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MTH 225-002

18 April, 2018

# The Best Overwatch Heroes and Class

**Introduction:**

My study was based off of the widely played video game Overwatch, by Blizzard Entertainment. Within Overwatch there are a total of 27 heroes. These heroes are split into 4 categories based off of their usage in-game. The four categories are: Offense, Defense, Tank, and Support heroes. Players can play the game in two styles. Quickplay, which is for casual players who just want to get a few games in before class or work, and competitive, which is the mode that will be focused on. The competitive game mode is split into 7 ranks based on Skill Rank, or SR. The ranks, from worst to best are: bronze, silver, gold, platinum, diamond, master, and grandmaster. A player earns SR by winning games and loses SR by losing games. These ranks are given to a player after 10 placement games at the start of every season, which is a roughly 3-month period.

The goal for this study is to find out which hero subclass is the best based off of data gathered, and also which heroes are played more as SR increases and why? Predictions were made for these two questions and I believe that support heroes will be proven to be the best due to almost always at least 2 being played every game and the skillful heroes are going to be played more as SR increases. This interested me and I chose this as my research study because I have put many hours into Overwatch and have seen from websites (PCGamesN) and forums that people have been arguing which hero is the best and which class is the best. After searching the

forums of the Overwatch wiki ("Overwatch Forums") to find statistics backing up any proof of the best, there weren't any detailed statistics that were found. That is where I decided I could prove it myself and explore for answers behind the heroes of Overwatch.

**Methodology:**

On February 12th, I took to the Overwatch wiki forums to try to find a question. After a few days were spent on the website, I finally found a question to start with. My original goal was to try and see if there was any sort of trends that existed which could relate the 27 heroes to being updated to be more powerful (buffed) or less powerful (nerfed), resulting in more or less usage of the specific hero. This idea didn't go as well as planned. On March 10th, about a month into season 9, I used a third-party website for tracking Overwatch hero stats called Overbuff.com to collect data for six categories (not including hero names) which were:

1. Pick rate percentage
2. Win rate percentage
3. On fire percentage
4. Eliminations on average
5. Damage output
6. Healing (if applicable)

I also took the data on the website to look back 1 and 2 seasons ago. On March 25th, I used another third-party website called masteroverwatch.com which was to make sure the data was able to be cross checked and ensure that these categories have the same results across multiple sites. On April 15th, the two sites were checked again to see if there was any effect that time had on the data, there was not fortunately which meant my data was holding true. On April 17th, I was able to use this information on these sites to look into skill rank pick rate percentage for every hero as well.

**Results:**

Upon collecting data for the 6 categories, there didn't appear to be any trends [see figure 1]. I tried to look back 1 and 2 seasons ago and make a matrix but could not find any satisfying

results. There was one graph that stuck out however [see figure 2] on the data matrix for season 9, a graph between pick rate % of heroes and win rate % of heroes. Looking at this graph it appeared to visually have a positive correlation and then it sparked a new question. **Statistically, which of the four subclasses is the best, which of the heroes are played the most as skill rank increases, and why?** After having a new question, it was time to search for more into what subclass was the best and why some heroes are played more at certain ranks than others. After looking at the "Pick Rate % vs Win Rate %" graph and the positive correlation, I used

- Abline(lm(overwatchdata[,3]~overwatchdata[,2]))
- print(cor(overwatchdata[,2],overwatchdata[,3]))

to get the lines of best fit and correlation coefficient(r) to see if my prediction was true. After seeing that the r value was 0.013 and the line of best fit was almost horizontal, it had to be because of outliers. The two outliers at the top are two heroes that go by the names of Symmetra (<58%) and Torbjorn (<54%). When removing them and tryin the same calculations [see figure 3], my new r value was 0.456.

