

Loot Boxes: Examining Gambling in Video Games

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction:

Video games are massively popular, with over three billion people actively playing games each year (Gilbert, 2020). While games serve as a common outlet for fun, they also have many different monetization techniques. Some of the techniques take the form of unregulated gambling. The most common form of gambling in video games is loot boxes, where players spend the in-game currency or real money to have a random chance of obtaining in-game items. In some games, these items can be bought, sold, or traded for real-world currency. This secondary market makes the loot boxes similar to slot machines, except video games can be accessed from a user's phone. But unlike traditional gambling, which is heavily regulated and requires users to go to a physical location, gambling in video games has very little regulation and can be accessed from anywhere.

This raises huge ethical concerns since gambling addiction is extremely damaging, having one of the highest suicide rates of any addictive disorder (Gordon-Davis, 2022). This is made even worse by the fact that many games' primary user base is children who may lack the cognitive and emotional maturity to fully understand the risks and consequences of gambling. In addition, children have less impulse control and are less likely to understand the long-term consequences of spending money (Gordon-Davis, 2022). Lastly, video games are often a way for children to interact socially, which means that for a child or their parents to remove them from situations that involve gambling, they may face social isolation.

Despite these ethical problems, some online gaming communities view loot boxes very positively. This paper aims to explain the difference and similarities between loot boxes and traditional gambling, both in their perception, ethical concerns, and legality.

The Mechanics of Loot Boxes:

Loot boxes are items that allow the user to acquire in-game items through a game of chance. Loot boxes can also be called crates, packs, or containers. Loot boxes are either purchased with real money, in-game currency, or earned through some in-game mechanic. There are two types of loot boxes cosmetic and gameplay altering. Cosmetic loot boxes give players a way to alter their in-game character, items, or world's appearance without locking any gameplay behind the need to gamble. Gameplay-altering loot boxes are different in that some weapons, abilities, or other gameplay features are locked behind loot boxes. This means that core aspects of the game are locked behind gambling.

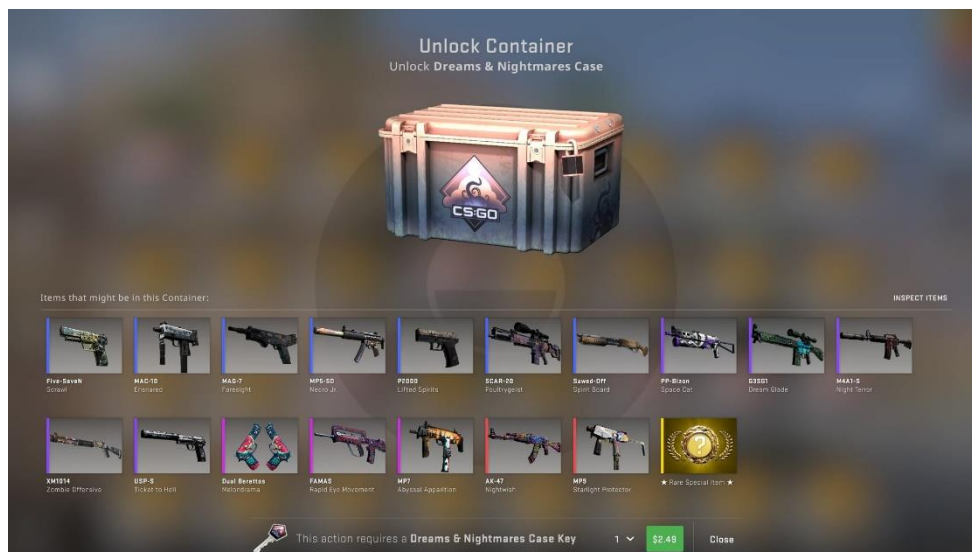


Figure 1: CS GO case opening screen.

In figure 1, shown above, a case from Counter Strike Global Offensive can be seen. The case contains weapon skins, which do not provide any gameplay advantage. Instead, the weapons skins are purely cosmetic replacing the skinless weapons. All players are given skinless weapons for free. This means cases in Counterstrike are cosmetic loot boxes, not gameplay-altering.

