



**ARE LOOT BOXES GAMBLING?
A CRATE START FOR A NEW GAMBLING FRAMEWORK**

Whether the Dutch and Belgian legal definitions of gambling coincide with what science defines as gambling.

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■ 1. INTRODUCTION

1.1 Background on the issue

In the realm of online gaming, especially Massive Multiplayer Online (MMO) games, loot boxes are digital containers that hold a random selection of multiple virtual items. To obtain loot boxes and/or acquire the ‘keys’ that open them, a player needs to spend real or in-game currency, with no guarantee of what will be inside the loot box. When a player decides not to use real-life money, he will usually have to spend extensive hours of gameplay in order to make in-game currency.

Loot boxes come in all shapes and forms, but in essence they may contain two kinds of items: items that do not affect the gameplay of the game, or items that do – by making the game easier for example. In both kinds, the items usually have different values depending on their rarity. Due to that rarity, there have been instances in which the purely cosmetic items of the first kind have reached the astonishing real-life value of 61.000\$.¹

To understand how this came to be, we have to briefly delve in the history of business models of gaming companies. Before the internet, videogame publishers solely relied on a pay-to-play (P2P) revenue. This model involves that consumers pay an upfront, single price to obtain a fully functional videogame: most of the time you pay to get a physical disk or cartridge with the game.² With the advent of the internet, free-to-play (F2P) came to be, furthermore reinforced by the rise of smartphone use and apps. With F2P games, anyone could play the functional game for free, but the game had a mixed variety of paid and free business models with assorted monetisation strategies attached.³ This is when microtransactions were developed, along with other business strategies such as loot boxes.

Having laid these foundations, it is understandable how loot boxes were born: they came from a necessity of the developers to make their games F2P, but still somehow make money. Loot boxes are, in essence, a special type of microtransaction. But while most opt-in types of microtransactions involve the converting of real-life money into the game’s usually ‘special’ currency (which would be different from the ‘normal’ in-game currency),⁴ loot boxes involve *chance*, and therefore sparked a controversy as awareness about them has started to spread in recent years.⁵ Players felt like loot boxes resembled gambling too much, making rewards or items in games feel *less* rewarding because you did not earn them, or work for them: you got lucky and happened to open the right box.⁶

The controversy around the gambling nature of loot boxes already has some precedents. Most notably, in 2012, Japan’s Consumer Affairs Agency declared the lucrative *Kompu Gacha* mechanic

¹ ‘Dragon Lore’, a skin for a sniper rifle in the game *Counter Strike: Global Offensive* (CS:GO), was initially purchased for 35.000\$ and subsequently sold for 61.052\$. Andy Chalk, ‘CS:GO ‘Dragon Lore’ AWP skin sells for more than \$61,000’ [2018] <<https://www.pcgamer.com/csgo-dragon-lore-awp-skin-sells-for-more-than-61000/>> last accessed 17 July 2019.

² Guðmundur Þorsteinsson and Rúnar Freyr Júlíusson, *A Case Study on Loot Boxes in Two Video Games – A comparison between Overwatch and Star Wars Battlefront 2* (Bachelor’s Thesis, Háskólinn í Reykjavík 2018) p.1.

³ Ibid.

⁴ To clarify, the vast majority of mobile games involve (at least) two different types of currency. For example, one could be coins, while the other could be gems. Both can be spent for in-game purchases, but one of them (the ‘special’ one, in this example it would be the gems) can also be earned outside of the game, ergo paid for with real money.

⁵ Guðmundur Þorsteinsson and Rúnar Freyr Júlíusson, *A Case Study on Loot Boxes in Two Video Games – A comparison between Overwatch and Star Wars Battlefront 2* (Bachelor’s Thesis, Háskólinn í Reykjavík 2018) p.26.

⁶ This is mainly caused by the decades-old entrenched idea in videogames that skills and hard work are rewarded, not luck, chance or paying. Joel Hruska, ‘Most gamers Hate Buying Loot Boxes, So Why Are Games Using Them?’ [2017] *ExtremeTech* <<https://www.extremetech.com/gaming/257387-gamers-hate-buying-loot-boxes-games-using>> last accessed 29 June 2019.

(a variation of the loot box model) illegal on the basis of consumer protection.⁷ In 2016, China's Ministry of Culture released online gaming regulations that required online game operators to disclose loot box items odds.⁸

No similar controversies regarding loot boxes were developed within the European-American community during those years – despite the mechanic already existing.⁹ However, loot boxes experienced a sudden boom in 2016 through the popularity of a game called *Overwatch*,¹⁰ a game that successfully included loot boxes in its gameplay. Said success did not go unnoticed, and neither did the business model. It is therefore hardly surprising that many subsequent high-grossing AAA games¹¹ included this feature in their games in late 2016 and throughout 2017 – with, however, varied results.¹² *Star Wars Battlefront II* is especially guilty, as its outlandish loot box model sparked a massive debate within the western-world community, to the point that multiple governmental authorities started taking notice and steps against the problem – the problem being that the loot box model resembled gambling too much, raising questions regarding its lawfulness. For example, the Netherlands concluded in a study in 2018 that 4 out of 10 types of loot boxes systems were in violation of national gambling laws.¹³ The Belgian Gambling Commission straight up declared loot boxes illegal in an official report in 2018,¹⁴ and even started a criminal investigation against one of the giants of video game companies, Electronic Arts (EA), for refusing to comply with the report's findings.¹⁵

1.2 Research Question and sub-questions

In recent years, videogames have grown from niche hobby to mainstream entertainment. Considering the global, far-reaching and commercialised distribution of online videogames,

⁷ Meaning 'complete capsule toy', the goal of this practice was to collect a complete set of specific virtual items. Upon completion of the set, the player would earn a rare virtual item. Serkan Toto, "'Kompu Gacha" Social Game Mechanic Is History, Here's How It All Went Down [Social Games]' [2012] <<https://www.serkantoto.com/2012/05/09/kompu-gacha-dena-gree-history/>> last accessed 6 December 2018.

⁸ Unofficial English translation from Chinese regarding the relevant articles provided by: Felix Hilgert and Benjamin Dankert, 'New Regulation for "Loot Boxes" in China – International Impact for all Online Games?' [2017] <<http://gameslaw.org/new-regulation-for-loot-boxes-in-china-international-impact-for-all-online-games/>> last accessed 6 December 2018.

⁹ *Team Fortress 2*, for example, introduced them in 2010. *CS:GO* and *Battlefield 4* in 2013.

¹⁰ A team-based multiplayer first-person shooter (FPS) which received universal acclaim from critics with an impressive average score of 9/10.

¹¹ Pronounced 'triple-A', it is an informal classification term used to indicate videogames with high quality standards that are distributed by a medium- or major-sized publisher, across multiple platforms, under direct control of an experienced producer, and expected to sell by the millions.

¹² Examples include (in chronological order): *FIFA Ultimate Team 17*, *For Honor*, *Mass Effect Andromeda*, *FIFA Ultimate Team 18*, *Destiny 2*, *NBA 2K18*, *Forza Motorsport 7*, *Middle-Earth: Shadow of War* and *Star Wars Battlefront II*.

¹³ According to the Betting and Gaming Act. Andy Chalk, 'Netherlands Gaming Authority cracks down on loot boxes in some games' [2018] <<https://www.pcgamer.com/netherlands-gaming-authority-cracks-down-on-loot-boxes-in-some-games/>> last accessed 6 December 2018.

¹⁴ *Belgische Kansspelcommissie* (Belgian Gambling Commission) *Onderzoeksrapport loot boxen* (Research Report on Loot Boxes), April 2018, pp.17-18 <https://www.gamingcommission.be/opencms/export/sites/default/jhksweb_nl/documents/onderzoeksrapport-loot-boxen-final-publicatie.pdf> last accessed 29 September 2019.

¹⁵ EA reportedly backed down after trying to take a stand against the Belgian ban: Paul Tassi, 'EA Surrenders in Belgian FIFA Ultimate Team Loot Box Fight, Raising Potential Red Flags' [2019] *Forbes* <<https://www.forbes.com/sites/insertcoin/2019/01/29/ea-surrenders-in-belgian-fifa-ultimate-team-loot-box-fight-raising-potential-red-flags/>> last accessed 21 July 2019.

especially MMOs where loot boxes are more present, the amount of people unguardedly exposed to them – most importantly minors, but susceptible adults as well – is drastically increasing. In view of the behavioural and psychological factors that some games include which can influence the players into buying loot boxes, plus the level of chance involved, this could lead to an addiction as dangerous as gambling addiction. Yet, it seems that loot boxes are still an ill-defined concept, and even the definition of gambling is all but clear-cut. It is still unclear whether we are to consider them as something already established as gambling, or whether we are to require a new definition based on behavioural and psychological analysis of its effect on people. Without a clear concept about what loot boxes are, applying regulations to them seems futile. The laws applicable to the online world are already a fragmented legal patchwork,¹⁶ while a uniform approach might be more desirable. This thesis will explore how new kinds of business models within games – loot boxes – might constitute gambling, or should be considered gambling in view of their resemblance to gambling.

Research Question: “To what extent are loot boxes covered by existing regulation applicable to online gambling in the Netherlands and Belgium, and which weak points could be covered by new regulation?”

Sub-questions:

1. What is gambling according to psychological and behavioural science?
2. What is the current legal definition of online gambling according to Dutch and Belgian law?
3. Following the findings of the first sub-question, are loot boxes gambling?
4. If yes, to what extent does the law cover them?
5. Where are the weak points in the law? Could they be covered by new regulation?

1.3 Methodology and Structure

In order to find the answer to the central research question, a doctrinal research is performed. Additionally, law reform research will be performed, as the thesis delves into literature stemming from the domains of psychology, neuroscience and business to identify what gambling is from a non-legal perspective. This will provide the basis to analyse whether or not the legal qualification of gambling corresponds to gambling reality.

This thesis will take the following steps: Chapter 2 delves into the scientific aspects of gambling: what *is* gambling? What happens within the brain when it is subjected to games of chance and to the enabling techniques involved? The disciplines involved will be psychology and neuroscience, in addition to technical business models devised and refined mainly by casinos to exploit the weaknesses of the brain and encourage gambling. Chapter 3 dives into the law, focusing on the legal definition of online gambling in multiple jurisdictions: on the European level, but mainly on the Dutch and Belgian national level. The reason for this choice is that gambling regulation is not harmonised, and that the Dutch and Belgian gambling authorities were the first to actively enter the debate on loot boxes of the EU Member States. This section will cover what the current legal definitions of gambling are. Chapter 4 will first analyse loot boxes before diving them into sub-types. Then, the findings from Chapter 2 will be applied, to determine whether and what kinds of loot boxes are gambling or not. Chapter 5 will then continue by implementing the findings from Chapter 3 to

¹⁶ Lawrence Lessig, ‘The Law of the Horse: What Cyberlaw Might Teach’ [1999] Vol.113 No.2 *Harvard Law Review* p.546; Dušan Pavlović, *Online Gambling in the EU – from Data Protection to Gambler Protection* (Phd, Università di Bologna, Università degli studi di Torino, Universitat Autònoma de Barcelona, Mykolas Romeris University and Tilburg University 2018) p.12.

see whether loot boxes are to be deemed as gambling under the current legal definition and to what extent. Chapter 6 considers the result of the scientific and legal findings of the previous chapters and accordingly provides a conclusion as to whether the law properly addresses loot boxes. If not, it provides suggestions on how the law could deal with these weak points. If loot boxes are indeed a form of gambling, and they are not sufficiently covered by law, this proves the law does not coincide with reality. Furthermore, with the fast pace of technological development, this will probably mean that new ways of gambling will surely arise in the future. The results of this thesis might provide lessons for future forms of gambling and their qualification under the law.

1.4 Limitations and Preliminary Remarks

It should be noted that a significant amount of the existing information about loot boxes is very recent. *Overwatch* was released in 2016, but *Star Wars Battlefront II*, the game title that was the catalyst of the loot box debate, was released in late 2017. So far, only limited authoritative works have been published on the subject matter. To the author's knowledge, this thesis is also the first legal work tackling this topic in particular. There are many recent news articles about the issue, a couple of papers published on university level, but the debate is still hot and ongoing. This is why some sub-chapters of this thesis, especially 4.3 in particular, are a bit lacking in official sources in footnotes. Since not enough empirical research has been done on the subject yet, a fair amount of knowledge and comparisons will come from the author's personal experience

Other factors that have to be taken into consideration are for example the current investigations against videogame developers happening within the EU, and the fact that Dutch gambling law is in an in-between developing law phase. Consequently, many of the conclusions to which this thesis will come to are original and have been made with very few authoritative legal works to fall back on. It is a brand-new insight, and that is both a strength and a weakness: this thesis provides an interesting view on how to regulate loot boxes, a first step in a debate to which more future research and insights are needed to come up with the perfect solution.

■ 2. THE SCIENCE: WHAT IS GAMBLING?

Gambling [gam-bling] (noun): 1. The activity or practice of playing a game of chance for money or other stakes. 2. The act or practice of risking the loss of something important by taking a chance or acting recklessly.¹⁷

Despite this seemingly straightforward definition, gambling is actually an ambiguous concept. Its meaning, function, and provision have differed depending on the culture and time period. Regardless of disagreements on the definition, there seems to be an overall consensus on which classic forms of gambling usually meet said definition.¹⁸ Ironically, this thesis is predominantly centred around the issue of whether a certain activity (using/buying/opening loot boxes) is to be considered gambling. In general, while there is no universally agreed-upon definition of gambling, all of them contain three core elements:

- A monetary or material wager on an event;
- The purpose of said wager is to win additional money or material goods by correctly predicting the outcome of the event; and
- The future outcome of the event is uncertain.¹⁹

These three elements can be boiled down to the notions of consideration, prize, and chance.²⁰ However, there are differences in structural characteristics and the experiences they offer to the gambler,²¹ especially considering the different amounts of chance and skill necessary for the game. For instance, lotteries offer the possibility to place a minor stake for the chance of winning a big sum of money; bingo often has a social dimension; sports betting and card games like blackjack or poker include a perceived or actual element of skill; Electronic Gambling Machines (EGMs), i.e. slot machines, on the other hand enable the gambler to engage in long play sessions in which small stakes are made repeatedly and in rapid succession.²²

However, to understand what gambling really *is*, and thus to regulate gambling activities, it is necessary to go deeper, and more specifically into the effects that gambling has on the brain. For this purpose, analysing gambling addiction would be a good starting point to find the main characteristics of it.

2.1 Behavioural Addiction: Gambling, the Silent Destroyer

First of all, it needs to be clarified whether it is even possible to talk about a ‘gambling addiction’. In fact, gambling addiction has been misunderstood and underestimated for centuries, and it has only very recently been officially recognised by the two most influential diagnostic systems, namely: the

¹⁷ Definition from *Dictionary* <<https://www.dictionary.com/browse/gambling>> last accessed 3 October 2019.

¹⁸ I.e. lotteries, instant win tickets, electronic gambling machines (EGMs), bingo, casino table games, horse/dog race betting. Robert Williams and others, *The definition, dimensionalization, and assessment of gambling participation* (1st edition, University of Lethbridge 2017) (Report prepared for the Canadian Consortium for Gambling Research) p.7.

¹⁹ *Ibid.* p.9

²⁰ Nelson Rose and Robert Loeb, *Blackjack and the Law* (1st edition, Rge Pub 1998) p. 109.

