Scouting Quarterbacks by Scouting their Wide Receivers

It is well known within the sports world that the quarterback position is amongst the most difficult to scout. Since the year 2000, 279 quarterbacks have been drafted, 66 of whom were first round picks. Despite this, only 13 unique quarterbacks have won a Super Bowl in this time. Due to the inherent difficulty of finding a Super Bowl caliber quarterback, many teams have chosen to stick with a good, but not great, option at this position. With the NFL undoubtedly becoming a more passing-focused league, teams should jump at the chance to stop settling for average quarterback play. Teams without top tier quarterbacks should be quick to move on through the draft, where they can take another swing at the position and save tens of millions of dollars in cap space through rookie contracts as well.

But how can teams improve their hit rate on quarterbacks given the position's notorious draft history? I suggest that teams start by scouting a college quarterback's weapons, using those scouting reports as a gage for the surrounding talent level a quarterback needs to thrive. By scouting a quarterback's receivers, we can get a closer look into how that quarterback will handle the transition from college to the NFL.

For this report, PFR's weighted career approximate value (wcav) will be used as a measuring stick for player talent in the NFL. Throughout the presented charts, this stat will twice be divided into 7 equal-value intervals of 20 points, That is:

- Group 1: wcav < 20

- Group 2: $20 <=$ wcav < 40

    …

- Group 7: wcav $>= 120$

 A higher wcav is equated to a more successful player. Other stats come from the CFBD data base. All stats and figures are up to date as of Wild Card Weekend 2023.

College Reception Shares

Max Reciever Reception Share vs Weighted Career Approximate Value (PFR)
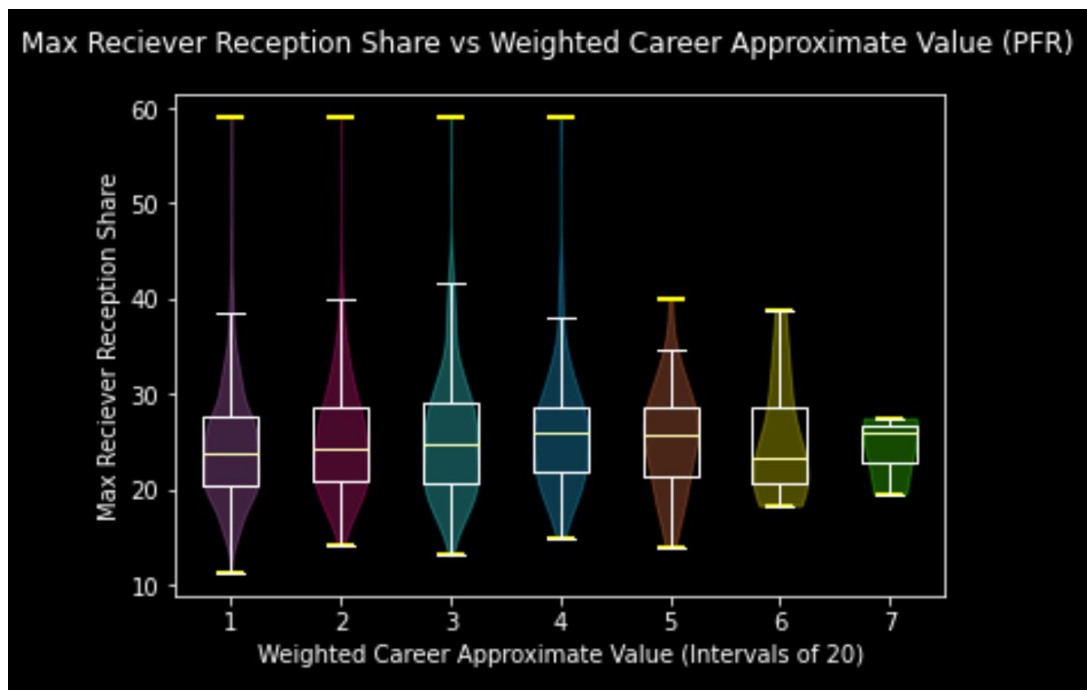
The above chart, a boxplot, represents distribution of the maximum reception shares of college quarterbacks in their final year of college, compared to the quarterback's professional wcav. That is, what percentage of receptions did their college's leading receiver have in the season leading up to the quarterback being drafted, across the seven aforementioned wcav intervals. As in any other box plot, the mean is represented by the middle line in each box, whereas the first (25%) and third (75%) quartiles are represented by the top and bottom of the box respectively. The white horizontal lines at the ends of the box's whiskers represent the min and max values, disregarding outliers. The yellow lines represent the min and max values including outliers. Outliers are defined as any point that lies more than 1.5 times the length of the box (interquartile range, or IQR) past the first our third quartile. The colorful violin plot behind the boxes offers a more pleasing view of the same distribution, outliers included.