In figure one, the rarity of skins in the case is indicated by the colored bar to the left of each weapon's image. Weapon skins with a blue bar are the most common with a drop rate of 79.92%, purple skins 15.98%, pink 3.2%, red .64%, and gold .26% (Morris, 2023). As shown in figure 2, cases can be earned through gameplay or purchased on the steam marketplace, regardless of player age. In addition to owning a crate the player must purchase a key, these keys cannot be earned through gameplay or purchased

NAME	QUANTITY	PRICE
Dreams & Nightmares Case Counter-Strike: Global Offensive	143,589	Starting at \$1.31
M4A1-5 Foresight (Field-Tested) Counter-Strike: Global Offensive	4,002	Starting at \$0.09
M4A1-5 Night Terror (Field-Tested) Counter-Strike: Global Offensive	5,341	Starting at \$0.98
USP-S Ticket to Hell (Field-Tested) Counter-Strike: Global Offensive	5,102	Starting at \$0.71
MPS-SD Necro Jr. (Well-Worn) Counter-Strike: Global Offensive	2,121	Starting at \$0.10
SCAR-20 Poultrygeist (Field-Tested) Counter-Strike: Global Offensive	2,146	Starting at \$0.09
P2000 Lifted Spirits (Well-Worn) Counter-Strike: Global Offensive	2,486	Starting at \$0.09
MAC-10 Ensnared (Field-Tested) Counter-Strike: Global Offensive	2,617	Starting at \$0.10
P2000 Lifted Spirits (Field-Tested) Counter-Strike: Global Offensive	2,017	Starting at \$0.10
Five-Seven Scrawf (Field-Tested) Counter-Strike: Global Offensive	3,869	Starting at \$0.09

Figure 2: CS:GO's Official Secondary Market

from the market. Instead, they have a fixed price as shown at the bottom of image one. Weapon skin values in this case range from as low as \$0.09 to as high as seven thousand dollars for the rarest skins.



Figure 3: In-game Screenshot Showing Free Skinless Weapon



Figure 4: In-game Screenshot Showing rare 3000-dollar skin.

History of Loot Boxes

Loot Boxes in video games get their roots from trading card games like Magic the Gathering and Pokémon (Wright, 2017). These games have varying mechanics but share one common feature in that players need certain cards, which can only be obtained by opening packs that have a random assortment of cards. If a player wants a specific card, they can only obtain it by opening more packs or trading cards in their collection with another player. Hence the name trading card game. This aspect made these games widely popular and profitable. For example, Magic the Gathering, one of the most profitable trading card games, brought in 1.1 billion dollars in revenue in 2022 (Schmidt, 2023).

The popularity of these games, combined with the scarcity of rare cards, caused certain cards to become highly demanded. This demand for certain rare cards led to secondary markets where cards could be bought and sold for real money (Schmidt, 2023). This meant that packs containing rare cards could be worth way more than the original price of the pack if they contained a rare card. This unintentionally turned these packs into a form of gambling for some users.

Despite the popularity and profit-making potential of these trading card games, it took over 20 years for them to show up in video games. The first major game to use loot boxes as a monetization effort was Valve's Team Fortress Two (Wright, 2017). Released in 2007 the game was initially unpopular, however after an update which made the game free-to-play, and added loot boxes the player base increase 500% and the revenue increased 1200% (Bishop, 2014). In this monetization model players would randomly receive loot crates by playing the game. However, in order to open these crates, the player must purchase a key for two dollars and fifty cents. These crates contained cosmetic items of varying rarities, which could be bought, sold,

and traded on the community marketplace. At the same time, sports games like FIFA were adding a different kind of loot box where players gambled for trading cards to assemble a team of virtual players. Better cards were rarer and, therefore, more sought after.

