Introduction

The aim of this exploration is to determine to what extent changes in an NFL player's personal life affects their in-game performance, as well as, the amount of points that they earn in fantasy football. The focus of this examination will be the Arizona Cardinals' quarterback, Kyler Murray. I decided to examine Kyler Murray's performances because while I was doing research on who I would like to draft for the coming fantasy football year, I saw some discrepancies in his point totals. I wondered what may have caused him to perform so well and so poorly within the span of a few weeks. This prompted me to do some research on why this might be occurring. I uncovered an unexpected outcome for his lowered point totals; it was not a death in his family, a marriage, or a birth of a child as I might have thought; the cause for these discrepancies was that a new iteration of the game of *Call of Duty* dropped, or an update occurred in the game! At first glance, it seems like there is no correlation between Murray's performance and *Call of Duty* updates. However, Murray is a very active player and has even signed a contract with "Faze Clan", a large gaming company (Faze Clan.com). My hypothesis is that a new iteration or update of *Call of Duty* being released resulted in Murray playing the game more often, which in turn meant that he spent less time studying plays or the defenses he was going to face causing lower fantasy points and a less consistent amount of points scored. I chose to focus on the fantasy points earned each week by Murray in this analysis because fantasy points take into account the things Murray does well - like gains in rushing and passing yards - and also things that Murray does poorly - like throwing interceptions or fumbling the ball. I want to go into more extensive research on this topic as discovering a true correlation may help fantasy football players by alerting them when it would be a bad idea to put Murray on their starting fantasy roster.

Overall Data

In the table below, labeled "Table 1", it discloses all available fantasy football points per week for each year. Additionally, the data is missing at least a week per year as inherently with the National Football League each season there is a "BYE" week, or a week that the team doesn't play to allow its players to rest. Furthermore, there are three times in two separate seasons, one in 2021 and two separate points in the 2022 season in which Murray sustained an injury; in 2021 Murray sustained an injury during a game so the week that this occurred, week eight, is also void of data. The table is color coordinated with the key supplied explaining what each color in the data means. All data in this exploration was compiled from multiple sources into data tables created by myself on excel, though most of the numerical values came from "FantasyData". Additionally, every date that a

new *Call of Duty* game releases or a large event occurs in the game comes from multiple websites stating dates disclosed by "Activision", the owner of *Call of Duty*. I also decided to round all data points to the hundredths place because fantasy football points naturally come in the hundredths place and I wanted to keep all the data consistent. With everything disclosed I will now begin the analysis of the fantasy points hoping to prove my previous hypothesis.

	SEASON OF FOOTBALL			
	2019	2020	2021	2022
WEEK	POINTS PER WEEK			
1	21.62	26.30	33.56	20.62
2	16.36	32.14	33.10	25.88
3	17.82	21.70	18.54	13.36
4	16.34	23.12	22.62	23.88
5	25.42	26.30	13.66	16.20
6	28.80	28.92	25.76	14.88
7	6.96	37.10	21.44	17.16
8	10.10	BYE	9.06	24.64
9	23.04	37.92	INJURY	19.00
10	26.76	29.9	INJURY	INJURY
11	26.70	20.26	INJURY	INJURY
12	BYE	7.90	BYE	25.24
13	13.32	16.42	30.82	BYE
14	9.96	18.46	17.42	INJURY
15	16.36	33.14	12.58	INJURY
16	12.72	15.38	21.90	INJURY
17	13.00	3.78	22.92	INJURY
18	N/A	N/A	17.10	INJURY

Table 1

RED = WEEK OF CALL OF DUTY DROP OR BETA DROP WEEK

ORANGE = DOUBLE XP WEEKEND

BLUE = 4 WEEK OBSERVATION PERIOD AFTER GAME RELEASES OR 1 WEEK OBSERVATION AFTER BETA DROPS

Fantasy Points Averages

AVG of all of 2019	17.83
AVG of COD WKS of 2019	18.35
AVG of Non-COD WKs of 2019	17.31
AVG of all of 2020	23.67
AVG of COD WKS of 2020	18.10
AVG of Non-COD WKs of 2020	27.04
AVG of all of 2021	22.42
AVG of COD WKS of 2021	19.28
AVG of Non-COD WKs of 2021	24.38
AVG of all of 2022	20.09
AVG of COD WKS of 2022	18.35
AVG of Non-COD WKs of 2022	20.09