The most important information to pick up on when looking at this chart is that the distribution about the most successful quarterbacks (interval 7) is far slimmer than those that precede it. In fact, this trend can be seen taking shape as early as intervals 3 and 4:

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Minimum values:        [11.2, 14.2, 13.0, 14.8, 13.9, 18.3, 19.5]
Maximum values:        [38.5, 39.8, 41.5, 37.9, 34.6, 38.8, 27.5]
Quartile 1 values:     [20.4, 21.0, 20.5, 21.7, 21.4, 20.6, 22.8]
Quartile 3 values:     [27.7, 28.6, 29.0, 28.5, 28.6, 28.5, 26.7]
Interquartile ranges:  [7.3, 7.6, 8.5, 6.8, 7.2, 7.9, 3.9]
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This shows that quarterbacks who rely too much on one receiver during college are less likely to make a meaningful impact in the NFL. Equally, quarterbacks who spread the ball too much are also unlikely to make a meaningful impact in the NFL. Ideally, a quarterback's top receiver should catch between 19.5 – 27.5% of his completions.

It is important to note, however, that this is just one facet of quarterback scouting. This stat alone can help narrow the field in quarterback scouting but should not be used independently. One good reason for this is that the median values for each box are relatively similar and show no discernable pattern:

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Median values:  [23.9, 24.3, 24.7, 26.0, 25.6, 23.2, 26.0]
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Therefore, **this stat should be used as part of a process of elimination rather as part of a process of selection.**

College Receiving Yardage Shares
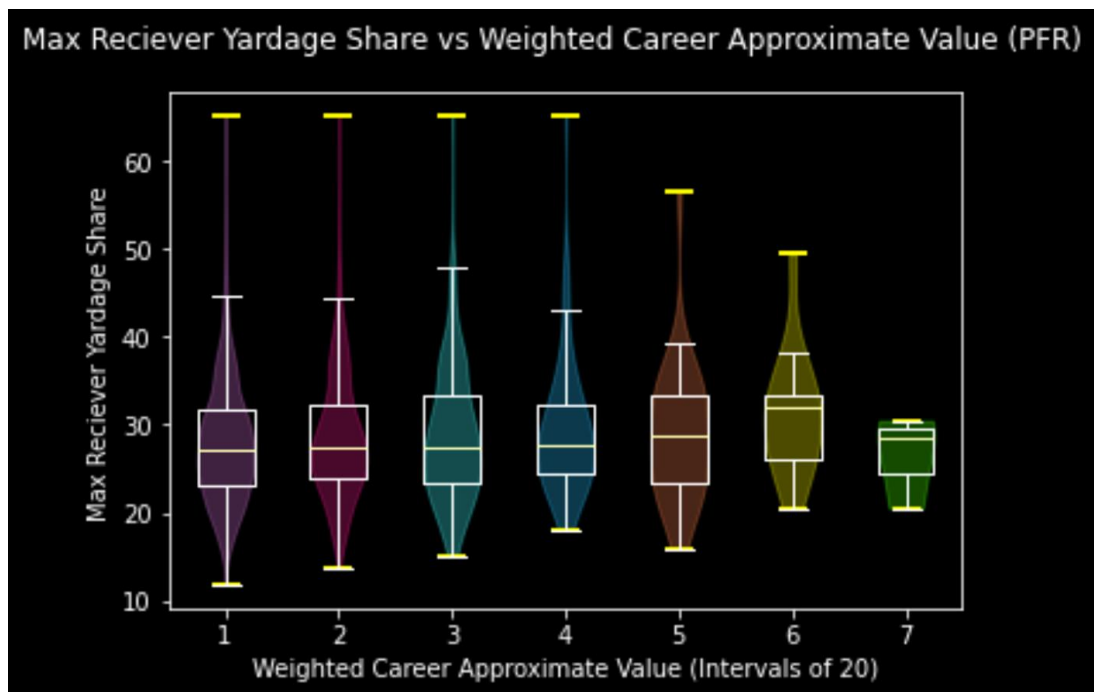
Reception yardage share can be looked at in a similar manor. The above chart is another boxplot represents distribution of the maximum reception yardage shares of college quarterbacks in their final year of college, compared to the quarterback's professional wcav. That is, what percentage of reception yardage did their college's leading receiver have in the season leading up to the quarterback being drafted, across the seven aforementioned wcav intervals. As in any other box plot, the mean is represented by the middle line in each box, whereas the first (25%) and third (75%) quartiles are represented by the top and bottom of the box respectively. The white horizontal lines at the ends of the box's whiskers represent the min and max values, disregarding outliers. The yellow lines represent the min and max values including outliers. Outliers are defined as any point that lies more than 1.5 times the length IQR past the first our third quartile. The colorful violin plot behind the boxes offers a more pleasing view of the same distribution, outliers included.

