



The Impact of NBA player-related Social Media Posts on their on-court Performance - An Analysis

DataSciR - Project Proposal

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Overview

The project aims to discover a significant impact of social media posts addressed to NBA players before matches with respect to their influence on the players game performance. For this purpose, we consider NBA players that are highly active on twitter and extract tweets that are addressed to them within a short period of time before matches via the twitter API. A sentiment analysis indicates the attitude of the posts. The resulting sentiment polarity scores test if there is a correlation between social media posts and players on-court performance.

Background and Motivation

With the growing presence of social media in all areas of life, allowing people from around the world to react to current events in real-time, an increasingly controversial discussion can be observed. Today more than ever, public figures are exposed to the reactions of millions of people, observing and commenting on every step in their life that becomes public. The negative impact extensive social media usage can have on users' behavior and mental state is subject to different scientific studies [1], [2].

Sports athletes, who use social media not only to communicate with peers and fans but also to promote themselves, are no exception to these issues [3]. Among researchers in the sports field there is a consensus that the mental state of an athlete can have a significant impact on his or her performance [4]. However, only little research has been conducted in order to analyze how social media usage of athletes directly influences their performance. Xu and Yu [4] tried to capture the mood of basketball players in the NBA from the tweets they posted just before a match, using sentiment analysis, to analyze how the predicted mood influenced their performance on court. Gruettner, Vitisvorakarn and Wambsganss [5] used a similar approach on tennis players and additionally analyzed the relationship between the number of tweets they posted before matches and their performance within the match. Even though both contributions show that athletes with a bad predicted mood tend to perform worse on-court they suffer from two limitations:

- The number of tweets an athlete posts per day is rather limited
- The predicted moods are not free of bias since an athlete might only post tweets how he or she wants to be seen on twitter (also indicated in [5])

Thus, we assume to quantify their career through their on-field performance and therefore make a possible impact of Social Media posts visible, if some conspicuous change in their performance is happening and can be correlated to these posts.

Both of these limiting factors may lead to an inaccurate prediction of the mental state of athletes. We believe that not only their own posts reflect their mood, but also posts they receive from peers and fans. This can be described as collective moods. Collective moods can for example take place at a concert or religious ceremony, often associated with the experience of ecstasy/ trance, i.e. positive feelings, but also negative feelings [6]. This could also apply to social media posts.

Project Objectives

This project aims to answer the following research question:

Does the attitude of social media posts addressed to NBA players affect their performance in games?

The main objectives for successfully running this project are:

- Loading & transformation of a suitable NBA players on-court performance dataset
- Detection & extraction of relevant Social Media posts related to selected NBA players
- Implementation & running of a Sentiment Analysis on the selected posts to find those that express strong reactions to or from the players
- Implementation of a exploratory data analysis with R to find a possible positive correlation between strong sentiments and player performance
- Validation of a possible correlation with Chi Square/Two Proportion Z-Test significance test

With this we can refine our initial research question to the following:

Can we find a correlation between negative/positive Social Media posts related to a specific NBA player and his on-field performance in the following matches?

Datasets

- Twitter API:
In order to access the twitter API it is a prerequisite to create a twitter account and apply for a developer account. After the acceptance it is required to register an app to generate the API keys [7]. To access the twitter data in R, we are using the package twitterR [8]. Important functionalities are:

Functionaly	Explanation
load_tweets_db	Functions to persist/load twitterR data to a database
register_db_backend	Functions to setup a database backend for twitterR
retweets	Functions to work with retweets
searchTwitter	Search twitter
search_twitter_and_store	A function to store searched tweets to a database
setup_twitter_oauth	Sets up the OAuth credentials for a twitterR session
timelines	Functions to view Twitter timelines
twListToDF	A function to convert twitterR lists to data.frames
user-class	A container object to model Twitter users

- NBA players on-field performance [9]
- Twitter accounts [10]

Design Overview

Formulate hypothesis which substance is tested within the analysis:

1. A bad social media reputation has a negative impact on player performance
2. High social media usage has a negative impact on player performance (tested and significant according to [5])
3. Bad mood of player leads to a bad performance (tested but not significant [5])

Time Plan

- Phase 1: Literature research about related works, methods and approaches
- Phase 2: Data cleaning, transformation and integration
- Phase 3: Exploratory data analysis
- Phase 4: Evaluation of the results
- Phase 5: Paperwork and finalization

Literature

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