The Role of Lionel Messi in Barcelona's 2011 UEFA Champions League Success

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Introduction

One of Barcelona's and Messi's most prominent era was the so-called Guardiola Era. In this period Pep Guardiola played Barcelona's most valuable player in an unusual position of False 9. The 2011 UEFA Champions League Final showed the importance of Messi, not only in terms of goals but by other metrics as well. At this position, Messi was more included in build-up plays, while which his quick movements, he pulled out the center backs of Manchester United, establishing spaces behind the English backline for exploitation. In this match, Manchester United fell into the trap of Barcelona, as Sir Alex pursued the traditional attacking philosophy at United. Their team was dominated by Barcelona, especially in the midfield area, and spaces created by Messi were exploited by the likes of Xavi and Iniesta.

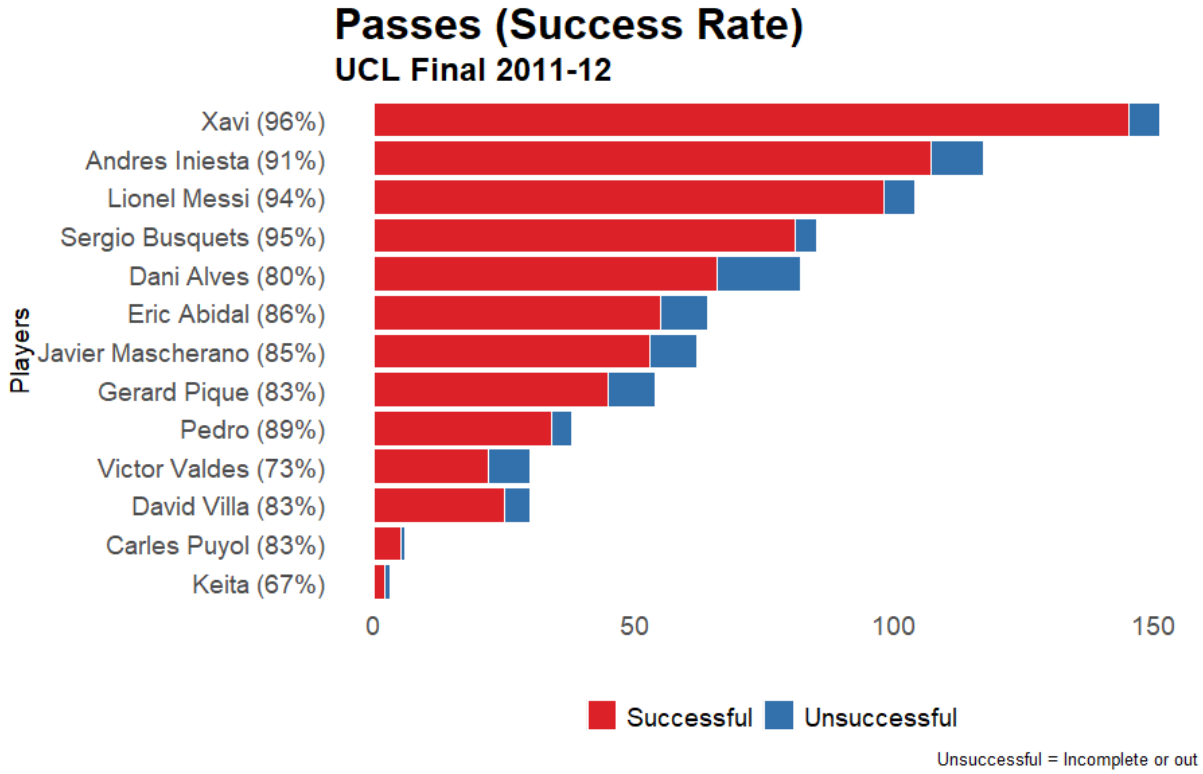
In this paper, we aim to evaluate Messi's performance against Manchester United by creating all sorts of descriptive illustrations, where we compare him to similar players in Barcelona. Also, we will determine the comparable player in the opposition, and finally, match the two best players on each side with each other to determine the Man of the Match. To inspect the source code to the charts shown in this paper, please refer to our GitHub repository.

We retrieved the data of the UCL Final from the StatsBomb open-data collection. It consists of roughly 150 variables recording every aspect of the game on a time frame. Through an easy-to-use API, one can have access to data from dozens of competitions around the world. Each match includes, on average, over 3,000 events including shots, passes, dribbles, defensive pressures, duels, saves, clearances, ball recoveries, interceptions, fouls, etc. A single event contains an unmatched level of detail to describe its unique characteristics, such as pitch location, body part, the pattern of play (open play, set piece, counter, etc), duration, and outcome. Here you can find a detailed description of each variable.

Team-wise Comparisons

Passes

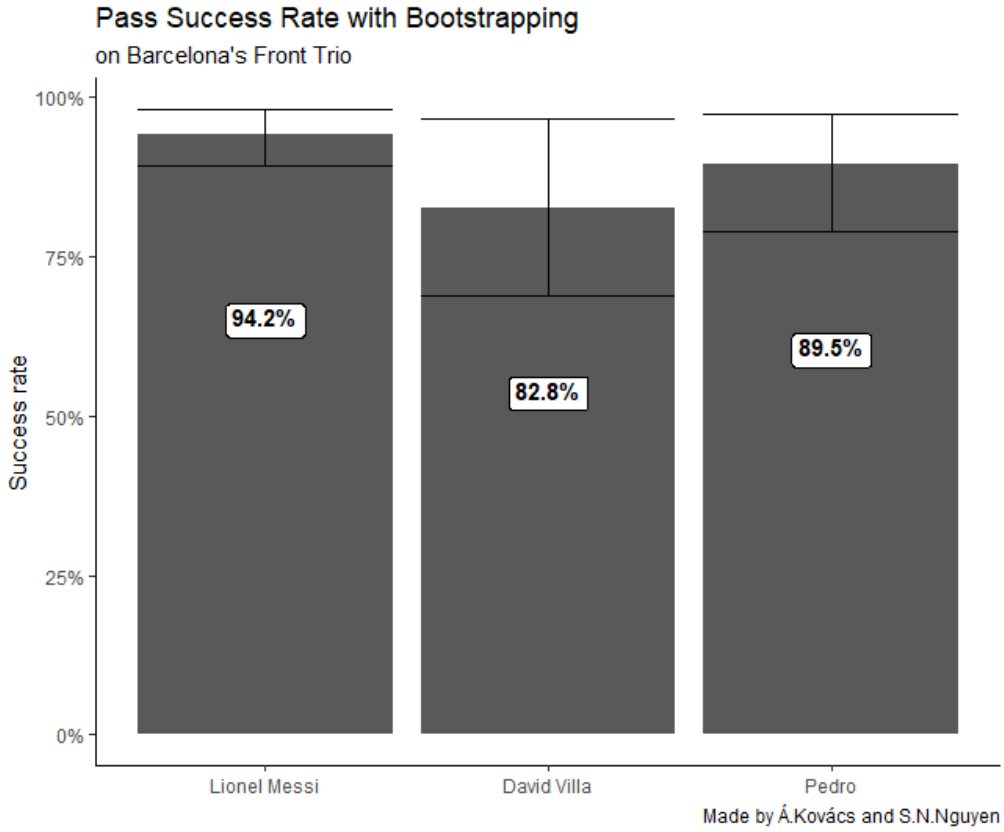
The first metric which we are going to consider is the related measures of a playmaker. In the plot below you can see the number of passes made by Barcelona players during the match. It is not surprising that the Spanish star playmaker duo of Xavi and Iniesta leads the chart with the most passes, however, Messi also made a substantial contribution in moving the ball around. In fact, looking at the success rates as well, he had the third highest, which is remarkable given his position and the sheer volume of the number of passes he made.