²¹ Per Binde and others, ‘Forms of gambling, gambling involvement and problem gambling: evidence from a Swedish population survey’ [2017] Vol.17 No.3 *Journal International Gambling Studies*; Vicki Abt and others, *The business of risk: Commercial gambling in mainstream America* (1st edition, University Press of Kansas 1985) pp.39-44; Jonathan Parke and others, *Key issues in product-based harm minimisation: Examining theory, evidence and policy issues relevant in Great Britain*, Report for GambleAware, 2016 DOI 10.13140/RG.2.2.30894.10560.

²² Per Binde and others, ‘Forms of gambling, gambling involvement and problem gambling: evidence from a Swedish population survey’ [2017] Vol.17 No.3 *Journal International Gambling Studies*.

Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-V or DSM-5)²³ and the International Classification of Diseases, 11th Revision (ICD-11).²⁴ Before the DSM-V, gambling addiction was named either ‘problem’ or ‘pathological gambling’, and had been labelled as an Impulse Control Disorder (ICD)²⁵ in the DSM-III.²⁶ The recent development of neuroscience has increasingly helped with the understanding of pathological gambling, the name of which was officially changed to ‘gambling disorder’.²⁷ The DSM-V now formally recognises gambling as a behavioural addictive disorder alongside drug and alcohol addictions.²⁸ There are several similarities with substance abuse, and partial overlap in diagnostic criteria. For these reasons, gambling addiction can be described as the silent destroyer, as it is on the same level of destructiveness of substance addiction, however it lacks all the physical ‘external’ signs thereof (like blown pupils, abrupt weight changes, poor physical coordination etc.).

According to Mark Griffiths, a professor of behavioural addiction with over 30 years of experience in the field of addiction, there are six cumulative components to *any* sort of addiction, and they can all be found in the DSM-V definition of gambling:

1. **Salience:** when the addiction becomes the most important activity in the person’s life and dominates thinking, feelings and behaviour;
2. **Mood modification:** subjective experiences that people report as a consequence of engaging in the addiction and can be seen as a coping strategy;
3. **Tolerance:** increasing amounts of the addictive behaviour are required to achieve the former mood-modifying effects;
4. **Withdrawal:** unpleasant feeling states and/or physical effects that occur when the behaviour is discontinued or suddenly reduced;
5. **Conflict:** between the addicted individual and those around him (interpersonal conflict), conflicts with other activities (job, schoolwork, social life, hobbies and interests), or within the individual himself; and finally,
6. **Relapse:** repeated reversions to earlier patterns.²⁹

In the DSM-V there are nine common behavioural symptoms listed for a gambling disorder. If the individual exhibits four or more in the span of a year, it means that persistent and recurrent problematic gambling behaviour is present.

²³ The DSM is the authoritative guide to the diagnosis of mental disorders. It is published by the American Psychiatric Association and offers a common language and standard criteria for the classification of mental disorders, used all around the world by clinicians, researchers, psychiatric drug regulation agencies, health insurance companies, pharmaceutical companies, the legal system and policy makers together with the ICD-11.

²⁴ The ICD-11 is the international standard diagnostic tool for epidemiology, health management and clinical purposes produced by the World Health Organisation (WHO). Its official full name is International Statistical Classification of Diseases and Related Health Problems.

²⁵ Class of psychiatric disorders characterised by impulsivity. Includes: Sexual compulsion, internet addiction, compulsive shopping, pyromania, intermittent explosive disorder, kleptomania.

²⁶ Christine Reilly and Nathan Smith, *The evolving definition of pathological gambling in the DSM-5*, White Paper from the National Center For Responsible Gaming, 2013.

²⁷ Ibid.

²⁸ Like Alcoholism, marijuana addiction, amphetamine addiction, cocaine addiction, nicotine addiction, opioid addiction, food addiction and sexual addiction.

²⁹ Mark Griffiths, ‘A ‘Components’ model of addiction within a biopsychosocial framework’ [2005] Vol.10 No.4 *Journal of Substance Use* pp.193-195. Mark Griffiths, ‘The Neuroscience of Gaming, Part III: When Gaming Goes Too Far’ [2016] <<http://www.brainfacts.org/Neuroscience-in-Society/Tech-and-the-Brain/2016/The-Neuroscience-of-Gaming-Part-III-When-Gaming-Goes-Too-Far-062216>> last accessed 2 May 2019.

DSM-V	Components ³⁰
a. Needs to gamble with <u>increasing amounts of money</u> in order to achieve the desired excitement.	Tolerance
b. Is <u>restless or irritable</u> when attempting to <u>cut down or stop</u> gambling.	Withdrawal
c. Has made <u>repeated unsuccessful efforts</u> to control, cut back, or stop gambling.	Salience, Withdrawal, Relapse
d. Is <u>often preoccupied</u> with gambling (e.g., having persistent thoughts of reliving past gambling experiences, planning the next venture, thinking of ways to get money with which to gamble).	Salience, Mood Modification
e. Often gambles when feeling <u>distressed</u> (e.g., helpless, guilty, anxious, depressed).	Mood Modification
f. After losing money gambling, often <u>returns</u> another day to <u>get even</u> ('chasing' one's losses).	Salience, Relapse
g. <u>Lies</u> to conceal the extent of involvement with gambling.	Salience, Conflict
h. Has <u>jeopardized or lost a significant relationship</u> , job, or educational or career opportunity because of gambling.	Salience, Conflict
i. <u>Relies on others to provide money</u> to relieve desperate financial situations caused by gambling.	Salience, Conflict

Currently, gambling is the *only* human behaviour officially recognised as addictive by both the DSM-V and the ICD-11. However, according to this component theory, *any* behaviour that is rewarding could be an addiction if it were to show these six components. In addition to gambling, Griffiths has done extensive research of addiction for other behaviours, such as video games,³¹ the internet,³² exercise,³³ sex,³⁴ and work.³⁵ Gambling addiction has been understood in recent years more than it has ever been in the past and is to be treated seriously. Having given this baseline, it is time to dive a little bit deeper, into the chemistry of the brain itself: what happens within the brain, when an individual gambles?

³⁰ The six components were added by the author to the DSM-V symptoms of gambling disorder.

³¹ Mark Griffiths, 'Adolescent Video Game Addiction: Issues for the Classroom' [2010] Vol.60 No.4 *Education Today: Quarterly Journal of the College of Teachers* pp.31-34; Mark Griffiths, 'Gaming Addiction in Adolescence Revisited' [2014] Vol.32 No.4 *Education and Health* pp.125-129; Mark Griffiths, 'Gaming Disorder, Revisited – A Brief Look at Some Myths About Gaming Disorder' [2019] *Psychology Today* <<https://www.psychologytoday.com/us/blog/in-excess/201906/gaming-disorder-revisited>> last accessed 8 June 2019.

³² Mark Griffiths, 'Internet Addiction: Does it Really Exist? (Revisited)' in Jayne Gackenback, *Psychology and the Internet: Intrapersonal, Interpersonal and Transpersonal Applications* (1st edition, New York Academic Press 1998) pp.61-75; Mark Griffiths, 'Internet Addiction: Fact or Fiction?' [1999] Vol.12 No.5 *The Psychologist* pp.246-250.

³³ Mark Griffiths, 'The Exercise Addiction Inventory: A Quick and Easy Screening Tool for Health Practitioners' [2005] Vol.39 No.6 *British Journal of Sports Medicine*; Mark Griffiths, 'Exercise Addiction in Team Sport and Individual Sport: Prevalences and Validation of the Exercise Addiction Inventory' [2014] Vol.22 No.5 *Addiction Research and Theory*.

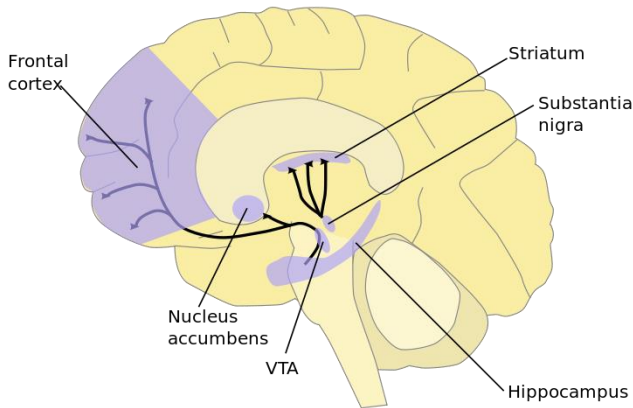
³⁴ Mark Griffiths, 'Sex Addiction on the Internet' [2004] Vol.7 No.1 *Janus Head* pp.188-217; Mark Griffiths, 'Compulsive Sexual Behaviour as a Behavioural Addiction: The Impact of the Internet and Other Issues' [2016] Vol.111 No.12 *Society for the Study of Addiction*.

³⁵ Mark Griffiths, 'Workaholism – a 21st-Century Addiction' [2011] Vol.24 No.10 *The Psychologist*.

2.2 Brain Chemistry: Dopamine, hijacker of the brain

Dopamine, the pleasure ‘I want’ chemical.

Dopamine is, for better or for worse, a key chemical responsible for several important functions in the brain and body – not only in humans, but also in plants and most animals.³⁶ It functions both as a hormone and a neurotransmitter. Especially significant is the neurotransmitter role of dopamine: neurotransmitters are chemical messengers that allow neurons to communicate with each other.³⁷ Dopamine is critical in all sorts of functions, including – but not limited to – executive functions,³⁸ motor control, motivation, arousal, reinforcement and reward, as well as lower-level functions.³⁹



Dopamine was originally thought of as the ‘pleasure’ chemical of the brain.⁴⁰ While it is still linked to sex, drugs and rock and roll, dopamine is not just the brain’s reward chemical, nor is it the brain’s only reward chemical.⁴¹ In reality, it is more accurate to describe dopamine as the ‘seeking’ or ‘wanting’ chemical, as it pushes us to want, desire, seek and pursue things.⁴² The brain has several dopamine ‘pathways’, and they can be exploited – for example by substances like nicotine or cocaine.⁴³ In grossly oversimplified terms, the dopamine process functions in the

following manner: the Ventral Tegmental Area (VTA) is activated by a wide variety of rewarding events.⁴⁴ This could be eating a brownie, or passing a difficult exam. Dopamine is sent through the reward pathway⁴⁵ towards three different areas in the brain: first, to the Nucleus Accumbens, which assigns incentive salience (i.e. ‘want’) to rewarding stimuli and its associated cues.

³⁶ Kent Berridge, ‘Just Rewards’ in Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.525.

³⁷ Neurons communicate with each other in two different ways: electrical impulses and chemical messages. Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.143, 145-146. Eric Kandel and others, *PRINCIPLES OF NEURAL SCIENCE* (4th edition, McGraw-Hill 2000) p.282.

³⁸ Eric Kandel and others, *PRINCIPLES OF NEURAL SCIENCE* (4th edition, McGraw-Hill 2000) p.361. Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.866. Amy Arnsten, ‘Catecholamine Influences on Dorsolateral Prefrontal Cortical Networks’ [2011] Vol.69 N.12 *Biological Psychiatry* pp.89-99.

³⁹ Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.522-524 and 526.

⁴⁰ James Olds, ‘Pleasure Centers in the Brain’ [1956] Vol.195 *Scientific American* pp.105-116; and the Anhedonia Hypothesis by Roy Wise, ‘Neuroleptics and Operant Behavior: the Anhedonia Hypothesis’ [1982] Vol.5 No.1 *Behavioral and Brain Sciences* pp.39-53.

⁴¹ Angela Chen, ‘Please Stop Calling Dopamine the ‘Pleasure Chemical’’ [2018] *The Verge* <<https://www.theverge.com/2018/3/27/17169446/dopamine-pleasure-chemical-neuroscience-reward-motivation>> last accessed 2 May 2018.

⁴² Angela Chen, ‘Please Stop Calling Dopamine the ‘Pleasure Chemical’’ [2018] *The Verge* <<https://www.theverge.com/2018/3/27/17169446/dopamine-pleasure-chemical-neuroscience-reward-motivation>> last accessed 2 May 2018.

⁴³ Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.526.

⁴⁴ Wolfram Schultz, ‘Neural Reward and Decision Signals: From Theories to Data’ [2015] Vol.95 No.3 *Physiological Reviews* pp.853-951.

⁴⁵ The Mesocortical Pathway plus the Mesolimbic Pathway (reward pathway) together form the Mesocorticolimbic Projection.

Second, to the Hippocampus and Amygdala, which mediate the consolidation of reward-related memories; the former lays down the memories of this rapid sense of satisfaction, while the latter creates a conditioned response to certain stimuli.

Third, to the Prefrontal Cortex (PFC), which plays a crucial role in learning, memory, motor control, impulsivity control and complex decision-making.⁴⁶ A study found that elevating or depleting dopamine levels in the PFC impaired the performance in working memory tasks.⁴⁷ Working memory does not affect intelligence; it is responsible for temporarily holding available information for processing – a.k.a. it is important for reasoning and the guidance of decision-making and behaviour.⁴⁸ Linked to the PFC is also the concept of reward prediction errors, or RPE. ‘Error’ refers to the discrepancy between what is happening and what is predicted to happen. To give an example, if someone were to have a fairly low expectancy of winning a game, but then *does*, the dopamine release will be much higher compared to when the same person expected to win in the first place.⁴⁹ It is one of the most powerful and best characterised reward signals.⁵⁰

While dopamine feels good, the release is not constant; natural rewards usually come with time and effort. This is partly why the ‘want’ is triggered, to get some more of the chemical to release. However, things like drugs can change that, and instantly flood the brain with it.⁵¹ In an addict’s brain, the brain receptors become overwhelmed, and the brain activates its defence mechanism: either producing less dopamine or eliminating dopamine receptors, which results in increased tolerance, to dampen the effect of the overload of drug-induced dopamine.⁵² This in turn causes the person to increase the amounts of drugs to elicit the same exciting response which was experienced the first time. In the case of gambling, increasingly riskier ventures will be pursued. On top of this, the neural pathways connecting the reward circuit to the PFC weaken, diminishing the control of impulsivity and influencing the decision making, consequently making it harder to *stop*. It becomes a self-feeding vicious cycle. These are physical, lasting changes in the human brain that can be assessed through scans, and it has been shown that they can be caused by repeated exposure to gambling.⁵³

Apart from being the ‘seeking’ chemical to pursue pleasure, dopamine also contributes to two key elements in the transition from ‘like’ to ‘want’ to ‘need’⁵⁴ – otherwise called ‘addiction’.

⁴⁶ Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.461-462, 570, 754-756. Iconic and early corroborating evidence of this is the famous case of Phineas Gage, the “American Crowbar Case”. Phineas was a 19th-century railroad foreman who became wildly impulsive after an explosion drove an iron rod (not a crowbar) through the front of his brain.

⁴⁷ M. Victoria Puig and others, ‘Dopamine Modulation of Learning and Memory in the Prefrontal Cortex: Insights from Studies in Primates, Rodents, and Birds’ [2014] *Frontiers in Neural Circuits* <<https://www.frontiersin.org/articles/10.3389/fncir.2014.00093/full>> last accessed 2 May 2019.

⁴⁸ Eric Kandel and others, *PRINCIPLES OF NEURAL SCIENCE* (4th edition, McGraw-Hill 2000) p.361. Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.757.

⁴⁹ Wolfram Schultz, ‘Reward Prediction Error – Quick Guide’ [2017] Vol.27 *Current Biology Magazine* p.369-371.

