

# Race for the First Dragon

A quantitative and qualitative study on the impact of the first Dragon kill in League of Legends

Giorgos Karambasis Rodriguez

s5215512

Creative Technology

Bournemouth University, UK

s5215512@bournemouth.ac.uk

## ABSTRACT

This paper investigates the importance of the first dragon kill in a game of League of Legends and its impact on the jungler's performance. The Riot Games API was used to gather 1000 matches for telemetry analysis. Interviews were conducted on experienced League of Legends players to gather qualitative data on the topic. The study found minimal impact on team performance. As for team morale, a strong desire to achieve the dragon soul was noted. Significant correlation between jungler performance and first dragon kill was found. Data was not enough to make an accurate prediction on win chance but there is evidence to suggest that winning teams are more likely to kill the dragon first.

## KEYWORDS

Win Rate, Team Performance, League of Legends, First Dragon Kill, Jungler Performance

## 1 Introduction and Background

League of Legends is a team-based MOBA<sup>1</sup>, developed and published in 2009 by Riot Games. The game is receiving very frequent patches, with an average of a patch every 2 weeks (Riot Games, 2022). League of Legends has a total of 2 main bosses, including a mini boss, in its gameplay loop. The developers make it clear in their how-to-play page that they are the most important monsters, thus it can be assumed that they have a significant impact on the course of the game (Riot Games, 2022).

### 1.1 The Dragon

The Dragon is a boss that spawns on the fifth minute of every game, and it has a 5 minute respawn timer. It is located between the middle lane and the Bottom lane on the map (see *Figure 1*). The reward for the team that effectively takes down the dragon is a small, but permanent buff that stacks every time you kill it as well as a gold bonus. Killing 4 dragons provides the player with a *dragon soul*, which is a significant buff for the whole team.

### 1.2 The Jungler

The Jungler is one of the 5 roles that a player can choose within League of Legends. They are tasked with leveling in the jungle, killing minions that spawn in the area. According to Riot Games (2022):

“Junglers live for the hunt. Stalking between lanes with stealth and skill, they keep a close eye on the most important neutral monsters and pounce the moment an opponent lets their guard down.”

As seen in the quote, one of the roles of the jungler is to look after the most important monsters, also known as the bosses, which include the dragon. Thus, the jungler's relation to the dragon will also be a part of this paper.



**Figure 1:** The main map of League of Legends, “The Summoner’s Rift”. The orange dot indicates the location of the dragon.

---

<sup>1</sup> MOBA: Multiplayer Online Battle Arena

### 1.3 Study Scope

The purpose of this paper is to evaluate the impact of the first dragon kill in a game of League of Legends. To answer this question, it will be broken down to the following sub questions.

- What is the impact of the first dragon kill on the team performance?
- What is the impact of the first dragon kill on team morale?
- What is the impact of the first dragon kill and the Win chance of a game.
- What is the relation of the first dragon kill with the jungler's performance

### 1.4 Relevant Research

The impact of the dragon kills in the outcome of a game of League of Legends is evident. It has been proved that one of the four main factors in predicting the outcome of a game of league would be the dragon gap between the two teams (No, 2021). The focus of this paper is only on the first dragon kill and its impact on the game.

## 2 UX User Study

To answer the research question, a user study was conducted to get a deeper understanding of the first dragon kill. An interview was conducted on 5 League of Legends players with more than 2 years of experience based in the EU West region. They were chosen because they could provide insight from an experienced point of view, with knowledge on how the basic mechanics of the game work.

### 2.1 User Study Methodology

The user study conducted consisted of an 18-question structured interview with participants that had an average duration of 15 minutes. The interview followed Goodman's Interview Format (2012, p.129). Interviews are likely to be biased, hence the interview questions were carefully crafted to avoid leading questions as suggested by Goodman (2012, p.131). The participants were introduced to the interview and briefed that no personal data would be collected, and anonymity would be maintained in any responses used for this study. They were then warmed up with a few broad questions around their experience with League of Legends, to slowly introduce them to the subject matter and help put them at ease (Drachen 2018, p.164). Following that, they were asked general questions about the game, with questions on factors that increase the chance of winning a game. This served to get an idea of the priorities of each player and to check for consistency for the more focused questions. Consecutively, they were asked more focused questions on the research subject, the dragon. The questions surrounded three different main topics: The impact on team performance, the jungler's roles and the team morale when killing the first dragon.