I made a prediction that support is going to be the best class. I started to look for an answer by seeing which of the four classes had the best correlation coefficient with the same "Pick rate % vs Win rate %" scatterplots. I made data tables which separated the characters exclusively into their designated in-game subclasses. The use of

- par(mfrow = c(2,2))

makes all 4 classes fit into one plot page. After calculating for r, I got the received the following results [see figure 4]:

| Class | r value | $R^2$ |
|---|---|---|
| All: | 0.013 | 0.000164 |

| | | |
|---|---|---|
| All no bias: | 0.456 | 0.207 |
| Offense: | 0.188 | 0.035 |
| Defense: | -0.156 | 0.024 |
| Tank: | 0.469 | 0.219 |
| Support: | -0.533 | 0.284 |

I then took the Pick rate % data and Win rate % data for each subclass and put them into boxplots to see the exact mean of each, along with the overall graph mean. I calculated these numbers by using the command

- print(mean(overwatchdata[,2]))
  - “ “ “ “ “ (for every data table)
- print(mean(overwatchdata[,3]))
  - “ “ “ “ “ (for every data table)

I made the 2 by 2 plots to make the boxplots next to each other [see figures 5 and 6].

Here is the mean for both variables:

| Mean | Pick rate % | Win rate % |
|---|---|---|
| All: | 3.846 | 50.407 |
| Offense: | 2.977 | 49.491 |
| Defense: | 1.828 | 50.085 |
| Tank: | 5.196 | 50.378 |
| Support: | 5.675 | 51.981 |

and calculated the standard deviation of these variables as well:

| SD | Pick rate % | Win rate % |
|---|---|---|
| All: | 2.651 | 2.703 |
| Offense: | 1.533 | 1.356 |
| Defense: | 1.448 | 2.938 |
| Tank: | 2.684 | 1.821 |
| Support: | 3.204 | 4.191 |

I then got to the second question to see if individual heroes pick rates vs the skill ranks are affected dramatically based off of skill of the players. Looking at figures 7, 8, 9, and 10, I took the pick rates for every character in bronze, platinum, and grandmaster. Compared to the earlier graph showing the pick rates of all the heroes together, these pick rates are restricted to their own classes, which is why the percentages are higher. As seen by these graphs, there is at least one hero in each class that almost exponentially increases with pick rate percentage.

| Class | Hero | Bronze | Platinum | Grandmaster |
|---|---|---|---|---|
| Offense: | Tracer | 13.90 | 18.47 | 40.38 |
| Defense: | Widowmaker | 13.63 | 27.95 | 50.22 |
| Tank: | Winston | 9.44 | 14.50 | 26.60 |
| Support: | Zenyatta | 11.92 | 18.37 | 32.27 |

It was also visible to see there was a few heroes who declined in pick percentage.

| Class | Hero | Bronze | Platinum | Grandmaster |
|---|---|---|---|---|
| Offense: | Reaper | 13.65 | 9.47 | 1.52 |
| Defense: | Junkrat | 41.69 | 34.48 | 28.28 |
| Tank: | Reinhardt | 24.67 | 23.14 | 11.85 |

| | | | | |
|---|---|---|---|---|
| Support: | Mercy | 28.86 | 24.06 | 16.95 |

**Data Analysis:**

After looking at the forums ("Overwatch Forums") the reasoning for Torbjorn and Symmetra's extremely high win rates and extremely low pick rates is because these heroes are usually picked early at the beginning of the games or rounds because of their skills in game and if they aren't used properly on the first few lives, are switched off since it is a waste of time and that is their primary usage. This explains that if they win, it is because the player did really well with them and the character was held onto until the match was won, giving the hero a win percentage to go up. If they lose the first try on these heroes, they are swapped off for other heroes who take the hit towards their stats as where these two don't take the statistical damage.

Looking at figure 4, and as seen by the correlation coefficients and R^2 values, support has the best correlation. For figures 5 and 6 as well, already by visually looking at the interval on the y axis, support looks to be the highest. Then after getting the mean of the pick rates and the win rates, support is the highest mean in regards to both variables. After calculating standard deviation as well, it is seen that support takes the highest standard deviation for both pick rate and win rate again.