Table 2

In the table above, labeled "Table 2", it states the averages of all four of the years in which Kyler Murray has been in the NFL, the averages consist of: the average of each and every week in

the normal season (playoffs are not counted in this data), an average consisting of only weeks in which *Call of Duty* has events (such as a game drop or a double experience points weekend), and finally an average of all weeks in which a event in *Call of Duty* did not occur. To calculate the average of all the weeks I took all the points and added them up and then divided the number obtained by the number of weeks, for example the average of all weeks in the 2019 season would be:

$$\frac{21.62 + 16.36 + 17.82 + 16.34 + 25.42 + 28.80 + 6.96 + 10.10 + 23.04 + 26.76 + 26.70 + 13.32 + 9.96 + 16.36 + 12.72 + 13.00}{16}$$

which equates to 17.83. I then took the average of all weeks for each season and compared it to the average of "*Call of Duty weeks"*(COD weeks), for example the 2019 seasons average of all weeks when compared to the average of the COD Weeks which was 18.35. After this I determined if the average of COD Weeks was higher or lower than the average for all weeks and then repeated this process for the average for weeks where there were no *Call of Duty* events occurring, which I called "Non-*Call of Duty* Weeks"(Non-COD weeks). The 2019 season is highlighted in yellow as it is the only year that had proved the opposite of my hypothesis when purely looking at the averages because weeks in which call of duty events occurred were actually higher than the other two averages. These averages are the closest point differentials in any full season for the whole exploration and it is the only outlier of the previously stated hypothesis when looking at the numerical averages. The average of the COD Weeks was 0.52 points above the average of all weeks and 1.04 points off of the weeks in which nothing occurred with *Call of Duty*. The other important analysis that is stated in each season's analysis is the win-loss ratio on COD Weeks against the Non-COD Weeks.

Standard Deviation

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2}$$

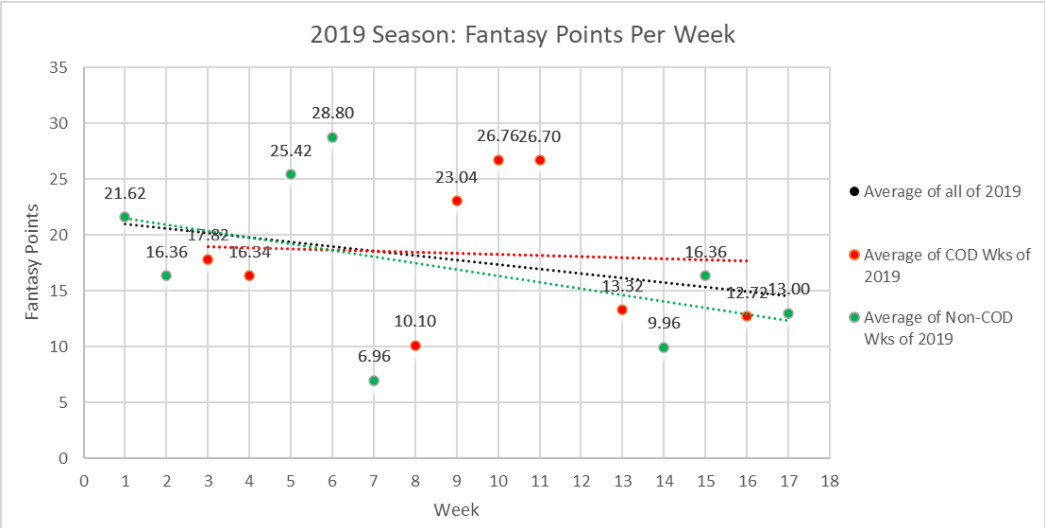
The Equation above is the equation for standard deviation, standard deviation will be able to demonstrate how spread out each of the data points are for the data of Murray's fantasy points, or in other words demonstrate how consistent Murray was during certain weeks, may it be COD Weeks or Non-COD Weeks. To begin the examination of standard deviation the mean, or average, of all the data points must be found first. To demonstrate how to find standard deviation the COD Weeks of the 2019 season will be used as an example. First the mean must be found which is already known as 18.35, then all data points that are deemed COD Weeks must have the mean subtracted from it and then have that number squared; take the third week of the 2019 season for example, in which Murray

scored 17.82 points. With this information the part of the equation $(x_i - \mu)^2$ is used, for week three it would be $(17.82 - 18.35)^2$ which equates to 0.28. After repeating the same part of the equation for each data point, the next step would to be to use the Sigma notation, $\sum_{i=1}^{N}$, which means the sum of all values $(x_1 - 18.35)^2$ to $(x_N - 18.3)^2$, in the case of the example there are eight weeks observed so the N value would be 8, in the previous step it was found that the first of the weeks observed was 0.28 so this step will be repeated for weeks 4, 8, 9, 10, 11, 13, and 16. The data points come out to 1.01, 68.06, 22.00, 70.73, 69.72, 25.30, and 31.70 respectively. The previous data points collected along with the first data point of 0.28 all get added together which comes out to 288.8, then this number obtained is divided by the N value, or in the case of this example N = 8 so the fraction $\frac{288.8}{8}$ is solved which equates to 36.1. The final step to find the standard deviation is to account for the square root ($\sqrt{\ }$) of the equation; square root the last number to find the standard deviation, σ, in this example 36.1 would be square rooted so $\sqrt{36.1}$ equates to 6.01, which means that 6.01 is the standard deviation. These steps will be repeated for COD Weeks, Non-COD Weeks, and all weeks of the four seasons examined which will be announced in each section of the exploration. Then be analyzed along with the win-loss ratios, and the averages, with the idea that a lower standard deviation shows more consistency.

