

WINNING NUMBERS

An Analysis of Success Metrics in the Modern NFL

Christian J. & Colin M. // December 10, 2025

THE FUNDAMENTAL QUESTION



As football players, we wondered why some teams seem perpetually stuck, unable to improve. Is it the players? The coaches? The general management? We set out to determine which team metrics were most affiliated with a team's success over the course of a given NFL season to find out whether this was a problem of on-field performance or something deeper rooted in strategy.

PROJECT RESEARCH QUESTIONS



Which team performance statistics are most strongly correlated with overall success in American football?



Are offensive or defensive metrics more predictive of a team's win-loss record?



How do situational factors (e.g., turnovers, third-down efficiency, red zone performance) influence a team's likelihood of winning?

METHODOLOGY & DATA

This exploratory data analysis investigates team-level NFL data from 2018–2024 using the `nflreadr` and `nflfastR` packages in RStudio.

To ensure consistency, the dataset was cleaned to include only regular season games, providing a level playing field for all franchises.

Key metrics were calculated, including Offensive EPA and Defensive EPA measurements, along with custom variables like Third Down Differential. Offensive EPA was used for all offensive analyses to measure team offensive play value.



KEY FINDINGS AT A GLANCE



OFFENSE IS KEY

Contrary to the old adage, offensive efficiency is slightly more correlated with winning than defensive efficiency in the modern NFL.



IT'S NOT JUST BIG PLAYS

Team success is more about consistent performance in key situations (like third downs) than it is about redzone scoring.



TURNOVERS MATTER

Turnover margin remains a powerful indicator of a team's success, proving that protecting the ball is critical.

DEEP DIVE: OFFENSIVE EPA

Offensive EPA measures how much a single offensive play increases or decreases a team's chance to score. It considers context like down, distance, and field position, revealing a play's true value beyond just yards gained.

CASE STUDY: THE DETROIT LIONS

2021 SEASON

3 Wins, 13 Losses

Total Offensive EPA

-85.2

Mean Offensive EPA

-0.06

2024 SEASON

15 Wins, 2 Losses

Total Offensive EPA

+202.6

Mean Offensive EPA

+0.13

OFFENSE VS. DEFENSE: THE GREAT DEBATE

The age-old saying is "Defense wins championships." Our data suggests a more balanced reality.



OFFENSIVE EPA

Correlation with Win Percentage

0.71



DEFENSIVE EPA

Correlation with Win Percentage

0.69

Note: Offensive EPA and Defensive EPA are measured separately. Defensive EPA values use inverted sign convention (higher negative correlation indicates stronger defensive impact).

SITUATIONAL FOOTBALL: WHAT REALLY MOVES THE NEEDLE?

01

THIRD DOWNDIFFERENTIAL

Correlation to Wins

0.67

02

TURNOVERMARGIN

Correlation to Wins

0.61

03

RED ZONEDIFFERENTIAL

Correlation to Wins

0.37

CONCLUSION

Throughout this analysis, EPA referenced is Offensive EPA. Our findings demonstrate that Offensive EPA correlates strongly with wins (0.71 correlation coefficient). By focusing on offensive efficiency and key situational metrics, teams can build a more sustainable path to success. Higher Offensive EPA isn't just a statistical improvement — it directly corresponds to better on-field performance and more wins.

THANK YOU

A Project by Christian J. & Colin M.