In regards to the individual hero pick rates increasing and figure 11 specifically, D.va is higher in general than Winston, but she doesn't really move in terms of pick rate. After finding the increase and decrease in pick rates as skill rank increases, I went and looked in game to find that in the game, the heroes are split into a three-star, difficulty ranking system, 1 being the easiest, 3 being the hardest. For the heroes who increase pick rates as the rank increases, they are all 2 and 3-star heroes. These heroes are also incredibly lethal if there is a good player on it and

results in easier wins. For the heroes who decrease pick rates as SR increases, they are 1 and 2-star heroes.

**Conclusions:**

Based off of the data analysis, I can make some conclusions. Support heroes dominate in these data sets compared to other subclasses. Support subclass has the best correlation coefficient, R^2 value, average pick rate and win rate, and standard deviation. This is what I predicted and I can conclude that since healers there is a minimum of 2 per team every game, they are absolutely necessary to win a game. This is the reason for the positive correlation between the two variables. I can also make the conclusion that the star difficulty system within the game holds true and as the SR increases, there is a much higher chance that the 2 and 3-star heroes will be played more. Also, as SR increases, the 1 and 2-star heroes are played less. This is what I predicted as well and felt that when players are in higher SR they want to challenge themselves and that is the reasoning behind the climb in the harder characters so dramatically. I feel that for some heroes such as Tracer, Winston, and D.va, they have higher pick rates because they are fan favorites and Tracer is used as the face of the game, as Mario is in Mario Kart. Support is the best subclass, and as SR increases, 2-3-star heroes are played more.

