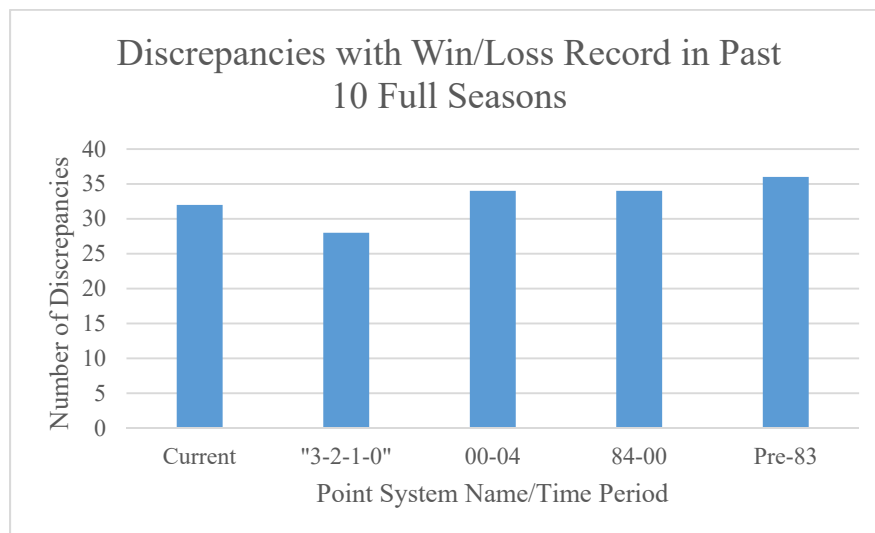# The NHL Playoff Picture

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Introduction: The National Hockey League (NHL) uses a point system to determine team standings rather than the win-loss record alone. When a game goes to overtime, the rules are modified and points are allocated differently to finish a tied game quickly and fairly. Under the current point system, teams are incentivized to end regulation in a tie. We analyze different point systems to assess fairness and to determine if the point system impacts style of game play.

Methods: Five point systems are compared to the playoff picture captured by win-loss record. Four are previous or current rules: "Pre-1983," "1984-1999," "2000-2004," and "2005-Present". The "3-2-1-0" system is one many critics argue the NHL should implement (Reiff). An integer linear program determines which teams make the playoffs for a given point system. Data are NHL team records from the 2005 to 2016 seasons, which are the only seasons with both an overtime and shootout (excluding the abbreviated 2012-2013 season).

Statistical analysis was used to determine if the point system impacts style of game play. Data from every game in the 2002-2003 season was collected and parsed using R and C++. Per minute goals, shots, penalties and face-offs anytime a game was tied was captured. Paired z-tests assessed whether the means (per minute) for the first 55 minutes and last 5 minutes of each hockey game were statistically different.

Results: The integer program determines the top division and the wildcard for each point system. The number of discrepancies with win/loss record were recorded:

The hypothesis tests indicate more passive play in the last five minutes than in the first fifty-five. Face-offs are found to be statistically higher in the last five minutes. Face-offs occur due to goals, icing, off-sides, penalties, and the goalie holding the puck. Of these, goals, penalties and possibly off-sides would indicate aggressive play, increasing the number of face-offs. The z-tests indicate that goals do not have any significant statistical difference, however, penalties are statistically significantly less in the last five minutes. Since face-offs are significantly higher per minute in the last five minutes than the first fifty-five, this measure indicates more passive play in the last five minutes (icing and goalie holding the puck).

Conclusion: The current point system rewards games ending in regulation and overtime in an attempt to address fairness that using win-loss record alone would not. The current system, however, simultaneously rewards more passive play in the last five minutes of regulation for an even-score game because both teams want to ensure at least one point. The "3-2-1-0" point system minimizes discrepancies with win-loss record, and does not compromise the competitiveness and entertainment of the game and should be used.

Work Cited: Reiff, Cody. "The NHL's Point System Is Flawed." *The Hockey Writers*. USA Today Sports, 14 July 2016. Web. 31 Aug. 2016.

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