### 2.2 Results

The results from the interviews were processed using inductive coding to categorize and simplify the process of explanation (Goodman, 2012). It also helped mitigate research and participant bias. The following table shows the codes that resulted from the interviews:

**Table 1: Interview Codes sorted by Research Sub Questions**

| Jungler's Role in the First Dragon Kill      |
|--|
| 1. The importance of supporting lanes        |
| 2. Jungle Control                            |
| 3. Map Control & Awareness                   |
| 4. Emphasis on communication                 |
| First Dragon kill on Team Performance        |
| 5. Minor effect on win chance                |
| 6. Minor effects of the buff                 |
| 7. Importance of dragon stacks               |
| First Dragon kill on Team Morale             |
| 8. Determined to get the rest of the dragons |
| 9. Feeling of conceding to the enemy         |

#### 2.2.1 Jungler's Roles

First, an analysis of the jungler's roles would be necessary to evaluate the jungler's importance in relation to the first dragon kill. The participants named 4 main roles that the jungler should be responsible for in every game. The roles mentioned where considered significant if more than one participant had mentioned them.

The role that all the participants mentioned and emphasized was supporting other lanes. They mentioned that it is of utmost importance for a jungler to help when one of the lanes is falling behind by ganking<sup>2</sup>.

One of the other main roles that participants mentioned was Jungle Control. They claimed that the jungler must keep an eye on the main jungle bosses (Riot Games, 2022), as well as knowing how to navigate around the jungle and what jungle monsters to prioritize.

Another role is Map Control & Awareness. Participants mentioned they need their jungler to always be aware of player movements. When questioned about important skills that a jungler should have, P2 said:

"Keep good objective control, keep track of the opposing jungler, have map awareness and know what to do and when to do it."

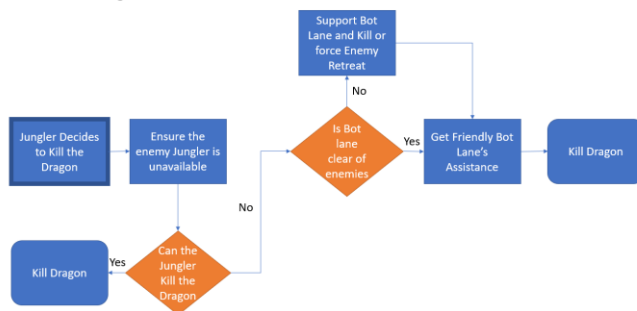
<sup>2</sup> Ganking: according to the participants' definition, consists of the jungler ambushing a lane to help teammates.

Finally, three of the participants made an emphasis on Communication as one of the roles of the jungler. They claimed it is crucial to communicate with the team, and not just show up in their lane unannounced. When responding to why communication is important for a jungler, P1 mentioned:

“It happens often when they come to gank and they don’t ping or indicate that they are on their way”

One of the questions had participants describe how the first dragon is killed. *Figure 2* shows a flow chart created to explain the process of getting the first dragon kill according to how the participants described it. In every instance participants mentioned the jungler initiating the first dragon kill process.