# Appendix

## OVERWATCHDATA

```
plot(overwatchdata)
#plots my table to form a data matrix

print("Correlation coefficients")
plot(x=overwatchdata[,2],y=overwatchdata[,3],xlab="Pick Rate %",ylab="Win Rate %",main="Pick Rate % vs Win Rate %")
abline(lm(overwatchdata[,3]~overwatchdata[,2]))
print(cor(overwatchdata[,2],overwatchdata[,3]))
plot(x=OverwatchdataExOL[,2],y=OverwatchdataExOL[,3],xlab="Pick Rate %",ylab="Win Rate %",main="Pick Rate % vs Win Rate %")
abline(lm(OverwatchdataExOL[,3]~OverwatchdataExOL[,2]))
print(cor(OverwatchdataExOL[,2],OverwatchdataExOL[,3]))
#Prints in the console Correlation Coefficients so that the user can see the printed correlation calculations easily.
#the plots are to show Pick rate % vs Win rate % of all the heroes and it looked like a positive correlation, the first is with
#outliers, the second is without and used abline for line of best fit

par(mfrow= c(2,2))
plot(x=OverwatchOffense[,2],y=OverwatchOffense[,3],xlab="Pick Rate %",ylab="Win Rate %",main="Offense")
abline(lm(OverwatchOffense[,3]~OverwatchOffense[,2]))
print(cor(OverwatchOffense[,2],OverwatchOffense[,3]))
plot(x=OverwatchDefense[,2],y=OverwatchDefense[,3],xlab="Pick Rate %",ylab="Win Rate %",main="Defense")
abline(lm(OverwatchDefense[,3]~OverwatchDefense[,2]))
print(cor(OverwatchDefense[,2],OverwatchDefense[,3]))
plot(x=OverwatchTanks[,2],y=OverwatchTanks[,3],xlab="Pick Rate %",ylab="Win Rate %",main="Tanks")
abline(lm(OverwatchTanks[,3]~OverwatchTanks[,2]))
print(cor(OverwatchTanks[,2],OverwatchTanks[,3]))
plot(x=OverwatchHeals[,2],y=OverwatchHeals[,3],xlab="Pick Rate %",ylab="Win Rate %",main="Support")
abline(lm(OverwatchHeals[,3]~OverwatchHeals[,2]))
print(cor(OverwatchHeals[,2],OverwatchHeals[,3]))
#used par to make the plots all on the same table, did the same thing as before except now it is for each of the four individual classes


par(mfrow= c(2,2))
boxplot(OverwatchOffense[,2],ylab="Pick Rate %",main="Offense")
boxplot(OverwatchDefense[,2],ylab="Pick Rate %",main="Defense")
boxplot(OverwatchTanks[,2],ylab="Pick Rate %",main="Tanks")
boxplot(OverwatchHeals[,2],ylab="Pick Rate %",main="Support")
#legend("bottomleft",title="Pick Rate Class",c("Offense","Defense","Tank","Support"),col=top.colors(4))
#used boxplots to get the means of the pick rates for each class


par(mfrow= c(2,2))
boxplot(OverwatchOffense[,3],ylab="Win Rate %",main="Offense")
boxplot(OverwatchDefense[,3],ylab="Win Rate %",main="Defense")
boxplot(OverwatchTanks[,3],ylab="Win Rate %",main="Tanks")
boxplot(OverwatchHeals[,3],ylab="Win Rate %",main="Support")
#used boxplots to show the mean of win rates for each class



#CALCULATIONS

print("Mean (Pick rate)")
print(mean(overwatchdata[,2]))
print(mean(OverwatchOffense[,2]))
print(mean(OverwatchDefense[,2]))
print(mean(OverwatchTanks[,2]))
print(mean(OverwatchHeals[,2]))
#prints the means for pick rates of all of the classes together, and then each individually

print("Mean (Win rate)")
print(mean(overwatchdata[,3]))
print(mean(OverwatchOffense[,3]))
print(mean(OverwatchDefense[,3]))
print(mean(OverwatchTanks[,3]))
print(mean(OverwatchHeals[,3]))
```

```
#prints the mean of win rates for all of the classes together, and then each individually

print("SD (Pick rate)")
print(sd(overwatchdata[,2]))
print(sd(OverwatchOffense[,2]))
print(sd(OverwatchDefense[,2]))
print(sd(OverwatchTanks[,2]))
print(sd(OverwatchHeals[,2]))
#prints the standard deviation od pick rates for all of the classes together, and then each indiviudally

print("SD (Win rate)")
print(sd(overwatchdata[,3]))
print(sd(OverwatchOffense[,3]))
print(sd(OverwatchDefense[,3]))
print(sd(OverwatchTanks[,3]))
print(sd(OverwatchHeals[,3]))
#prints the standard deviation of win rates for all the classes together, and then each individually
```

## SROFFENSE

```
Doomfist<-c(3.42, 4.52, 4.86)
Genji<-c(18.19,       22.02,      23.99)
McCree<-c(11.22,      17.69,      11.15)
Pharah<-c(15.02,      10.02,      3.7)
Reaper<-c(13.65,      9.47,       1.52)
Soldier<-c(20.99,     14.63,      10.01)
Sombra<-c(3.61,       3.17,       4.38)
Tracer<-c(13.9,       18.47,      40.38)

plot(Doomfist, col="grey",ylim=c(1,45),xlab="Skill Rank(1=bronze, 2=platinum, 3=grandmaster)",ylab="Pick rate %",main="Pick Rates of
Offense" )
lines(Doomfist, type = "l", col ="grey")
par(new=TRUE)
plot(Genji, col="green",ylim=c(1,45))
lines(Genji, type = "l", col = "green")
par(new=TRUE)
plot(McCree,col="brown",ylim=c(1,45))
lines(McCree, type = "l", col = "brown")
par(new=TRUE)
plot(Pharah,col="purple",ylim=c(1,45))
lines(Pharah, type = "l", col = "purple")
par(new=TRUE)
plot(Reaper,col="black",ylim=c(1,45))
lines(Reaper, type = "l", col = "black")
par(new=TRUE)
plot(Soldier,col="blue",ylim=c(1,45))
lines(Soldier, type = "l", col = "blue")
par(new=TRUE)
plot(Sombra,col="red",ylim=c(1,45))
lines(Sombra, type = "l", col = "red")
par(new=TRUE)
plot(Tracer,col="orange",ylim=c(1,45))
lines(Tracer, type = "l", col = "orange")
```