2019 Season

In the 2019 NFL draft, the Arizona Cardinals cardinals with the first overall pick chose Kyler Murray, the former Oklahoma quarterback with great potential to be something big in the NFL. Since 2019 was his first year, fans were weary about what he would actually achieve. Nevertheless, Murray ended up having a decent first season for a rookie quarterback as the Cardinals ended with a 5-10-1 with a 50% win-loss ratio. When looking at his average passing yards for 2019 it can be seen that the passing yards were good for a rookie quarterback. His average passing yards per week in 2019 were 232.63 yards and his average rushing yards per week was 34 yards. These numbers are good for a rookie as the average passing yards for veteran quarterbacks in the NFL are around 260 yards (Melbye). When looking at the chart, labeled “Chart 1” below, all the relevant stats for Kyler Murray in the 2019 season can be seen, but as previously stated, I will focus my analysis on his fantasy points. This year, the fantasy points actually disprove my hypothesis as when the averages are calculated, the average of the COD Weeks weeks is higher than the other two. However, I suspect that the reason for this occurrence is due to two factors that the data cannot fully demonstrate. The

first factor being that this was Murray's rookie year and even though he had the starting position as quarterback, the Arizona Cardinals had a backup plan incase he didn't work out; that being a veteran quarterback signed on a two year contract (Urban), because of this it can be assumed Murray did not play as much *Call of Duty* because he was focusing on keeping the paycheck he worked his whole life to achieve. The other factor that must be taken into account is the game in which Kyler Murray was only able to rack up 6.56 fantasy points and 104 passing yards against another rookie quarterback, Daniel Jones, and his NY Giants. This data is an outlier in my analysis of the 2019 season and occurred because the weather in NYC on October 20th, 2019, was a very rainy day, which was not good weather for passing. The coaching staff of the Cardinals decided that the best course of action was to run the ball which reduced Murray's chances to obtain fantasy points. During this fateful Sunday afternoon it was prior knowledge that the starting running-back for the Arizona Cardinals, David Johnson, was out with a sprained ankle and would have very limited snaps. The Cardinals were forced to start a rookie running back against their better judgment as there were no other options. Yet, the running back blew away the competition with 126 rushing yards, and three rushing touchdowns against the New York Giants. This staggering performance by the rookie running back (and the horrible fantasy performance by Murray) all occurred because of the personal life that this rookie, Chase Edmonds, had. Edmonds was very good friends with the starting running back, Johnson, and despite Edmonds throwing up before the play he went in and even though he was waved off by Johnson back to the sideline, Edmonds came in to protect his friend who was hurt. In an interview by the Arizona Cardinals after the game, Edmonds had this to say, "I want to look out for [Johnson's] career and his future… He's so selfless. Dave would go out on one leg if he has to. I told him before the game, 'Bro, I know what type of guy you are, I know what type of player you are, just think of the future" (Urban). This one game that contributed to the skewing of the data in the analysis on Kyler Murray and his personal life events, was actually caused by another player's personal life. As weather nor other player's personal life is not accounted for at any other point of the exploration, neither can be accounted for as evidence to aid my hypothesis.



Graph 1

	YEAR 2019		PASSING							RUSHING				POINTS	RESULT
GAME	Week	OPP	CMP	ATT	PCT	YDS	AVG	TD	INT	ATT	YDS	AVG	TD	FPTS	W/L/T
9/8/2019	1	DET	29	54	53.7	308	5.7	2	1	3	13	4.3	0	21.62	T
9/15/2019	2	BAL	25	40	62.5	349	8.7	0	0	3	4	1.3	0	16.36	L
9/22/2019	**3**	**CAR**	**30**	**43**	**69.8**	**173**	**4**	**2**	**2**	**8**	**69**	**8.6**	**0**	**17.82**	**L**
9/29/2019	4	SEA	22	32	68.8	241	7.5	0	1	4	27	6.8	1	16.34	L
10/6/2019	5	CIN	20	32	62.5	253	7.9	0	0	10	93	9.3	1	25.42	W
10/13/2019	6	ATL	27	37	73	340	9.2	3	0	11	32	2.9	0	28.80	W
10/20/2019	7	NYG	14	21	66.7	104	5	0	0	10	28	2.8	0	6.96	W
10/27/2019	**8**	**NO**	**19**	**33**	**57.6**	**220**	**6.7**	**0**	**0**	**2**	**13**	**6.5**	**0**	**10.10**	**L**
10/31/2019	9	SF	17	24	70.8	241	10	2	0	5	34	6.8	0	23.04	L
11/10/2019	10	TB	27	44	61.4	324	7.4	3	1	3	38	12.7	0	26.76	L
11/17/2019	11	SF	24	33	72.7	150	4.5	2	0	8	67	8.4	1	26.70	L
BYE	12	BYE WEEK VOID OF DATA													
12/1/2019	13	LAR	19	34	55.9	163	4.8	0	1	4	28	7	1	13.32	L
12/8/2019	14	PIT	20	30	66.7	194	6.5	2	3	6	2	0.3	0	9.96	L
12/15/2019	15	CLE	19	25	76	219	8.8	1	1	8	56	7	0	16.36	W
12/22/2019	16	SEA	11	18	61.1	118	6.6	1	0	6	40	6.7	0	12.72	W
12/29/2019	17	LAR	26	42	61.9	325	7.7	2	2	2	0	0	0	13.00	L