Pass Success Rate w/ Bootstrapping

We also conducted a sampling of pass success rates on the front trio of Barcelona, with non-parametric bootstrapping (N = 10000). What we expect to show is that even with uncertainty, Messi's pass success rate was close to the likes of Xavi and Iniesta, thus, he was not only a natural goalscorer but also a playmaker. Below, you can see the barplot of Messi, Villa, and Pedro's pass success rate with confidence intervals at a 5% significance level, where noticeably Messi has the narrowest confidence interval and Villa has the largest. Put differently, in 95% of the cases, Messi has the ability and consistency to give pinpoint passes to his teammates and achieve between 90

and 98% of pass accuracy at the end of the game as opposed to the two other players who do have many passes during a game and can do between 69 to 96% and 79 to 97% accuracy.

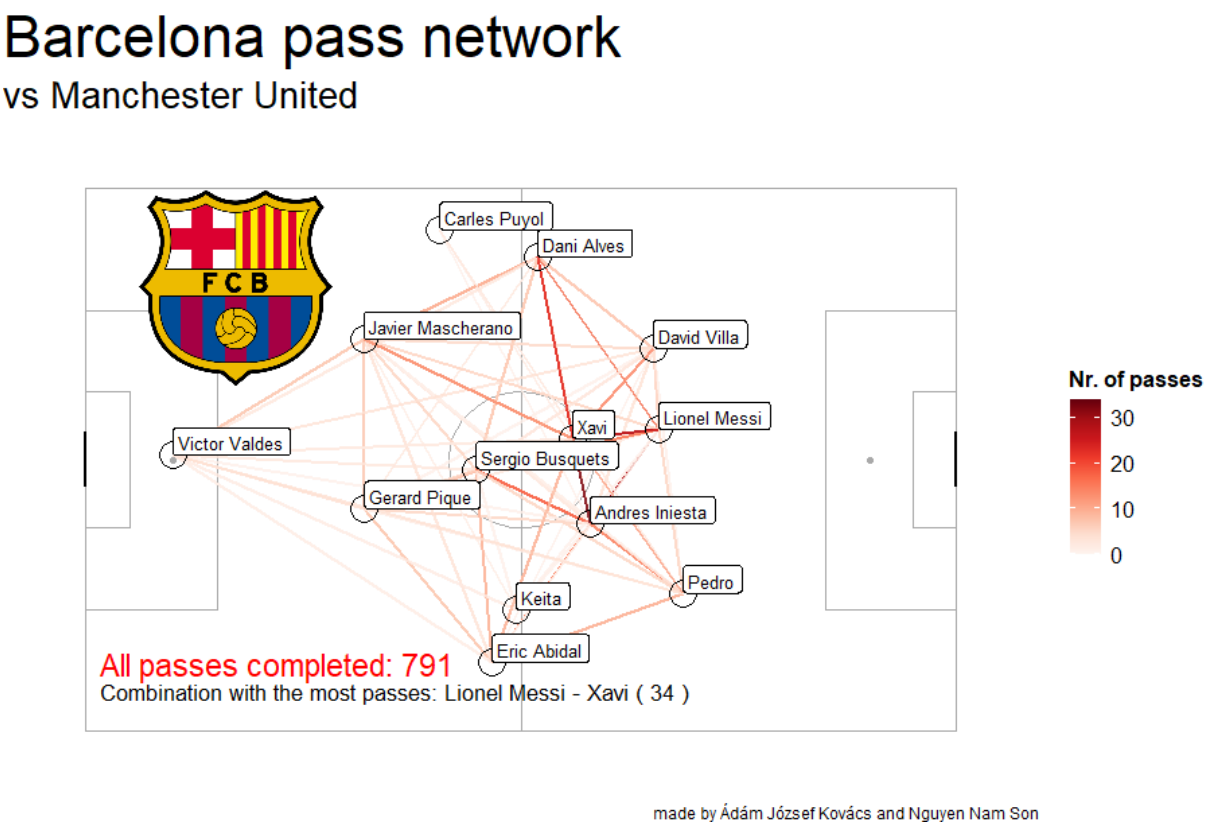


Pass networks

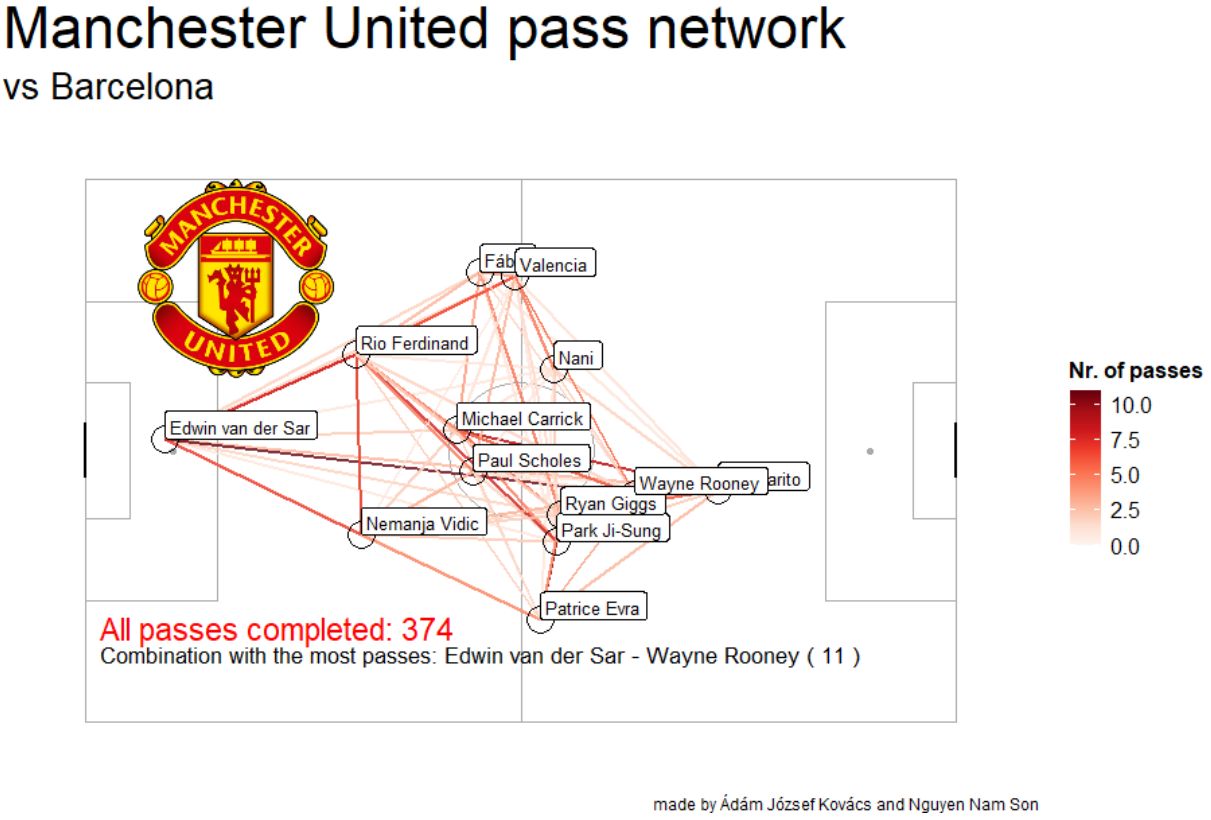
Since passes also have a spatial dimension and are numerous between pairs of players, we created pass maps to capture these additional layers as well. In this respect, it is notable that every event when the player is a part of an action, be it making a pass, a tackle, or something else, has a location variable in our dataset with specific coordinates where the player was at the time of the action. We calculate the mean of these x and y coordinates for all actions and each player. On the pass maps, the players are located on these average positions, which shows us where they spent most of their time throughout the match.