## SRDEFENSE

```
Bastion<-c(11.46, 3.10, 1.43)
Hanzo<-c(15.32,       20.89, 10.02)
Junkrat<-c(41.69, 34.48, 28.28)
Mei<-c(8.68, 8.03, 4.88)
Torbjorn<-c(9.22, 5.55, 5.17)
Widowmaker<-c(13.63, 27.95, 50.22)

plot(Bastion, col="grey",ylim=c(1,55),xlab="Skill Rank(1=bronze, 2=platinum, 3=grandmaster)",ylab="Pick rate %",main="Pick Rates of
Defense" )
lines(Bastion, type = "l", col ="grey")
par(new=TRUE)
plot(Hanzo, col="green",ylim=c(1,55))
lines(Hanzo, type = "l", col = "green")
```

```
par(new=TRUE)
plot(Junkrat,col="orange",ylim=c(1,55))
lines(Junkrat, type = "l", col = "orange")
par(new=TRUE)
plot(Mei,col="red",ylim=c(1,55))
lines(Pharah, type = "l", col = "red")
par(new=TRUE)
plot(Torbjorn,col="brown",ylim=c(1,55))
lines(Torbjorn, type = "l", col = "brown")
par(new=TRUE)
plot(Widowmaker,col="purple",ylim=c(1,55))
lines(Widowmaker, type = "l", col = "purple")
```

## SRTANKS

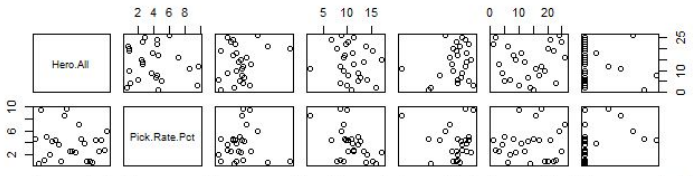
```
D.va<-c(35.15,28.88,34.19)
Orisa<-c(13.36,          7.49, 6.57)
Reinhardt<-c(24.67, 23.14, 11.85)
Roadhog<-c(12.53, 15.48, 13.01)
Winston<-c(9.44, 14.50, 26.60)
Zarya<-c(4.85, 10.51, 7.79)

plot(D.va, col="grey",ylim=c(1,40),xlab="Skill Rank(1=bronze, 2=platinum, 3=grandmaster)",ylab="Pick rate %",main="Pick Rates of Tanks" )
lines(D.va, type = "l", col ="grey")
par(new=TRUE)
plot(Orisa, col="green",ylim=c(1,40))
lines(Orisa, type = "l", col = "green")
par(new=TRUE)
plot(Reinhardt,col="orange",ylim=c(1,40))
lines(Reinhardt, type = "l", col = "orange")
par(new=TRUE)
plot(Roadhog,col="red",ylim=c(1,40))
lines(Roadhog, type = "l", col = "red")
par(new=TRUE)
plot(Winston,col="brown",ylim=c(1,40))
lines(Winston, type = "l", col = "brown")
par(new=TRUE)
plot(Zarya,col="purple",ylim=c(1, 40))
lines(Zarya, type = "l", col = "purple")
```