⁵⁰ Wolfram Schultz, ‘Dopamine Reward Prediction Error Coding’ [2016] Vol.18 No.1 *Dialogues in Clinical Neuroscience* pp. 23-32.

⁵¹ Addictive drugs can release 2 to 10 times the amount of dopamine that natural rewards do, and they do it more quickly and more reliably. Michael Miller, ‘How addiction hijacks the brain’ [2011] Vol.28 No.1 *Harvard Mental Health Letter* <https://www.health.harvard.edu/newsletter_article/how-addiction-hijacks-the-brain> last accessed on 29 June 2019.

⁵² This is called a homeostatic response: Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.526.

⁵³ Isabelle Boileau and others, ‘*In Vivo* Evidence for Greater Amphetamine-Induced Dopamine Release in Pathological Gambling: a Positron Emission Tomography Study With [11C]-(+)-PHNO’ [2014] Vol.19 *Molecular Psychiatry* pp.1305-1313.

⁵⁴ It is important to stress that there are no separate brain systems for ‘like’ and ‘want’, a flawed idea that came from a set of failed experiments and has since been debunked. Kent Berridge, ‘Just Rewards’, in Mark Bear and others, *NEUROSCIENCE – Exploring the Brain* (3rd edition, Lippincott Williams & Wilkins 2007) p.525.

Dopamine is involved both in learning and memory, as its connection to the PFC shows. The chemical is a ‘teaching’ signal: when an action is followed by an increase in dopamine activity, the dopamine circuit is altered in a way that makes the same response easier to evoke when similar situations arise in the future. This is the basis of Operant Conditioning, in which dopamine plays the role of a reward signal, but this will be addressed in 2.3. In essence, dopamine responses represent the crucial term underlying basic, error-driven learning mechanisms for reward.⁵⁵

Another problematic element in dopamine is the ‘pleasure principle’, which explains that all pleasures are registered the same way, the origin of the pleasure – i.e. the kind of rewarding activity, whether it be eating a sugary doughnut or using cocaine – does not matter.⁵⁶

Uncertainty as a motivator

One of the hallmarks of gambling is its uncertainty – whether it is the size of the jackpot or the probability of winning at all. If the reward is uncertain, it has been shown that dopamine is released.⁵⁷ Connected to RPEs, reward uncertainty plays a crucial role in gambling’s attractiveness: it is not a reward per se, but it magnifies the effect of dopamine.⁵⁸ Plus, dopamine neurons can reinforce the risk-taking and -seeking behaviour seen in gambling as the PFC behaviour-controlling connection is weakened.⁵⁹

In gambling, dopamine is at its maximum during a gambling task when the probability of winning and losing is identical (50%), representing maximal uncertainty. A considerable amount of behavioural studies support the fact that mammals and birds prefer an uncertain food option over a certain food option in dual-choice tasks, sometimes despite a lower reward rate. This is the reason why games are also designed to have some level of uncertainty, as a predictable game becomes dull very quickly. Unsurprisingly, it has been noted that several slot machines, roulettes and craps have a probability of winning close to 50%, eliciting the maximal dopamine release and reinforcing the gambling behaviour.⁶⁰

The uncertainty in gambling, as it causes the release of dopamine, is also one of the factors behind the lasting changes like hypersensitivity in the human brain and its reward pathways.⁶¹

2.3 Cognitive Neuroscience

The Near-Miss Effect – “I’m not losing, I’m almost winning”.

With the advancement of technology, EGMs become more and more sophisticated, as possible outcomes of a machine can be programmed. It is possible to make certain events occur more frequently, and this is especially important when talking about near-misses. Near-misses happen

⁵⁵ Wolfram Schultz, ‘Dopamine Reward Prediction Error Coding’ [2016] Vol.18 No.1 *Dialogues in Clinical Neuroscience* pp. 23-32.

⁵⁶ Michael Miller, ‘How addiction hijacks the brain’ [2011] Vol.28 No.1 *Harvard Mental Health Letter* <https://www.health.harvard.edu/newsletter_article/how-addiction-hijacks-the-brain> last accessed on 29 June 2019.

⁵⁷ Christopher Fiorillo and others, ‘Discrete Coding of Reward Probability and Uncertainty by Dopamine Neurons’ [2003] Vol.299 no.5614 *Science* pp.1898-1902.

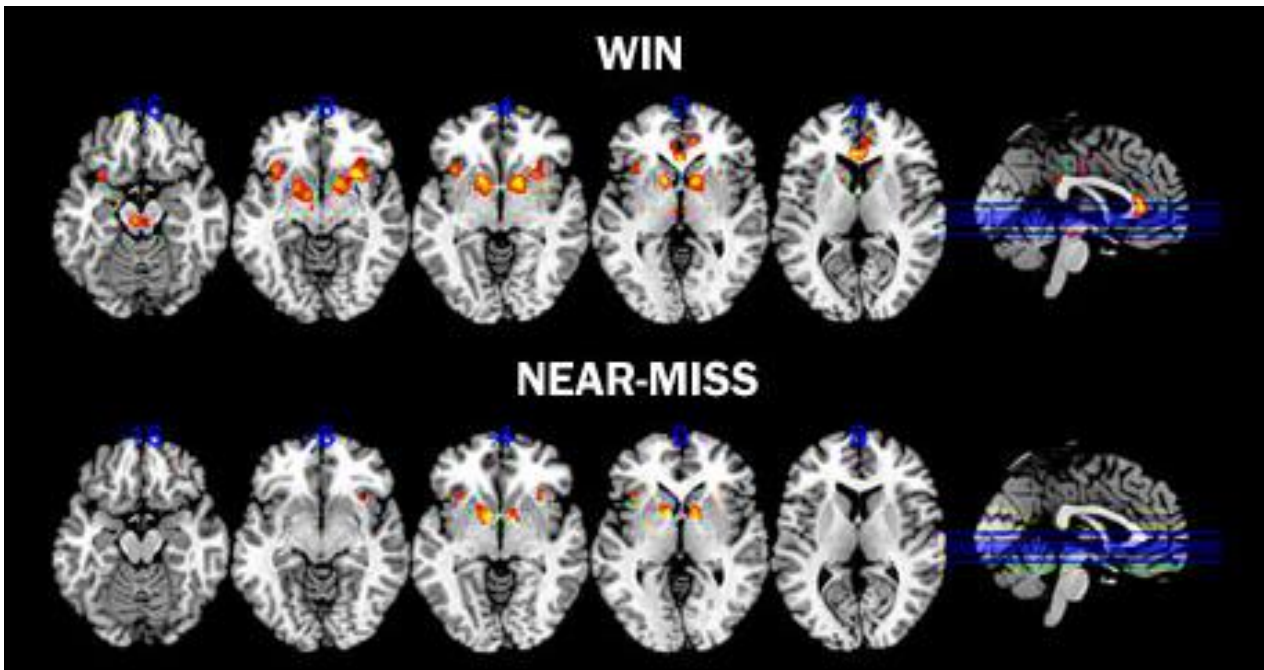
⁵⁸ Patrick Anselme and Mike Robinson, ‘What Motivates Gambling Behavior? Insight into Dopamine’s Role’ [2013] Vol.7 *Frontiers in Behavioral Neuroscience*.

⁵⁹ Christopher Fiorillo, ‘Transient Activation of Midbrain Dopamine Neurons by Reward Risk’ [2011] Vol.197 *Neuroscience* pp.162-171.

⁶⁰ Patrick Anselme and Mike Robinson, ‘What Motivates Gambling Behavior? Insight into Dopamine’s Role’ [2013] Vol.7 *Frontiers in Behavioral Neuroscience*. An example of a dull game is tic-tac-toe.

⁶¹ Isabelle Boileau and others, ‘In Vivo Evidence for Greater Amphetamine-Induced Dopamine Release in Pathological Gambling: a Positron Emission Tomography Study With [11C]-(+)-PHNO’ [2014] Vol.19 *Molecular Psychiatry* pp.1305-1313.

when, for example in a slot machine, one of the reels stops just short of lining up for a jackpot. This almost-winning activates areas of the brain that usually respond to wins.⁶² In fact the only difference between activated areas from a real win and a near-miss, is an area thought to be linked with satisfaction, as can be seen in the illustration below.⁶³



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Near-misses increase the desire to play more, especially in problem gamblers,⁶⁵ they are simultaneously more provoking, more frustrating *and* less pleasant than a big loss.⁶⁶ The key element is that almost-winning triggers a bigger urge to continue playing than an actual win, since there is no satisfaction of having won.⁶⁷ Near misses are therefore highly motivating and actually increase a player's commitment to a game, resulting in a play-session that is longer than intended.⁶⁸ The effect is also heightened when there is a smaller amount of time (seconds) between putting down the stake and playing the game.⁶⁹ However, excessive amounts of near-misses will reduce their reinforcing strength, and research suggests that a moderate frequency of them is actually more reinforcing.⁷⁰ It

⁶² Luke Clark and others, 'Gambling Near-Misses Enhance Motivation to Gamble and Recruit Win-Related Brain Circuitry' [2009] Vol.61 No.3 *Neuron* pp.481-490.

⁶³ Davit Nutt, *Inside the brain of a gambling addict* – BBC News, video available here <<https://www.youtube.com/watch?v=BF5SzIN63w8>> last accessed 9 May 2019.

⁶⁴ Image Source: Mary Bates, 'Gambling Addiction and the Brain' [2015] *BrainFacts/SfN* <<https://www.brainfacts.org/Diseases-and-Disorders/Addiction/2015/Gambling-Addiction-and-the-Brain>> last accessed 8 June 2019.

⁶⁵ Guillaume Sescousse and others, 'Amplified Striatal Responses to Near-Miss Outcomes in Pathological Gamblers' [2016] Vol.41 *Neuropsychopharmacology* pp.2614-2623.

⁶⁶ Steve Sharman and Luke Clark, 'Mixed Emotions to Near-Miss Outcomes: A Psychological Study with Facial Electromyography' [2016] Vol.32 No.3 *Journal of Gambling Studies* pp.823-834.

⁶⁷ Luke Clark and others, 'Gambling Near-Misses Enhance Motivation to Gamble and Recruit Win-Related Brain Circuitry' [2009] Vol.61 No.3 *Neuron* pp.481-490.

⁶⁸ Jeffrey Kassinove and Mitchell Schare, 'Effects of the "Near Miss" and the "Big Win" on Persistence at Slot Machine Gambling' [2001] Vol.15 *Psychology of Addictive Behaviors* pp.155-158.

⁶⁹ Jonathan Parke and Mark Griffiths, 'Gambling addiction and the evolution of the "near miss"' [2004] Vol.12 No.5 *Addiction Research and Theory* p.408.

⁷⁰ *ibid.* p.411.

has also been shown that the amount of dopamine response to a near-miss correlates with the severity of an individual's gambling addiction.⁷¹

The Skinner Box – The Operant Conditioning Chamber

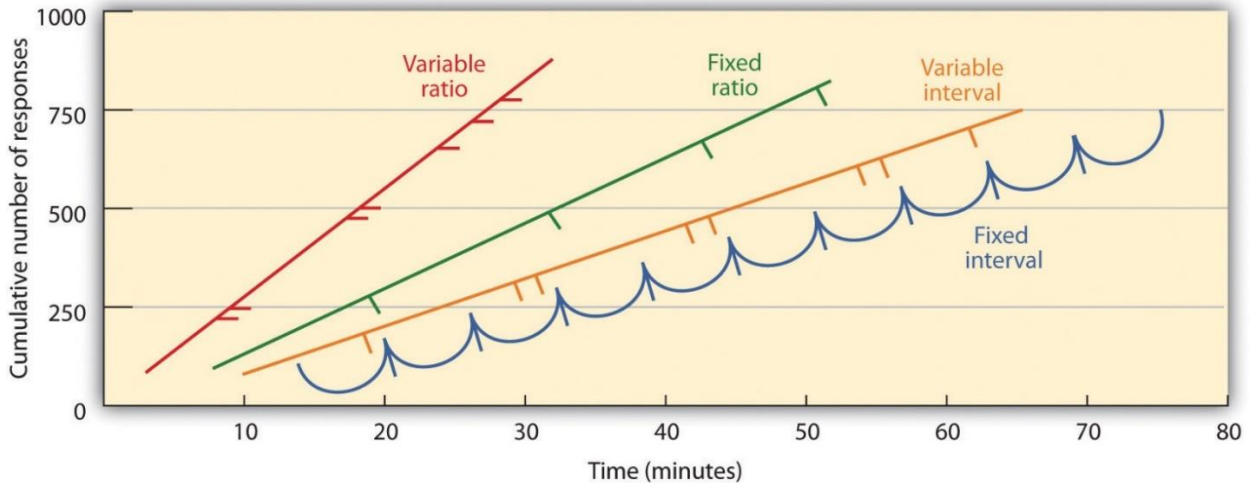
The Operant Conditioning Chamber (also known as Skinner Box) is a closed apparatus used to study animal behaviour in conditioning and training through reward and punishment mechanisms. There are various designs depending on the type of animal and the experimental variables, but usually it contains a lever or button that can be pressed; the reward is normally food or water, while the punishment is a light shock.

Using the box, Burrhus Skinner discovered which schedule of reinforcement lead to the highest response rates – the response rate being the rate at which the animal pressed the lever. The second relevant parameter in the analysis is the extinction rate, which is the rate at which lever pressing decreases (i.e. when the animal gives up or gets bored).⁷²

- **Continuous reinforcement:** when the animal receives a pellet of food for every time the button is pressed. It was found that the response rate was slow, and the extinction rate was fast, i.e. the animal got bored quickly after few presses.
- **Partial reinforcement schedule:**
 - a. **Fixed-interval:** when the pellet is obtained after an n minute time period has elapsed. It was found that the response rate was medium, and the extinction rate was medium (blue line in the illustration below).
 - b. **Variable-interval:** when the pellet is obtained after random intervals of time. It was found that the response rate was fast, and the extinction rate was medium-slow (yellow line)
 - c. **Fixed-ratio:** when the pellet is obtained after the button is pressed n number of times. It was found that the response rate was fast, and the extinction rate was medium (green line).
 - d. **Variable-ratio:** when the pellet is obtained after a random number of responses. It was found that the response rate was fast, and the extinction rate was slow because of unpredictability. This is the schedule used in gambling (red line).

⁷¹ Henry Chase and Luke Clark, 'Gambling Severity Predicts Midbrain Response to Near-Miss Outcomes' [2010] Vol.30 No.18 *Journal of Neuroscience* pp.6180-6187.

⁷² Saul McLeod, 'Skinner – Operant Conditioning' [2018] *Simply Psychology* <<https://www.simplypsychology.org/operant-conditioning.html>> last accessed 7 May 2019. And a short interview of Skinner himself: Burrhus Skinner, 'Operant conditioning', video available here <https://www.youtube.com/watch?v=l_ctJqjlrHA> last accessed 6 July 2019.



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The variable ratio schedule is the one which elicits the most responses in time. The reward's randomness is the key player here. On the other hand, the nature of the reward, ergo the reinforcement, can be different: for a rat or pigeon it can be a pallet of food or some water, while for gambling humans it could be a financial, physiological, psychological or psychosocial reward.⁷⁴ In addition, there is almost no difference between pulling the lever (be a Skinner Box lever or a slot machine lever) and actually winning: the dopamine has already been released, the uncertainty has amplified its effects, and the animal pulling the lever wants to pull it again.

2.4 Psychological factors

Apart from what happens within the brain, there is a multitude of psychological factors at play as well when an individual is gambling. All of these psychological elements compete and cooperate, pushing and pulling at an individual's various buttons to continue playing.

