Impact of Game Performance and Sponsorship Visibility on Fan Engagement
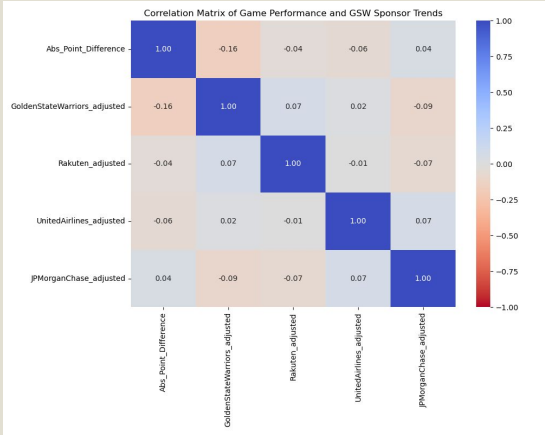
ANIKA TSE

SOURCE: WIKIPEDIA

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In professional sports leagues, many companies participate in team sponsorships to expand brand visibility and build deeper relationships with consumers. My final project examines if game-to-game performance and visibility significantly affects sponsoring companies' engagement. I specifically take a closer look at the Golden State Warriors and their major sponsors, Rakuten, United Airlines, and Chase.
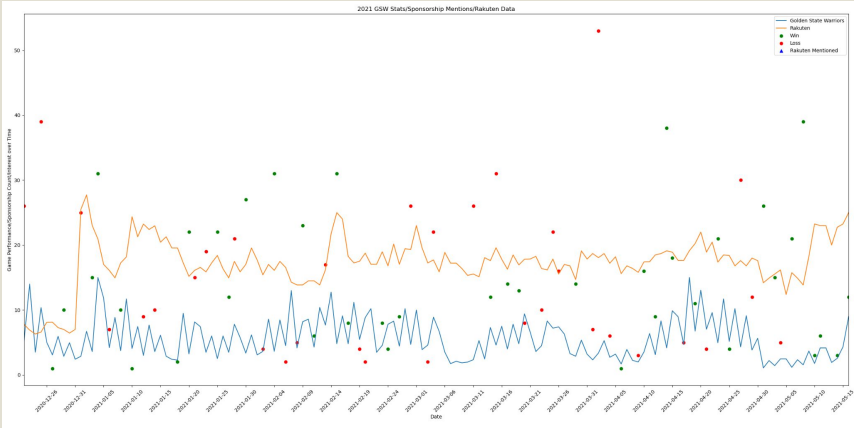
DATA SOURCE	NAME | DESCRIPTION	TYPE	LIST OF FIELDS	FORMAT	DATA SIZE
1	Team Performance | GSW Seasons 2021-2025 Game Statistics	Web Page	Date, Opponent, Result, W-L, Hi-Points, Hi-Rebounds, Hi-Assists	HTML	406 (Games)
2	Sponsorship Visibility | GSW News Articles	API	Title, Date, Excerpt, URL, Author	JSON	842 (Articles)
3	Fan Engagement | Sponsor Daily Google Trends	API	Time, Interest over Time	CSV	1826 (Daily Trend per Sponsor)

Game Performance vs Sponsor Interest over Time

Line/Scatter Plots

Correlation Matrix

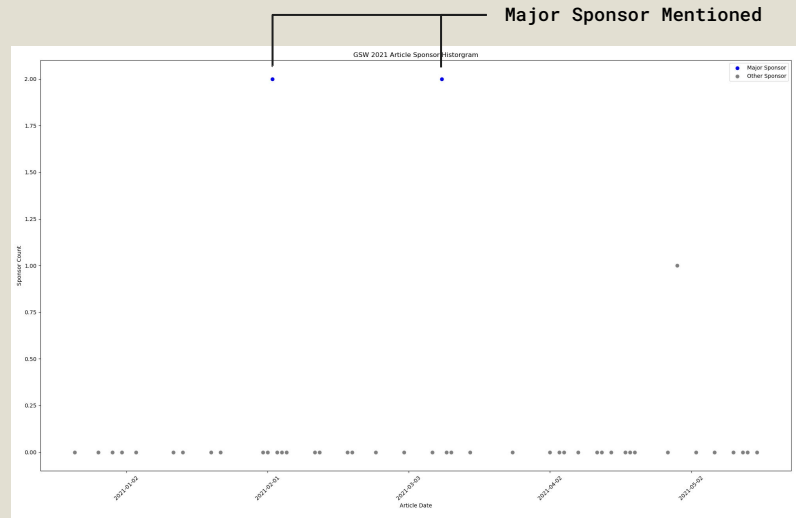**Linear Regression (t-test and r-squared)**

Correlation Analysis: Across the entire 2021-2025 time frame and individual seasons, absolute point difference in games are very weakly correlated with all GSW and sponsor interest over time.

Linear Regression: Fitting a linear regression model to the data, absolute point difference accounts for almost none of the variance within the data. Additionally, the coefficients return insignificant.