Once again, the better quarterbacks have a slimmer distribution, a trend that can once again be seen as early as intervals 3 and 4:

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Minimum values:        [11.8, 13.8, 15.1, 18.1, 16.0, 20.5, 20.5]
Maximum values:        [44.5, 44.4, 47.8, 43.1, 39.2, 38.2, 30.5]
Quartile 1 values:     [23.0, 23.9, 23.4, 24.3, 23.3, 26.2, 24.5]
Quartile 3 values:     [31.7, 32.3, 33.3, 32.2, 33.5, 33.2, 29.5]
Interquartile ranges:  [8.7, 8.4, 9.9, 7.9, 10.2, 7.0, 5.0]
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This reinforces the previous point that quarterbacks who rely on one receiver too much in college will have trouble transitioning to the NFL. Ideally, a college quarterback's top receiver accounts for 20.5 – 30.5% of the teams receiving yards. Interestingly, this range is slightly higher than that of the reception range.

Once again, however, **this stat is to be used as a tool for elimination rather than selection.** As we can see here, the median points remain relatively similar across intervals and show no discernable pattern:

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Median values:  [27.2, 27.3, 27.5, 27.7, 28.7, 32.1, 28.4]
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What is Actually Being Scouted Here?

Why should these statistics be considered reliable? What are they actually measuring? These charts showcase the conglomeration of three important factors:

- Play calling

- Read progression ability

- Ability to form in-game chemistry with different types of receivers

First of all, play calling plays a large role in the above charts. Almost serving as the prime diluting factor in the charts' ability to scout talent, play calling is the one piece of the puzzle that

is typically out of the quarterback's control. Different styles of play calling can affect the quarterback's need to make progressions or their ability to spread the ball as much or as little as they would like to. Ultimately, most college play styles are drastically different from those in the NFL. However, in order to limit the effect that this has on a player's transition into the pros, NFL teams can look into the play calling decisions of college coaches and coordinators, matching small similarities, and focusing on them come player-development time.

While all play calling styles would affect the reception and yardage shares differently, a quarterback with good read progression ability would be able to overcome this obstacle. When combined with a study of an offense's play calling, reception share can be used to measure a quarterbacks read progression ability. The ability to make good reads is, of course, drastically more important in the NFL than in college as wide receiver separation margins decreases and tighter, more precise, and more decisive throws are needed to complete passes.

Finally, and perhaps most importantly, these stats can be used to measure a quarterback's ability to form chemistry with different types of receivers. A deep report into a quarterback's favorite receiver(s) can help determine what types of wideouts the quarterback will be able to work with best at the next level. Teams can then use this information to match a quarterback to their team who would be able to play well with the receivers already listed on their roster. For example, an NFL team whose number one receiver is known for sharp route running and separation should look to draft a quarterback whose primary target in college had a similar skillset. Conversely, if an NFL team notices that a college quarterback underuses a receiver with a similar skillset to their own top guy, they could take this as a sign that the two may not mesh well. Thus, that NFL team should stay away from that quarterback unless they plan to rebuild their wide receiver room as well.

Real Draft Application

Taking a look at some of this year's draft prospects offers some interesting insight into the quarterbacks available. For example, Bryce Young's top target, Jahmyr Gibbs, caught roughly 16.7% of Young's receptions. Meanwhile, his top receivers via reception yardage share, Jermaine Burton and Ja'Corey Brooks, (who are nearly even in the category) account for 18.9% of his reception yardage share each. Both of these values are below the minimum values found for the top tier of NFL quarterbacks. Conversely, both stats fit well into mid-level groupings. While this isn't a definitive sign that Young's ceiling is as a mid-level quarterback, it is certainly worth looking into, as Young would still only be on the edge in those mid-level tiers, placing in the first quartile. Despite this, Young did much better in these categories in 2021, where his top receptions share was 26.2% (Metchie) and top yardage share was 32.2% (Williams). While his yardage share was actually above the average in 2021, his max reception share was right in the middle. Many may argue that Young's top weapons were significantly weaker in 2022, which may be cause for such a change. While this may be true, it is worth noting that Burton was considered by many to be a low first or high second round pick coming into the season. Not only this, but the addition of Gibbs, who is known for his great hands and route running out of the backfield, also should have helped to offset the losses of Metchie and Williams. Perhaps the lack of a true number one receiver for Alabama has to do with the types of wide receivers Young had to throw to? Williams and Burton profile similarly, however Williams is clearly a better talent, so that difference could strictly be chalked up to a talent gap. Meanwhile, both Gibbs and Metchie were known in part for their twitchiness and shifty route running. This playstyle seems to be one of Young's favorite to target. Perhaps the only reason for the production drop off

between these two is that Gibbs had to play out of the backfield while Metchie got to play at the line of scrimmage.