AVG of all of 2019	17.83
AVG of COD WKS of 2019	18.35
AVG of Non-COD WKs of 2019	17.31

Chart 1

When the data is plotted onto a graph it is easier to see what is occuring in fantasy football for Kyler Murray and the correlations that occurred. In the graph, labeled “Graph 1”, it displays all the fantasy points for Murray during the 2019 season along with distinct lines to demonstrate what is occurring with the points. First the range of the fantasy points can be seen as [6.96, 28.8], additionally the different points as color coordinated, first the green points are the Non-COD Weeks and then the red points are all the COD Weeks. Even though the 2019 season disproves my hypothesis about Murray and his fantasy points having a downward correlation with COD Weeks it still provides an opening look into my theory. As it can be seen that for the first 5 weeks the data line for the COD Weeks was below the, black, mean line while the Non-COD Weeks line stays almost exactly at the mean line and only begins to drop at the week 7 game against the giants which the reason for this occurrence was previously stated. In addition, when looking at the graph it is visible that many of the games below the mean line occurred during the COD Weeks. Additionally, the standard deviation for the COD Weeks equates to 6.04, while the Non-COD Weeks standard deviation sits at 7.54, and all weeks sit at 6.80, which shows that Murray was more consistent during the COD Weeks nonetheless the succeeding seasons hopefully may aid in proving my hypothesis.

2020 Season

In the preceding year, 2020, it is possible to see the best example of my hypothesis especially when looking at the following chart, labeled “Chart 2”, and the following graph, labeled “Graph 2”. This year shows the greatest example of my hypothesis with the average of all of 2020, or the mean, being 5.62 fantasy points higher than the average of the COD Weeks. Additionally, there was a

whopping 8.99 point differential between the COD Weeks and the Non-COD Weeks. Furthermore, the average passing yards for 2020 is 248 yards while the average passing yards on COD Weeks is 225. Additionally, for Non-COD Weeks the average passing yards is 262 which is a nearly 40 yards per game difference when compared to the COD Weeks.

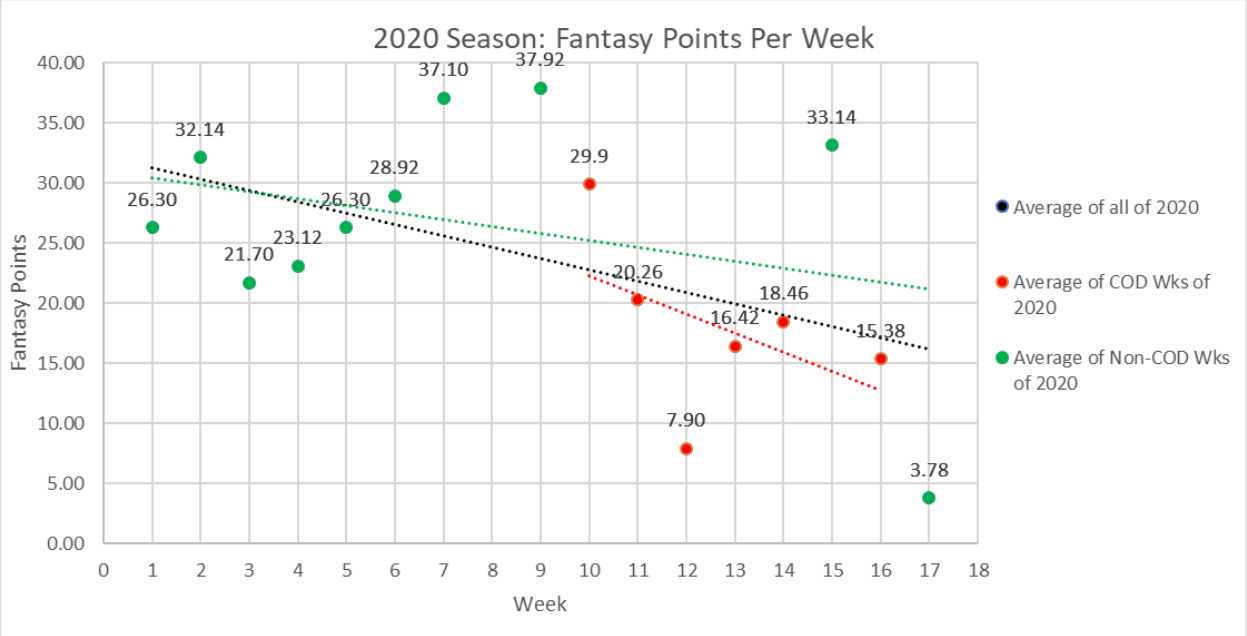
	YEAR 2020		PASSING							RUSHING				POINTS	RESULT
GAME	Week	OPP	CMP	ATT	PCT	YDS	AVG	TD	INT	ATT	YDS	AVG	TD	FPTS	W/L/T
9/13/2020	1	SF	26	40	65	230	5.8	1	1	13	91	7	1	26.30	W
9/20/2020	2	WAS	26	38	68.4	286	7.5	1	1	8	67	8.4	2	32.14	W
9/27/2020	3	DET	23	35	65.7	270	7.7	2	3	5	29	5.8	1	21.70	L
10/4/2020	4	CAR	24	31	77.4	133	4.3	3	0	6	78	13	0	23.12	L
10/11/2020	5	NYJ	27	37	73	380	10.3	1	1	9	31	3.4	1	26.30	W
10/19/2020	6	DAL	9	24	37.5	188	7.8	2	0	10	74	7.4	1	28.92	W
10/25/2020	7	SEA	34	48	70.8	360	7.5	3	1	14	67	4.8	1	37.10	W
BYE	8	BYE WEEK VOID OF DATA													
11/8/2020	9	MIA	21	26	80.8	283	10.9	3	0	11	106	9.6	1	37.92	L
11/15/2020	10	BUF	22	32	68.8	245	7.7	1	1	11	61	5.5	2	29.90	W
11/19/2020	11	SEA	29	42	69	269	6.4	2	0	5	15	3	0	20.26	L
11/29/2020	12	NE	23	34	67.6	170	5	0	1	5	31	6.2	0	7.90	L
12/6/2020	13	LAR	21	39	53.8	173	4.4	3	1	5	15	3	0	16.42	L
12/13/2020	14	NYG	24	35	68.6	244	7	1	0	13	47	3.6	0	18.46	W
12/20/2020	15	PHI	27	36	75	406	11.3	3	1	8	29	3.6	1	33.14	W
12/26/2020	16	SF	31	50	62	247	4.9	0	1	8	75	9.4	0	15.38	L
1/3/2021	17	LAR	8	11	72.7	87	7.9	0	0	2	3	1.5	0	3.78	L

