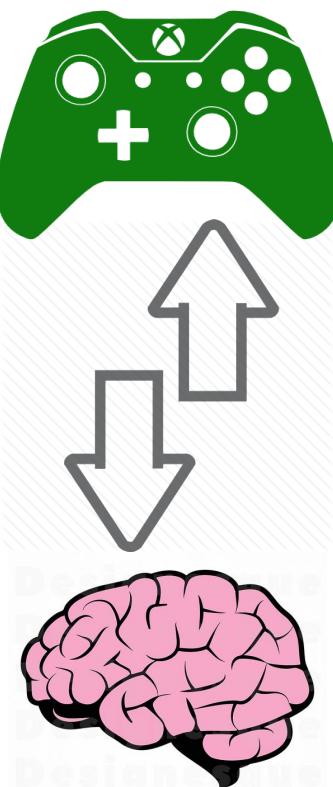


Could Psychology Be The Underlying Reason For The Success Of The Gaming Industry?

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Aims

- To determine the impact that the field of psychology has had on the games industry
- To understand the contrasting techniques used within different areas of the gaming industry
- To Research, investigate and analyse scientific research related to gaming and human conditioning
- To find what factors determine a game's success
- To Comprehend the correlation between psychological factors and how successful a game is

Objectives

- In depth reading of all sources and carry out a full analysis for each aspect of my aims
- To Utilise my findings to outline what makes a successful game
- Conclude on which aspect of psychology has the greatest impact on the success of games
- To compare data and information from a variety of sources so that I can synthesise a conclusion

Introduction

The rapid growth of the gaming industry has taken the world by surprise. Within the past year alone it has increased in value by 11% and is expected to further increase and reach \$180 billion by 2021¹. I decided to undertake this study as I'm intrigued by the reason for this unprecedented success. I've always loved gaming and have a fascination in discovering what makes one successful, not only in design but in every area of the industry such as marketing and sales. Additionally, I have a huge interest in human conditioning and behaviourism and was unable to take Psychology at A level. Therefore this seemed like the perfect crossover of a subject I find fascinating and a hobby I really enjoy. As a result I have decided to analyse the range of psychological techniques employed by gaming manufacturers in order to determine what effect they have on the industry's success. I will be observing these techniques within the two central areas of games development which are game design and marketing and sales in order to determine the extent to which each utilise psychology to drive the success of gaming.

¹ <https://techjury.net/stats-about/gaming-industry-worth/#gref>

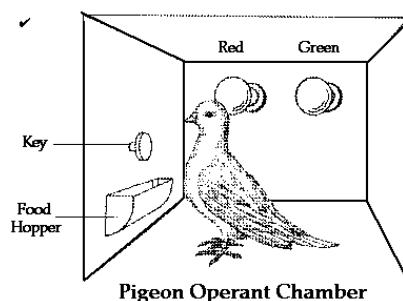
Psychological Tools Used Within The Game Industry

The main purpose of this project is to discover how and why certain Psychological tools are utilised within the gaming industry and the extent to which they are able to generate success. Below are some of the major discoveries that are vital to outline as they underline some of the key ideas that will be investigated throughout this study.

Self Determination Theory²

Self determination theory is an idea ‘proposed and tested by researchers Andrew Przybylski, Scott Rigby and Richard Ryan.’ They believe that people play games and participate in activities in order to ‘scratch three psychological itches.’ These are the need to feel competent, the need to feel you are making choices that are meaningful and the need to be connected with others in the process. They shortened these to ‘Competence, autonomy and relatedness.’ Throughout the rest of this paper the self determination theory will become increasingly evident as it is utilised in all areas of game design to attempt to increase engagement.

The Skinners box theory and the dopamine pathway



The Skinner Box theory is an idea that translates to the very base ideas of game design.³ It is an idea that humans can be conditioned to perform certain actions through providing them with a reward. Skinner called this ‘Operant conditioning.’ His experiment consisted of placing three pigeons in a box with a button. For one pigeon every time the button was pushed it was rewarded with food (this is known as ‘fixed reinforcement’). However, for the second pigeon it was rewarded with food after a random number of pushes each time (known as a ‘variable interval schedule’) and for the third a set number of pushes each time (known as a ‘fixed ratio schedule’). Skinner’s discovery was that the one who was awarded each time lost