The most common ones will be explained here.

Availability Heuristic

The availability heuristic causes people to predict the frequency of an event based on how easily an example can be brought to mind.⁷⁵ Ergo, when people's minds can produce immediate examples of when something happened in the past, people will tend to overestimate the probability that it will happen again. In the case of gambling, immediate examples would be remembering news stories of people winning the lottery, or the flashing lights and music of the slot machine caching out after a jackpot. In essence, people overestimate their chances of winning because their mind can produce a couple of good memories of winning instead of dredging up the hundreds of losses.

⁷³ Image Source: Charles Stangor, 'Changing Behaviour through Reinforcement and Punishment: Operant Conditioning' in Jennifer Walinga and others, *Introduction to Psychology – 1st Canadian Edition* (1st Edition, BCcampus 2010) <<https://opentextbc.ca/introductiontopsychology/chapter/7-2-changing-behavior-through-reinforcement-and-punishment-operant-conditioning/>> last accessed 8 June 2019.

⁷⁴ E.g. money, the thrill of the risk, peer praise or the social meaning of the activity. Jonathan Parke and Mark Griffiths, 'Gambling addiction and the evolution of the "near miss"' [2004] Vol.12 No.5 *Addiction Research and Theory* p.407.

⁷⁵ Amos Tversky and Daniel Kahneman, 'Judgement under Uncertainty: Heuristics and Biases' [1974] Vol.185 No.4157 *Science* pp.1124-1131.

Gambler's and Hot Hand Fallacy

Contrasting the availability heuristic, which focuses on the past, the gambler's fallacy focuses on the future: it causes people to feel that the likelihood of a low probability event occurring again is a decreasing function of its previous occurrence, i.e. the chances of winning increase with each loss.⁷⁶ The diametrically opposed misconception is the 'hot hand fallacy', a belief that luck comes in streaks.⁷⁷ However, the chances of winning do not increase or decrease when gambling. As mentioned previously, most gambling-related games have the maximum amount of uncertainty, set at 50%, similar to flipping a coin. If one were to flip a coin and it landed on heads fourteen times in a row, that would not change the 50% chance of the next toss also being heads. Every new flip will be a new, isolated, 50% split event, as were the fourteen tosses before it. Technically speaking, it would be possible for one coin to *always* land on heads every single toss, and the chance would still be 50%, not 100%.

However, humans have a hard time understanding the nature of random events, and our brains try to rationalise the unlikeliness of the random event happening again (heads for the fifteenth time) by saying it will balance out the next time.⁷⁸ This flawed mentality is the one that pushes people to keep playing even after losing dozens of times at the slot machine or roulette table, as they believe luck is bound to change at *some* point.

Illusion of control

In addition to the gambler's fallacy, there is a stubborn belief of possessing special skills, knowledge or other advantages that can push gamblers to keep playing.⁷⁹ This conviction of having some sort of influence over chance can be reinforced by the type of game that is played – for example, betting on sport events or playing card games like blackjack or poker. There can be some level of control due to choices, but chance is still involved and still the primary force behind winning or losing. Humans like to be in control so much, that even in games that are completely ruled by chance, it is not unusual to try to gain some control over it, for example by wearing a lucky item, blowing on the dice or throwing them in a certain way, or sitting in a particular spot.

Loss aversion principle – Chasing losses

The loss aversion principle elucidates the fact that humans, in principle, *hate* losing: losing 10€ has a much larger psychological impact than gaining 10€.⁸⁰ Combined with the gambler's fallacy, this leads to the phenomenon known as 'chasing losses', where gamblers will frustratingly lose in a game and then increase their bets in an attempt to win back the lost money or alleviate the feeling of

⁷⁶ Rachel Croson and James Sundali, 'The Gambler's Fallacy and the Hot Hand: Empirical Data from Casinos' [2005] Vol.30 No.3 *The Journal of Risk and Uncertainty* pp.195-209. Infamous is the time when the ball fell on black 26 times on a roulette in Monte-Carlo on 18 August 1913; as the streak lengthened gamblers lost millions betting on red, believing that the chances changed with the length of the run on blacks.

⁷⁷ Christopher Roney and Lana Trick, 'Sympathetic Magic and Perceptions of Randomness: The Hot Hand Versus the Gambler's Fallacy' [2009] Vol.15 No.2 *Thinking & Reasoning* pp.197-210.

⁷⁸ Amos Tversky and Daniel Kahneman, 'Judgement under Uncertainty: Heuristics and Biases' [1974] Vol.185 No.4157 *Science* pp.1124-1131.

⁷⁹ Elizabeth Cowley and others, 'How do Gamblers Maintain an Illusion of Control?' [2015] Vol.68 No.10 *Journal of Business Research* pp.2181-2188.

⁸⁰ Amos Tversky and Daniel Kahneman, 'Prospect Theory: An Analysis of Decision under Risk' [1979] Vol.47 No.2 *Econometrica* p.279.

disappointment or frustration by gaining at least one big win.⁸¹ This phenomenon would also be exacerbated by near-misses.

Sunk cost fallacy

Linked to the loss aversion principle, is the idea of sunk cost fallacy. The sunk cost fallacy is what makes it difficult to leave a long bad relationship, an ill-thought or -timed investment, or gambling. Rational decisions are tainted by the amount of emotional, personal, and/or economical investment in something, and the more one invests, the harder it becomes to abandon said thing.⁸² The ‘sunk costs’ are the investments which can never be recovered, which in gambling usually consist of money and time. Money and time that has been lost, but at least money can, theoretically, be recovered. So the gambler keeps playing, and the more he plays, the more time and money he invests, the more he loses, and the harder it becomes to leave and give up.

Dark flow - Losses Disguised as Wins

A loss disguised as a win is a unique outcome in EGMs. It occurs when a player gains credit on a spin of a slot machine, but it is fewer credits than their original wager (e.g. an 8€ gain on a 10€ wager). These outcomes alter the gambler’s play experience by providing frequent, if smaller, credit gains – the player feels like he has still won *something* out of the ordeal but they are still losses.⁸³ The name ‘dark flow’ refers to the fact that a ‘smoother’ and highly absorbing losing experience is created for the player.

2.5 Business models – How casinos exploit gambling

After having explained in which ways the brain can be susceptible to gambling, it is important for the scope of this thesis to briefly delineate how these weaknesses can be and are exploited.

The House Edge

The House Edge is the statistical, built-in advantage that a casino has in each game and each bet; with a few notable exceptions, the house always wins on the long run.⁸⁴ The casino will always have a small advantage over the player, regardless of skill or chance.⁸⁵ Of course, in the first few bets anything can happen, the house does not win every single time. But the more players there are, and the longer they play, the more likely they are to lose – and the house will win a percentage of the total at the end of the year. The house edge varies per game, and unsurprisingly, games like slot machines have the highest house edge percentage, while card games have the lowest. It is no wonder that

⁸¹ Daniel Kahneman, ‘Maps of Bounded Rationality: Psychology for Behavioral Economics’ [2003] Vol.93 No.5 *The American Economic Review* p.1456-1457.

⁸² Hal Arkes and Catherine Blumer, ‘The Psychology of Sunk Cost’ [1985] Vol.35 No.1 *Organizational Behavior and Human Decision Processes* pp.124-140; Brian Sweis and others, ‘Sensitivity to “Sunk Costs” in Mice, Rats, and Humans’ [2018] Vol.361 *Science* pp.178-181.

⁸³ Mike Dixon and others, ‘Dark Flow, Depression and Multiline Slot Machine Play’ [2018] Vol.34 No.1 *Journal of Gambling Studies* pp.73-84.

⁸⁴ Robert Hannum, ‘Casino Mathematics’ [2012] *UNLV Center for Gaming Research*. Guide excerpted from: Robert Hannum and Anthony Cabot, *Practical Casino Math* (2nd edition, Trace Publication 2005) <<https://gaming.unlv.edu/casinomath.html>> last accessed 14 May 2019.

⁸⁵ For an example on percentages, consult the tables at the bottom of Robert Hannum, ‘Casino Mathematics’ [2012] *UNLV Center for Gaming Research* <<https://gaming.unlv.edu/casinomath.html>> last accessed 14 May 2019.

casinos are, usually, filled with slot machines, because they are the means for the casino to make the most profit. As for skill-based games, even though skill *can* play a role in lowering the house edge, the games where this is possible usually take time and effort to master – e.g. blackjack, craps, or poker. Even then, the house edge is never completely eliminated, just lowered, and that is assuming a perfect play from someone who knows the game well.⁸⁶

Marketing strategies: Attract, capture and induce to return

The casino therefore has a vested interest in attracting as many players as often as possible, as it smoothens out volatile and occasional jackpots into the stable and lucrative house edge. This is where other marketing strategies come in, in order to ‘hook’ players even more than their brains already have: loyalty, complementary and retention programs, with the mantra of *attract, capture and induce to return*.⁸⁷

Loyalty programs typically have the following features: Sign up bonuses, ergo a bonus the moment the new player joins. After that, there are deposit bonuses, a bonus received the moment the player chooses to deposit a certain sum of money. Additionally, there are free bets, which are typically connected with the size of the deposit.

Apart from these, complementary programs (‘comps’) exist as well, to give the player the feeling of gaining something in return for their gambling activities despite their numerous losses. Examples include free drinks and snacks, open buffets and the occasional free dining, accommodation or transportation for high spenders.

Retention and personalisation programs round it all off: there are systems like the Frequent Player Points (FPP), which is a bonus initiative for the players, but also a great retention tool, as it makes said players feel appreciated for their loyalty. There are countless VIP Loyalty Programs, geared towards high spenders and other VIP players. On top of those, there are seasonal events promotions: time-locked and with a flair of the ‘exclusive’, these temporary promotions relate to big events like World Championships or Christmas, Chinese New Year, Easter etc. Finally, the last retention tool is betting assistance, a tool to help new players learn the ropes and a friendly introduction to the games.

2.6 Conclusion

In this chapter, the question that has been addressed is: what is gambling according to psychological and behavioural science? It can be concluded that gambling and its addiction are the sum of multiple different factors, from behavioural to chemical self-feeding loops.

Dopamine is the prime culprit, with the uncertainty factor in gambling overexciting the brain too often. The brain then defends itself by building tolerance and weakening the reward pathways. However, this weakening, especially towards the PFC, contributes to the increasing loss of impulsivity control – increasing risk-taking behaviour and making it harder to stop. The brain still craves the sweet taste of dopamine, however it starves due to high tolerance. The gambler responds by taking bigger risks, since the PFC allows the risk-taking to happen increasingly faster and easier, in an attempt to get the same dopamine rush as at the beginning – and this goes on in a vicious cycle.

⁸⁶ Assuming optimal strategies, in Blackjack the house edge can be as low as 0.5%, but the average player raises the edge to 2%, a poor one even to 4%. Poker similarly can lower the edge to 0.5%, but it can go up until 3%. Tables from: Robert Hannum, ‘Casino Mathematics’ [2012] UNLV Center for Gaming Research <<https://gaming.unlv.edu/casinomath.html>> last accessed 14 May 2019.

⁸⁷ Andrew Klebanow, ‘Developing the Casino Marketing Plan’ [2001] Vol.6 No.2 UNLV Gaming Research & Review Journal p.69.

Thanks to the advancements of neuroscience, it has been demonstrated how the brain physically reacts to gambling as well. The pitfall of near-misses, which are more motivating than wins or complete losses, and the Skinner Box show that even animal brains are susceptible to the rewarding rhythm of gambling and its intoxicating uncertainty factor.

Adding to that are the numerous other psychological factors tied to human nature: the illusion of control, the hate of losing, the gambler's and sunk cost fallacy – all of them contribute to the special kind of snowballing that can be gambling, if one were to not be careful enough. All of these behaviours and factors are preyed upon and exploited by casinos and other venues that involve games of chance.

Having understood this, it is time to move on to the legal section, to observe what the legal definitions of gambling cover, and, most importantly, what they do not.

■ 3. THE LAW: HOW IS GAMBLING DEFINED

What is the current legal definition of online gambling? Before tackling this question, it is necessary to curtail the covered jurisdiction. Due to limited space, the European level will be briefly considered, before focusing on the Dutch and Belgian jurisdiction as these were the first EU countries to actively engage in the debate about loot boxes. In addition, a specification must be made: loot boxes are almost exclusively a phenomenon of the online gaming world, and gambling law is remarkably complex. Therefore, normal, ‘offline’ gambling regulation will be left out of this analysis, favouring instead a central focus on online gambling regulation.

3.1 European Level – Tug of War

Gambling Legislation in the EU

On a European level, gambling regulation does not exist as of yet, neither ‘offline’ or online, despite multiple regulative initiatives having taken place in the past.⁸⁸ The struggle between the attempted initiatives taken by EU and the Member States developing their own laws has been described as a “tug of war without a winner”.⁸⁹ The result is a patchwork of regulation: both kinds of gambling are controlled, organised and regulated exclusively at the national level.⁹⁰ For the online gambling kind, this is not only highly inefficient and costly for the internal market, but also risky for the gamblers, who do not have a clear and predictable legal framework of reference.⁹¹

A lack of targeted regulation does not mean there is no EU law influence; after all, there is a duty to observe related Union law by the national regulators.⁹² As a service industry, online gambling is subject to the freedom of movement of services within the Community,⁹³ and is subject to multiple EU secondary legislative acts: the GDPR,⁹⁴ the Directive on Privacy and Electronic

⁸⁸ Dušan Pavlović, *Online Gambling in the EU – from Data Protection to Gambler Protection* (Phd, Università di Bologna, Università degli studi di Torino, Universitat Autònoma de Barcelona, Mykolas Romeris University and Tilburg University 2018) p.12.

⁸⁹ Ibid.

⁹⁰ Ibid. Five different regulatory approaches have been identified: Totally prohibitive jurisdictions; Protectionist prohibitive systems; Completely liberal systems; Restrictive liberal jurisdictions; Liberal prohibitive systems (from: Salvatore Casabona, *The EU’s online gambling regulatory approach and the crisis of legal modernity*, EU Centre in Singapore Working Paper No.19, 2014 pp.3-4).

⁹¹ Salvatore Casabona, *The EU’s online gambling regulatory approach and the crisis of legal modernity*, EU Centre in Singapore Working Paper No.19, 2014 p.3.

⁹² Ibid. p.4

⁹³ Consolidated Version of the Treaty on the Functioning of the European Union (TFEU) [2012] OJ C 326, Art.56-62.

⁹⁴ Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L 119.

Communication,⁹⁵ the Unfair Commercial Practices Directive⁹⁶ and the Directive on Consumers Rights⁹⁷ – plus the rules and provisions set to guard against money laundering.⁹⁸

Despite the ‘tug of war’, the European Commission recognised the need for cooperation between the EU and Member States, as well as the EU and third countries.⁹⁹ Perhaps unsurprisingly, it seems like the Commission will not opt for either recognition or harmonisation techniques, but will rather adopt a bottom-up approach in the future.¹⁰⁰

Why? Common issues

There are multiple common issues behind the lack of online gambling regulation from a European perspective. One of them is the fact that the online world challenges (supra-)national sovereignty with its own technological rules.¹⁰¹ Another issue is the phenomenon of forum shopping, ergo the cross-border search for a more advantageous legal regime, mainly tax and licences regimes. This is only facilitated by the very nature of online gambling. On top of that, linked to the cyber nature there are two other phenomena to take into consideration.