Looking at the pass map of Barcelona with the edges colored by the number of passes between the players, we can get a nice insight into the significant connections on the pitch. At first glance, Messi, though playing as the center forward, was not the player who spent the most time closest to the opponent's goal, (it was Pedro actually). Partly due to his position, the ball was exchanged a lot of times between him and the central midfielders Xavi and Iniesta, the connection with the latter being the strongest of all. This was crucial in the attacking build-up play of Barcelona. But Messi

also had a strong connection with the wingers, especially David Villa, who played relatively close to him on his left. Interestingly, another playmate who found him with the ball very often was the left-back Dani Alves. He often helped the attacks of Barcelona with his runs in the space on the left-hand side as a result of the more central left position of David Villa. This allowed for this, at first sight rather unlikely combination of the left-back with the center forward.



We also included the pass network of Manchester United for comparison. On this figure, a much more disorganized team can be detected. In the case of Barcelona, the 4-3-3 tactical formation was very well detectable (disregarding the substitutes). In contrary to this, the average positions of the Manchester United players do not show their tactical formation at all. The central midfielders are very close to each other and the ball was hardly progressed from the wings to the most forward player, Chicharito (based on the light red color of the edges pointing to him). It is also notable that the maximum number of passes between the two players was only 10. Another interesting takeaway from this figure is that United operated with longer passes. Nothing proves this better than the fact that the link between the keeper van der Sar and Rooney was the strongest throughout the match with 11 passes, but the connection between the defensive midfielder Carrick and the center forward Chicharito was also strong.



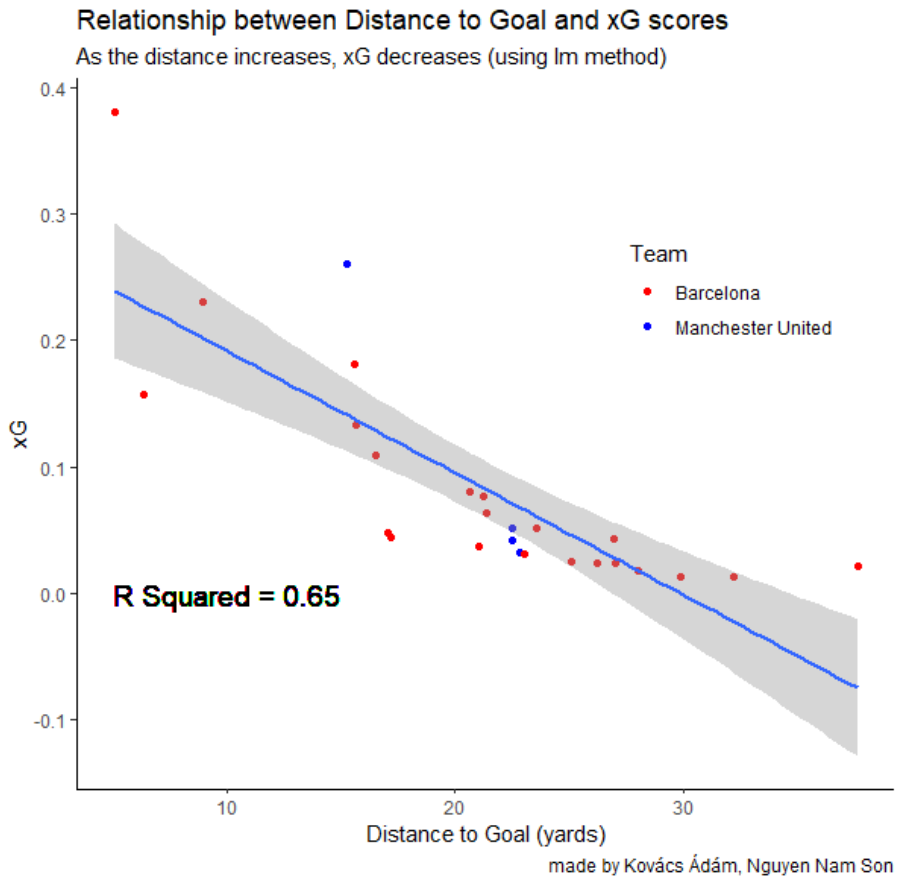
xG (Expected Goals)

Though relatively simple statistics are also informative, we also look at a more complicated metric in our analysis that is gaining popularity rapidly in the footballing world. xG, which is short for expected goals is a revolutionary football metric used to evaluate both team and player performance. Since football is a sport riddled with randomness, merely rating performance based on the actual score after the match can be misleading, especially if it is a low-scoring game. Put simply, the xG of a team tells us the quantity and quality of chances that a team creates over a match. Thus, expected goals have the capability to quantify the chances produced. Its calculation results in a likelihood of each shot of it resulting in goal. For example, a shot with 0.95 xG means that that shot has a 95% probability of finding the back of the net. The question of how we get to such a value naturally emerges.

The fundamental weighing factor of each shot is naturally its distance to the goal. In the figure below you can see that as the distance to goal increases, the likelihood of a shot to result eventually in a goal decreases. It is intuitive because players tend to be more accurate when they are close to the goal, while keepers can react better to the shots aimed at their goal from larger distances. The

most basic linear method implies that the variance in the distance to goal explains 65% of the variance in the xG scores. But, as this correlation is not 1, it is clearly visible that there is more to xG than the location of the shot. Other determining factors include the quality of a shot given the assist type (from a cross, simple pass or chested down), the shot angle, the body part with which the shot is taken, the number of defenders between the goal line and the shooter and many more.

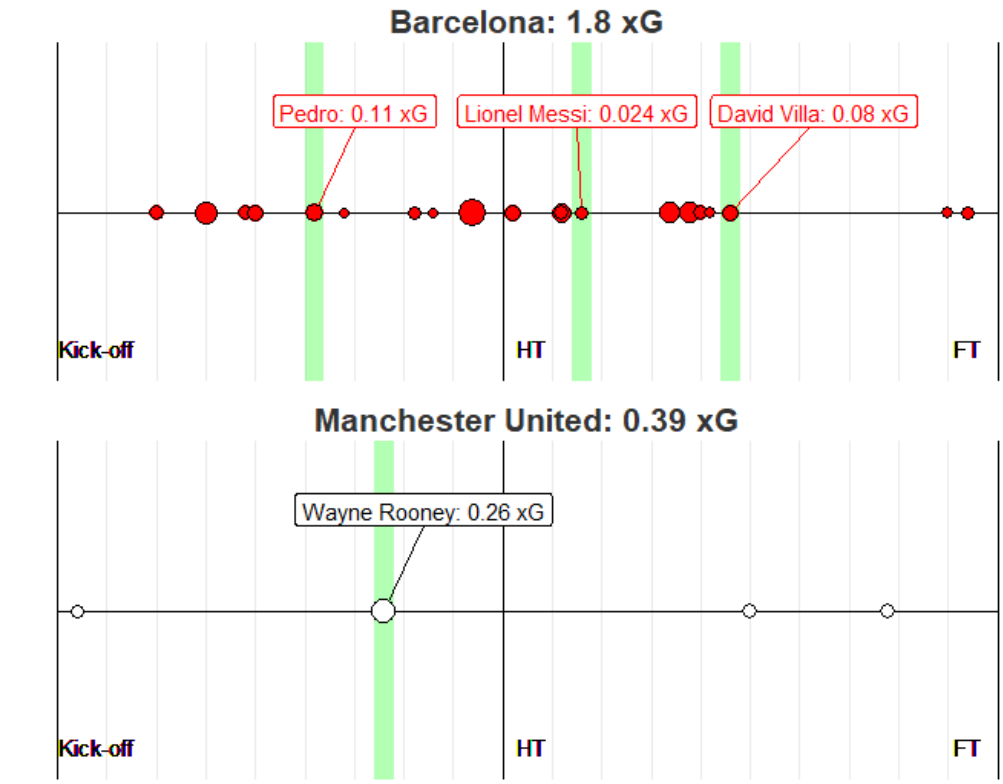
The last question that may appear regarding this metric is how these quantities are assigned to a shot not yet attempted (i.e. the next one). The answer is that companies that specifically deal with sports statistics and betting sacrificed a lot of time in going through thousands and thousands of historic matches and analyzed each chance and shot their location and outcome. Lucky for hobby analysts like us, this resulted in a very cool and fairly reliable tool.



