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Skill-Based Matchmaking in the *Call of Duty* Franchise

Skill-based matchmaking is a mechanic that has been in the *Call of Duty* franchise since *Call of Duty: Black Ops II* but hasn't been noticed that much until now. *Call of Duty: Modern Warfare*, released August 23, 2019, introduced a newly updated skill-based matchmaking system. This system's overall idea is to get players with similar skill levels in the same lobby; therefore, reducing the chance of skilled players getting matched with casual players. It should work by gathering data from players, such as killing death averages, scoring per minute, and level; this might sound like a good implementation, but it's only beneficial to casual players since they are not affected by it much. On the other hand, skilled players always get into matches with "try-hards" this might sound like a fair system. Still, after playing for two hours as if you were a pro-player, it gets infuriating, since every time you do well, the game punishes you by putting you in harder lobbies. This system would work perfectly if the *Call of Duty: Modern Warfare* had a ranked or skill-based specific playlist, but it doesn't, so players don't have the choice to play against casual players or ranked and experienced players. Although the developers of *Call of Duty* haven't acknowledged that skill-based matchmaking hasn't been reworked and redone from how it was in *Black Ops II*, the community can notice the changes. From this whole year of playing *Call of Duty: Modern Warfare*, it is obvious that skill-based matchmaking has been updated, and it looks like it's set to stay since both the alpha and beta of this year's *Call of Duty*, *Call of Duty: Black Ops Cold War* seemed to feature this system.

Activision hasn't acknowledged or explained why skill-based matchmaking was reworked and updated for *Call of Duty: Modern Warfare* and future titles. But I could assume it was redone so new players aren't matched with skilled players. This new system is an improvement for new players since they will not get matched with very skilled players the first few matches, therefore allowing *Call of Duty* to have a longer player retention. Skill-based matchmaking is the "perfect" solution for new to be "shielded from skilled players" (Lucien, 2020). Lucien further explains how important player retention is in the video game industry. Player retention makes it possible for games to build a "long lasting relationship with players"(Lucien, 2020). *Call of Duty: Warzone*, one of the game modes available in *Call of Duty: Modern Warfare*, is a free-to-play battle royale which is available for any one to download for free without purchasing *Modern Warfare's* full game. Skill-based matchmaking is an essential system for new players who download *Warzone* since they are guaranteed to get into matches with new, or less skilled players. With *Warzone* players getting into matches with new players, it makes it possible for them to have a chance to compete, therefore making the game more enjoyable, and making it possible for the game to make more money. Aside from "sheltering new players from skilled players"(Lucien, 2020), the end goal for skill-based matchmaking is to increase the retention rate and increase their revenue from in-game purchases.

Youtube content creators such as Drift0r have analyzed how skill-based matchmaking works. He worked alongside TheXclusiveAce to see how skill-based matchmaking worked and the significant statistics *Call of Duty: Modern Warfare* took into account when making lobbies. Their testing was built around multiple games and hundreds of data entries. From their analysis, matchmaking prioritized player's ping and internet connection over statistics; this is good since this system won't affect player's internet connection to prioritize skill-based matchmaking, so if

there aren't many good players in a certain region, skill-based matchmaking won't make a big impact on matchmaking. Since every match is "broken" after each game, meaning players are less likely to play against the same players in their previous match, Drift0r and TheXclusiveAce thought that skill-based matchmaking worked by taking players kill death ratio and score per minute, but this was not the case. Table 1 shows how the average K/D was 1.12 of a player's lobby with a K/D of 3.94. This data doesn't make sense since one would assume that the average K/D of a skilled player's lobby should be higher than one and closer to that player's K/D. From Drift0r's conclusion, he assumes that matchmaking considers more than just a player's public statistics. It has sort of a ranking system that is not visible to the public. This system makes it possible for players to average a 1 K/D in every lobby since they are all the same skill level. The kill death ratio averages out to 1 since every player has similar playstyles and total kills in the match. Suppose there is an outlier, and a player performs higher than expected. In that case, the system recognizes that the player is better than that group of players and "increases" their "rank." Hence, their put into a lobby with better players.

This system affects skilled players more than the casual player. I play with a variety of players, from casual to skilled. One of the players I play with is a very casual player; he usually plays between 6-8 hours a week. When I asked him if he noticed SBMM (skill-based matchmaking) in the game, he asked me, "what is that?" (Bartels); once I explained it, he told me he didn't notice a difference in lobbies; all his lobbies are usually "not bad" (Bartels). Usually, when I play with him, the first lobbies are easy. I'm usually at the top of the leaderboards. Still, about after five matches, I notice a change in lobbies since skill-based matchmaking starts taking into account my statistics over his, even though I'm not the host of the party. Whenever that