First, company delocalization, which is a well-known business model consisting of setting up a holding company with various subsidiaries. The entity that provides and manages the online platform which hosts the online gambling activities may not necessarily be the same legal entity which deals directly with the players, and could also easily be established in a different jurisdiction. Additionally, there is contractual standardisation: online gambling contracts usually follow the same template with similar terms and conditions at a *global* level, with very few differences stemming from the specific economic strategy rather than a particular legal system. Both of these phenomena highlight the trend and intention of keeping distance from any jurisdiction and specific legal tradition.¹⁰²

Other common issues involve for example the usual struggle of legislation lagging behind technological innovation – the attempts to regulate the online gambling market are relatively recent. Plus, it is quite hard to find the sweet spot between taxation and a safe and fair environment for

⁹⁵ Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications) [2002] OJ L 201.

⁹⁶ Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning the unfair business-to-consumer commercial practices in the internal market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC of the European Parliament and of the Council and Regulation (EC) No 2006/2004 of the European Parliament and of the Council (Unfair Commercial Practices Directive) [2005] OJ L 149.

⁹⁷ Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, amending Council Directive 93/13/EEC and Directive 1999/44/EC of the European Parliament and of the Council and repealing Council Directive 85/577/EEC and Directive 97/7/EC of the European Parliament and of the Council [2011] OJ L 304.

⁹⁸ Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC [2015] OJ L 141.

⁹⁹ Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions towards a comprehensive European framework for online gambling COM(2012)0596 final p.5; Cooperation Arrangement between the gambling regulatory authorities of the EEA Member States concerning online gambling services (2015).

¹⁰⁰ Salvatore Casabona, *The EU's online gambling regulatory approach and the crisis of legal modernity*, EU Centre in Singapore Working Paper No.19, 2014 p.7.

¹⁰¹ Lawrence Lessig, ‘The Law of the Horse: What Cyberlaw Might Teach’ [1999] Vol.113 No.2 *Harvard Law Review* p.546

¹⁰² Salvatore Casabona, *The EU's online gambling regulatory approach and the crisis of legal modernity*, EU Centre in Singapore Working Paper No.19, 2014 p.8.

players: levy too much tax and the demand will be redirected towards underground and unregulated gambling.¹⁰³

Case Law

In the area of online gambling, the CJEU has provided guidance in interpreting the fundamental freedoms of the Internal Market so that national courts can assess the circumstances under which restrictive national gambling laws are justified.¹⁰⁴ The CJEU also confirmed that the provision and use of cross-border gambling services constitutes as an economic activity¹⁰⁵ – therefore falling within the scope of the TFEU.¹⁰⁶

European law is far from homogenous or harmonised on this front, and regulation is left mainly to the Member States. Therefore, it is appropriate to turn towards the national level of the Netherlands and Belgium, as these EU Member states have entered the debate on loot boxes.

3.2 The Netherlands

The Law: Gambling - WOK

In the Netherlands, gambling is defined in the *Wet op de Kansspelen* (WOK), a.k.a. the Betting and Gaming Act, as:

“Providing an opportunity to compete for prizes or premiums if the winners are designated by means of any calculation of probability over which the participants are generally unable to exercise a dominant influence.”¹⁰⁷

Contrary to most definitions of games of chance in other jurisdictions, this one does not have the requirement for the player to have placed a stake.¹⁰⁸ Additionally, the inclusion of ‘prize or premium’ means that there has to be some sort of economic value.¹⁰⁹ The phrase ‘over which the participants are generally unable to exercise a dominant influence a dominant influence’ dictates that the outcome of the game has to be determined by chance. This however has unsurprisingly given rise to

¹⁰³ ‘European Online Gambling Regulation Changes Expected in 2019’ [2018] *EUbusiness* <<https://www.eubusiness.com/focus/18-10-292>> last accessed 12 June 2019.

¹⁰⁴ ‘Gambling Case Law’ [2019] *European Commission* <https://ec.europa.eu/growth/sectors/gambling/infringements-court-cases_en> last accessed 15 June 2019. The page also contains a list of all European online gambling cases.

¹⁰⁵ Case C-275/92 *Her Majesty’s Customs and Excise v Gerhart Schindler and Jörg Schindler* [1994] ECR I-01039 §24-25; Case C-6/01 *Associação Nacional de Operadores de Máquinas Recreativas (Anomar) and Others v Estado português* [2003] ECR I-08621 §46, 56, 60; Case C-67/98 *Questore di Verona v Diego Zenatti* [1999] ECR I-07289 §18-19; Case C-124/97 *Markku Juhani Läärä, Cotswold Microsystems Ltd and Oy Transatlantic Software Ltd v Kihlakunnasyyttäjä (Jyväskylä) and Suomen valtio (Finnish State)* [1999] ECR I-06067 §15.

¹⁰⁶ *Ibid.*; Consolidated Version of the Treaty on the Functioning of the European Union (TFEU) [2012] OJ C 326, Art.56.

¹⁰⁷ *Wet op de Kansspelen* (Betting and Gaming Act) 1964 Art.1(1)(a) <<https://wetten.overheid.nl/BWBR0002469/2018-07-28>> last accessed 29 September 2019. Translation from: Alan Littler, ‘NETHERLANDS’ in Carl Rohsler, *The Gambling Law Review* (3rd edition, Law Business Research Ltd 2018) p.231.

¹⁰⁸ For example: France’s ‘random contract’ includes the wagers, Code Civil, 1804 Art.1108 <<http://codes.droit.org/CodV3/civil.pdf>> last accessed 4 August 2019; Italy needs a ‘monetary wager’, D.Lgs 14 April 1948 n.496/1948 *Disciplina delle attività di giuoco* G.U. 22 May 1948, Art.1 <https://www.adm.gov.it/portale/documents/20182/1100014/D_Lgs_14_4_1948_n_496.pdf/7d9ec808-332d-430b-ae4c-98bf83f12ea1> last accessed 4 August 2019; Spain requires ‘amounts of money or economically measurable objects’, Ley 13/2011 of 27 May *De Regulación del Juego* Art.2(1)(a) <<https://www.boe.es/buscar/act.php?id=BOE-A-2011-9280>> last accessed 4 August 2019. Similar to the Netherlands, the UK also excludes the need for a stake, Gambling Act 2005 Section 6(4)(b) <http://www.legislation.gov.uk/ukpga/2005/19/pdfs/ukpga_20050019_en.pdf> last accessed 4 August 2019.

¹⁰⁹ Alan Littler, ‘NETHERLANDS’ in Carl Rohsler, *The Gambling Law Review* (3rd edition, Law Business Research Ltd 2018) p.231.

intermittent discussions about which games are games of chance and which of skill – poker in particular has generated an impressively long string of case law.¹¹⁰ The *Kansspelautoriteit* (KSA) has launched a consultation process at the end of 2017 on assessing when a game amounts to a game of chance – it is yet to be published, however.¹¹¹

Finally, all gambling activities are unlawful unless they are either deemed ‘too unimportant’,¹¹² or, when important, licenced¹¹³ – and the law is very specific on the grounds on which the KSA can award such licences.¹¹⁴

The Law: Online Gambling - KOA

The WOK stems from 1964, decades before the Internet. Until very recently, despite being popular, online gambling was illegal in the Netherlands.¹¹⁵ Since 19 February 2019 however there has been an amendment to the WOK in order to legalise it.¹¹⁶ In addition, the Remote Gambling Bill (*Kansspelen op Afstand*, or KOA)¹¹⁷ which has been in the works for years, has finally been approved.¹¹⁸ The date of entry into force is still unknown, but when it does it will provide for a comprehensive new structure and licencing rules.¹¹⁹ In addition, the KOA will clarify the requirements regarding the betting and gambling operators’ duty of care¹²⁰ and a register to prevent

¹¹⁰ According to the *Hoge Raad*, poker is a game of chance in the meaning of WOK Art.1: ECLI:NL:HR:1998:ZD0952; ECLI:NL:GHAMS:2016:774; ECLI:NL:GHAMS:2016:775 and ECLI:NL:GHAMS:2016:776. Most courts and courts of appeal seem to agree: ECLI:NL:RBHAA:2011:BU6574 and ECLI:NL:GHAMS:2013:2316; ECLI:NL:GHAMS:2013:3141; ECLI:NL:GHDHA:2014:1717; ECLI:NL:RBOBR:2013:2857; ECLI:NL:RBOBR:2014:436; ECLI:NL:GHLEE:2012:BY1198 and ECLI:NL:PHR:2014:284. Some do not - dissenting courts and cases: ECLI:NL:RBSGR:2010:BN0013; ECLI:NL:RBAMS:2014:254; ECLI:NL:RBAMS:2014:255; ECLI:NL:RBAMS:2014:256.

¹¹¹ Alan Littler, ‘NETHERLANDS’ in Carl Rohsler, *The Gambling Law Review* (3rd edition, Law Business Research Ltd 2018) p.231.

¹¹² There is a threshold limit of importance that needs to be reached before the KSA considers the activity as possible gambling and therefore in need of licencing (e.g. board games like Monopoly or the Game of the Goose that depend on dice are not considered): *Leidraad beoordeling kansspelen – een leidraad om te inventariseren of een spel onder het toezicht van de Kansspelautoriteit valt* [2018] Kansspelautoriteit p.7.

¹¹³ *Wet op de Kansspelen* (Betting and Gaming Act) 1964 Art.1(1)(a) <<https://wetten.overheid.nl/BWBR0002469/2018-07-28>> last accessed 29 September 2019.

¹¹⁴ *Wet op de Kansspelen* (Betting and Gaming Act) 1964 Art.3-4, 4c, 6, 7b <<https://wetten.overheid.nl/BWBR0002469/2018-07-28>> last accessed 29 September 2019.

¹¹⁵ Margaret Carran, ‘Consumer Protection in EU Online Gambling Regulation – Review of the implementation of selected provisions of European Union Commission Recommendation 2014/478/EU across EU States’ [2018] *European Gaming and Betting Association* p.52.

¹¹⁶ Law Proposal 33 996 of 12 February 2019 nr.O, N, M, P, L, K <<https://zoek.officielebekendmakingen.nl/dossier/33996>> last accessed 16 June 2019; ‘Eerste Kamer stemt in met legalisering online kansspelen’ [2019] *De Kansspelautoriteit* <<https://kansspelautoriteit.nl/nieuws/nieuwsberichten/2019/februari/eerste-kamer-stemt/>> last accessed 16 June 2019; ‘33.996 Organiseren van kansspelen op afstand’ [2019] *Eerste Kamer der Staten-Generaal* <https://www.eerstekamer.nl/wetsvoorstel/33996_organiseren_van_kansspelen> last accessed 25 June 2019.

¹¹⁷ Its latest and finally accepted form being from 27 May 2019: *Wet van 20 Februari 2019 tot wijziging van de Wet op de kansspelen, de Wet op de kansspelbelasting en enkele andere wetten in verband met het organiseren van kansspelen op afstand* [2019] N.127 Staatsblad van het Koninkrijk der Nederlanden <<https://zoek.officielebekendmakingen.nl/stb-2019-127.html>> last accessed 29 September 2019.

¹¹⁸ Since 2013-2014: *Wijziging van de Wet op de kansspelen, de Wet op de kansspelbelasting en enkele andere wetten in verband met het organiseren van kansspelen op afstand* [2013-2014] 33.996 Nr.2 Tweede Kamer der Staten-Generaal <https://www.eerstekamer.nl/behandeling/20140718/voorstel_van_wet_4/document3/f=/vijlpn9o2lx8d.pdf> last accessed 29 September 2019.

¹¹⁹ ‘Senate assents to legalisation of online gambling’ [2019] *De Kansspelautoriteit* <<https://kansspelautoriteit.nl/english/remote-gambling-0/>> last accessed 25 June 2019.

¹²⁰ Ibid.

gambling addiction (called CRUKS).¹²¹ The KSA is aiming to make licencing accessible on the 1st of July 2020,¹²² while the actual online gambling market is set to be established on the 1st of January 2021.¹²³

The proposed and by now accepted definition of online gambling builds upon the already established gambling definition: Gambling – which is directly provided from a distance using electronic means of communication (computers, laptops, tablets or smartphones) and in which a person participates without having any physical contact with the person providing this opportunity or providing space and resources for participating in these games of chance.¹²⁴ The jurisdiction from which the gambling games come from is irrelevant, it is sufficient to have a Dutch person involved using a computer in the Netherlands.¹²⁵ Plus, virtual items are included in the definition of ‘prize or premium’ of the WOK.¹²⁶ Finally, there is a general ban on participating in any games of chance that are organised without a licence.

The KOA is not in force yet, but will be soon. In the meantime, for the purposes of this thesis, the definition of online gambling that will be considered is the official WOK one, but with added KOA provisional texts.¹²⁷ So, according to Dutch law, the factors determining what online gambling is, are:

- Providing an opportunity to compete,
- From a distance,
- Where a person uses electronic means of communication (computers, laptops, tablets and smartphones) located in the Netherlands,
- In which he participates without having any physical contact with the person providing this opportunity, space, or resources,
- In which the person participating is of Dutch nationality,
- Without the need for a stake
- For prizes or premiums, which:

¹²¹ *Centraal Register Uitsluiting Kansspelen* (Central Exclusion Register) Ibid.

¹²² ‘Wet Kansspelen op afstand’ [2019] *De Kansspelautoriteit* <<https://kansspelautoriteit.nl/onderwerpen/a-z/wet-kansspelen/>> last accessed 16 June 2019

¹²³ Ibid.; ‘René Jansen: ‘Online gokmarkt hopelijk open op 1 januari 2021’ [2019] *De Kansspelautoriteit* <<https://kansspelautoriteit.nl/nieuws/nieuwsberichten/2019/rene-jansen-online/>> last accessed 16 June 2019

¹²⁴ Alan Littler, ‘NETHERLANDS’ in Carl Rohsler, *The Gambling Law Review* (3rd edition, Law Business Research Ltd 2018) p.231. *Wet van 20 Februari 2019 tot wijziging van de Wet op de kansspelen, de Wet op de kansspelbelasting en enkele andere wetten in verband met het organiseren van kansspelen op afstand* [2019] N.127 Staatsblad van het Koninkrijk der Nederlanden, Art.31 <<https://zoek.officielebekendmakingen.nl/stb-2019-127.html>> last accessed 29 September 2019.

¹²⁵ Ibid. and Alan Littler, ‘NETHERLANDS’ in Carl Rohsler, *The Gambling Law Review* (3rd edition, Law Business Research Ltd 2018) p.232.

¹²⁶ Ibid.; virtual items were identified as ‘good’ also in national case law: ECLI:NL:HR:2012:BQ9251 (Runescape).

¹²⁷ There is other regulation apart from the WOK and future KOA that deal with gambling, and it includes: *Kansspelenbesluit* (Games of Chance Decree, 1 December 1997) <<https://wetten.overheid.nl/BWBR0009067/2013-01-01>>; *Speelautomatenbesluit 2000* (Slot Machine Decree, 23 May 2000) <<https://wetten.overheid.nl/BWBR0011373/2014-04-01>>; *Speelautomatenregeling 2000* (Slot Machine Regulation, 25 May 2000) <<https://wetten.overheid.nl/BWBR0011382/2014-01-01>>; *Besluit werving, reclame en verslavingspreventie kansspelen* (Decree on Games of Chance: Recruitment, Advertising and Addiction, 7 May 2013) <<https://wetten.overheid.nl/BWBR0033412/2013-07-01>>; *Regeling Werving, reclame en verslavingspreventie kansspelen*, (Regulation on Games of Chance: Recruitment, Advertising and Addiction, 24 June 2013) <<https://wetten.overheid.nl/BWBR0033613/2015-01-01>>; *Beleidsregels niet-incidentele artikel 3 Ioterijvergunningen*, (Policy Rules Non-Incidental Article 3 Lottery Licences, 12 July 2016) <<https://wetten.overheid.nl/BWBR0038255/2016-07-14>>; all last accessed 29 September 2019.