The addition of loot boxes as the main form of monetization in video games proved hugely successful leading to the video game loot box industry being worth 18.7 billion dollars, with 59% of the top mobile games and 36% of the top desktop games containing loot boxes (Zendle et al., 2020). During this time, many games shifted to a free-to-play model where the games were free to download and play. However, in-game items and cosmetics were locked behind loot boxes. By doing this, game publishers were able to gain a much bigger audience who might eventually spend more on loot boxes than they would have if the game was sold using the traditional pay-to-play model (Leaver & Willson, 2015).

Loot Boxes vs Gambling

Legally gambling is defined as "consist[ing] of three elements: consideration, prize, and chance" (Rose, 2014). Chance is a random event that is not considered a game of skill that affects your odds of winning. Consideration means the user must put up something of value to participate in the game of chance. A prize means that you can win something of value from the game.

Depending on the implementation of loot boxes into a game they can meet a variety of these three elements. The first element of gambling, consideration, is met if a loot box requires something of value to be put up to be opened or obtained. Therefore, if a game requires loot boxes to be purchased, or requires items to open the loot box, like in Counter Strike, then it

would meet the bar for consideration. The second element of gambling is prize. Prize in the context of loot boxes is met by the rewards that the loot box gives the player, particularly if a secondary market has formed around the rewards contained in the loot boxes. Lastly chance is met by every loot box since all loot boxes are random in nature with no skill involved in opening the loot boxes.

Despite online gambling being mostly illegal in the United States, and many implementations of loot boxes meeting the legal definition for gambling, loot boxes currently exist in a legal gray area. In some cases, video game publishers like Electronics Arts, have successfully argued that loot boxes do not contain anything of value. Therefore, they do not meet the definition of the prize within traditional gambling. This counter argument was accepted in a class action lawsuit against Electronics Arts where the judge threw out the claim against Electronics Arts, that the publishers loot boxes were a form an illegal gambling based on the fact the loot boxes lacked sufficient prize (Phillips, 2023). However, another lawsuit against Big Fish Casino, a mobile gambling game resulted in a judge ruling that the chips gambled in the game did constitute prize (Soper, 2020) . This was despite the fact the chips within the Big Fish Casino could be exchanged for real world money, and could only be used to continue playing the various games within the app. Therefore, it seems the legality of loot boxes within the United States is left in a legal gray area until more explicit regulation is regarding whether loot boxes are legally gambling.

Despite loot boxes existing in a legal gray area in the United States; other countries like Japan, the Netherlands, and Belgium have ruled that many implementations of loot boxes are gambling, and that loot box mechanics must be removed, or game publishers will be subjected to the gambling laws of the country. In the U.K., the gambling commission stopped short of

putting loot boxes under gambling regulation. However, they stated that children should be unable to purchase loot boxes without parental approval (Department for Digital, Culture, Media & Sport, 2022).

Regardless of the legality of loot boxes, there are many ethical concerns with allowing gambling to be both accessible and socially acceptable. One problem with online gambling is it makes it easier to spend money compared to having to travel to a physical casino. This can be shown in a study conducted by Sally Gainsbury which found that 40% of online gamblers were problematic compared to 20% of traditional gamblers (problematic gamblers were those who scored eight or higher on the Problem Gambling Severity Index).

Another ethical concern about gambling in video games is that video games are often a social activity. The social component could both lead to positive and negative outcomes. On the positive side some studies have shown that social gambling is associated with a lower rate of addiction and healthier gambling habits compared to gambling alone. For example, a study found that "People who gamble alone are more likely to gamble frequently, risk higher amounts of money, gamble for recreation, and be more at risk for problem gambling"(Salonen et al., 2018). The social component baked into many video games could potentially lower the risk of creating problem gamblers.

However, the addition of a social component into gambling is not always positive. In traditional gambling, a study showed that Asian immigrants facing social and cultural isolation, poverty, and high levels of stress turned to casinos for a sense of community and entertainment. This led to a higher rate of problem gambling in the Asian immigrant community compared to the general public (Colby et al., 2022). If this study held true for gambling in video games, it

could cause those with a predisposition to gambling addiction to stay addicted for longer as they would have a harder time quitting because their social group is exposing them to gambling.