The second plot illustrates all the attempted shots for both teams, from kick-off to full-time. As can be seen, Barcelona was more dangerous during the game having many more shots compared to the opposition. Pedro, Messi, and David Villa all scored during the game, and Messi scored from a shot with the lowest xG (0.024) among the three which implies how big of a threat Messi is by being able to convert chances that the majority of players would most probably miss. Compared

with the 1.8 xG accumulated by the Barcelona players, the total of 0.39 by the Manchester United players is very telling. This low total xG is no surprise given the fact that the whole team had only four shots throughout the match. As we will see, this is less than what Messi alone had for Barcelona. Among the Manchester United players, only Wayne Rooney managed to score, having converted a relatively big chance.

Find out more about xG and xGA at this webpage.



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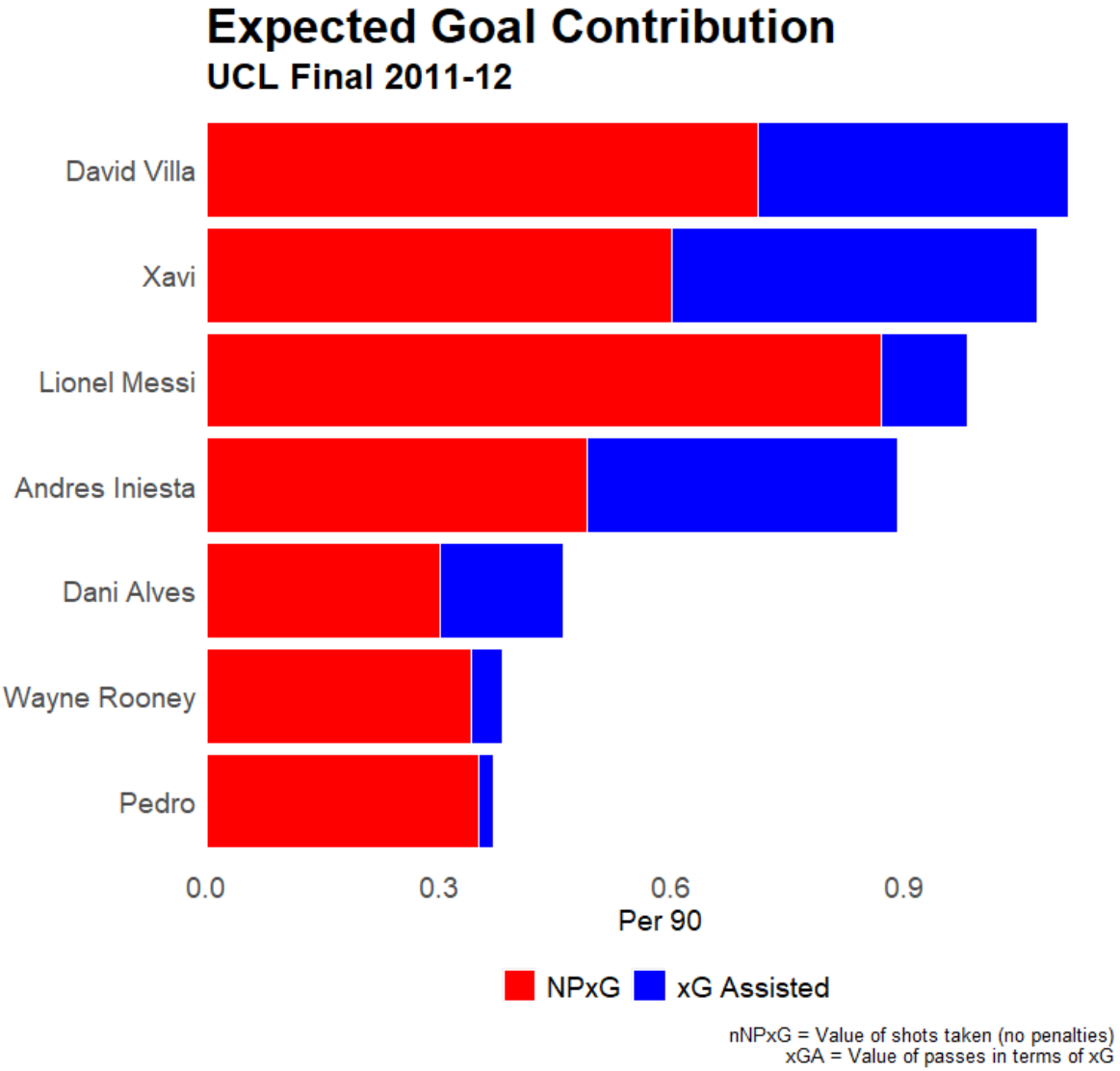
xG and xGA (Expected Assists) Rankings

When looking for complex metrics to measure performance, it is no surprise that the xG, measuring shots, shooting positions, goalscoring chances is what gained popularity the fastest. After all, football is a sport won by goals, which are just converted chances. But there is more to goal than converting a chance of course, one has to receive a ball to get into those positions. Luckily, there is a measure that measures just that, it's called xGA, and it allows us to measure the creativity brought by the players too. xGA is a similar measure to xG in that it also considers lots of factors to determine the likelihood of a pass to be converted to a goal by the recipient. In other words, it reflects the chance of a pass being an assist based on various circumstances. It is important to note here that not only those passes of a player are given an xGA value that results in a shot. All