Over at Ohio State, CJ Stroud's top reception share was roughly 29.8% to Marvin Harrison Jr., with Emeka Egbuka sitting just 3 receptions behind. His top reception yardage share was also to Harrison at 34.2%. Both of these numbers are too large to qualify Stroud for the top interval of NFL quarterbacks, leaving him in the second tier. Similar to Bryce Young, Stroud's numbers also do not fit in the IQR at any tier, making him a near outlier in the fourth quartile regardless of where he lands. These numbers are not new to Stroud, however, as he had a similar issue in 2021, where Jaxon Smith-Njigba caught 30% of his total receptions for 36.2% of his total reception yardage. While Young at least had a superb max reception percentage in 2021, Stroud has consistently over targeted wide receivers in both of his years in college football. While it is possible that play calling is at fault here, it is equally possible that Stroud is not making progressions properly or is struggling to form chemistry with a unique array of wide receivers. One aspect of Stroud's career that is not mentioned enough is that he is constantly surrounded by top tier receiving talent. Following the 2021 season, Stroud's Olave and Wilson both went in the top half of the first round of the NFL draft. Despite an injury holding him out of play in 2022, many still expect Smith-Njigba to follow suit as a first-round selection. Furthermore, 2022 saw Stroud primarily targeting Harrison Jr., who is often seen as a top-10 selection for the 2024 draft, and Egbuka, who many also see as a first-round selection in 2024. For NFL teams truly looking to improve their passing game, perhaps the attention should be on one of Stroud's plentiful targets rather than the QB himself.

Kentucky's Will Levis had a solid 27% of his receptions and 26.1% of his reception yardage completed to his lead receiver Barion Brown. These numbers put him right around the

medians for both statistics and place him within the min and max for the top tier, as well as in the IQR of the top tier for reception yardage. While Levis certainly has his own detractors, namely his TD to INT ratio and age, he does will in both of the categories presented here.

Florida's Anthony Richardson hosted a 21.6% max reception share and a 25.9% max reception yardage share this season. While his max reception share places him within any category, he just barely makes the top 2 tiers and is only within the IQR starting at the third tier. His max reception yardage share places him within the IQR at every tier. Similarly to Levis, Richardson has other detractors. His completion percentage was very low compared to other potential first round QBs. He also struggled with his TD to INT ratio.

Tennessee's Hendon Hooker had similar problems to Stroud as Jalin Hyatt, his top receiver, caught 29.3% of his receptions while accounting for an astounding 40.4% of his reception yardage share. Hyatt's reception share discounts Hooker from the top reception share tier, while his reception share discounts him from the top 3 reception yardage shares. Neither of his values fall within any IQR. Hooker will enter the 2023 season at 25 years of age.

While these statistics may not appear super important at first, it should be alarming to any scout how many red flags they produce for the top five quarterback candidates in 2023.

Conclusion

Through scouting a college quarterback's targets, an NFL team can simultaneously scout the quarterback himself. By looking at his team's reception and reception yardage shares, an NFL team can better gage a quarterback's ability to make reads as well as their ability to form chemistry with different types of wide receivers. Matching a quarterback's skillset to your own team's skillset will help them make the NFL transition easier. Secondly, we find that the best

NFL quarterback's top college receivers accounted for 19.5 – 27.5% of their receptions and 20.5 – 30.5% of their total receiving yards. These stats should be used as a tool for elimination rather than selection within the scouting process. Quarterbacks who target their top guy too much may struggle to make NFL caliber reads. Their stats may also be inflated as their lead receiver makes them appear better than they actually are. Conversely, quarterbacks who spread the ball around too much do not properly utilize their top playmakers. Ideally, your lower-tier targets should get the ball just enough to draw attention from the defense, however not enough that they draw touches from your top playmaker. Why target your fourth wide receiver five times a game when two is enough to draw the defense's attention? Instead, you can use those extra three passes getting the ball into that hands of the player who can do the most with it in his grasp. Ultimately, these stats may seem miniscule however they have legitimate implications in this upcoming draft. When looking at the top five quarterbacks for 2023, only one fit within the IQR at all tiers. With the NFL growing as a passing league every year, these stats should certainly play a role in deciding what quarterback your team should select in the draft.

For more analysis on how wide receivers influence college quarterbacks, check out section 1 of my first project here.

For all of my projects, check out my github here.