AVG of all of 2020	23.67
AVG of COD WKS of 2020	18.10
AVG of Non-COD WKs of 2020	27.04

Chart 2

Despite all things previously stated being true an outlier can still be seen, as in all statistical analysis there is prone to be one, for this season the outlier shows Murray putting up almost 30 points with a whopping win against the Buffalo Bills on the week that the full *Call of Duty* game dropped in stores, for this things can always be assumed such as he didn't play the game yet because it only released two days prior Even with accounting for this data point as a regular point and not an outlier the data clearly shows a downward trend with all except one point for the COD Weeks. These data points were not only below the mean line, but the data points for COD Weeks were nearly every one of Murray's worst games. This season single handedly caused the NFL to observe these occurrences and question the same question that I had at the beginning of this paper, and because of this it caused a clause in Murray's professional contract, called the "Homework Clause." The "Homework Clause" stated that Murray would have to watch at least four hours of film a week, this clause was added to try and limit his time spent on *Call of Duty* (Traina). This season, Murray and the Cardinals would have a 8-9 overall record with a 47% win rate. However, he had just a 2-4 record with a 33% win rate during COD Weeks, so not only is Murray being detrimental to his own statistics because of his necessity to play *Call of Duty* but he is also harming his team as the Cardinal's win rate drops lower by a whole 14% on COD Weeks. The standard deviation of Murrays points during COD Weeks in 2020 was 7.19, while the Non-COD Weeks sat at 9.85, and all weeks sat at 9.78. Interestingly, it

seems as if even though Murray scored less points on average in 2020, he was more consistent compared to all weeks, and the Non-COD Weeks. During this season, Murray's fantasy points fluctuate a lot with the range of his points being [3.78, 37.92], coincidentally these points happen to both occur on a non call of duty week as the 3.78 points is another outlier that occurs during this season. Though this outlier is accounted for I will discuss it further during my discussion of limitations.



Graph 2

2021 Season

The following year was the 2021 season and a large upset for Kyler Murray and the Cardinals as Murray had to miss four games because of an ankle injury that occurred during the week eight game versus the Green Bay packers (Fragoza). Even though many of the data points that could be collected this season during COD Weeks had no data due to the injury, this season supports my hypothesis as the chart, labeled "chart 3", and the graph, labeled "graph 3" show that the averages of the COD Weeks is lower than the other two averages. The mean of this season was 22.42 which was a whole 3.14 points ahead of the average of the COD Weeks which sat at 19.28. Additionally, like with the 2020 season, an even better demonstration is the fact that the Non-COD Weeks are 5.1 points ahead of the COD Weeks. Murray's fantasy points were not as spread out as they were in previous seasons with the range of this data only being [12.58, 33.56]. Murray's Cardinals win-loss record this season 11-7 record this season is tremendously better than the last season as Murray is beginning to settle into his position as the starting quarterback. The Cardinals plan to keep Murray

starting at this position for years to come. Additionally, the standard deviation aids my hypothesis better this season as the COD Weeks had a standard deviation of 7.42 while the Non-COD Weeks had a standard deviation of 6.13 and all weeks had a standard deviation of 7.49. This standard deviation does support part of my hypothesis as the COD Weeks was a higher standard deviation than the Non-COD Weeks. The Cardinals went on a seven game win streak until week eight when Murray was injured, even when Murray was not playing because of his injury, the backup quarterback, Colt McCoy, was able to win two out of the three games he played, effectively keeping the Cardinals with a good win rate on the season (Urban). The win-loss ratio for the COD Weeks that Murray played in this season was 3-2 or a 60% win rate compared to the 61% win rate for the year. These numbers are very similar this year as Murray is decreasing his detriment to his team's statistics and only is causing issues to his own statistics.