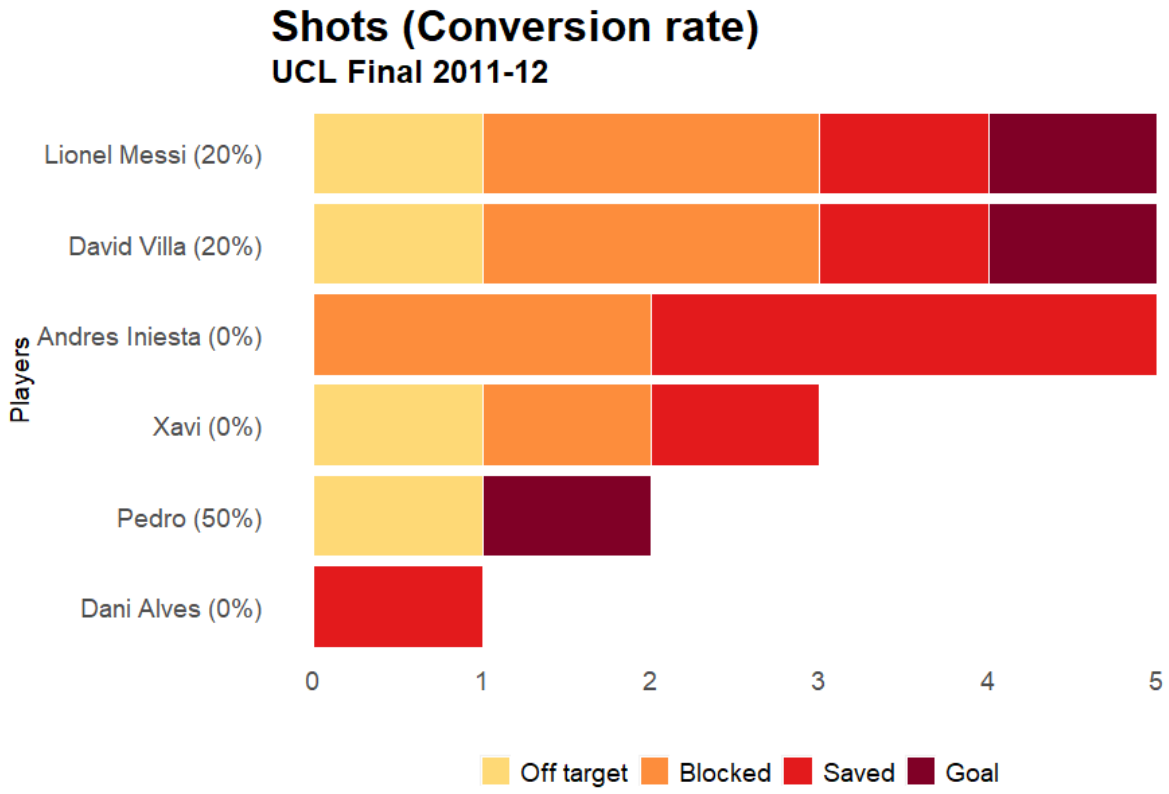
passes have an xGA value, there have been goals scored even from the own half of a team over the course of history, however, those passes obviously have a value very close to zero.

The graph below ranks the Barcelona players according to their xG and xGA values added up. We can see that the two most standout players were David Villa and Xavi in this respect, followed by the main man of our analysis, Messi. Though Villa, Xavi Iniesta, and even Dani Alves outperformed Messi in xGA, his contribution should be given some perspective. First of all, Messi, even though playing as a 'false 9' was still the center forward who was expected to be the main source of danger not the main creator of danger. Also looking at the player in the similar position he played in in the opponent team (Rooney), his xGA value is not that bad already. Also, Messi tops the chart in terms of xG and this combination of really high xG and a fairly great xGA makes for effective forward performance.



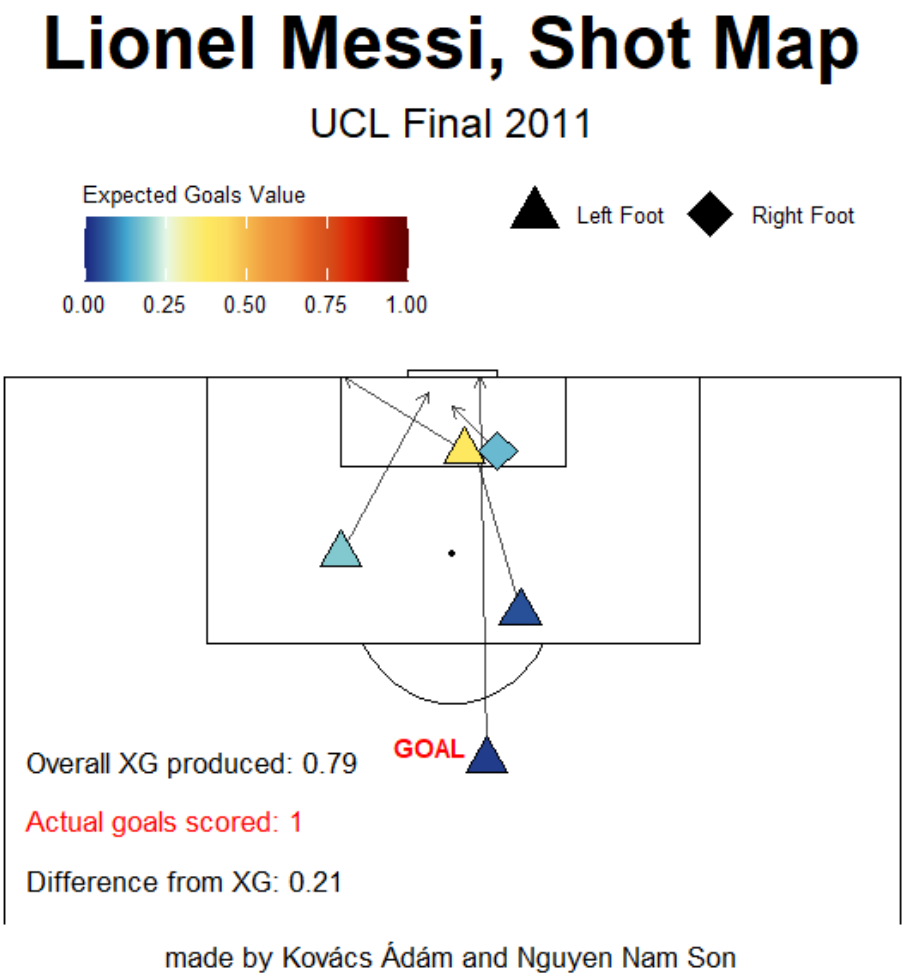
Shots and conversion rate

Traditionally, it is often said that only goals define a striker. Thus, we looked at the distribution of shots made based on their placement. On the figure, you can see the performance of Barcelona players in this respect. Messi, David Villa, and Iniesta had the most shots, though with very differing results. Messi and David Villa had identical distributions: scoring once, two blocked shots, one off-target shot, and one saved shot by Edwin Van Der Sar. Iniesta on the other hand could not find the net, having three shots saved by the goalkeeper next to his two blocked attempts.



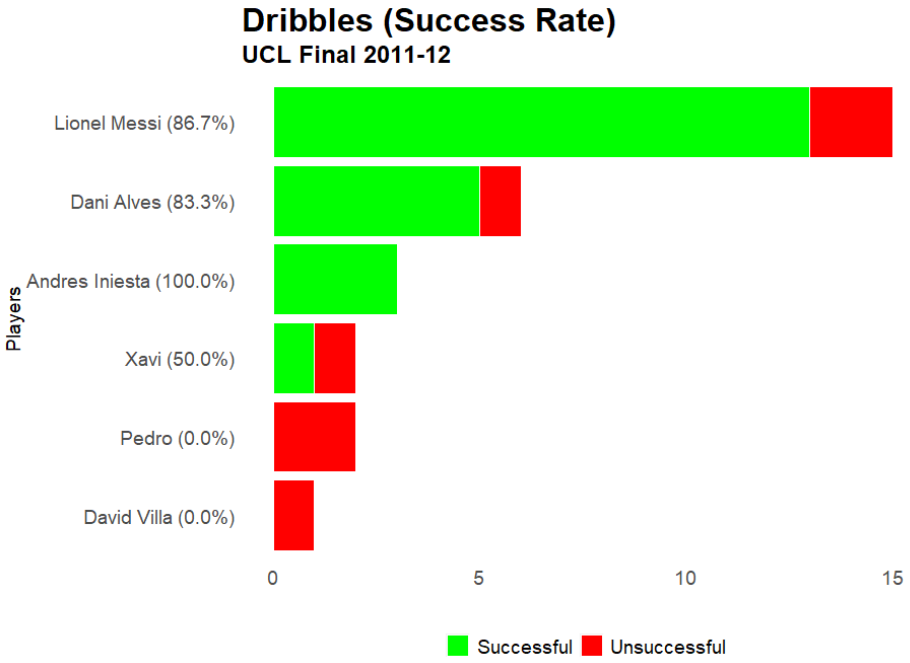
Shot map

To get even more insight about our main man of this report, we created his shot map, showing visually the attempts Messi tried his luck against Manchester United. As can be seen on the figure, being a left-footed player, all but one of his attempts were left-footed strikes. He had altogether five shots, from which four were from shooting positions inside the opposition's box. Ironically, his only effort coming from outside the penalty box found its way to the back of the net. It is also interesting that of the five attempts, the one with the highest xG was the only one not at least on target. Even though Messi had two opportunities from a very close range, his overall XG adds up only to 0.79, indicating that he was able to in fact 'overperform' in this respect as well, even by scoring only once. This can be interpreted in the following ways: An average attacker based on historical data from these goalscoring opportunities would have scored on average 0.79 goals. But Messi is obviously not an average attacker.