- Have to have an economic value.
- Can be digital.
- If the winner is designated by random chance,
- Over which the participants cannot exercise a dominant influence.¹²⁸

Additional factors:

- The opportunity to compete has to meet the ‘importance’ threshold and be licenced.

3.3 Belgium

The Law - Gambling

Similar to the Netherlands, when a game of chance is recognised as gambling, it is in principle illegal, unless licenced by the *Kansspelcommissie* (KSC), the Belgian Gambling Commission.¹²⁹ The reasoning behind both the Dutch and Belgian model is to limit illegal gambling, by allowing a determined amount of legal gambling.¹³⁰ The main laws in place to regulate gambling are in two distinctly separate pillars: one is the *Wet op de Kansspelen*¹³¹ while the other is the Belgian *Code pénal*, covering lotteries as a separate category.¹³² Gambling is defined in the *Wet op de Kansspelen* as:

“Any game, by which a stake of any kind is committed, and the consequence of which is either loss of the stake by at least one of the players or a gain of any kind in favour of at least one of the players, or organisers of the game and in which chance is a factor, even if only ancillary, for the conduct of the game, or for determining the winner or his/her gains.”¹³³

All games or activities that fall under this definition qualify as gambling activities, and they are strictly prohibited unless licenced.

¹²⁸ *Wet van 20 Februari 2019 tot wijziging van de Wet op de kansspelen, de Wet op de kansspelbelasting en enkele andere wetten in verband met het organiseren van kansspelen op afstand* [2019] N.127 Staatsblad van het Koninkrijk der Nederlanden, Art.31 <<https://zoek.officielebekendmakingen.nl/stb-2019-127.html>> last accessed 29 September 2019.

¹²⁹ There are 9 different kinds for ‘offline’ gambling licences in Belgian law: A, B, C, D, E, F1, F2, G1 and G2. ‘Wat zegt de Wet over Gokken?’ [2016] *Vlaams expertisecentrum Alcohol en andere Drugs* <<https://www.vad.be/assets/1485>> last accessed 29 June 2019. *Kansspelwet* (Law on Games of Chance, 7 May 1999), amended 10 January 2010, Art.4 and 25.

¹³⁰ ‘Gokbeleid in België - Visienota’ [2018] *Algemene Cel Drugsbeleid* p.7 <https://overlegorganen.gezondheid.belgie.be/sites/default/files/documents/20180702_imcvgdrugs_cimdrogues_gokken_visienota_0.pdf> last accessed 29 June 2019.

¹³¹ *Wet op de kansspelen, de weddenschappen, de kansspelinrichtingen en de bescherming van de spelers* from 7 May 1999, also known as *Kansspelwet* (Law on Games of Chance), amended 10 January 2010.

¹³² Belgian Code Pénal 1867 Art.301 <http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=1867060801&table_name=wet> last accessed 26 September 2019. The definition is quite broad, including lottery draw-games, Lotto games and bingo, scratch cards and lottery games coordinated on a European level like EuroMillions. From: Philippe Vlaeminck and Robbe Verbeke, ‘BELGIUM’ in Carl Rohsler, *The Gambling Law Review* (3rd edition, Law Business Research Ltd 2018) p.63.

¹³³ *Kansspelwet* Art.2(1). Translation of the article from: Philippe Vlaeminck and Robbe Verbeke, ‘BELGIUM’ in Carl Rohsler, *The Gambling Law Review* (3rd edition, Law Business Research Ltd 2018) p.62.

The Law – Online Gambling

In addition to the nine different kinds of licencing available for offline gambling, since 2010 Belgian law offers three more supplementary kinds for online gambling.¹³⁴ The licences are essentially the same, only with a ‘plus’ status, in order to guarantee the same level of protection as with ‘offline’ gambling. To clarify, the usual licences would be called A, B, C etc, while online gambling licences would be A+, B+. Before the amendment to the *Kansspelwet*, only the National Lottery operator was allowed to offer its games online. The National Lottery currently still has a monopoly online and is considered separate from other gambling activities.¹³⁵

An added requirement to online gambling in Belgium is that only land-based (ergo physically located in Belgium), offline and already licenced gambling venues may apply for the upgraded, ‘plus’ licence for online gambling.¹³⁶ The normal licence and the ‘plus’ one are linked, both in requirements and in duration.¹³⁷ In addition, there has to be a permanent establishment located in Belgium for the servers involved.¹³⁸

The KSC has extensive powers and put up a system in order to prevent Belgians from accessing illegal (i.e. lacking a Belgian licence) offshore gambling websites. It is a blacklist and blocking system: when an illegal website is identified and accessed in Belgium, it is blocked. The blacklist is publicly available, and works in a broad collaboration between local IT-crime units and Internet Service Providers (ISPs).¹³⁹ There is also a complete and updated list of licenced websites on the KSC website.¹⁴⁰ This system has not been uncontested. However, the cases brought to different Belgian courts unanimously favoured the Belgian government.¹⁴¹

Having considered these elements, the factors that determine what online gambling is according to Belgian law, are:

- A game
- Committing a stake, with the consequence of:
 - a. Either losing the stake by at least one of the players, or
 - b. A gain of any kind in favour of at least one of the players or organisers of the game,
- Chance is a factor – even ancillary – for:
 - a. The conduct of the game.
 - b. Determining the winner.

¹³⁴ Called A+, B+ and F1+: *Kansspelwet* (Law on Games of Chance, 7 May 1999), amended 10 January 2010, Art.25(1/1), (2/1), (6/1).

¹³⁵ Philippe Vlaemminck and Robbe Verbeke, ‘BELGIUM’ in Carl Rohsler, *The Gambling Law Review* (3rd edition, Law Business Research Ltd 2018) p.66-67.

¹³⁶ *Kansspelwet* Art.43/8 §1.

¹³⁷ *Kansspelwet* Art.43/8 §2(1)-(2), §3.

¹³⁸ *Kansspelwet* Art.43/8 §2(3).

¹³⁹ The blacklist is publicly available and regularly updated on the KSC site: ‘Lijst van verboden kansspelwebsites’ [2019] *KansspelCommissie*

<https://www.gamingcommission.be/opencms/opencms/jhksweb_nl/establishments/Online/blacklist/> last accessed 29 June 2019.

¹⁴⁰ ‘Officiële lijst van de Kansspelcommissie – Vergunningen A+’ [2019] *KansspelCommissie* <https://www.gamingcommission.be/opencms/opencms/jhksweb_nl/establishments/Online/aplus/> last accessed 29 June 2019;

‘Officiële lijst van de Kansspelcommissie – Vergunningen B+’ [2019] *KansspelCommissie* <https://www.gamingcommission.be/opencms/opencms/jhksweb_nl/establishments/Online/bplus/> last accessed 29 June 2019;

‘Officiële lijst van de Kansspelcommissie – Vergunningen F1+’ [2019] *KansspelCommissie* <https://www.gamingcommission.be/opencms/opencms/jhksweb_nl/establishments/Online/fplus/> last accessed 29 June 2019.

¹⁴¹ See judgement of the President of the Court of Commerce of Brussels (Flemish Chamber) of 13 June 2012 (*Bwin* case), and judgement of the Civil Court of First Instance of Brussels (Flemish Chamber). Philippe Vlaemminck and Robbe Verbeke, ‘BELGIUM’ in Carl Rohsler, *The Gambling Law Review* (4th edition, Law Business Research Ltd 2019) p.85.

c. Determining his or her gains.

Additional factors:

- The online game needs to be licenced by an already-licenced, land-based gambling venue.
- With servers permanently located in Belgium.

Conclusion

This chapter aimed to provide an answer to the following questions: What is the current legal definition of online gambling according to Dutch and Belgian law?

The research at the European level has not yielded any results: while there are European influences on national regulations, there is no coherent legislative instrument dealing with online gambling, despite attempts having been made in the past. The result is a fragmented scene of 28 different gambling systems.

The analysis of Dutch gambling legislation is quite complex at this moment in time as it is in an in-between phase. The current Dutch gambling act (WOK) does not cover online gambling. An update including online gambling (the KOA) is to be adopted soon, including the CRUKS system which will not monitor websites, but people and their gambling activities. The Netherlands follows a passive nationality-based jurisdiction,¹⁴² in addition to territorial jurisdiction from the user's end.¹⁴³ Furthermore, there is not an official blacklist operated by the KSA.¹⁴⁴ Finally, compared to the Belgian definition of gambling, the role that chance has to have is considerably larger, to the point where the player's skill cannot exercise dominant influence over the outcome.

The Belgian system of dealing with online gambling seems to be a strictly controlled one, but it keeps a permitted gambling sites list and a blacklist openly accessible. In this case it would seem that Belgium is definitely a follower of the creed 'what holds offline should also hold online'.¹⁴⁵ Possibly linked to this, is a strong territorial jurisdiction: the servers have to be permanently located in Belgium, and the online licences can only be upgraded from already licenced land-based gambling venues. Compared to the Dutch definition of gambling, however, the role that chance has to have is way smaller – ancillary can be enough.

¹⁴² Based on the nationality of the 'victim', in this case of the user/player/gambler.

¹⁴³ The electronic means of communication must be located in the Netherlands.

¹⁴⁴ There are some Dutch websites aiming to inform online gamblers, but they are not officially managed by the KSA. Examples include: *Casino Vergelijker* <<https://casinovergelijker.net/>> and *Casino Jager* <<https://www.casinojager.nl/>> both last accessed 27 September 2019.

¹⁴⁵ Bert-Jaap Koops and Corien Prins, 'Internationalization and ICT Law: The Position of the UK, Germany, France and the United States' [2000] Vol.16 No.5 *Computer Law and Security Review*, p.1.

■ 4. APPLICATION – LOOT BOXES

So far what has been analysed are the general definition of gambling, its scientific manifestation in the brain, and the regulation thereof through online gambling law. The new sub-questions for this chapter are: following the findings of the first sub-question, are loot boxes gambling?

Before progressing however, it is necessary to outline the course this chapter will take. First, loot boxes and their characteristics will be explained: the notion of Random Reward Mechanisms (RRMs) will be introduced, and through an economic perspective different kinds of loot boxes will be identified. After that, the overlap with the three core elements of gambling (consideration, prize and chance) will be examined, to determine if loot boxes fulfil the basic requirement to be possibly considered gambling. Following that, the key findings of Chapter 2 will be taken into consideration and whether they occur in loot boxes, determining if loot boxes are gambling from a scientific point of view.

4.1 What are Loot Boxes – Characteristics

The Notion of RRMs

As addressed in the introductory chapter, loot boxes are digital containers that hold a random selection of multiple virtual items. To obtain loot boxes and/or acquire the ‘keys’ that open them, a player needs to spend real or in-game currency, with no guarantee of what will be inside the loot box. When a player decides not to use real-life money, he will usually have to spend extensive hours of gameplay in order to make in-game currency.

Loot boxes run on the notion of ‘random reward mechanisms’, or RRMs, which is a much wider category that includes functionally similar ‘offline’ implementations like baseball or Pokémon card packs, or the ‘chance’ cards in Monopoly.¹⁴⁶ Generally speaking, the random reward mechanism has always been common in games, but recently its mechanics have been refined, for example by introducing artificial scarcity through different classifications and rarity (e.g. ‘common’, ‘average’, ‘rare’, ‘very rare’, ‘legendary’ etc.).

RRMs are hardly something new, despite the loot box debate being a recent one.¹⁴⁷ Multiple factors went into the continuous shift that gradually led to the coming into existence of games like *Overwatch* and ultimately *Star Wars Battlefront II*: as mentioned during the introduction, the rise of the internet, online gaming and F2P business models that developed microtransactions were the protagonists, but something else was at work as well. Breaking down the RRM process down into its basic components, it comes down to three elements, where the fulfilment of one leads to the next:

Eligibility Condition → Random Procedure → Reward

The eligibility conditions indicate the requirement that the player has to meet in order to trigger the random procedure. This can take infinite forms. In the case of ‘offline’ gambling, it could be putting a coin in the slot machine, starting a game of blackjack, raising the stakes at a roulette table, buying scratch cards or a lottery ticket. In the case of videogames, the examples become even more numerous: to name a few, the eligibility condition could be reaching a certain level or stage, achieving a certain amount of experience points, killing a monster, finishing a level, or using a key for a loot box.

¹⁴⁶ Rune Nielsen and Paweł Grabarczyk, *Are Loot Boxes Gambling? Random Reward Mechanisms in Video Games* (Paper, IT University of Copenhagen 2018) p.2-3.

¹⁴⁷ The catalyst *Star Wars Battlefront II* came out in late 2017.

Random rewards (mostly loot) were always celebrated to *some* degree by videogames, with either music, sound or graphic effects. This is plain to see in relatively older but also current videogames. However, videogames that follow this so-called ‘older’ model focus a lot more on the first and third components: the eligibility and the reward. For example, killing a monster rewards the player with experience points, sometimes in-game currency or (random) items; placing a piece in Tetris makes the next one randomly spawn; finishing a quest rewards the player with experience and other digital objects, etc. The list could go on indefinitely. Essentially, the randomness was already known, but it was not the central focus. *That* is one of the core differences with newer videogames, where the focus is put on the second RRM component instead, and its *uncertainty* is celebrated by the game. Newer videogames accentuate the randomness involved by using easily recognizable gambling tropes: packs of cards, spinning reels, shacking dice or shuffling cards sounds, etc.¹⁴⁸

Here are some visual examples:



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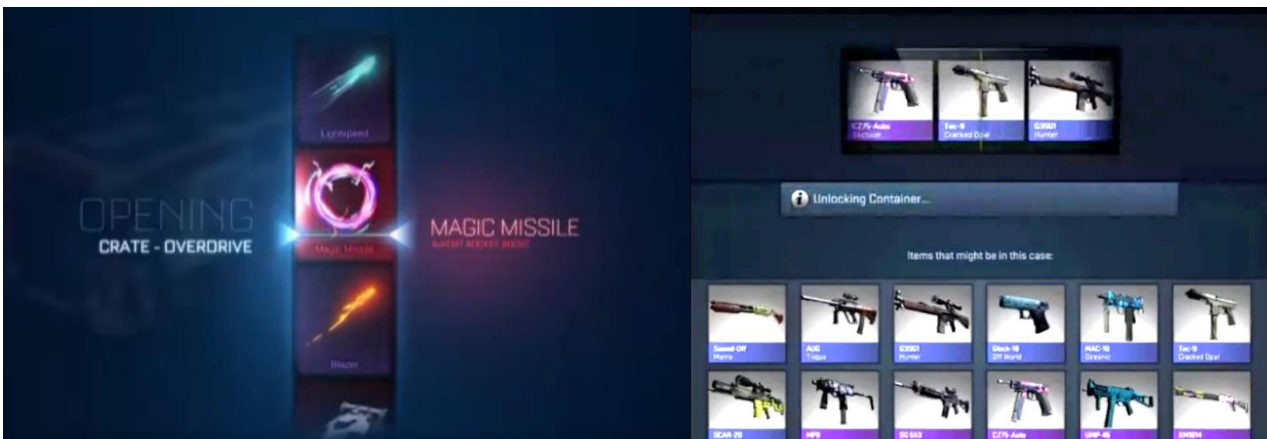
¹⁴⁸ Ibid. p.4

¹⁴⁹ *Star Wars Battlefront II*: opening loot boxes shoots several spinning cards to the side, covered until revealed by the player. They are colour-coded based on their rarity.