² Getting Gamers Jamie Madigan rowan & Littlefield 2016

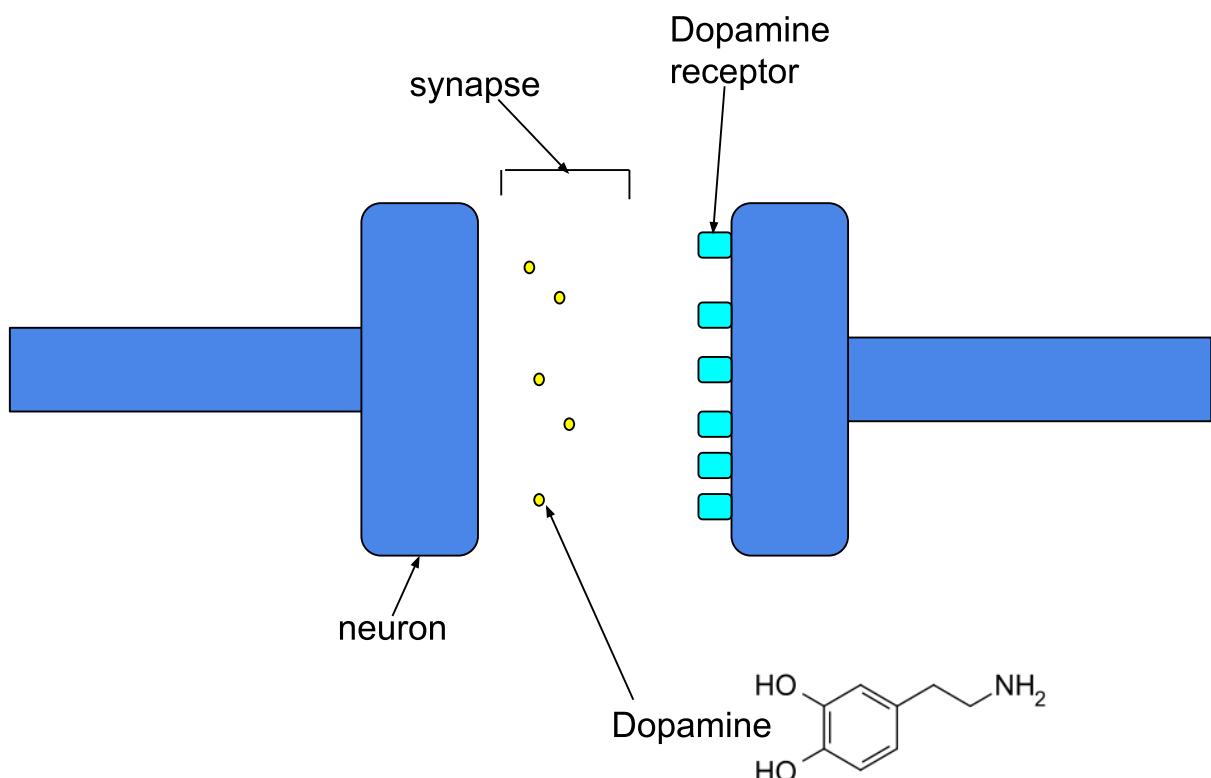
³

I was made aware of this idea via a video on
<https://gamequitters.com/video-games-designed-to-be-addictive/> and used
<https://www.verywellmind.com/what-is-a-skinner-box-2795875> to find information

incentive and eventually stopped pushing the button whilst, the others constantly continued to press the button.

Skinner believed that without the guarantee of reward the desire for one becomes much greater, as its value has increased. This is due to the difficulty of achieving the reward which requires the user to put in work (like pushing a button) in order to receive a reward. This has a lot of obvious uses within games to keep players engaged such as rewarding players for 'leveling up'⁴.⁵

The reason for this behaviour was later discovered by Dr Carlson in the 1950s⁶. He discovered a chemical in the brain called Dopamine which acts as a neuro-transmitter responsible for controlling pleasure and reward within the human body.



The diagram above⁷ clearly demonstrates Carlson's discovery. Whenever a human experiences joy or excitement ions are created within the brain's neurons. As a result of this electric charge dopamine is released into the synapse (the gap between neurons) and is received by the dopamine receptors. This activates the pleasure centres of the brain and causes happiness. However, if dopamine is released too frequently then dopamine receptors

⁴ Leveling up is when a player receives a certain amount of experience points for completing certain actions in a game. When a player receives a certain amount his player level goes up by one.

⁵ Getting Gamers Jamie Madigan rowan & Littlefield 2016 (chapter 6)

⁶

<https://www.nytimes.com/2018/07/01/obituaries/arvid-carlsson-who-discovered-a-treatment-for-parkinsons-dies-at-95.html>

⁷ Drawn by me in Google Docs to represent the synapse between two neurons(the skeletal formula of dopamine is from

https://pages.shanti.virginia.edu/PSYC_5559_Evol_Neurosci/dopaminergic-pathway/

begin to shut off and much more of the stimulus causing the release is required to cause the same sensation of pleasure. This results in the person getting bored of the action and stopping as it isn't providing enough dopamine.⁸ This behaviour is reflected in Skinner's box theory as the pigeons who are always rewarded got bored of pushing the button quickly. However, the other two showed addictive signs of behaviour due to the reinforcement being infrequent thereby stopping the dopamine receptors from shutting off. According to a video by a popular youtube channel known as 'Game Theory'⁹, the infrequent reinforcement of stimulus is frequently used in a number of different games in order to provide an addictive nature to different elements - for example microtransactions like loot boxes.¹⁰

Game Design

The actual design of a game takes many shapes and forms. This can be the mechanics¹¹ of the actual gameplay or it can be just captivating colours used in the design of characters. For example, Jamie Madigan (a psychologist specialising in Gaming)¹² discusses how factors such as these can result in people investing a lot of time and money into the gaming industry. He suggests that the gaming industry is increasingly turning towards Psychologists to help make their games as effective as possible, in getting players hooked on their games through interesting and exciting design. In this section I will be delving into all the techniques which are used in design, through a series of examples of mechanics implemented in games, to assess whether this makes an impact on the success of the industry.