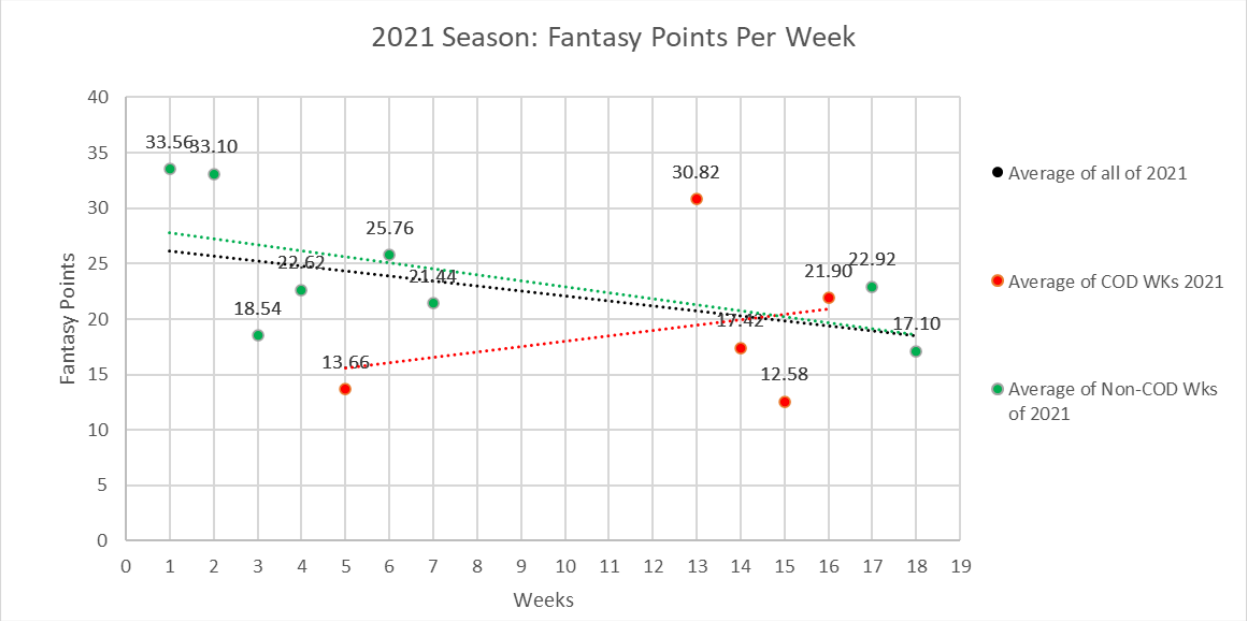
	YEAR 2021		PASSING							RUSHING				POINTS	RESULT
GAME	Week	OPP	CMP	ATT	PCT	YDS	AVG	TD	INT	ATT	YDS	AVG	TD	FPTS	W/L/T
9/12/2021	1	TEN	21	32	65.6	289	9	4	1	5	20	4	1	33.56	W
9/19/2021	2	MIN	29	36	80.6	400	11.1	3	2	5	31	6.2	1	33.10	W
9/26/2021	3	JAX	28	34	82.4	316	9.3	0	1	7	19	2.7	1	18.54	W
10/3/2021	4	LAR	24	32	75	268	8.4	2	0	6	39	6.5	0	22.62	W
10/10/2021	5	SF	22	31	71	239	7.7	1	0	7	1	0.1	0	13.66	W
10/17/2021	6	CLE	20	30	66.7	229	7.6	4	0	7	6	0.9	0	25.76	W
10/24/2021	7	HOU	20	28	71.4	261	9.3	3	1	6	10	1.7	0	21.44	W
10/28/2021	8	GB	22	33	66.7	274	8.3	0	2	6	21	3.5	0	9.06	L
11/7/2021	9	SF	OUT FOR INJURY VOID OF DATA												W
11/17/2021	10	CAR													L
11/21/2021	11	SEA													W
BYE	12	BYE WEEK VOID OF DATA													
12/5/2021	13	CHI	11	15	73.3	123	8.2	2	0	10	59	5.9	2	30.82	W
12/13/2021	14	LAR	32	49	65.3	383	7.8	0	2	7	61	8.7	0	17.42	L
12/19/2021	15	DET	23	41	56.1	257	6.3	1	1	4	3	0.8	0	12.58	L
12/25/2021	16	IND	27	43	62.8	245	5.7	1	0	4	74	18.5	0	21.90	L
1/2/2022	17	DAL	26	38	68.4	263	6.9	2	0	9	44	4.9	0	22.92	W
1/9/2022	18	SEA	28	39	71.8	240	6.2	1	0	5	35	7	0	17.10	L

AVG of all of 2021	22.42
AVG of COD WKS of 2021	19.28
AVG of Non-COD WKs of 2021	24.38