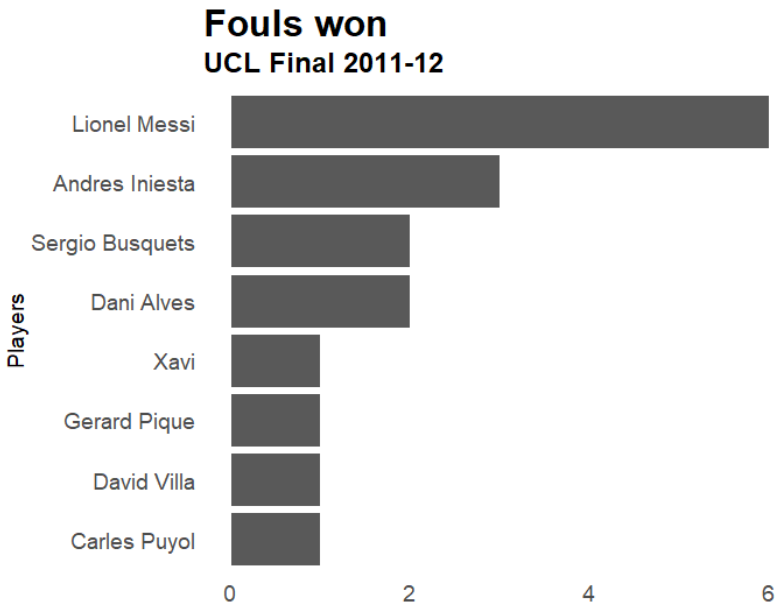
Dribbles Attempted

As far as dribbles are concerned, Messi was a clear winner not just within the team but among all others on the pitch. He attempted 15 dribbles during the match, with an impressive success rate. It should not be surprising because we all know how decent dribbler Messi is.



Fouls Won

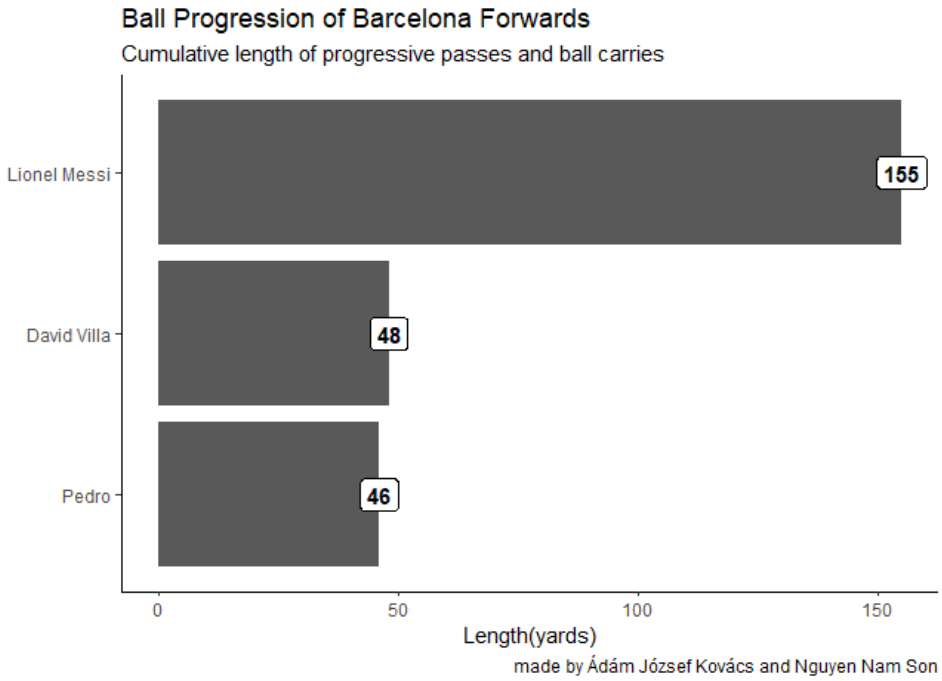
In the next plot ranking the players of Barcelona, we created a plot of fouls won, which means Barcelona was awarded a free-kick as a result of the action of this player. One may expect that the number of dribbles attempted correlates with the number of fouls won because Manchester United



often broke the transition with tactical fouls against Messi. The chart below reflects the phenomena as most of the fouls were committed against him.

Ball progression

We also added a plot on a measure that is not generally looked at, 'ball progression'. We defined ball progression as the sum of yards made with ball carries/sprint and progressive passes towards the opposition goal. We aggregated these measures for the front trio of Barcelona and ranked them with a bar chart. As we can see, Messi made more than three times more progressive yards during the match than any other Barcelona player. Therefore, Messi was very much part of the buildup play and helped to connect the midfield with the final third.

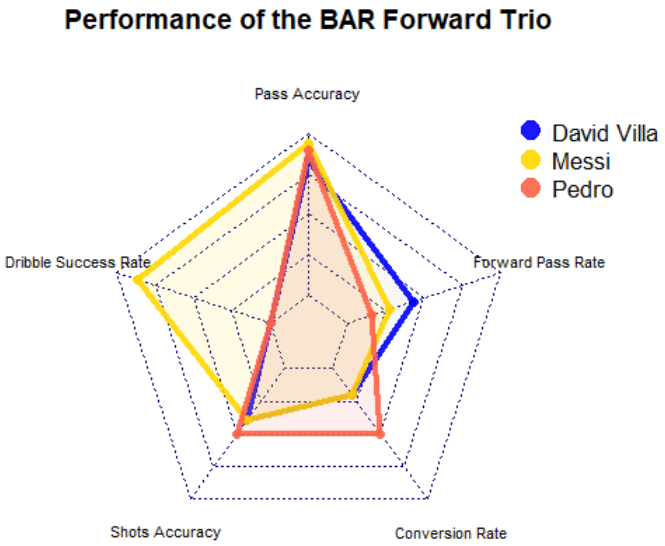


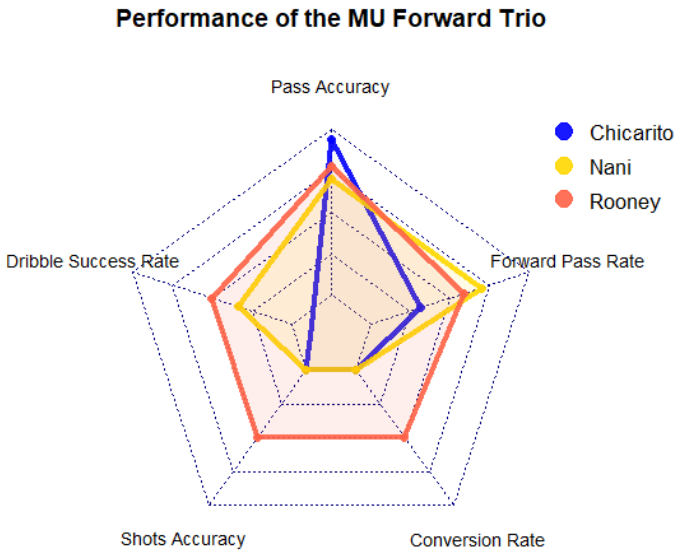
Radar/Spider Plots

To summarize and compare the most important metrics we chose to create radar/spider plots describing the accuracy rates of the descriptive measures depicted before, such as the pass accuracy, shot accuracy, conversion rate, dribble success rate, and the percentage of forward-passes made. We believe that it is one of the most interpretable and fascinating representations when visualizing multivariate data as comparisons. Another advantage is that many variables can be represented while still giving the same resolution to each of them. However, we are also aware of the fact that when it comes to comparing lots of individuals, the plot can be overcrowded. For such a matter,