Leveling systems and varied game difficulty

Within games of all genres there is a general trend to incorporate the idea of a player or skill level. This allows players to gain a sense of progress throughout the game and be rewarded for achieving goals. Gaming companies supposedly utilise this to keep players interested in games for much longer due to the goals and rewards being provided. Jamie Madigan suggests that due to the higher engagement of players companies are able to increase their games success.¹³

Firstly, this idea of levelling up can be used to reward the player and maintain their engagement with the game. This is an example of the use of Skinner's idea of a fixed ratio schedule. By rewarding players after a set amount of time spent on the game (e.g. Leveling up by playing a set amount of matches in Overwatch¹⁴) it allows them to feel accomplished and continue to invest their time into the game. Additionally, as the user can see how close

⁸ https://www.youtube.com/watch?v=_BTGgCEFQw

⁹ https://www.youtube.com/channel/UCo_IB5145EVNcf8hw1Kku7w

¹⁰ Is further touched upon in the Loot Boxes and other microtransactions section

¹¹ Game design term referring to the individual rules surrounding a certain object or action within the game(e.g. gravity)

¹² Getting Gamers Jamie Madigan rowan & Littlefield 2016

¹³ Getting Gamers Jamie Madigan rowan & Littlefield 2016 (chapter 6)

¹⁴ Video game created by Blizzard <https://playoverwatch.com/en-us/>

they are to the next level it means they can often be incentivised to continue in order to reach it as they are close to receiving a new reward.

Additionally, there is the idea of a ratio leveling system¹⁵ explained by Celia Hodent which is similar to fixed ratio leveling.¹⁶ However, each time you level up experience or achievements need to be completed before leveling up again. This makes the game increasingly difficult as it continues. As a result this means players start off the game finding everything really easy.

This pulls in the first of the three Psychological Itches, ‘competence’.¹⁷ As the game is easy at the start it creates a false sense of achievement making the user feel competent in what they are doing, therefore maintaining or increasing their engagement. This is demonstrated through the research of Christoph Klimmt, Christopher Blake, Dorothée Hefner, Peter Vorderer, and Christian Roth who researched the effect that Game difficulty had on overall enjoyment which was rated on a scale of 1-5.¹⁸

Table 1. Average number of “kills” and own “deaths” across experimental groups of different game difficulty (n=71)

Game difficulty	Enemies killed		Deaths of player character	
	Mean	Standard Deviation	Mean	Standard Deviation
Easy (n = 25)	24	7.58	1.72	4.52
Moderate (n = 23)	8.96	5.77	15.09	5.59
Very difficult (n=23)	2.65	2.81	25.74	4.85

Main effect of game difficulty on enemies killed: $F(2,68) = 86.63, p < .0001; \eta^2 = .72$.
Main effect of game difficulty on own deaths: $F(2,68) = 139.52, p < .0001; \eta^2 = .80$.

Table 4. Game enjoyment across experimental groups of different game difficulty (n=71)

Game difficulty	Mean	Standard Deviation
Easy (n = 25)	4.29	0.59
Moderate (n = 23)	3.84	0.83
Very difficult (n = 23)	3.53	0.86

Main effect of game difficulty level: $F(5,65) = 6.49, p < .01; \eta^2 = .17$

The above tables are both from the study carried out regarding difficulty in gaming. The game used was a First Person Shooter game created especially for the study to vary its difficulty through the alteration of different variables¹⁹.

Table 1 clearly demonstrates that the harder the game the less progress a player makes within it. This is shown with the very hardest game having a player kill, on average, 3 enemies²⁰ with the player dying roughly 26 times to achieve this. Contrastingly the easiest difficulty has a player killing 24 enemies per 2 deaths. This suggests a lot more progress and correlates to the enjoyment of the game shown in *Table 4*, which shows that those who played the easy game had an average enjoyment of $\frac{4}{5}$ whereas those playing the difficult one rated it around $\frac{3}{5}$. Additionally, the harder one has a higher standard deviation which means that the opinions on the game were a lot more spread than the easy one. This implies that if a more difficult game was released it would be less likely to succeed as, statistically speaking, people would have a larger range of opinions on how much they enjoyed it.

¹⁵ In The Gamers Brain by Celia Hodent

¹⁶ Seen in Skinner's Box Theory

¹⁷ Getting Gamers Jamie Madigan Rowan & Littlefield 2016 (Chapter 6)

¹⁸ https://link.springer.com/content/pdf/10.1007%2F978-3-642-04052-8_1.pdf

¹⁹ These are variables such as player health, enemy health and enemy damage

²⁰ This is rounded up

These results coincide heavily with the ideas of the dopamine pathway discovered by doctor Carlson and may indeed be similar to the idea of Skinner, as the easier the game is the more a player completes a task and feels accomplished. As a result dopamine is more frequently released in the brain causing enjoyment. Additionally, it is similar to Skinner's box theory as the game rewards for getting kills and consequently, the easier the game the more kills you get.

The use of ratio leveling in both game difficulty as well as game achievement (rewarding for leveling up) is used to scratch the first of the three psychological itches by making the player feel competent and therefore is a vital mechanic when thinking about designing an engaging and successful game.