¹⁵⁰ *Call of Duty WWII*: after dramatically dropping from the sky, opening a ‘supply drop’ reveals one by one what is behind the cards in exaggerated fashion and with dramatic sounds. The cards are also of different color-coded rarity.



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¹⁵¹ *The Elder Scrolls Online*: after opening a 'crown crate', an in-game character literally deals the player covered cards.

¹⁵² *Rocket League*: opening a crate will show a top-down spinning reel analogous to one of a slot machine.

¹⁵³ *CS:GO*: opening a 'case' in this game will reveal a left-to-right spinning reel analogous to one of a slot machine at the top that will show the player all the guns he could potentially get, before stopping on the prize.

¹⁵⁴ *Overwatch*: opening loot boxes makes the whole screen shake before the box ejects 'chips', the colour-coded rarity of which can be glimpsed before they 'land' and reveal what they are.

Types of Loot Boxes – A helpful economic perspective

Before turning towards the brain and answering the question of whether loot boxes (RRMs) are scientifically analogous to gambling, it is important to cover the fact that there are many different kinds of loot boxes. To do so, we will be loosely following the steps of one of the few authoritative papers on this subject; it however follows an economic perspective and its conclusions fall short for the legal scope of this thesis. Nevertheless, it provides a good overview on how to classify loot boxes, and the reason why it is being considered at all is because some legal systems, for example the Dutch one, base their judgement on such economic perspectives.¹⁵⁵

While videogame players feel *very* differently about this, whether a loot box ejects only cosmetic items (*Overwatch*) or actual in-game advantages and boosts (*Star Wars Battlefront II*) is remarkably unimportant from a strictly economic point of view. Despite what was discussed in the introduction, and even though it caused the outcry that started this whole ordeal, the effects of the rewards in the game are not the issue. In order to differentiate types of loot boxes, there are other parameters that need to be considered instead: ‘Real’ gambling vs simulated gambling; ‘Real’ money and ‘real’ value; and, which RRM element is focused on.

The first distinction is important to make, because some games or sections of games *directly simulate* gambling (e.g. poker or roulette, or sometimes whole casinos), through typical gambling iconography.¹⁵⁶ Interestingly, the number of games simulating the aesthetics of gambling has steadily decreased during the years – and none of the games that spawned the current controversy contain such sections.

To make matters more complicated, it has also been established that simulated gambling does not necessarily have to include typical gambling iconography, to be *structurally* similar to real-life gambling.¹⁵⁷ What exactly the difference between this representational and structural simulated gambling means in practice is, however, still unclear and, empirically speaking, there are no studies as of yet that have analysed the effects of simulated gambling on future players’ behaviour – more research is needed on that front.

The second clarification that is useful is with ‘real’ money and ‘real’ value, as opposed to their virtual counterparts. As mentioned during the introduction, many games involve a dual system of in-game virtual currency, where both can be spent on in-game purchases, but one ‘special’ currency can be acquired with real money. The ‘special’ currency is *embedded* in the real-life economy, as it can be assigned a real-life value. The other, in-game currencies are on the other hand *isolated* from real-life economy: they have no value outside of the game itself.¹⁵⁸

Finally, something else that has to be taken into consideration is *which* RRM element is embedded, ergo involved with real-life money: either the eligibility condition, the reward, or both. The consequence of these scenarios can be as follows: if one were to focus on the eligibility condition, then it could be argued that RRM fulfils the conditions for gambling if “purchases to participate are

¹⁵⁵ Written by two professors at the IT University of Copenhagen: Rune Nielsen and Paweł Grabarczyk, *Are Loot Boxes Gambling? Random Reward Mechanisms in Video Games* (Paper, IT University of Copenhagen 2018).

¹⁵⁶ Ergo actual playing tables and slot machines, representational of real-world gambling. A good example of such a game comes from 1997: *Final Fantasy VII* contains a whole casino (‘The Gold Saucer’) where players can win in-game money through minigames – it is only accessible after many hours of gameplay, however. Rune Nielsen and Paweł Grabarczyk, *Are Loot Boxes Gambling? Random Reward Mechanisms in Video Games* (Paper, IT University of Copenhagen 2018) p.8-9.

¹⁵⁷ Daniel King and others, ‘A review of Australian classification practices for commercial video games featuring simulated gambling’ [2012] Vol.12 No.2 *International Gambling Studies* pp.231-242.

¹⁵⁸ Rune Nielsen and Paweł Grabarczyk, *Are Loot Boxes Gambling? Random Reward Mechanisms in Video Games* (Paper, IT University of Copenhagen 2018) p.11.

made”.¹⁵⁹ In other words, if a player buys keys or passes to open the loot boxes with real money. On the other hand, if one were to focus on the reward, the argument would be centred around whether or not the reward has an embedded, real-life economic value; if it does, then it can be traded and sold, and it is therefore considered gambling.¹⁶⁰ On the complete opposite side of the spectrum, there is the position that since players are *always* guaranteed a reward, just not what they *wanted*, RRM are definitely not gambling.¹⁶¹

Taking all of these conditions into account, from an economical perspective, this is the result for different types of loot boxes:

	Resources (i.e. Currency)	Reward	Business Model	Games Examples
TYPE 1	Isolated	Isolated	P2P	<i>Diablo, Diablo 2</i>
TYPE 2	Isolated	Embedded (i.e. virtual sellable object)	P2P	<i>Diablo 3</i>
TYPE 3	Embedded (i.e. real money purchase)	Isolated (i.e. virtual unsellable object)	P2P	<i>Overwatch, Star Wars Battlefront II, FIFA 17, FIFA 18</i>
			F2P	Most mobile games: <i>Candy Crush, Clash of Clans</i>
TYPE 4	Embedded (i.e. real money purchase)	Embedded (i.e. virtual sellable object)	P2P	<i>PUBG, CS:GO</i>
			F2P	<i>Team Fortress 2</i>

¹⁶²

According to this analysis, it is surprising to arrive at the conclusion that the games that sparked the current loot box controversy, are, from an economic perspective, not functionally similar to gambling: only Type 2 and 4 of the table, since there is a (possible) economic turnover. Despite the fact that this analysis is certainly illuminating, and despite the fact that this structure will be used, the author of this thesis does not agree with its economic conclusion, as will be illustrated in the following sub-chapters.

¹⁵⁹ “...rather than being given free spins or keys, or earning them through skillful gameplay”. Mark Griffiths and Rosie King, ‘Are mini-games within RuneScape gambling or gaming?’ [2015] Vol.19 No.9 *Gaming Law Review and Economics* p.642.

¹⁶⁰ Rune Nielsen and Paweł Grabarczyk, *Are Loot Boxes Gambling? Random Reward Mechanisms in Video Games* (Paper, IT University of Copenhagen 2018) p.12.

¹⁶¹ Similar arguments were made in the 1950s when baseball cards, some of the most influential collectibles of all time, became the newest trend among children in the US. The same arguments came back decades later for Pokémon trading cards, and would be repeated with every other new kind of collectible trading card. The same arguments have resuscitated again in the wake of the loot boxes debacle. Jason Schreier, ‘ESRB Says It Doesn’t See ‘Loot Boxes’ As Gambling’ [2017] *Kotaku* <<https://kotaku.com/esrb-says-it-doesnt-see-loot-boxes-as-gambling-1819363091>> last accessed 18 July 2019.

¹⁶² Credit for table’s initial structure, further modified by the author: Rune Nielsen and Paweł Grabarczyk, *Are Loot Boxes Gambling? Random Reward Mechanisms in Video Games* (Paper, IT University of Copenhagen 2018) p.13.

Now it is finally time to put together the points and research that have been gathered so far and compare them to loot boxes.

4.2 Overlap with Gambling

Once again, it is necessary to bring up the three core elements of gambling:

- A monetary or material wager on an event;
- The purpose of said wager is to win additional money or material goods by correctly predicting the outcome of the event; and
- The future outcome of the event is uncertain.

The first element is **consideration**: in order to open a loot box, the *conditio sine qua non* is to have a compatible ‘key’. This key is the stake, the wager to the random event that is behind opening a loot box; it is the coins put in the slot machine. Keys may be acquired through a variety of different means: one may be given for free, others may be awarded for some special events or achievements, others may even be dropped randomly as loot (though this is quite rare),¹⁶³ they ultimately and most reliably can be bought with real or otherwise embedded in-game currency. Even then, there can be deals, bundles or discounts available on the number of keys that one could buy. Nevertheless, the possibility of very occasionally gaining a key for free does not remove the in-game value of the key – which can be measured both in embedded and in real-life currency. After all, finding a 5€ note on the ground does not take away its value. Therefore, the first condition of having a monetary wager (the key) on an event (the loot box opening) is fulfilled.

The second element is **prize**. The purpose of opening a loot box is to gain an item or boost that is normally impossible to purchase or buying it is considered too expensive. The aim is definitely to win something. The second part of the ‘prize’ condition is fulfilled as well – correctly predicting the outcome of an event is an ancillary condition, since games that are completely unpredictable and unaffected by skill are still unanimously considered gambling, like EGMs or lotteries.¹⁶⁴

The third and final element is **chance**, which is automatically fulfilled due to the RRM nature of loot boxes and their dependency on Random Number Generators (RNGs). An RNG is an algorithm that simulates chance and luck in videogames by generating random number patterns – which the game then can use to create random results for different events.¹⁶⁵

The three conditions are thus met. This does not, however, give us a clear-cut result, since the meaning, function, and provision of gambling have differed depending on the culture and time period. This is partly the reason behind this thesis, why loot boxes are currently such a hotly debated topic and why we will continue with the findings of Chapter 2.

4.3 The Brain

It appears to be fitting to start from the prime culprit of it all, **dopamine** and the uncertainty boosting its effects. The connection of uncertainty as a motivator behind behaviour such as gambling and the phenomenon of loot boxes is crystal-clear: both are random, are supposed to be random, and thrive

¹⁶³ It can happen, for example, extremely rarely in *Guild Wars 2*, the author experienced it herself and dropped a key for a ‘Black Lion Chest’ from an unspecified low-level creature encounter.

¹⁶⁴ Robert Williams and others, *The definition, dimensionalization, and assessment of gambling participation* (1st edition, University of Lethbridge 2017) (Report prepared for the Canadian Consortium for Gambling Research) p.7.

¹⁶⁵ It is important to stress the ‘simulated’ part, because an RNG is a man-made machine that runs on code. While true uncertainty may be present, so-called ‘true’ luck cannot happen, not really. It may also even happen that, hypothetically, if an RNG is sufficiently flawed or not complex enough, to the highly experienced player it will appear as what it is, namely not random but deterministic. Such an experienced player may even find ways to use and exploit it to their advantage and ‘make their own luck’, in a way comparable to card counting.

on the fact of being random. RRM and RNGs make sure to keep it that way in videogames. Chance is, however, a necessary component in games, as it makes a game enjoyable and fun, a.k.a. it releases dopamine. A completely predictable game is not as fun or enjoyable and can become dull fairly quickly.¹⁶⁶ How much said chance should impact the game to be entertaining, on the other hand, is debatable and depends on the game itself.¹⁶⁷ Following people's many different tastes, some games depend on near-complete randomness, others rely entirely on skills, and most of the times they are a varying mix of both.¹⁶⁸

It can be safely concluded, however, that the element of randomness and chance is predominantly present in loot boxes: a player's skills have zero influences on what will come out of a crate once opened. In addition, the shift in recent videogames towards focusing on and celebrating this randomness does nothing but highlight this.

The RRM and RNG factors play a leading role in loot boxes from the point of view of **variable-ratio schedule of reinforcement**: Skinner's most successful schedule in fast response rate and low extinction rate, the same schedule used in gambling. It almost seems redundant to clarify this element – it is in the names themselves, *Random Reward Mechanisms* and *Random Number Generator*.

The **near-miss effect** is also encountered when opening loot boxes: in the vast majority of them, the player experiences the following things when opening a container: shaking or dramatic animations, exciting or suspenseful noises, and above all, the split-second glimpse of the rarity of the items that are about to be unlocked.¹⁶⁹ This, just before being awarded with something the player already possesses (a double more or less common skin, or weapon, etc.), disappointing the player and not really 'winning'. The player already owns the 'won' reward and will thus not benefit from it. The disappointment and the intensity of the effect increase when the RPE¹⁷⁰ is low. This can be clarified via a hypothetical scenario: for example, when the player has low expectations, then suddenly glimpses the colours of the items he is about to receive. For a split second, he sees a rare colour, and there comes the rush of dopamine, as the player is pleasantly surprised by the fact that he is about to win a rare item – only to be disappointed at the reveal that that particular item is something he already owns. On the flip side, another scenario could be that the player has won an extremely rare item when his expectations were low, and was therefore pleasantly surprised. He might give it another try, but this time the expectations will be higher due to the previous win – and the disappointment will also be higher when the same stroke of luck does not happen.

These RPE examples tie into the **gambler's fallacy**, the expectation that the likelihood of winning increases with every loss, and the **hot hand fallacy**, the belief that luck comes in streaks. Thanks to the RRM and RNG nature of loot boxes, which are algorithm- and code-based, any superstitious belief in true luck disappears. The luck in videogames is simulated, fabricated by a machine – and it may be very advanced and truly random, but once again humans have a hard time understanding the true nature of randomness and irrationally overestimate their chances after a streak

¹⁶⁶ Patrick Anselme and Mike Robinson, 'What Motivates Gambling Behavior? Insight into Dopamine's Role' [2013] Vol.7 *Frontiers in Behavioral Neuroscience*.

¹⁶⁷ Lennart Nacke, 'Basic Introduction to Game Design - Chance and Skill in Game Design' [2014] *The Acagamic – Usable Game Science* <<http://www.acagamic.com/courses/game-design-course/chance-and-skill-in-game-design/>> last accessed 19 July 2019.

¹⁶⁸ Games almost completely dependent on chance are, for example, the *Mario Party* series, or most videogames simulating dice, like *Monopoly*. Examples of games of complete skill could be *Tetris*, *Pac-Man*, or fighting games like the *Street Fighter* or *Tekken* series. Most of the games today, however, rely on a healthy mix of both.

¹⁶⁹ This last element of the split-second glimpse is not omni-present, but especially true in *Star Wars Battlefront II*, *Overwatch* and *CS:GO*.

¹⁷⁰ Reward Prediction Error: when low expectations award a higher amount of dopamine at the unexpected pleasant result of an action or event, and when high expectations award a bigger disappointment to the unexpected disappointing result.

of losses. They still believe that at some point, their (fabricated) luck is bound to change, and they will finally get that coveted player in *FIFA*.

The **availability heuristic** also is involved, and it even seems pretty straightforward: when a player wins a coveted item (a rare skin, weapon, player etc.) they will be there for the player to equip and show off to others online. It will be very easy, therefore, for a player to bring to mind examples of times and things he has won, compared to the – probably more numerous – times he has received low-tier, common items or duplicates of items already owned. This is also supported by hundreds, if not thousands of videos available online of players unlocking stacks of loot boxes in a row and receiving good items from them.¹⁷¹ Apart from videos, there are many other online (social) platforms where players can share their successes which also leads to players thinking more easily of good loot.