Another major ethical concern of loot boxes in video games compared to traditional gambling is the higher risk of exposing children to gambling. Traditional casino gambling is age restricted in most states to people over the age of twenty-one. This blanket ban differs greatly from video games, where 93% of children report playing video games, and 40% of those 93% report opening loot boxes (Close & Lloyd, 2021). In fact, it was only in 2020 when the ESRB, a video game age rating board, began requiring games to self-label loot box mechanics. Despite this new requirement, games which contain loot boxes are still able to obtain the least strict rating, "E for everyone." For example, FIFA, which contains both loot boxes and a secondary market within the game, obtained an "E" rating in 2023. This is problematic because research has shown that children are at a higher risk for the development of gambling problems (Riley et al., 2021). Children lack impulse control and cost-reward capabilities when compared to adults. Because of this, society grants children certain protections recognizing their inability to fully comprehend certain situations. However, due to the lack of regulation children who play games like Counter Strike, are free to gamble with loot boxes and participate in the built in secondary market.

Research has already shown that children who used loot boxes had poorer mental health than their non-user counterparts. These results revealed the relationship between psychosocial problems and the use of loot boxes among adolescents (Irie et al., 2022). Although there have only been a few studies that focused on the negative health impacts of loot boxes, the results of these studies have mostly found similar negative results to the numerous studies on the general negative health impacts of gambling (Griffiths, 2019).

In these studies, on gambling, researchers compared individuals who do not have gambling problems to those with gambling issues. They found that individuals with gambling problems were more likely to have an unhealthy diet, engage in little physical exercise, experience poor overall health, use tobacco, consume high levels of alcohol, and were 2-3 times more likely to have poor mental well-being (Butler et al., 2019).

These ethical concerns are compounded by the aggressive and predatory nature of how game publishers have monetized their games. As previously mentioned, the explosion of loot boxes in gaming has coincided with a free-to-play model. This model has shifted revenue from a relatively equal split among the user base of the game to a much more exploitative model. In this model, 5% of spenders, or .15% of the general player base, bring in over 50% of a game's revenue (Mobile, 2014).

Methods

To gather more information on the attitudes of different video game communities toward loot boxes, this paper analyzed the sentiment of sixty reddit posts from three different game subreddits. The games chosen were Overwatch, Counterstrike: Global Offensive, and FIFA. These games were chosen because each implemented loot boxes in a different way and therefore differences in community sentiment may show how different loot box implementations are viewed. In Overwatch loot boxes were purely cosmetic and could be easily earned and opened for free. However, eventually the loot boxes were removed and replaced with a non-gambling-based system. In Counterstrike: Global Offensive the loot boxes were purely cosmetic and could be earned for free, however they required a payment of real-world currency to open. Additionally, Counterstrike: Global Offensive has a secondary market built into the game where players can buy and sell skins and loot boxes for real world money. Lastly FIFA was chosen

because of its similarity to the Counterstrike: Global Offensive loot box system, however the loot boxes were non cosmetic containing items that affected gameplay.

To gather reddit posts for sentiment analysis searches were conducted on google and reddit using relevant general keywords (e.g loot boxes, crates, and packs). For the Counterstrike: Global Offensive community posts were gathered both from /r/globaloffensive subreddit as well as the /r/csgo subreddit. The posts for the sentiment of the FIFA community were gathered from both the /r/FIFA subreddit and the /r/games subreddit. The overwatch posts were gathered from the /r/Overwatch and /r/Overwatch2 subreddits. The analysis looked for common themes between posts and the comments on those posts, as well as individual posts with relevant information to the paper.

Perception

The first community looked at was the Counter Strike community. In the Counter-Strike community, opening cases is almost universally seen as gambling. I found a small sentiment that argued because you are guaranteed something out of the case, it is not gambling, but the most common and most upvoted posts comments agreed about cases being a form of gambling. That is not to say that users want the cases removed; most posts agreed that the growth in player population was in large part due to the addition of weapon skins and cases. However, there was a common sentiment about the potential for addiction from case unboxings, which is a particular concern for adolescent players. I found numerous posts where people vented their addiction to opening cases, often with people in comments sharing similar stories. Some even detailed the negative effects case openings had on their relationships with their wives and kids.