The First Dragon Kill Process



**Figure 2: Flow chart describing how Junglers on average go about killing the first dragon.**

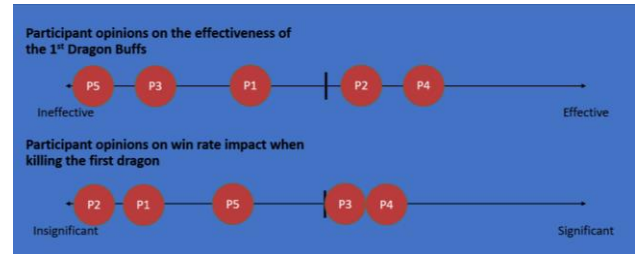
### 2.2.2 Team Performance

Participants claimed, when asked on whether the first dragon kill has an impact on the win chance, that it has little to no effect. Two participants claimed that it is an advantage, since the team is granted a buff that the other team does not have, and it gets them closer to the dragon soul. However, the other three claimed that it does not play a big part in the outcome of the game.

When questioned on the buff for killing the first dragon, participants agreed that it is mostly negligible. When asked about the contribution of the first dragon buff on player performance, P3 says:

“Very minor, it doesn’t feel like it does much. It feels more important the more stacks you have later on in the game.”

Overall they seemed to agree that the value behind the first dragon is the stack that leads to the dragon soul, rather than the buff that it provides.



**Figure 3: Participant Response Spectrum**

### 2.2.3 Team Morale

First, all of them referred to a need to kill the next dragon. When asked to elaborate, they mentioned that the more dragons a team manages to take down, the more important the buffs rewarded become. Losing the first dragon is an indicator that their team is behind and serves as a motivator for them to catch up.

Although some did not find it important, the 3 out of 5 participants mentioned a feeling of conceding an objective to the enemy. They felt like it was a sign of the enemy team winning. When asked to describe the first thing that comes to mind when the enemy team kills the dragon, P1 mentions:

“Oh s---. We should have done that. Conceding things to the enemy is not good”,

The reaction of P1 shows surprise and regret for not being able to take down the dragon first. In this situation the participant felt discouraged that their team failed in securing it first.

### 2.3 User Study Conclusions

In terms of the jungler’s role in killing the first dragon, the study showed that they are the ones responsible for organizing and communicating the strategy to their team. All of the Jungler roles identified take part in the flow chart created from the participant responses. Therefore, it can be concluded that for a jungler to kill the first dragon they have to have a good communication and awareness and be able to take initiative.

Participants’ views on team performance shows that they do not value the rewards of the dragon that much. They claimed that the stack is a good advantage to have, however the direct performance buffs are negligible.

Interestingly, the impact that the first dragon has on team morale shows otherwise. Even though they mention that the buff doesn’t play a big role in team performance or win chance, they felt like they were losing when they did not kill the first dragon. They also agreed that they felt a need to secure the rest of the dragons to get the dragon soul.

### 3 Telemetry Analysis

For the telemetry analysis contemporary match data was collected from the Riot Games API. As mentioned before, League of Legends gets patched very frequently, therefore, the data collected needed to be up-to date. The data was collected during the latest patch at the time: Patch 12.22.

For the purpose of this study, 15 random players from a pool of the top 100 challenger<sup>3</sup> players in the EU West region were chosen to provide the matches. Up to 100 matches were collected from the players to a total of  $n=1000$  matches. The players' region was chosen to maintain consistency with the User Study participants' region.

#### 3.1 Telemetry Methodology

To answer these questions, the match data was filtered based on the first dragon kill. Statistical significance tests were conducted on all the numerical values and averages calculated to account for the possibility of coincidence in the data. All data used in this study proved to be statistically significant.

The first question looks into whether killing the first dragon increases the chances of victory. To answer this question 2 variables were analyzed: The win rate and the average team kills per team. This was done to ensure that not only the match results are considered but also the average team performance, since good team performance leads to victory.

The second question looks into the first dragon kill in relation to the jungler's performance. To answer the question, the jungler's performance was defined as their KDA score<sup>4</sup>, because it is the simplest way to judge a player's performance in a game. More kills lead to better items, making your character stronger, and more deaths indicate player making mistakes.

