Modeling the ACFT

MAJ Andrew Cammack

3/18/2022

Is there an association between the Standing Power Throw (SPT) and Leg Tuck (LTK) raw scores?

Causal Diagram: SPT $\rightarrow$ LTK

1. Write the equation for the linear model with beta's.

2. Give the hypotheses in symbols and words.

3. Plot the association, including the regression line. Is there anything unusual about the data? (Hint: You may need to remove an outlier.)

4. Create a linear model to test your hypotheses.

5. Give the updated linear model with the coefficients determined by linear regression.

6. Interpret the intercept term.

7. Interpret the slope term.

8. Conclusion of your hypothesis test at a 5% significance level.

9. Interpret the R-squared value.

10. Check the 4 Validity Conditions (L.I.N.E.). Are any not met?

11. Can we generalize these results to a larger population? Why or why not?

12. Can we determine causation? Why or why not.

Does sex change the association between the Standing Power Throw (SPT) and Leg Tuck (LTK) raw scores?

1. Draw the updated causal diagram.

2. Write the equation for the linear model with beta's.

3. Give the hypotheses in symbols and words.

4. Plot the association, including the regression line.

5. Create a linear model to test your hypotheses.

6. Give the updated linear model with the coefficients determined by linear regression.

7. Which level of *sex* is included in the base model?

8. Interpret the intercept term.

9. Interpret the base slope term.

10. Interpret the base term for *sex*.

11. Interpret the interaction term.

12. Calculate the LTK reps for a male cadet with an SPT of 6m.

13. Calculate the LTK reps for a female cadet with an SPT of 6m.

14. Conclusion of your hypothesis test at a 5% significance level.

15. Interpret the R-squared value.

16. Check the 4 Validity Conditions (L.I.N.E.). Are any not met?