we restricted our sample to the front trios. Finally, one may think that only the area of the polygons matter, even though the shape can change depending on the position of axes around the circle.

We restricted our sample to the front trio of each team to select the best performing player in the attacking positions. Regarding Barcelona, Messi was the obvious best-attacking player in the Barcelona team with a spider plot extending the most on each axis overall. Although David Villa, had a better forward pass rate and Pedro better metrics for goalscoring it does not reflects the true value of Messi, because he attempted much more shots than Pedro and passed a lot more compared to David Villa. Observing the same plot for the attacking trio of Manchester United, we can see that Wayne Rooney was the one who performed consistently in all metrics.



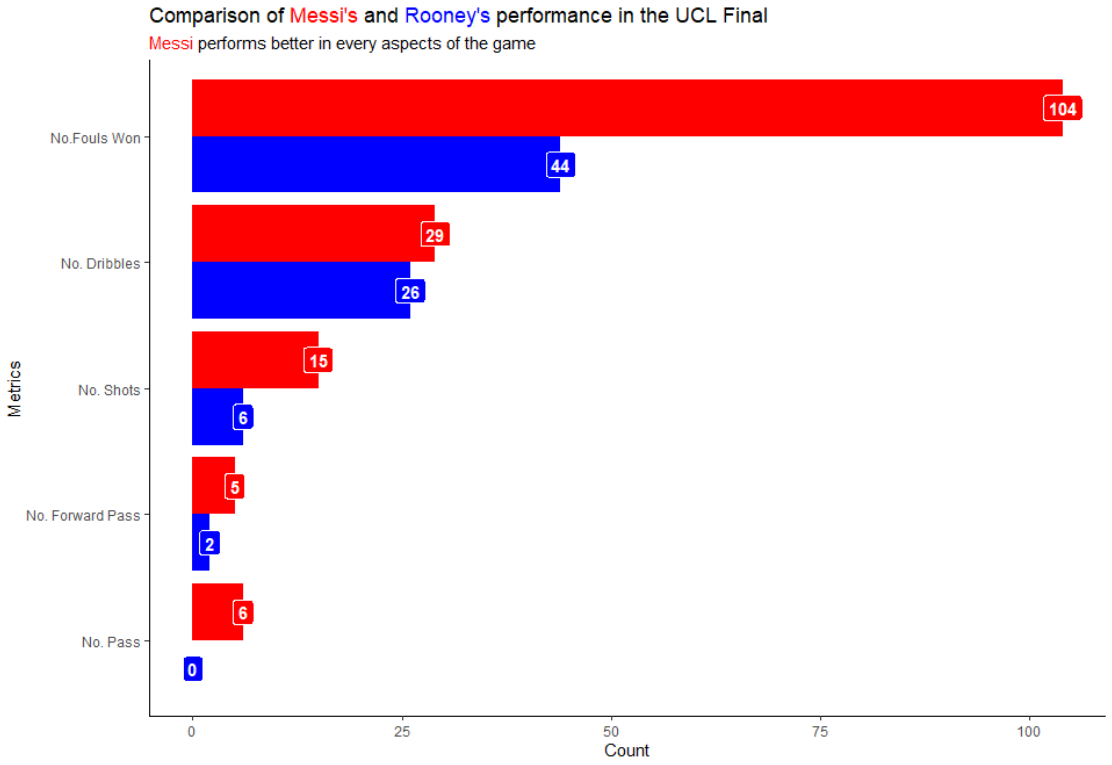


Messi vs. Rooney Comparison

Based on our preliminary analysis, we derived that the most influential player of Barcelona and United was Lionel Messi, and Wayne Rooney, respectively. By comparing the two top players, we can get a clear picture of who was the man of the match in the UCL final.

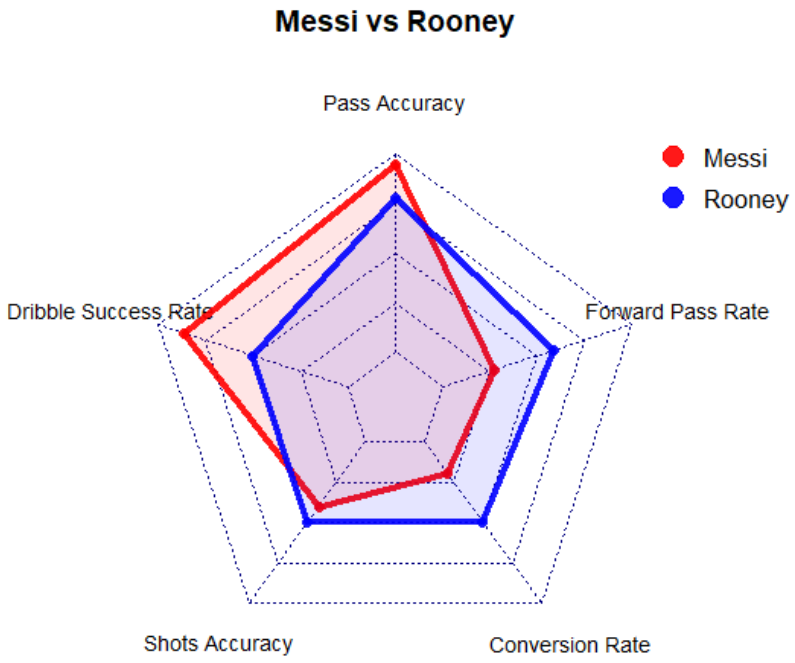
Barplot Comparison

First, let us compare the baseline metrics of the two players with a dodged bar plot. The plot shows that Messi performed better in the chosen aspect of the game. The large difference between the number of passes compared to the nearly identical number of forward-passes suggests that Barcelona dominated the game and hold the ball on the opposition play, while Rooney had to play out the ball from the back and make quick counterattack transitions with direct forward passes. Also, Messi made almost three times more dribbles during the game and won six fouls compared to zero of Rooney. All in all, based on such metrics, Messi came out as a winner by fine margins, while the patterns show the difference between the possession-oriented "Tiki-taka" and the traditional long-ball play of English clubs, as well as Manchester United were trying to get rid of the ball as soon as possible by making direct passes rather than carrying the ball, and making dribbles.