Gameplay

This is one of the most important parts of the games industry as it defines the contents of each game and who they should be advertised to. This can range between Racing games to dating simulators. They all attract different audiences. As a result when playing a game it is key to keep your audience engaged in order to increase a game's success for a larger period of time.

A prime example of this is a game called fortnite released in July 2017. It was one of the first of its style of games called a 'battle royale' and this took into account multiple psychological steps in order to make it successful. The Battle royale game design basically consists of a map with around 100 players. Players jump out onto the map from the 'battle bus' choosing a location, landing there, gathering loot and fighting to remain the last one standing.

Firstly the design of the map²¹ that is used within the game could be a key reason as to why the game was so successful. The areas I have outlined in red are key drop points on the map. They have names such as 'Tilted Towers' and 'Loot Lake'. These areas are the top 9 drop zones of season 5 and are advertised to have better loot (this refers to more guns / items that will give players a higher chance of victory.) However, due to this a large amount of players in a game will choose to land in these locations. As a result the likelihood of the player dying quickly is much higher. The area highlighted in blue ('tilted towers') is the most popular landing spot according to a survey



²¹ Map copied from
<https://www.theverge.com/2018/5/6/17321172/fortnite-epic-games-biggest-game-living-breathing-world-mmo-rpg-battle-royale>

taken of players in 2019.²² On average around 30-60 players land here each game out of a lobby of 100 people. Those landing here get killed extremely quickly whereas those landing in more out of the way or unnamed areas will easily last into the top 20 of each game due to the size of the map and the likelihood of running into other players. However Matthew Patrick, a famous game theorist,²³ suggests that it is this kind of design that keeps players interested. If a player makes the active decision to land in a highlighted area they are mentally preparing themselves for a loss as it is highly likely that they will die if they land here. As they are aware that they still have fun and probably get a lot of kills making them feel competent²⁴ at the game even though they didn't win. Contrastingly if a player makes the decision to land in a smaller, more out of the way location, it increases the likelihood of placing higher due to the smaller concentration in players. No matter where you land you end up walking away from it feeling better than average as you got so many kills or placed highly in a game.

Another way in which the design of Fortnite has been so successful is in its progression. Fortnite gives players daily challenges such as 'get 5 shotgun kills' or 'land at rusty reels'.²⁵ Whilst these appear as regularly easy challenges, the game provides new ones each day to make sure players come back. Additionally, during each season there are a weekly set of

challenges that come with the battle pass.²⁶ Players are never short of challenges, most of which are always half complete. This results in two effects known as the Zeigarnik effect²⁷ and the Ovsiankina Effect²⁸. The Zeigarnik effect refers to the higher chance of a person remembering a task if left half incomplete whereas the Ovsiankina effect is a person's inability to leave an unfinished task unfinished. As a result, these two work together pushing players into completing 'just one more' and through making sure the stock of challenges never depletes, causing addictive behaviour.



Finally Fortnite perfectly implements a form of the 'variable interval schedule' suggested by Skinner. This is done through the actual items within a game. As each game is different and the weapons that you find on the floor, or which come out of chests, are completely random, whenever you find a good item your brain gets sent a rush of dopamine. Due to the infrequency and randomness of these events the brain is unable to form a dopamine pathway²⁹ and therefore players remain excited whenever they come across a good item.

²² Found in EDGE magazine

²³ In charge of the youtube channel game theory

²⁴ This therefore links back into the self determination theory

²⁵ These are both actual challenges pulled from the game

²⁶ Another purchasable part of the game that give players items in a tier based system

²⁷ <https://www.psychologistworld.com/memory/zeigarnik-effect-interruptions-memory>

²⁸ <https://www.alleydog.com/glossary/definition.php?term=Ovsiankina+Effect>

²⁹ Mentioned in the previous section regarding dopamine

Moreover the randomness of running into other players causes small bursts of adrenaline resulting in the heightened enjoyment of the player.

Sales - financial success

Loot Boxes and other microtransactions



Microtransactions are found in the majority of games and offer the opportunity to buy virtual items or currency. Loot boxes are one of the most popular forms of these transactions and they are boxes containing randomised content. They are available for players to buy in popular games like *Overwatch* (40 million players³⁰), *Rocket League* (40 million players³¹), and *Counter-Strike: Global Offensive* (Over 25 million players³²). It is roughly estimated that the total amount of revenue generated by loot boxes annually is approximately \$30 billion³³.

Firstly, to comprehend why Loot boxes are such a ‘cash cow’³⁴ we must look at an example of their implementation. To investigate this I will be using the example of *Rocket League*³⁵. This game utilises a system where ‘crates’ are given to you at random after playing a certain amount of games. This is another example of the use of Skinnners ‘variable interval schedule.’ This idea of not knowing when you’re going to get a crate raises excitement and engagement as the player feels more rewarded not having them guaranteed.³⁶ However the catch in a game like this is the only way to open these ‘crates’ is to buy keys from the in game shop. These cost \$1.49 individually; \$4.99 for five **keys**, \$9.99 for ten **keys**, and

³⁰ <https://www.pcgamer.com/overwatch-has-more-than-40-million-players/>

³¹ Williams M, “Rocket League Crosses 40 Million Players Worldwide,” USgamer, 03-Jan-2018.