Chart 3

Though the numerical values can clearly show a large drop in fantasy points during these weeks, in the graph, "graph 3", below, isn't as well shown, this is caused for multiple reasons. The first reason being that on the graph there is once again a clear outlier, being very high above the mean line, this causes the trendline for the average of the COD Weeks in 2021 to trend upwards towards the end of the season. The second reason is because of the four week period, five if the bye week is taken into account, there was no data as Kyler Murray was on the sideline, as he could not play with his injury. Though this is purely speculation, I believe that if Murray was to play during those weeks, as they were COD Weeks, the data would be more sufficient to show on the graph my hypothesis. Additionally, I believe there would be no upwards trend that crosses over the mean line. The green

line, which depicts the average during Non-COD Weeks, is almost on the mean line other than at the beginning because of the first two games being the two highest scoring games this year. This year supports my hypothesis when just looking at the numerical values. When plotted on a graph, it discredits my hypothesis as the trendline of the COD Weeks is the only trendline that has a positive slope while Murray played a majority of the season. Though the data was skewed because of the weeks Murray missed for injury. Sadly, like with 2019, the 2021 season disapproves my hypothesis once the graph is taken into account.



Graph 3

2022 Season

The 2022 season is the final season that will be analyzed, the main concern with the 2022 season is the fact that Murray missed nearly half the season with two separate injuries, including an ACL tear which forced him to go into surgery and may not even be able to play some, or all, of next season. On top of this the rules of Kyler Murray's contract are starting to take effect, or in more specific terms, the “Homework Clause” which causes him to spend multiple hours a week studying film (Urban). This causes Murray to not have the ability to play as much *Call of Duty*, or focus his time on streaming *Call of Duty* on his Twitch channel. This season so far at week 17 the Cardinals have a 4-12 win-loss record while having a 2-3 win-loss record during COD Weeks that puts them at a 25% win rate overall and a 67% win rate on COD Weeks. This completely disproves a hypothesis as there is a 42% higher win rate on COD Weeks. This is very significant as this year is when the “Homework Clause" is taking effect and presumably causing Murray to focus even harder during

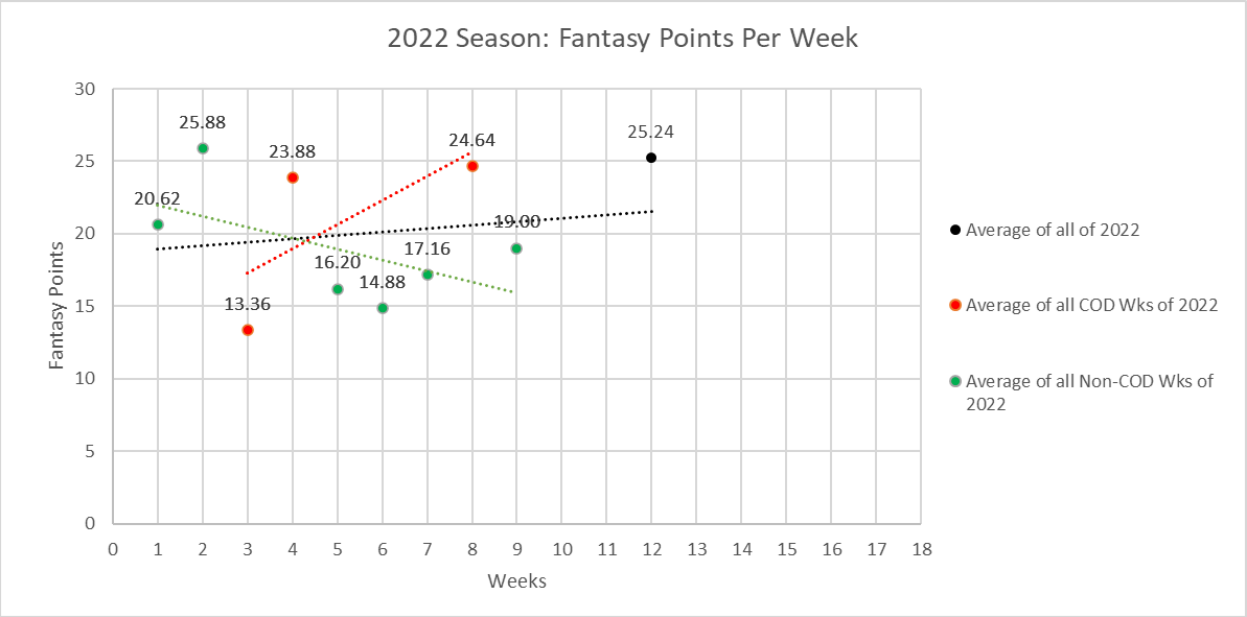
weeks that the NFL and the Cardinals would be focusing on his statistics . The chart and graph below are labeled, “chart 4” and “graph 4” , which both demonstrate the data that can be collected by week 17 that had occurred last week.