The sentiment from the FIFA community was similar in that players seemed to view pack openings as gambling. One post received 1,600 upvotes detailing how the user thought that the pack system was creating gamblers and how they thought the system was predatory. The overall sentiment about the inclusion of loot boxes seemed much more negative. This mostly seemed to stem around packs in FIFA provide a gameplay advantage, whereas, in Counterstrike, they are cosmetic only.

The last community I looked at was Overwatch, which has since had loot boxes removed from the game and had a much different reaction than the other communities. The overwatch subreddit seemed to be almost no posts complaining about addiction or problematic behavior. Additionally, there seemed to be a trend of posts that missed loot boxes after they had been removed from the game. The main sentiment seemed to stem from the fact that loot boxes in the game had a high chance of gifting rare cosmetic items and, as such, lacked a secondary market. Additionally, loot boxes could be earned and opened just by playing.

Conclusion

In conclusion, loot boxes share many similarities with traditional gambling, both in terms of their mechanics and the ethical concerns surrounding them. These concerns are heightened by the fact that video games are accessible to a wide audience, including children who may not fully understand the risks associated with gambling. While the legal status of loot boxes remains in a grey area in many jurisdictions, some countries have already taken passed legislation to regulate or ban them due to their potential negative impacts on mental health and well-being. The perception of loot boxes within gaming communities varies, but there is a consensus that they can be potentially harmful. From my research of online communities, I have found loot box

mechanics which incorporate a secondary market to be of more harm to their communities.

However, further research is required to provide a more quantitative measurement of this impact.

As the gaming industry continues to grow and evolve, it is crucial for researchers, lawmakers, and game publishers to work together in addressing the ethical concerns associated with loot boxes and gambling mechanics. By regulating access to loot boxes, lawmakers could help strike a balance between the monetization needs of game publishers and the well-being of players, particularly younger and more vulnerable individuals.

References

- Bishop, T. (2014, December 7). *How valve experiments with the economics of video games*. GeekWire. <https://www.geekwire.com/2011/experiments-video-game-economics-valves-gabe-newell/>
- Burns, W. (2018, February 18). *States With Legal Betting: Which States Allow Online Gambling?* BettingUSA.com. <https://www.bettingusa.com/states/>
- Butler, N., Quigg, Z., Bates, R., Sayle, M., & Ewart, H. (2019). Gambling with Your Health: Associations Between Gambling Problem Severity and Health Risk Behaviours, Health and Well-being. *Journal of Gambling Studies*, 36(2), 527–538.
<https://doi.org/10.1007/s10899-019-09902-8>
- Close, J., & Lloyd, J. (2021). *Lifting the Lid on Loot-Boxes Chance-Based Purchases in Video Games and the Convergence of Gaming and Gambling*.
https://www.begambleaware.org/sites/default/files/2021-03/Gaming_and_Gambling_Report_Final.pdf
- Colby, M. H., Hires, B., Le, L., Sauma, D., Yau, M. Y., Chu, M. T., & Rubin, H. L. (2022). Unpacking the root causes of gambling in the Asian community: Contesting the myth of the Asian gambling culture. *Frontiers in Public Health*, 10.
<https://doi.org/10.3389/fpubh.2022.956956>
- Counter-Strike: Global Offensive [Video Game]. (2012). Valve