³² <https://www.pcgamesn.com/counter-strike-global-offensive/csgo-best-selling-pc-game-minecraft>

³³ <https://www.juniperresearch.com/document-library/white-papers/in-game-gambling-the-next-cash-co>

³⁴ <https://www.juniperresearch.com/document-library/white-papers/in-game-gambling-the-next-cash-cow>

³⁵ <https://www.rocketleague.com/>

³⁶ Mentioned In The gamers brain by Celia Hodent

\$19.99 for 20 **keys** and each only opens **one** ‘crate.’ Despite the profit gained by Psyonix³⁷ being 100% due to keys and ‘crates’ costing nothing to make, the true reason for the success of loot boxes (According to David Zendle³⁸) is their addictive nature. He believes that the system of loot boxes heavily reflects the style of online gambling. This is due to the rates of item drop from loot boxes. In Rocket League the drop rates for crates are as follows

³⁹.

- Rare item: 55%
- Very Rare Item: 28%
- Import Item: 12%
- Exotic Item: 4%
- Black Market Item: 1%



All these items have highly different values in game and out and this is reflected through their cosmetics. For example, a *rare item* is often very plain cosmetically and therefore has a value of around 0.2 keys in game⁴⁰. However a Black Market item is often very good looking with moving attributes and can sell for up to 60 keys. There are other factors that can affect the value of an item such as colour and whether it is certified.⁴¹ These varying factors cause a dopamine release as if an item is painted(different colour) or certified it makes a player value its worth more in their head and feel like they've received a good item despite not knowing its actual value. As a result furthering the addictive nature of loot boxes.

Additionally each type of ‘crate’ has a set list of items that can drop. This means the user can try for a certain item they really like in a crate, hoping that by picking this crate they might get the valuable item. The user feels that by selecting a certain crate the chances of them getting a good item significantly increases. Despite this clearly being false due to the drop rates being identical for all crates. It puts the user under the illusion that their choice may result in them getting a good item. This causes them to invest a few keys in crates which is likely to result in them receiving an item of good value or one that they personally like and want to use⁴². So they feel that the choice they made in spending money on the loot box was a valid one and are likely to repeat it. As a result of this they continue, and due to the ‘randomised’ reward mechanism,⁴³ which has a heavy bias on invaluable items, they are

³⁷Company which originally built rocket league Rocket League (to avoid confusion the game is now owned by Epic Games)

³⁸ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0213194>

³⁹ <https://rocketleague.fandom.com/wiki/Crate>

⁴⁰ I am basing all prices in this section off PC prices found at

<https://www.rocketprices.com/trading-prices> however prices vary between console and website

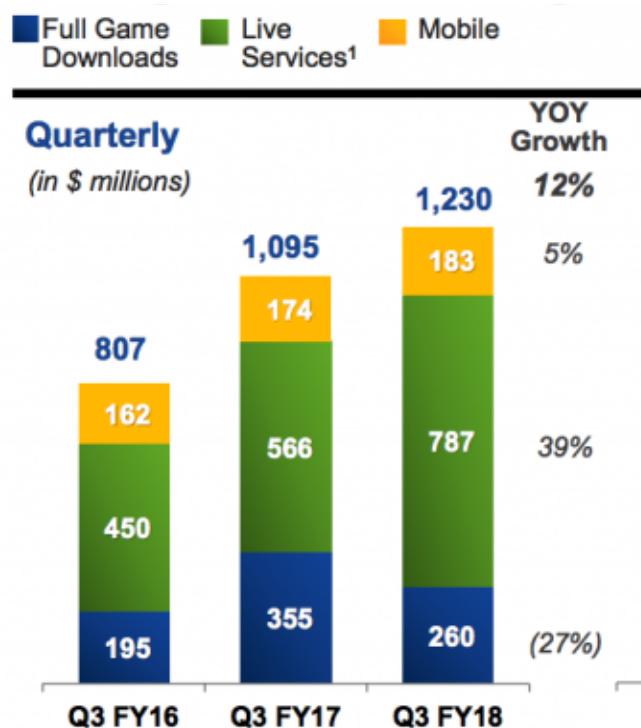
⁴¹ This is something that tracks an attribute e.g. goals scored with item equipped

⁴² Reminding that all parts received in crates can be used on the users own car

⁴³ <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0213194>

likely to receive items of little value. However, as they aren't sure what they are going to get in their next box they feel maybe 'the next box is the one.' This inability to stop is the first symptom of addiction and is the true reason behind the addiction. Due to 'variable interval schedule'⁴⁴ it uses dopamine to make the user feel a huge sense of success. They need to keep buying loot boxes in order to feel this success and therefore this can result in a heavy gambling addiction. Whilst the morals of this may be questionable it is clearly vital when creating a successful video game, as Psyonix earned \$110 million within a year of its release. As the game was sold for \$20 retail this means the majority of its profit was through key sales. Therefore this implies that loot boxes is a successful business model when it comes to the financial success of a video game.