### 3.2 Findings

#### 3.2.1 Does killing the first dragon increase the chances of victory?

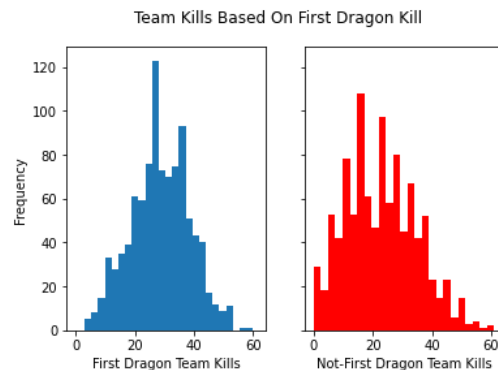
The win rate of teams that managed to take down the first dragon (67.38%) have proven significantly higher than teams that did not (33.37%). The problem with this data alone, is that there is no way to prove that it was the first dragon that contributed to the win rate.

As for the overall team kills, Table 2 shows the teams that took down the first dragon seem to perform better on average than teams that did not, though not by a large amount. However, in *Figure 4* The standard deviation of graph 1 ( $\sigma=9.95$ ) seems to be higher than graph 2 ( $\sigma=11.98$ ). The figure shows that teams with the first dragon kills have more consistent performance. They tend to have less instances in the ranges from 0-20 compared to the other teams.

Although these variables cannot be used as a direct answer to the question at hand due to the many variables that play role in team performance in a game of league, a notable difference is evident between the teams.

**Table 2: Win and Loss Table for Teams based on the First Dragon Kill**

|                              | Average Team Kills                   | Win Rate                            | Wins       | Losses     |
|------------------------------|--------------------------------------|-------------------------------------|------------|------------|
| <b>First Dragon Kill</b>     | <b>28.6278</b><br>( $p=3.27^{-30}$ ) | <b>67.38%</b><br>( $p=4.67^{-51}$ ) | <b>659</b> | <b>319</b> |
| <b>Non-First Dragon Kill</b> | <b>22.8571</b><br>( $p=3.27^{-30}$ ) | <b>33.37%</b><br>( $p=4.67^{-51}$ ) | <b>341</b> | <b>681</b> |



**Figure 4: Team Kills Histograms based on First Dragon Kill**

#### 3.2.2 Does killing the first dragon influence the jungler's performance?

The mean KDA score of junglers that killed the first dragon is higher than those that did not (Table 3). The data shows strong statistical significance for every mean, but the deaths showed the lowest p factor by far, thus why they will be the focus of this analysis. While kills and assists are a crucial aspect of a player's performance, it should not impact the jungler's ability to kill the first dragon.

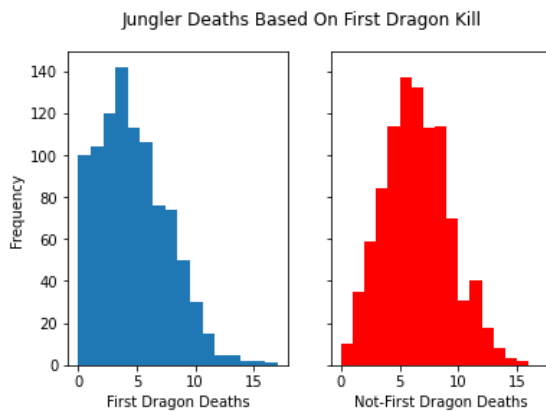
Deaths on the other hand have a bigger effect on the jungler's ability to kill the first dragon. If the jungler is dead, they cannot perform their role, making it less likely that they will kill the first dragon. As seen in *Figure 5* junglers that managed to take down the first dragon had lower mean deaths. The standard deviation between the two graphs is almost identical ( $\sigma_1=2.86$ ,  $\sigma_2=2.81$ ), but the peak deaths for junglers that did not kill the first dragon lie between the 5-10 range and the ones that did rest between 0-6.