## SRSUPPORT

```
Ana<-c(9.59,15.11, 7.65)
Lucio<-c(16.66,          11.55, 21.19)
Mercy<-c(28.86, 24.06, 16.95)
Moira<-c(28.05, 29.18, 20.48)
Symmetra<-c(4.92, 1.73, 1.47)
Zenyatta<-c(11.92, 18.37, 32.27)

plot(Ana, col="grey",ylim=c(1,35),xlab="Skill Rank(1=bronze, 2=platinum, 3=grandmaster)",ylab="Pick rate %",main="Pick Rates of Support" )
lines(Ana, type = "l", col ="grey")
par(new=TRUE)
plot(Lucio, col="green",ylim=c(1,35))
lines(Lucio, type = "l", col = "green")
par(new=TRUE)
plot(Mercy,col="orange",ylim=c(1,35))
lines(Mercy, type = "l", col = "orange")
par(new=TRUE)
plot(Moira,col="red",ylim=c(1,35))
lines(Moira, type = "l", col = "red")
par(new=TRUE)
plot(Symmetra,col="brown",ylim=c(1,35))
lines(Symmetra, type = "l", col = "brown")
par(new=TRUE)
plot(Zenyatta,col="purple",ylim=c(1, 35))
lines(Zenyatta, type = "l", col = "purple")
```