Table 1

Account	LVL of Account	KD of Account	SPM of Account	WIL of Account	KD of Account (Past 5)	AVG LVL of Lobby	AVG KD of Lobby	AVG SPM of Lobby	AVG WIL of Lot	AVG KD of Lobby (Past 5)	Correlations by stat	
D_r_a_f_t_3_r	43	0.81	207	0.61	1.34	69	1.00	170	1.00	1.24 LVL		0.90
Xclusive	13	0.93	173	1.33	0.77	44	0.93	134	0.92	1.03 KD		0.43
Rockhead333	88	1.05	72	0.62	1.07	84	1.13	162	1.05	1.12 SPM		-0.12
Drift0r_x	155	1.21	142	1.07	1.29	90	1.13	201	1.13	1.39 WIL		0.20
TheXclusiveAce	129	1.89	298	2.27	2.15	77	1.18	160	1.11	1.41 KD AVG Past 5 games		0.83
BigFatMoose68	155	3.94	189	1.1	1.53	100	1.12	193	1.18	1.35		

starts happening, I see a drop in my kills and his since he gets put into lobbies that are with people with higher skill than him; usually, the emotions that are felt after this happens are frustration, and anger, since the skill level of the lobbies increase because one of us start to play well. We then have to start trying to compete, and if we are successful at "competing," the game "punishes" us since we get put into harder lobbies.

Another example is when I play with a more skilled player, lobbies start hard. Even though his kill death ratio is 0.99, which is not that good compared to others, the system doesn't consider that number; it takes his and my last five games and matches similar statistics. Once we start playing well against good players, we already know we will be put against better and better players and ready to play "competitively" even though we don't. The game doesn't provide us with a rank to show off. Whenever we get into "easy" matches, the first thing that comes to our mind is, "Great, now we will be put against better players." This "mindset" shouldn't be a part of a casual match; this stress skilled players have shouldn't be a thing. Even some professional players agree that there should be a specific playlist for "try hards" to go and play as if it was a professional match.

Professional player Seth (Scump) Abner expressed his opinion on the alpha of *Call of Duty: Black Ops Cold War*; "SBMM does not belong in *Call of Duty*. There should be a ranked playlist for people to sweat in. I'm not trying to play Scuf wielding game fuel chugging demons with szn in their psn on Miami TDM. Also, to the noobies that are gonna cry about this tweet, hold this choppy gunny" (Abner). Although being a professional player, there was no reason for an alpha of the game to show significant skill-based matchmaking signs. The system was able to determine the player's ability and skill in a short time played and accurately placed them into lobbies. *Call of Duty: Black Ops Cold War* has gone through different testing periods for the

public; there was an Alpha and a Beta. During the alpha, it was only available for PlayStation players. The matchmaking system seemed similar to older Call of Duty's since the lobbies wouldn't break after each game, so it made it seem that skill-based matchmaking wasn't going to be a part of the game. Still, after further playing through the weekend, players started to feel skill-based matchmaking when leaving games and returning later in the day.

On the other hand, the beta implemented the same matchmaking system as *Call of Duty: Modern Warfare*; after each game, the lobby would break and pair players with the same skill or better players. This gave players a sense of how the game would play out when it comes out on November 13, 2020; this matchmaking made players complain since it has been an "issue" for skilled players for a whole year now. The realization of skill-based matchmaking being a standard now in the Call of Duty franchise upsets some players since Activision, the parent company and developer hasn't made any official statements on how skill-based matchmaking works. This "ghosting" from Activision makes it possible for players to assume and make false assumptions on how this system works. Suppose we briefly told how the system works. In that case, we, as a community, could probably accept it more since Activision would own up to this system and possibly explain how it works.

Black Ops Cold War could implement a ranked playlist and remove skill-based matchmaking from the regular modes, but that wouldn't solve the problem since skilled players would be able to play against casual players and abuse those lobbies sort of how it was before *Call of Duty: Modern Warfare*, one way that Treyarch could "fix" this is by forcing skilled players to play on this ranked playlists, but that would make it unfair for good players to be forced into trying and playing competitively every single game. In my opinion, the best solution would be to leave skill-based matchmaking how it is and implement a public reward

system or rank system that lets players show off what "rank" they are and make it public so if a player is really good in a lobby, every other player knows their rank and can decide if they want to play in that lobby or not. This system would help both casual players and skilled players since it could be used to show a "rank" and progression system, so players know if they're getting better or worse. It would help casual players by showing improvement in their gameplay and, on the other side, help skilled players sort of "cherry-picking" lobbies. If Activision lets us know how skill-based matchmaking, there could be a downside since players would be able to better learn the algorithm and go against it and find loopholes to bypass it and find ways to get put in lobbies with less skilled players. Right now, there is a way of reverse boosting, where players can do bad intentionally for two or three matches and get put into easier matches for the next five matches. However, this is sort of temporary since good players will always play well without realizing it. They can't reverse boost forever. If Activision were to put this information, public players could "reverse boost" the algorithm and put the whole system vulnerable. The game would be in a worse state than it is now.

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