questions of interest.
- 3.) Calculate and interpret a 95% confidence interval for the athlete's overall ability. Show work!
- 4.) Calculate and interpret a 95% confidence interval for the difference in the athlete's ability in two different contexts. Show work!
- 5.) Discuss if the second interval provides convincing evidence that the athlete has a greater ability in one context than the other.
- 6.) Discuss any limitations or possible errors you may have made in your conclusion. If there is convincing evidence of a difference in ability, discuss possible causes.

### Web sites with data for multiple sports include:

- ✓ [www.sports-reference.com](http://www.sports-reference.com)
- ✓ [www.espn.com](http://www.espn.com)
- ✓ [www.usatoday.com/sports](http://www.usatoday.com/sports)
- ✓ [Sports.yahoo.com](http://Sports.yahoo.com)
- ✓ [www.si.com](http://www.si.com)

## Chapter 9 Investigation Guide: Checklist

- Title Page**
- Table of Contents**
- Introduction**
  - What are the questions of interest (There should be 2)
  - Introduce the performance and context of the investigation
  - Give some noteworthy accomplishments in that year and why you picked these variables and context
  - How and where you obtained your information
  - Give preliminary answers to the questions of interest
- Raw Data Collection**
  - Lists data in a two way table (categorical data)
  - Lists the raw data in both contexts in a two way table (numerical data)
  - Discuss whether you are using categorical or numerical data and which CI formula is necessary for your data
- Dotplots**
  - A dotplot for ENTIRE set of performances (1 dotplot)
  - A dotplot that compares the performances for each context (2 dotplots)
  - Compare the graphs in detail using SOCS and include the appropriate summary statistics
    - Discuss the data for the entire set
    - Compare the two contexts using comparison words
- Confidence Intervals**
  - Calculate and interpret a 95% CI for the athlete's overall ability (show work)
  - Calculate and interpret a 95% CI for the difference in the athlete's ability in two contexts (show work)
  - Express what positive, negative and zero means within your CI.
- Conclusion**
  - Give a conclusion based on your results. (1 page minimum)
  - Discuss if the second interval provides convincing evidence that the athlete has a greater ability in one context than the other
- Errors/Causes**
  - Discuss the possible reasons for your conclusion
  - Discuss possible errors, limitations, etc.
  - 1 page (minimum)
- References**
  - Use MLA formatting