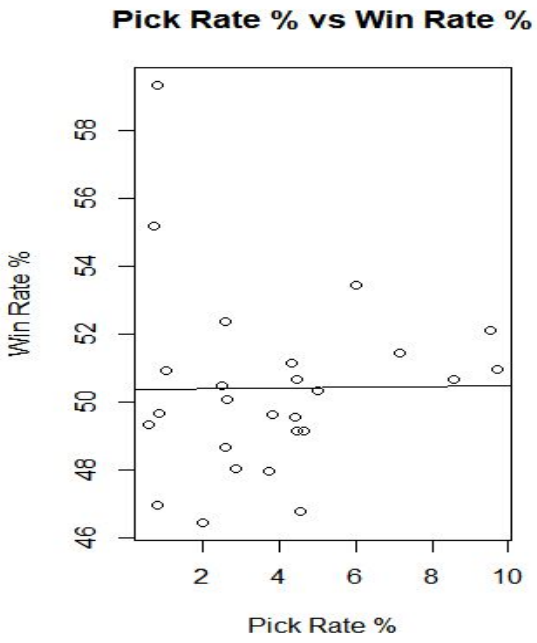



Figure 1

Figure 2

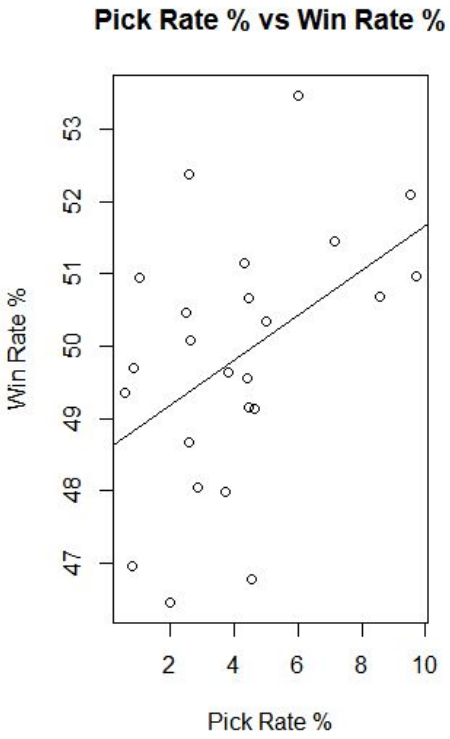



Figure 3

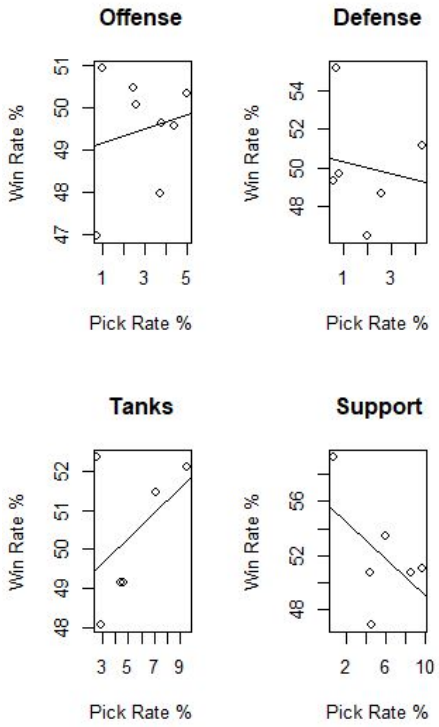



Figure 4

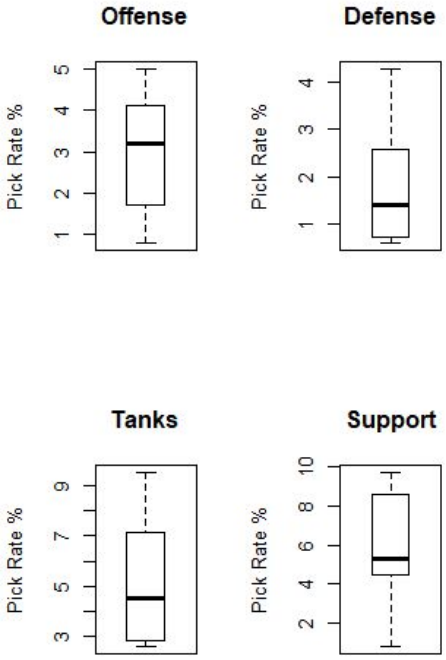



Figure 5

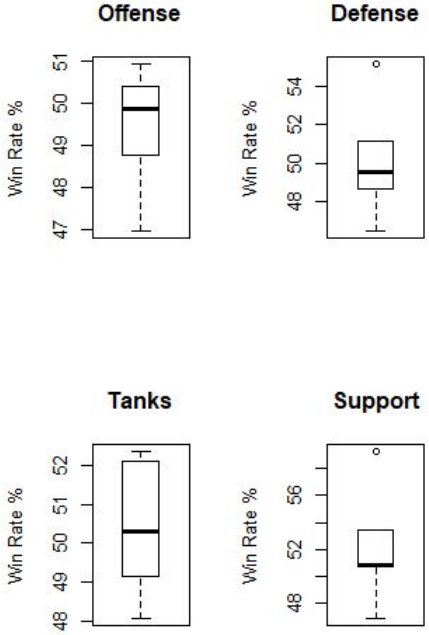



Figure 6

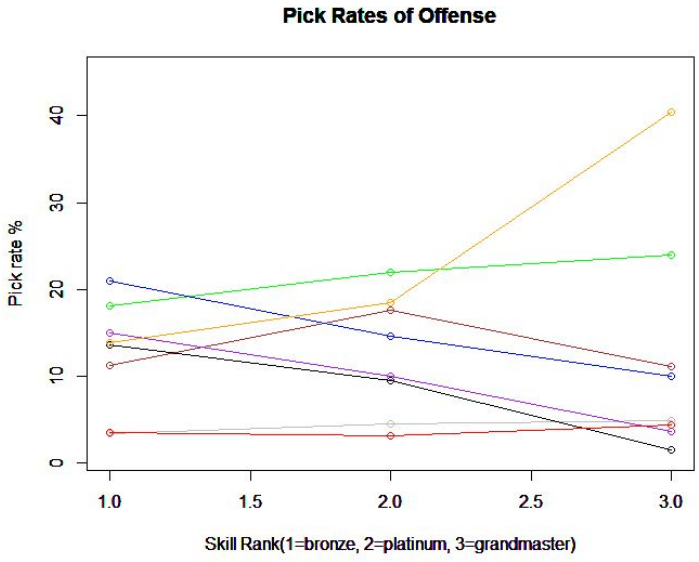
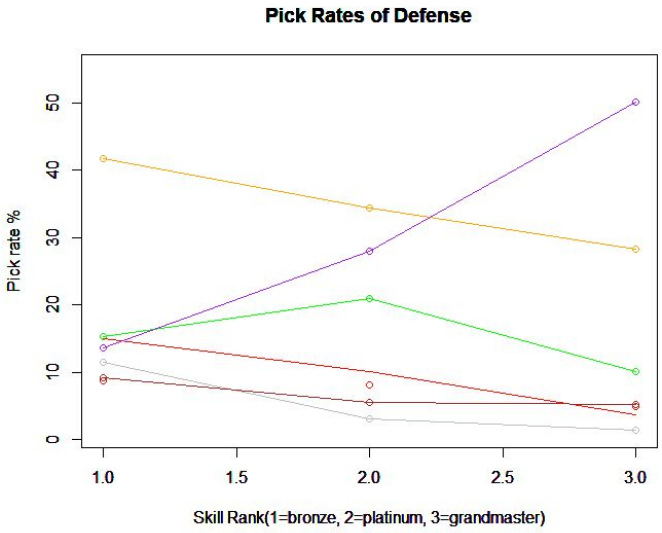