	YEAR 2022		PASSING							RUSHING				POINTS	RESULT
GAME	Week	OPP	CMP	ATT	PCT	YDS	AVG	TD	INT	ATT	YDS	AVG	TD	FPTS	W/L/T
9/11/2022	1	KC	22	34	64.7	193	5.7	2	0	5	29	5.8	0	20.62	L
9/18/2022	2	LV	31	49	63.3	277	5.7	1	1	5	28	5.6	1	25.88	L
9/25/2022	3	LAR	37	58	63.8	314	5.4	0	0	2	8	4	0	13.36	W
10/2/2022	4	CAR	23	32	71.9	207	6.5	2	1	12	26	2.2	1	23.88	W
10/9/2022	5	PHI	28	42	66.7	250	6	1	1	4	42	10.5	0	16.20	L
10/16/2022	6	SEA	23	37	62.2	222	6	0	1	10	100	10	0	14.88	L
10/20/2022	7	NO	20	29	69	204	7	1	0	7	30	4.3	0	17.16	W
10/30/2022	8	MIN	31	44	70.5	326	7.4	3	2	6	36	6	0	24.64	L
11/6/2022	9	SEA	25	35	71.4	175	5	2	0	8	60	7.5	0	19.00	L
11/13/2022	10	LAR	OUT FOR INJURY VOID OF DATA												W
11/21/2022	11	SF													L
11/27/2022	12	LAC	18	29	62.1	191	6.6	2	1	7	56	8	1	25.24	L
BYE	13	BYE WEEK VOID OF DATA													
12/12/2022	14	NE	OUT FOR INJURY VOID OF DATA												L
12/18/2022	15	DEN													L
12/25/2022	16	TB													L
1/1/2023	17	ATL													L
1/8/2023	18	SF													TBD

AVG of all of 2022	20.09
AVG of COD WKS of 2022	18.35
AVG of Non-COD WKs of 2022	20.09

Chart 4

Murray had to miss nearly half of the season with injuries, yet it still shows the hypothesis very limitedly when only looking at numerical values as there is only a 0.175 point difference between Non-COD Weeks and COD Weeks. On top of this limited demonstration of my hypothesis numerically, the graph does not prove the hypothesis. As the average of the COD Weeks trendline actually trends upwards and has a positive slope with a much higher value than the mean line of all weeks. On top of this two of the three highest points in the data was taken on COD Weeks, yet to counteract this fact the lowest score was also taken on a “*Call of Duty* week”. The standard deviation for COD Weeks was 6.30, while the standard deviation for Non-COD Weeks was 4.32, and all weeks was 4.63 completely disapproving my hypothesis. The range of this graph is [13.36, 25.88] and I predict that with more data during the weeks Murray was injured this could have also proven my hypothesis. Although there is insufficient data to conclude anything about the 2022 season, I believe that, based on Murray’s other seasons, I would be able to conclude with a high level of certainty that *Call of Duty* does impact Murray’s Fantasy points and consistency, yet the magnitude is unclear.



Graph 4

Conclusion

After undergoing a more extensive collection and analysis of data, one can easily see my hypothesis is relatively accurate. It was shown that, generally, Murray's fantasy point averages were lower on COD Weeks than both Non-COD Weeks, and the average of all of the weeks in the season. Though when looking at the data and analysis as a whole it demonstrates my hypothesis to an extent. Looking at the values of the averages of the COD Weeks one can see that the averages fall into a range of (18.05, 19.28). This is extremely interesting to me as during a "*Call of Duty* week" Kyler Murray's fantasy points were very consistent with a range of only 1.23. This is very interesting to note as even though he was very consistent in his amount of points gained on average every season, it was consistently a worse amount of points than the rest of the season. Which can be shown through standard deviation as the standard deviation of COD Weeks of the four seasons was 6.42 which is much lower than both the Non-COD Weeks, 8.19, and all the weeks of the four seasons, 7.79. This completely disproves part of my hypothesis about Murray being less consistent during COD Weeks. Additionally, my hypothesis can be proven fully when looking at the mean of all four seasons combined as the COD Weeks had an mean of 18.79 points a whole 3.72 points lower than the Non-COD Weeks, 22.51, and 2.02 points lower than all weeks of the four seasons, 2.02. The exploration does answer my question as it can show different effects of personal events on NFL players especially when looking at the effect of *Call of Duty* on Murray's statistics as Murray's points are lower during these weeks, and are on the lower side of his true potential. Though one part of my

hypothesis was disproved as Murray is actually more consistent during COD Weeks, albeit consistently worse.

Limitations

The exploration does contain a few limitations due to some factors that will be analyzed. The first limitation occurs with the amount of data collected, a small sample size of four seasons of Kyler Murray's career. The small sample size, the results of my analysis cannot be precisely accurate; if there was a larger sample size I could come to a more precise and accurate conclusion. Furthermore, there are multiple gaps in my data; may it be the three injuries that occurred in back-to-back seasons that caused Murray to miss 10 total weeks, four of which were COD Weeks. The exploration was focused on one player and one team. Including instances of speaking on another player's statistics in correlation to personal life events. Finally, there are too many variables to account for in every game, such as weather, strength of defense, whether or not key players to the team are missing, and games that Murray underperforms in which results in outliers. With these factors considered, if I were to do this research again, I would aim to study at least four additional players concurrently with Kyler Murray. I would also take more variables into account when doing my analysis of the data.

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