<sup>3</sup> Challenger: The top League in the competitive League of Legends game mode, known as "Ranked"

<sup>4</sup> KDA: A player's Kills / Deaths / Assists

**Table 3: Jungler's KDA Score based on First Dragon kill**

|                              | Average Kills                        | Average Deaths                       | Average Assists                      |
|------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| <b>First Dragon Kill</b>     | <b>7.54709</b><br>( $p=1.96^{-06}$ ) | <b>4.89101</b><br>( $p=1.09^{-16}$ ) | <b>9.01376</b><br>( $p=1.64^{-07}$ ) |
| <b>Non-First Dragon Kill</b> | <b>6.51496</b><br>( $p=1.96^{-06}$ ) | <b>5.99587</b><br>( $p=1.09^{-16}$ ) | <b>7.85965</b><br>( $p=1.64^{-07}$ ) |

**Figure 5: Team Kills Histograms based on First Dragon Kill**

### 3.2 Telemetry Analysis Conclusions

The win rates and team kills cannot be used to make a claim that the first dragon was the factor that increased the chances of victory in a game of league, but they uncovered a notable difference that can be expanded upon.

As mentioned before, one of the main roles of the jungler is to keep an eye on the bosses. The data shows a significant difference in performance, especially deaths. If the jungler dies more, they tend to not kill the first dragon. This shows that the first dragon kill is heavily reliant on the jungler.

## 4 Conclusions and Future Work

First, the difference in team performance based on the first dragon kill, does not seem to be that significant to make predictions. While the telemetry analysis resulted with higher win rates and higher average team scores, the user study suggested the opposite. Participants claimed that rewards from the first dragon play little role in the game, thus the reason behind the statistics lie elsewhere. The assumption is that more skilled teams are able to kill the dragon first, but further study is required to confirm this claim.

In terms of morale, user study participants showed mixed feelings on losing the first dragon kill. What they did agree upon is that they felt a need to secure the rest of the dragons, highlighting the importance that is given to the dragon soul by players.

Telemetry data shows that there is a significant relation between jungler performance, and the first dragon kill. The user study concluded that killing the first dragon requires a lot of communication and knowledge from the jungler. It is concluded that, while the first dragon might not have a direct impact on the jungler themselves, the jungler can be considered as one of the deciding factors as to whether a team is going to get the first dragon kill or not.

To conclude, the direct impact that the dragon has in a game can be considered as insignificant when it comes to match results. The most important direct impact that the first dragon provides, is the buff stack that builds up to the dragon soul. While participants claimed that the first dragon does not provide a big advantage, they felt discouraged when they did not get the first dragon kill. The first dragon kill can be used as a way to evaluate the performance of the teams, and specifically the jungler in the early game. Overall, the good performance of a team that can lead to the first dragon kill rather than the first dragon kill improving team performance.

Further study is required to confirm whether a team that is already winning the early game, is the one that kills the first dragon. This would explain the significant difference in win rates currently evident. An observational study could be carried out to measure the consequences of the jungler when they lose the first dragon kill. Participants demonstrated a morale hit when losing the dragon kill which could potentially lead to toxicity aimed towards the jungler. If such is the case it could potentially uncover systems in the game that promote toxicity between players.

## REFERENCES

- Drachen, A, Mirza-Babaei, P, & Nacke, L., 2018. *Games User Research* [online]. Oxford: Oxford University Press, Incorporated.
- Goodman, E, Kuniavsky, M, & Moed, A., 2012. *Observing the User Experience : A Practitioner's Guide to User Research* [online]. Saint Louis: Elsevier Science & Technology.
- No, S.J., Moon, Y.J. and Hwang, Y.H., 2021. *Quantitative Analysis for Win/Loss Prediction of 'League of Legends' Utilizing the Deep Neural Network System through Big Data*. Journal of the Korea Society of Computer and Information, 26(4), pp.213-221.
- Riot Games Inc. (2022). *Game Updates - League of Legends* [online]. Riot Games. Available from: <https://www.leagueoflegends.com/en-gb/news/game-updates/> [Accessed 15 December 2022]
- Riot Games Inc. (2022). *Learn the Basics* [online]. Riot Games. Available from: <https://www.leagueoflegends.com/en-gb/how-to-play/> [Accessed 15 December 2022]