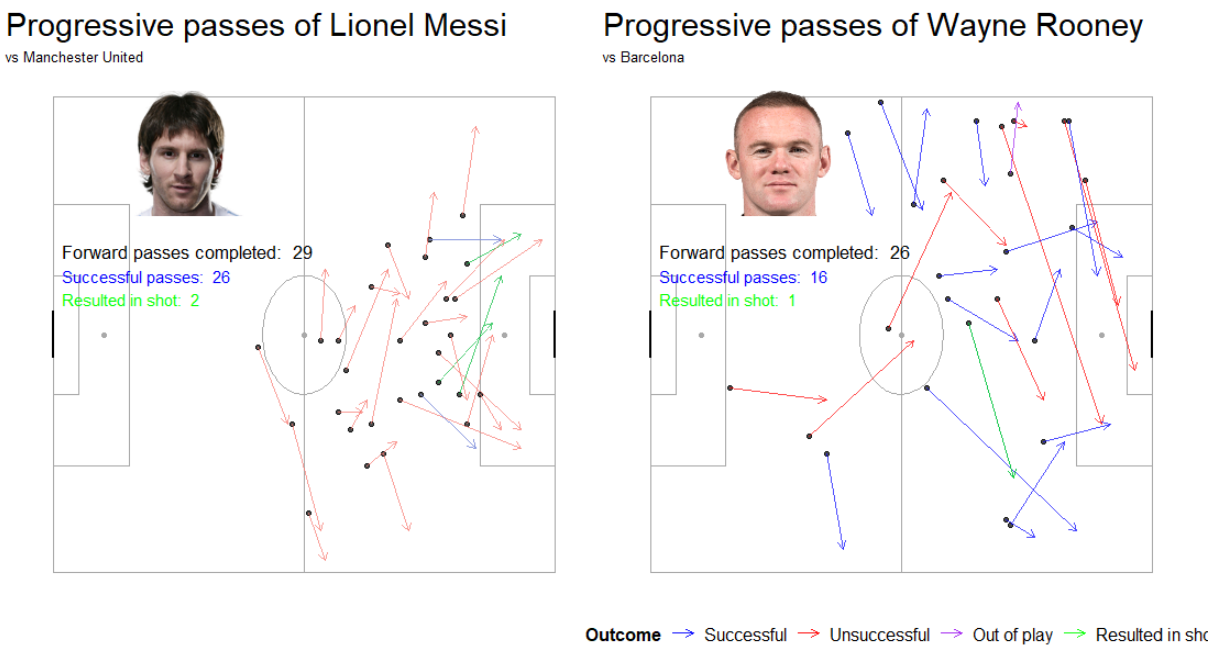


Radar Plot Comparison

We can also compare the two players based on accuracies in a 5-axis radar plot. Doing so we can see that based on the accuracies it is ambiguous whether Messi was more precise than Rooney, rather they performed better and worse at different rates. Messi was better at making pinball passes and dribbling past opposition players, while Rooney had a better conversion rate and forward pass rate. As said before the latter can be explained by the differences in playing styles.

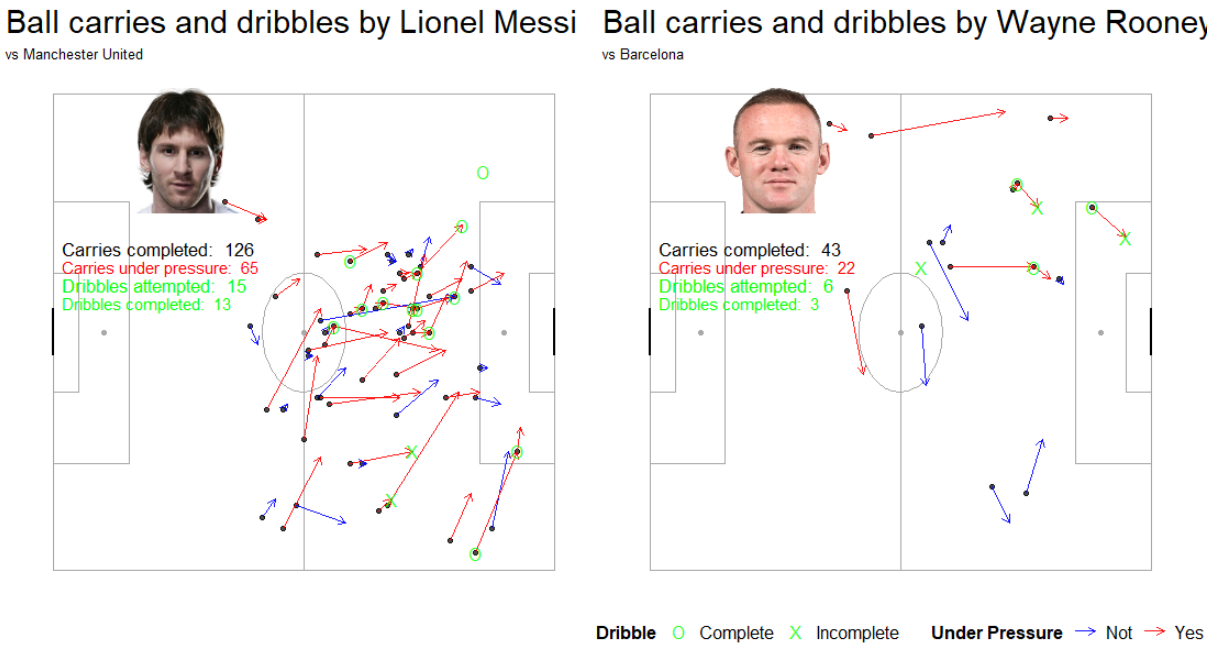


Progressive Passes



As mentioned earlier, Messi's position in the Barcelona team was rather a false 9, and as such, he took part in a significant part of the build-up as well. This plot shows the progressive passes (and their outcome) of the Argentinean genius in comparison with Rooney's same statistics. At first glance, it is easy to see that Messi played much more centrally than Rooney and often pulling back towards the halfway line to make forward passes. Rooney, on the other hand, made progressive passes all over the pitch (including several on his own half), which tells us that Manchester United was forced to defend a lot, resulting in even their number 9 coming back very deeply. The difference in precision is also apparent, a much higher proportion of passes by the Argentinean found a teammate with two resulting in a shot right afterwards.

Ball Carries and Dribbles



This plot compares the two strikers in their ability to carry the ball forwards by making runs with the ball at their feet. Messi started his runs most often from the middle of the pitch, but also opted for the right-wing on numerous occasions to utilize his ability to cut back and make passes with his preferred left foot. He completed a total of a whopping 126 carries, which is especially outstanding in the light of his English opponent attempting only 43. Both players were under pressure in roughly half of their carries, meaning they were pressured by a defensive player during their runs.

As for dribbling, the brilliance of Messi shows again. Of his fifteen times, when he tried to mislead his opponents, he was successful thirteen times. If we look at the figure, we can see that he often started his carries with a dribble or ended it in one, before giving the ball to one of his teammates. In the other team, Rooney attempted six dribbles and was successful only 50% of the time, two times starting his run with a successful dribble but then ending it with an unsuccessful one.

Conclusion

The 2011 UEFA Champions League final was a memorable match (like all UCL finals, but still). One of the best teams to ever play the beautiful game played at their prime under the management of Pep Guardiola. Other than the sublime overall team performance, the Barcelona team enjoyed the greatness of the Argentinean genius Lionel Messi who excelled in his newly invented 'False 9' position. In this report, we used a number of complex statistical measures and visual graphics to uncover the influence his contribution had on the game. We learned that he not only produced the most shots and scored the reassuring second Barcelona goal, but connected with his team meats really well, completing a really high number of forward- passes as well. He managed to progress the ball through his excellent dribbling and ball carrying and won the most fouls as well. A thorough comparison with the Manchester United forward Wayne Rooney was also carried out. We can conclude based on our plots that Messi's influence on the match and the success of his team was way superior compared to the opponent's goal scorer.