- Gainsbury, S. M. (2015). Online Gambling Addiction: the Relationship Between Internet Gambling and Disordered Gambling. *Current Addiction Reports*, 2(2), 185–193.
<https://doi.org/10.1007/s40429-015-0057-8>
- Gilbert, N. (2020, February 3). *How many active video gamers were there in 2020? There were 2.69 billion video game players worldwide in 2020.* Financesonline.com; FinancesOnline.com. <https://financesonline.com/number-of-gamers-worldwide/>
- Gordon-Davis, C. (2022, March 31). *A Public Health Approach to Problem Gambling - Health Resources in Action.* Health Resources in Action.
<https://hria.org/2022/03/31/problemgambling/>
- Griffiths, M. D. (2019). *Loot box buying among adolescent gamers: A cause for concern?.* SHEU. https://irep.ntu.ac.uk/id/eprint/38055/1/1198234_Griffiths.pdf
- Department for Digital, Culture, Media & Sport. (2022). *Government response to the call for evidence on loot boxes in video games* GOV.UK.
<https://www.gov.uk/government/consultations/loot-boxes-in-video-games-call-for-evidence/outcome/government-response-to-the-call-for-evidence-on-loot-boxes-in-video-games#loot-box-impacts-and-potential-harms-1>
- FIFA [Video Game]. (2022). Electronic Arts.
- Irie, T., Shinkawa, H., Tanaka, M., & Yokomitsu, K. (2022). Online gaming and mental health: Loot boxes and in-game purchases are related to problematic online gaming and depression in adolescents. *Current Psychology*. <https://doi.org/10.1007/s12144-022-03157-0>

Market Study on In-game Gambling and Loot Boxes: Covid-19, followed by lockdowns, has pushed the market growth with a CAGR of 5.6% through 2032. (2022). Persistence Market Research. <https://www.persistencemarketresearch.com/market-research/in-game-gambling-and-loot-boxes-market.asp>

Morris, D. (2023, January, 19) *CS:GO Case Odds: How Rare Is Rare?*. Esports.net. (2023, January 19). <https://www.esports.net/news/csgo/csgo-case-odds>

Overwatch [Video Game]. (2016). Blizzard.

Phillips, T. (2023, March 22). *EA loot box lawsuit fails in bid to brand games as gambling.* Eurogamer.net. <https://www.eurogamer.net/ea-loot-box-lawsuit-fails-in-bid-to-brand-games-as-gambling>

Swrve. (2014). *Finds 0.15% of Mobile Gamers Contribute 50% of All In-Game Revenue.* <https://www.swrve.com/company/press/swrve-finds-015-of-mobile-gamers-contribute-50-of-all-in-game-revenue>

Riley, B. J., Oster, C., Rahamathulla, M., & Lawn, S. (2021). Attitudes, Risk Factors, and Behaviours of Gambling among Adolescents and Young People: A Literature Review and Gap Analysis. *International Journal of Environmental Research and Public Health*, 18(3), 984. <https://doi.org/10.3390/ijerph18030984>

Salonen, A. H., Hellman, M., Latvala, T., & Castrén, S. (2018). Gambling participation, gambling habits, gambling-related harm, and opinions on gambling advertising in Finland in 2016. *Nordic Studies on Alcohol and Drugs*, 35(3), 215–234. <https://doi.org/10.1177/1455072518765875>

- Schmidt, G. (2023). *Magic: The Gathering Becomes a Billion-Dollar Brand for Toymaker Hasbro*. *The New York Times*. <https://www.nytimes.com/2023/02/16/business/magic-the-gathering-hasbro.html>
- Soper, T. (2020, September 1). *Judge approves \$155M class action settlement related to big fish games and online gambling lawsuit*. GeekWire. <https://www.geekwire.com/2020/big-fish-games-pay-155m-tweak-games-part-class-action-settlement-gambling/>
- Taylor, K. (2017, October 19). *Casinos' perks for high rollers tied to Las Vegas shooting*. Business Insider; Insider. <https://www.businessinsider.com/casinos-perks-for-high-rollers-tied-to-las-vegas-shooting-2017-10>
- Wright, S. T. (2017, December 8). *The evolution of loot boxes*. Pcgamer; PC Gamer. <https://www.pcgamer.com/the-evolution-of-loot-boxes/>
- Zendle, D., Meyer, R., Cairns, P., Waters, S., & Ballou, N. (2020). The prevalence of loot boxes in mobile and desktop games. *Addiction*, *115*(9), 1768–1772. <https://doi.org/10.1111/add.14973>