Figure 7

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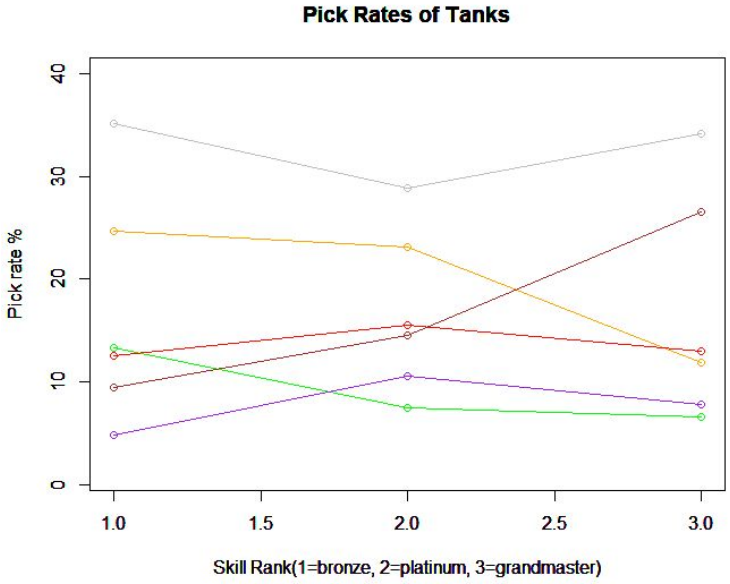


Figure 9

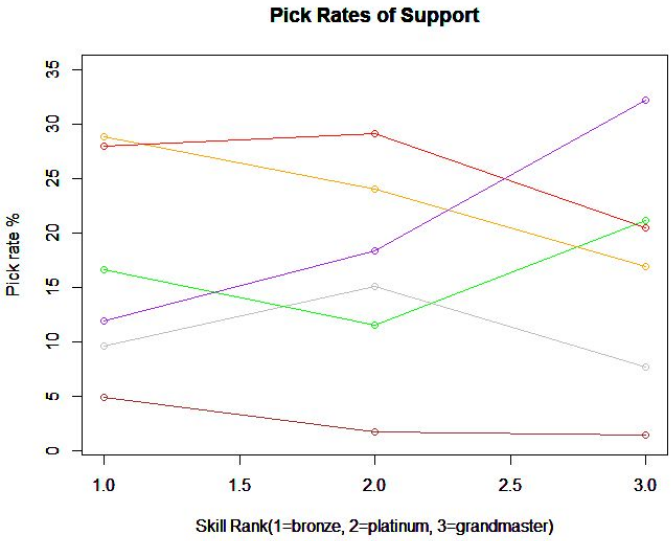


Figure 10

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