Another area where microtransactions are extremely successful is where the company gives the player the option to purchase a competitive advantage within the game. This can be found in recent games such as Battlefront II⁴⁵ and Fifa 20⁴⁶ both made by the company EA⁴⁷. The company made 'a total revenue of \$1.23 billion in the last quarter, a whopping \$787 million of that comes from live services'⁴⁸ as shown in the diagram below. It Constitutes 39% of the company's quarterly growth suggesting that their business model is successful.



⁴⁴ Refer back to skinner's box theory

⁴⁵ <https://www.ea.com/games/starwars/battlefront/star-wars-battlefront-2>

⁴⁶ <https://www.ea.com/games/fifa/fifa-20>

⁴⁷ <https://www.ea.com/>

⁴⁸ www.extremetech.com/gaming/263204-ea-remains-committed-microtransactions-partially-faulty



This model can be demonstrated through the game *Battlefront II* which is based on the popular Star Wars franchise⁴⁹. It pits players against each other online as they play through different stories within the Star Wars Universe. Players are given the option to purchase 'heroes'⁵⁰ from within the Star Wars universe for the in game 'credits.' These are earned either through playing the game or can be purchased outright by the player.

However the real catch, and where EA makes their money, is that in order to earn the amount of credits to buy a hero it takes over 40 hours on average or approximately 2,395.97 minutes.⁵¹ However this amount of credits can be purchased for \$4.99. As a result a player is likely to spend this seemingly insubstantial amount of money to give them a competitive advantage within the game. As suggested by Both Jamie Madigan⁵² and Celia Hodent⁵³ purchase seems intelligent to the user at the time as it's a tiny amount of money and saves them loads of hours of gameplay, allowing them to enjoy more of the game with their new purchased hero.

This idea takes into account two of the three 'itches' outlined in the self determination theory as it makes the player feel like they have made their own choice in purchasing the 'hero' and afterwards makes the game significantly easier because of the advantage they have just purchased. Madigan suggests that players will be likely to make an additional purchase as they believed their previous purchase resulted in them enjoying the game more. Hodent adds that users' purchases become cyclical because games will always keep releasing heroes and the user will continue to buy them. This turns the base \$40 game into an almost \$100-200 profit for EA per player.

⁴⁹ <https://www.starwars.com/>

⁵⁰ Examples of heroes can be shown in image above

⁵¹

https://www.reddit.com/r/StarWarsBattlefront/comments/7c6bjm/it_takes_40_hours_to_unlock_a_hero_spreadsheet/

⁵² Author of GETTING GAMERS (mentioned earlier)

⁵³ Author of THE GAMERS BRAIN (mentioned earlier)

Moreover the credits used within the game can be purchased within bundles giving users more credits for less money (e.g. instead of 5000 credits for \$4.99 you can buy 15,000 for \$10.00.⁵⁴) This references Madigan's ideas regarding 'sales.' It means that the user feels they are getting a good deal as they are getting 'more for less'⁵⁵ and resultantly players spend more money on the game.

Alternatively the franchise EA is most famous for is FIFA. The most recent title Fifa 20, accumulated over 28% of EA's annual income last year⁵⁶. This is because of their system that mixes ideas of both giving players a competitive advantage as well as an element of chance through microtransactions called 'FIFA packs.' They give players the option to purchase a variety of different packs each with varying chances of giving them a 'good' player which will result in the user having a serious competitive advantage. Below is a table of the individual drop rates⁵⁷ for the most commonly purchased fifa packs along with their prices:⁵⁸



Pack	Price	75+	82+	83+	84+	85+	86+	87+	88+	90+
Gold Pack	5000	100%	9.3%	3.4%						
Premium Gold Pack	7500	100%	20%		4.4%					
Premium Gold Jumbo	15000	100%	42%			4.7%				
Premium Electrum Players	12500	100%	41%			4.3%				
Gold Players Premium	25000	100%	59%				3.6%			
Rare Gold	25000	100%	58%				4.0%			
Mega Pack	35000	100%	79%					4.5%		
Prime Gold Players	45000	100%	80%					4.0%		
Rare Player Pack	50000	100%	95%						5.2%	
Jumbo Rare Player Pack	100000	100%	99%							2.9%
Ultimate Pack	125000	100%	99%							3.4%

⁵⁴ <https://www.ea.com/games/starwars/battlefront/star-wars-battlefront-2>

⁵⁵ Getting Gamers by Jamie Madigan

⁵⁶ <https://www.eurogamer.net/articles/2019-09-30-fifa-20-comfortably-the-biggest-physical-video-game-launch-of-2019-so-far>

⁵⁷ The chance of receiving certain players from a pack

⁵⁸

<https://www.goal.com/en-gb/news/fifa-19-ultimate-team-pack-odds-what-are-the-chances-of-12oy2k26lbcbm1ku3kg1xf2ifz>