Time Lag Adjustment: To account for potential delay in game discussion, I measured correlation and fit a linear regression model using adjusted trend data, shifting values forward by one day. The data still returned weak relationships between game performance and sponsor trends.


```
All Data R Squared: 0.001
                      Test for Constraints
==================================================================
                 coef    std err        t    P>|t|    [0.025    0.975]
------------------------------------------------------------------
c0            18.9543      0.853   22.225    0.000    17.278    20.631
c1           -0.0387      0.053   -0.734    0.463    -0.142     0.065
==================================================================

2021 Season R Squared: 0.002
                      Test for Constraints
==================================================================
                 coef    std err        t    P>|t|    [0.025    0.975]
------------------------------------------------------------------
c0            17.8479      0.743   24.031    0.000    16.367    19.329
c1           -0.0151      0.040   -0.376    0.708    -0.095     0.065
==================================================================
```

GSW Sponsorship Visibility vs Sponsor Interest over Time

Stephen Curry Performance and Game Win vs Sponsor Interest over Time
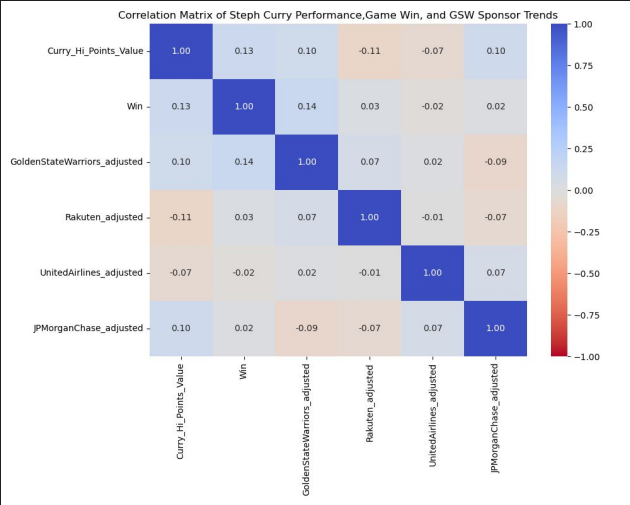

Comparing sponsorship visibility on GSW's news website with sponsor interest over time, exploratory analysis and regression modeling also returned low correlation and insignificant results. It seems as though sponsors are not consistently mentioned enough in articles.

For further analysis, I would evaluate sponsor mentions in social media and visibility during game broadcasts(jersey sponsor, court/arena sponsor).

Stephen Curry's performance and game wins have a stronger effect on sponsor interest over time, however the correlation between performance and sponsor trends is still weak (<0.15) and coefficients are not significant in linear regression.

In this project, I only evaluated Curry's performance when he was GSW's top scorer. For further analysis, I would evaluate his game to game performance, including other statistics like assists, clutch performance, and +/-.

DOES GAME PERFORMANCE AFFECT TEAM DISCUSSION?

When fitting a linear regression model for the effect of Stephen Curry's performance, team win/loss, and absolute value point difference on the Warriors' interest over time, these parameters seem to account for a larger amount of variation (10-25%) within the data.

When reviewing trend data over the course of 2021-2025, the team wins and absolute point difference are significant. As in, when the Warriors win and when point difference decreases (tighter game score), team discussion increases.

However, season by season, the significance of the parameters fluctuate and overall, Stephen Curry's scoring performance does not seem to have a significant influence on Warriors interest over time.

All Data R Squared: 0.065

Test for Constraints

	coef	std err	t	P>|t|	[0.025	0.975]
c0	10.4883	1.510	6.947	0.000	7.513	13.464
c1	0.0271	0.043	0.636	0.526	−0.057	0.111
c2	1.8116	0.704	2.575	0.011	0.425	3.198
c3	−0.1128	0.037	−3.052	0.003	−0.186	−0.040

2022 Season R Squared: 0.103

Test for Constraints

	coef	std err	t	P>|t|	[0.025	0.975]
c0	10.6557	4.212	2.530	0.016	2.113	19.198
c1	0.0632	0.120	0.525	0.603	−0.181	0.307
c2	4.2848	2.305	1.859	0.071	−0.389	8.959
c3	−0.0282	0.129	−0.220	0.827	−0.289	0.233

2025 Season R Squared: 0.249

Test for Constraints

	coef	std err	t	P>|t|	[0.025	0.975]
...						
c1	0.1945	0.099	1.968	0.057	−0.006	0.395
c2	1.0862	1.434	0.758	0.454	−1.824	3.996
c3	−0.1058	0.071	−1.491	0.145	−0.250	0.038

c0: Intercept   c1: Curry_Hi_Points_Value   c2: Win   c3: Abs_Point_Difference

PROJECT CHALLENGES

Data Sources: After deciding the topic of my project, I struggled to find accessible data sources, specifically for sponsorship visibility. I originally wanted to use a X (Twitter) API to evaluate sponsorship mentions as sports fans seem to be more engaged on social media rather than news reports. However, X no longer has free API use for student projects and under the free version of the API, you can only request 100 tweets per month, not meeting the requirements for data size in this project.

Data Scope: As I began retrieving, cleaning, and transforming data, I realized I would need to shift the scope of my project to effectively find meaningful relationships within my data. While trend data covers every day within my project's date range, my game data only covers the NBA regular season and Warriors' news articles are not posted consistently. Through plotting my datasets, I re-evaluated what relationships I wanted to measure and derived new features from existing variables for further analysis.

THANK YOU!