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HW 5
STAT 1341
Dr. Nelson

1)

a) The author's three hypotheses are the longitudinal fighting trends, momentum, and policy change hypothesis.

b) The author collected data by analyzing the relationship between fighting in NHL games and the outcome of the games. Additionally, the author collected data by online voting to asses the fight outcomes and demonstrate how a fight could impact a game when the score is tied.

c) The authors found a significant difference in the number of fights that occurred during each period by conducting a chi-square goodness fit test to examine the distribution of fights from different periods.
   i) Test Statistic: $x^2(2, N = 1216) = 82.61$
   ii) P-value: $p < 0.01$

d) The author stated that teams were more likely to win a game based on when games were tied, the home team was losing by one goal, and the home team was winning by one goal. To find this, the author used a logistic regression model, where the variable Who won the fight(H-A) was used for the significance of the model. After testing the model, the author did not find any significance to prove that winning a fight predicts the outcome of a game for in-game situations.

e) The author found that teams who won a fight were likely to score the next goal in a game. Unfortunately, the results did not support the hypothesis that winning a fight leads to increases in scores for the next goal. Additionally, a condition the author focused on was the fights that occurred in the first period of the games. However, it had the same result, showing no significant relationship between winning a fight and scoring a goal.

f) The authors suggest the common belief that winning a fight can help lead a team to victory because of human tendencies to have cause-and-effect relationships and to construct narratives that make sense to them. The authors propose the idea of a hot hand in basketball, where players and

fans often believe that a successful shot increases the chance to make more successful shots even if proven untrue.

g) The article had one confusing term - the enforcer system. The author used it to describe fighting in the NHL and mentioned that it's still being used today. However, after researching, I discovered that the enforcer system is a strategic play where coaches use specific players (enforcers) to protect or engage in physical situations. These enforcers are known to be rough or aggressive players in the games. The author's use of the term relates to winning a fight to have a higher chance of successfully hitting more shots.

2)

a) The author aimed to analyze the impact of concussions on the performance of non-goalie players in the NHL, focusing on the effect of concussions from various performance metrics in the same season or over three seasons. Also, the authors wanted to assess the return-to-play time after concussions and analyze some implications the injuries had on players' careers. From this, the larger goal was the impact of concussions on the performance of non-goalie players in the NHL.

b) The author had a sample of NHL players who experienced documented concussions during the regular seasons of 2009-2010 to 2015-2016, which excluded goalies. The authors used a sample of 48 players who had experienced their first confirmed concussion during the regular seasons and at the time of the occurrence. To ensure these reports, the authors referenced injury reports, player profiles, and public press reports to prove the concussions. However, the authors did not use players who had repeated concussions, injuries, or players who did not return during the season.

c) The authors mention that the mean time for RTP was 17.2 days, with a standard deviation of 15.1 days. Also, players missed an average of 7.5 games, with a standard deviation of 6.9 games. These large deviations are likely due to the mean variability in individual recovery times and the severity of a player's concussions. Overall, the authors could have presented the medical with the interquartile range instead of the methods used because they are less likely to be affected by extreme values and outliers, which may help for a clear representation of the data.

d) The study shows that players' performances did not differ significantly from pre-concussion to post-concussion in the same seasons. However,

the authors found after three seasons of concussions, players had fewer assists and points per 60 minutes. Moreover, their Corsi and Fenwick percentages decreased compared to the three seasons before the injury. These results suggest that age could be a potential variable that influences a player's performance and career potential. Older players may experience declines in performance due to age, but it's also difficult to disregard the effects of concussions.

e) The study shows that the NHL's new rules for handling concussions have helped improve player safety. It takes an average of 17 days for players to return to games, indicating enough time for recovery. Additionally, players' performance did not worsen after returning, suggesting that the new rules could've helped protect the longevity of players' health.

f) Concussion grade refers to the severity of a concussion based on a grading system that assesses various symptoms and signs. These grading scales have different levels for the severity and duration of symptoms. The study could have been more comprehensive in assessing the impact of a player's performance by evaluating the severity of their concussions. If the authors had used this grading system, they could have obtained better results, which could've been used to evaluate the effect of concussions on players' return-to-play times, changes in performance, and longevity of their careers. Overall, the study could have made a more impactful conclusion if it had used the grading system to determine the severity of players' concussions and their potential for their future careers.

g) The article had a confusing aspect regarding the use of age and its impact on the study's findings. Age is a confounding variable in the article because it could affect the recovery rates or performance of older players compared to younger ones. Ignoring the impact of age could lead to potential skewness in the effects of concussions on players and their careers. Therefore, the study could have misrepresented age and disregarded it as a factor.