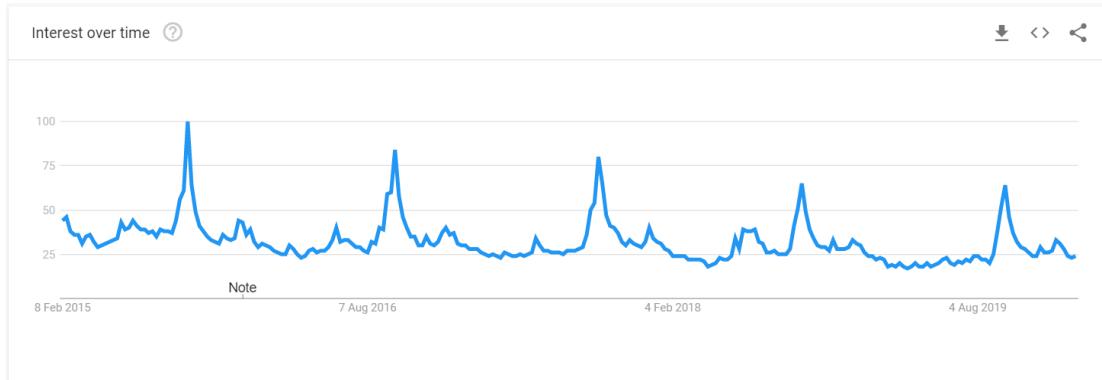
As shown in the table above the odds of receiving a good player increases as the cost of the pack does (3.4% chance of a 90+ rated player in the most expensive pack compared to virtually no chance in the base gold pack). This results in players taking the gamble of buying lots of slightly cheaper packs vs the ultimate pack. The ultimate pack costs an equivalent of around \$18 in FIFA coins. However, it is the pack with the highest chance of receiving a 90+ rating player⁵⁹. This means players are likely to spend that money in order to receive a highly rated player and therefore give them that competitive advantage over their friends and opponents. This purchase is a success in itself for EA. Players who purchase lots of the cheap standard ‘gold packs’ may receive an extremely good player as well. This takes into account the self determination theory’s idea of autonomy. No matter which pack the user chooses they are likely to receive a reward at some stage making them feel they made the correct ‘choice’. Moreover it looks at Skinner’s Variable interval schedule due to the random chance of the packs. Similarly to loot crates, this results in a larger flow of dopamine to the brain due to the unexpectedness of the situation. This results in the gambling effect discussed by Manigan where when a player is rewarded unexpectedly, they feel like they can do it again and therefore will invest more money into the game and reattempt.⁶⁰ Madigan shows how, due to the intervals shown in Skinner’s theory, people’s engagement is reinforced through reward frequently enough to keep them spending money on the game and stop them losing interest. This addiction will keep players investing in games similar to Fifa and their engagement will be refreshed with each successful pack.

⁵⁹ In short the higher the number the better the stats of the player(shooting ability, dribbling etc.)

⁶⁰ This is shown in Madigan’s book *Getting Gamers*

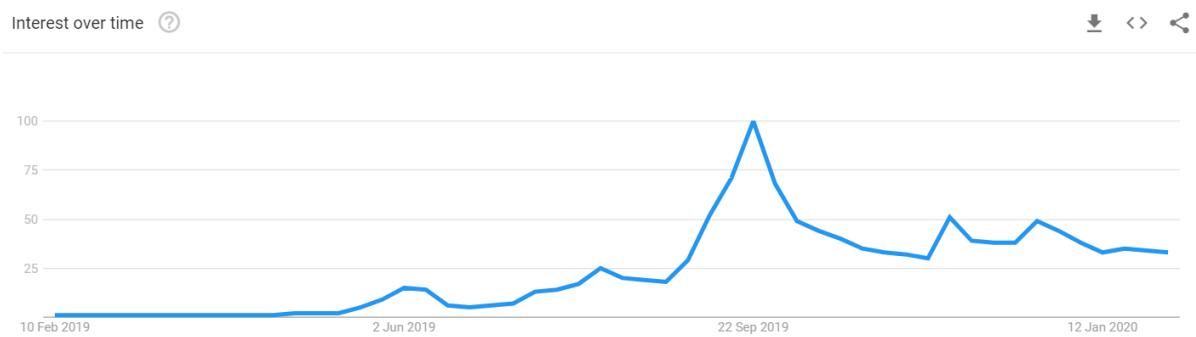
Game sales

The final area of the industry that could affect its success is the literal sale of its games. This is done through a variety of methods from publicity stunts to simple rereleases of games.



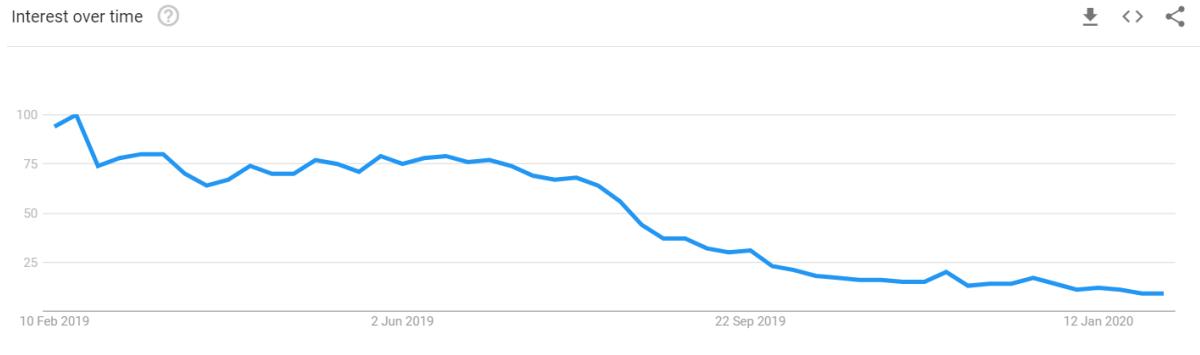
Firstly the success in the game sales of EA's FIFA franchise can be shown in the google trends graph above⁶¹. FIFA is a game that is re-released each year with improvements , new players and other gameplay changes. The graph displays how many times the term 'FIFA'⁶² is searched each month and shows that each year around the time of the release of the next instalment the search term rockets.

Another key reason as to why this method of rerelease works is because it manipulates the final area of self determination theory. This is the idea of 'relatedness' to other players within the game. As the majority of games are online (including FIFA) and require you to compete with other players who are moving away from the previous game to the next one each year, it means fewer players are on the previous game. As a result players no longer feel connected to others and feel the need to move over onto the next instalment in order to not get left behind by others or miss out on the new content. Shown below are the two interest trends of 'Fifa 20' and 'Fifa 19' respectively over the past 12 months:



⁶¹ https://trends.google.com/trends/explore?date=today%205-y&q=%2Fm%2F02_js1 - this is for 'FIFA' in general over the past 5 years , the other two are from the same site just searching for terms 'fifa 20' and 'fifa 19'

⁶² It does specify between the game 'FIFA' and the federal international football association. This is the number of searches for the game



As you can clearly see from the loss of connectivity with other players, EA are indirectly forcing people over to their new game around its release in September and spend around another \$50. Additionally as the game is reset, as their progress from the previous instalment is not carried over, they are forced to spend more on the new game in order to keep up as shown in the section on packs above. This suggests that this is an extremely successful technique as they have an annual cycle of income occurring from the FIFA franchise. Moreover it is proven to be a successful technique as a majority of successful games have multiple instalments such as 'Call of duty' and 'Final Fantasy', both of which have over 7 instalments in their series.

Conclusion

So what makes the perfect game and to what extent is psychology needed to drive the gaming industry's success?

Throughout my project I have narrowed the key aspects for a perfect game (in terms of both literal success and financial success) down to five points:

- Make sure the game makes the player feel important and above the average
- Have a mechanism that keeps the player coming back for more and prevents loss of interest
- Implement microtransactions that provide elements of chance but will also provide a somewhat small advantage in games
- Make the game *Unexpected* - by this I mean make the majority of the game's elements random to provide as many events that result in dopamine release possible
- Keep the game simple - if it is too complex a player will not maintain interest as it won't result in enough excitement due to lack of understanding

The study has clearly highlighted these points regarding a game's success. Firstly I think it has clearly been shown that the most important element of a game is that it fulfils a player's expectations and makes sure they enjoy it. Otherwise it would never sell. The idea that I think best shows the psychology behind how certain games are able to cause this feeling of enjoyment is the self determination theory. This is because the ideas of 'Competence, autonomy and relatedness' all provide a sense of connection with the game. Being able to feel competent is clearly important as it is part of the human condition to tell ourselves we are good at something and therefore if a game reinforces this, it will clearly boost its

success. Moreover the ability to make your own decisions in a game that affects the outcome is a core idea about games in general. Games give a player a sense of power by which they are able to control the world they are playing in and, as a result the more freedom the player is given to do this, the higher the likelihood of success. The idea of relatedness is clearly important as it allows a player to feel like they are together with others and this can also fulfill their wish to be above average as they can compare themselves to other players giving them an ego boost. Moreover another key factor in design is the ability to keep players playing and this is clearly supported through more psychology like Ovsiankina and Zeigarnik effects. These result in players being unable to leave tasks unfinished and in them keeping the game alive after release.

I think another key reason for success is the game's ability to tap into the biology of the brain and manipulate its emotions. The fact that games can utilise the release of dopamine through causing excitement shows the heavy reliance games have on the neural science of the brain. Through the use of Skinners 'random interval' and 'fixed ratio' leveling are able to prevent dopamine receptors from closing by providing just the right amount of excitement and then withholding it from the user to make them want to come back for more. This demonstrates to a whole new extreme how game success relies on psychology and neuroscience. Clearly if implemented properly this kind of psychological manipulation is the key reason for a game's financial success as it will force players into making purchases without realising the addictive repercussions it may have.

In addition, whilst the majority of games success is focused around a game's content its sales are still an incredibly key part of the process. Whilst a game purchase is clearly based on the factors mentioned above and how well it is advertised, after a game becomes successful any related game from the same studio or series will likely have a large following and playerbase moving over to the new content, resulting in a highly successful series.

In conclusion I feel that whilst games may rely on aspects like marketing and publicity in order to be successful, Psychology is clearly an underlying factor. It has proven itself capable of manipulating millions of people into enjoying games and therefore is extremely important in driving success. What is not clear though, is the extent to which the psychological mechanisms I have outlined are employed intentionally by the companies or whether it is just coincidental. The morality of exploiting these methods to drive addiction and sales, let alone the legal consequences have not been considered in this project. Whilst companies may not admit it the patterns are clearly devised to mold users' addictive impulses and drive game revenues, thereby cementing psychological techniques as a clear backbone of the gaming industry.