The **illusion of control** is a bit harder to verify, since the opening of loot boxes is a purely random and does not involve the skill of the player in any form. It is, however, possible in multiple games to buy different ‘tiers’ of loot boxes¹⁷² and different amounts in package deals.¹⁷³ The higher the amount of money a player puts in, therefore, the higher – perhaps – the chances of winning something rare are.

Tied to the illusion of control, players also experience a combination of **loss aversion, chasing losses and sunk cost fallacy**. Humans hate losing – near-misses only exacerbate this feeling – however in the case of loot boxes, not only does losing equate to wasting money on one or more items the player already owns, but also the more money a player wastes without getting something worthwhile, the more time is invested and thrown into the bottomless pit of keys for loot boxes. Players can escalate their commitment to this unsuccessful course of action in order to justify their previous investments. Buying crates in bulk plays into this logic – it seems reasonable, when chasing a particular item, that buying more for a cheaper price would be more convenient to increase winning chances. This far from an uncommon practice for example when a new skin hits the virtual game market. It can be even more unfortunate than actual gambling – at least in ‘real’ gambling, a player can get real currency back for his efforts. A player investing his savings in crates upon crates cannot recover them – not directly, at least. If the game he chose happens to have items that can be sold on third party websites for real currency, he may recover something if he gets lucky enough to drop a rare item. Otherwise, the hundreds of dollars or euros spent on getting a legendary skin on a game that does *not* allow that (RRM Type 3: games like *Overwatch* and *Star Wars Battlefront II*) are not recoverable.

Finally, the **losses disguised as wins** are very much present in loot boxes. To reiterate a very stale argument that is often made when speaking about them: the player always gets *something*.¹⁷⁴ The player pays a fixed price for a loot box only to receive common items, duplicates that stack in the dozens, instead of rare (or epic, legendary, or any other denomination of bigger rarity) rewards. It might sound counterintuitive, but just because the player won something, does not mean he has not lost. It is similar to winning 8€ after putting in a 10€ wager – the player won *something*, but *de facto* lost 2€.

¹⁷¹ The general sentiment regarding these videos is that they are likely fabricated by the videogame developers themselves, however this is all speculation.

¹⁷² With different amounts of rarity and higher chances of winning something rare – proportional to their price. An example of tiers from *Star Wars Battlefront II*: daily crates, trooper crates, allegiance crates, starfighter crates, hero crates.

¹⁷³ An example of a typical deal from *Overwatch*: 2 loot boxes for \$1.99; 5 for \$4.99; 11 for \$9.99; 24 for \$19.99; 50 for \$39.99.

¹⁷⁴ Jason Schreier, ‘ESRB Says It Doesn’t See ‘Loot Boxes’ As Gambling’ [2017] *Kotaku* <<https://kotaku.com/esrb-says-it-doesnt-see-loot-boxes-as-gambling-1819363091>> last accessed 18 July 2019.

Every single chemical, neuroscientific and psychological effect that has been analysed in this thesis that has an effect on players in real gambling, is present in varying degrees in the phenomenon of loot boxes.

Strikingly Similar Business Techniques

The **house edge** is the statistical advantage built into all games that a casino offers. Loot boxes reportedly have unfair odds stacked against the player – an analogy that can be made is that of a roulette where a player can only win when the ball lands on the green zero, and still the player only gets paid double the original wager (instead of 17¹⁷⁵ or 35¹⁷⁶ times).¹⁷⁷ One of the few sources on this subject analysed the crates – loot boxes – that are offered in the game *Player Unknown BattleGrounds (PUBG)*¹⁷⁸ after they released their odds and rates,¹⁷⁹ and came to the shocking following result: after opening 100,000 ‘militia crates’ with the overall cost of \$87,000, the overall value of the unboxed items was merely \$30,368.78. The total loss was \$56,631.21.¹⁸⁰ Further comparing the same crates to the spins of a roulette using the same stakes shows the abyssal gap between the two average losses:

	<i>PUBG</i> Militia Crates	Roulette
Identical Stakes	1,000 crates with \$2.50 keys	1,000 spins with \$2.50 bets
Average Losses	-\$1,040	-\$67.50

The house edge of *PUBG* is easily dozens of times higher than the one at a casino. It may be too hasty to conclude that all developers have built this ludicrous house edge in their games, however, this analysis and its result demonstrating the sheer amount of disparity between real-life casinos and *PUBG* should raise at least a couple of red flags.

The mantra of **attract, capture and induce to return** also rings true with the techniques developers use in loot boxes. Videogames often offer a gateway to loot boxes through the offering of a free key, to introduce the player to the concept. This may happen after first signing up, or after paying for the full version of the game after trying the free version, or during the tutorial.¹⁸¹ This first loot box may capture the player, it may not – after all, loot boxes are largely an optional feature of (most) videogames.¹⁸²

¹⁷⁵ American style wheel; it has two green slots, with 0 and 00.

¹⁷⁶ European style wheel; only has one green slot, the 0.

¹⁷⁷ “[...] [and] If you’re ever lucky enough to actually make a profit, you can’t leave until you hand over 20% to bouncers at the door.” Ollie Green, ‘A study on Loot crate Odds and How They’re Always Stacked Against You – Video Game Loot Developers Are Making a Killing Due to Their Unfair Loot Drop Rates’ [2018] *Medium* <<https://medium.com/@olliegreenfreelancewriter/a-study-on-loot-crate-odds-and-how-theyre-always-stacked-against-you-e3d374e56fe7>> last accessed 19 July 2019.

¹⁷⁸ An online multiplayer battle royale game released in 2017.

¹⁷⁹ Even if they provided the odds and rates of only four crate types out of twelve at the time of the study. The study used ‘militia crates’, and the odds can be found on the official *PUBG* wiki: <https://pubg.gamepedia.com/Militia_Crate> last accessed 20 July 2019. *PUBG* has currently released the odds of all their crates, and they can be found on the official wiki for their respective platforms (PC, Xbox and PlayStation): <<https://pubg.gamepedia.com/Crates>> last accessed 20 July 2019.

¹⁸⁰ Ollie Green, ‘A study on Loot crate Odds and How They’re Always Stacked Against You – Video Game Loot Developers Are Making a Killing Due to Their Unfair Loot Drop Rates’ [2018] *Medium* <<https://medium.com/@olliegreenfreelancewriter/a-study-on-loot-crate-odds-and-how-theyre-always-stacked-against-you-e3d374e56fe7>> last accessed 19 July 2019.

¹⁸¹ This last one is the most common in mobile app games.

¹⁸² They were not optional in *Star Wars Battlefront II* when it was initially released – which outraged players and is why the argument on loot boxes started in the first place.

Complementary food, drinks or accommodation programs (‘comps’) are technically impossible to implement in the online world of videogames, however the most important core element is still present in the loot boxes’ very nature. Comps exist to give the casino gamblers a feeling of gaining *something* in return – this is exactly what players get when they open a loot box: they always gain *something* in return from the box, whatever this may be. It may be a common or mediocre item they do not possess yet, hardly what the players are aiming for, but nevertheless *something*. When getting a duplicate, the duplicate items may be exchangeable into *something*, for example into in-game currency in some games. This exchange however is not as valuable, and so the player incurs into real monetary loss anyway.¹⁸³

The most powerful tool of loot boxes is, however, their retention and personalisation aspects. The most obvious one is the seasonal aspect: items that have a seasonal ‘flair’ are rarer, often can be more aesthetically polished and pleasing, and above all they are time-locked, a.k.a. one can only get them for a limited time, which only adds to the pressure to buy them. The most common ones are recurrent, with themes like Halloween, Christmas, Chinese New Year, April Fools, Easter, or even the game’s own anniversary. Others, on the other hand, are unique or take place more occasionally – like World Championships, World Cups or the Olympics.¹⁸⁴



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There are even other, more powerful albeit more hidden and insidious tools of retention and personalization. It has been shown that players’ spending behaviour is monitored through behavioural tracking - e.g. when and what they buy, what they hover over a bit longer as they ponder or hesitate over a purchase, whether discounts are involved when a purchase is made, etc. Furthermore, it has been demonstrated that the prices displayed to the players are adjusted using data manipulation – similar to how cookies can inflate prices on websites – to sell more (keys, boxes, or bundles of either or both) to the detriment of consumer protection.¹⁸⁶

4.4 Conclusion – Loot Boxes ARE Gambling

Following the findings of the Chapter 2, this chapter set out to discover whether loot boxes are gambling or not. It was found that loot boxes fulfil all three core elements of gambling, however said elements are just the starting point, and at the same time the cornerstone on which to build this thesis’s arguments. The next step was applying the findings on what constitutes gambling based on

¹⁸³ Mark Griffiths, *Is the buying of loot boxes in videogames a form of gambling or gaming?* (Paper, International Gaming Research Unit, Psychology Department Nottingham Trent University 2018) p.5. Valtteri Kauppi, *Do ‘Loot Boxes’ in Video Games Constitute Devices for Gambling or Lotteries – Comparative Study Between Finland and the United Kingdom* (Bachelor’s Thesis, Tallinn University of Technology 2019) p.10.

¹⁸⁴ Once again, the biggest and best example of this is *Overwatch*.

¹⁸⁵ From left to right, some examples from *Overwatch*: Halloween, Christmas, Chinese New Year and Summer Games (an event inspired by the Olympics) Loot Boxes.

¹⁸⁶ From an accepted, peer reviewed article that is not yet assigned a volume or issue number: Daniel King and others, ‘Unfair Play? Video Games as Exploitative Monetized Services: An Examination of Game Patents from a Consumer Protection Perspective’ [2017] *ScienceDirect* <<https://www.sciencedirect.com/science/article/pii/S0747563219302602>> DOI: <<https://doi.org/10.1016/j.chb.2019.07.017>> both last accessed 20 July 2019.

behavioural science, all the chemical, neuroscientific and psychological effects and phenomena that are involved in gambling – and, most importantly, phenomena that can lead to a self-feeding cycle of behavioural addiction. It was found that *all* points apply to loot boxes. As a corroborating fact, developers of games that employ loot boxes also employ business strategies that are shockingly similar to those used by casinos.

The problem is, casinos have a centuries-long reputation and instantly recognisable iconography. Even if gambling as a ‘proper’ addiction has only recently been recognised, gambling has never had a good reputation. Videogames, however, are something relatively recent; online videogames, micro transactions and loot boxes even more so. This is uncharted territory; it is something new – and something individuals, *especially* vulnerable ones like minors and problem gamblers are not pre-emptively warned against.¹⁸⁷

On the basis of the foregoing research, this author comes to the conclusion that the number of overlapping points and similarities with gambling pile up too much to just be a coincidence. Experts on addiction have established that *any* behaviour can become an addiction,¹⁸⁸ and a study on loot boxes has already shown that there is at least a link to problem gambling.¹⁸⁹ Loot boxes built in games with embedded currencies are mostly to the financial detriment of the consumers and can definitely be considered as gambling, regardless of whether the spoils can be sold on third-party websites. The games of Type 3 and 4 of the RRM table fulfil the requirements that have been analysed above, and both rows can lead to gambling addiction where a player just cannot stop himself anymore.¹⁹⁰ RRM Type 2 includes those rare games that do not have an embedded currency, but allow the obtained items to be sold on third party websites for real-life currency (*Diablo 3*). This type of loot box is technically not to the economical detriment of the player, however the loot boxes of these games can still scientifically be considered gambling, because they still showcase the characteristics that have been analysed up until this point. RRM type 1 is to be excluded, as it does not include loot boxes. This brings to the following conclusion: *All types of loot boxes are gambling, regardless of RRM distinction.*

As previously explained, loot boxes are a very specific type of RRM and a randomised type of microtransaction. While microtransactions in general have a purpose and respond to the necessity of making a game F2P, the biggest and flashiest users of loot boxes tend to actually be P2P games – a.k.a. fully-fledged and fully-priced (60€) games that do not necessarily *need* them. It is true that online games regularly release new content and funds are needed for this, and for this reason

¹⁸⁷ There are dozens of (unofficial) accounts online of individuals that have gotten addicted to opening loot boxes and spent hundreds, if not thousands of euros, dollars or pounds. Multiple confessions can be found on various online social platforms, however here are some official articles: Wesley Yin-Poole, ‘FIFA player uses GDPR to find out everything EA has on him, realises he’s spent over \$10,000 in two years on Ultimate Team’ [2018] *Eurogamer* <<https://www.eurogamer.net/articles/2018-07-23-fifa-player-uses-gdpr-to-find-out-everything-ea-has-on-him-realises-hes-spent-over-usd10-000-in-two-years-on-ultimate-team>> last accessed 21 July 2019. Makena Kelly, ‘How Loot Boxes Hooked Gamers and Left Regulators Spinning – ‘When your brain works like mine, you can’t stop’’ [2019] *The Verge* <<https://www.theverge.com/2019/2/19/18226852/loot-boxes-gaming-regulation-gambling-free-to-play>> last accessed 19 July 2019. And: Ethan Gach, ‘Meet the 19-Year-Old Who Spent Over \$10,000 On Microtransactions’ [2017] *Kotaku* <<https://kotaku.com/meet-the-19-year-old-who-spent-over-10-000-on-microtra-1820854953>> last accessed 19 July 2019. Lydia Thomas and Mike Young, ‘I spent £700 on loot boxes in a month’ [2019] *BBC News* <<https://www.bbc.com/news/business-47470182>> last accessed 21 July 2019.

¹⁸⁸ Mark Griffiths, ‘A ‘Components’ model of addiction within a biopsychosocial framework’ [2005] Vol.10 No.4 *Journal of Substance Use* p.193-195.

¹⁸⁹ From a peer reviewed article that is not yet assigned a volume or issue number: David Zendle and Paul Cairns, ‘Loot boxes are again linked to problem gambling: results of a replication study’ [2019] *PLOS/ONE* <<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0213194#abstract0>> DOI: <<https://doi.org/10.1371/journal.pone.0213194>> both last accessed 21 July 2019.

¹⁹⁰ *Ibid.*

microtransactions can be considered necessary. The randomness provided by loot boxes and the risks they can entail to players, however, are not.

■ 5. LOOT BOXES AND THE LAW

This chapter will address the following sub-question: if loot boxes are to be considered gambling, to what extent does the law cover them? After reiterating the key overlapping points found in the previous chapters, at last the legal aspects will be analysed, to understand whether the Dutch and Belgian law cover loot boxes. The chapter will close with a short mention on current events unfolding in the European Union regarding loot boxes.

5.1 Overlapping Elements

Gambling and its three core elements will be the foundation for this overview. The key findings of Chapter 2 and what happens within the brain will be linked to these.

Taking these points into consideration in addition with the legal findings of Chapter 3, a table has been created to illustrate how the elements of gambling overlap from the perspective of what actually takes place within the brain, what is said in Dutch law and in Belgian law.

3 Elements	The Brain	The Law: Dutch	The Law: Belgian
Consideration / Competition	The risk-taking control by the PFC is weakened through the homeostatic response.	Providing an opportunity to compete .	A game.
Sub-element: stakes	Reward Prediction Error	There is no need for a wager/ stake .	Committing a stake .
Prize	Winning is a rewarding activity that releases dopamine.	For prizes or premiums , which have to have an economic value .	Losing the stake by at least one of the players / A gain of any kind in favour of at least one of the players or organisers of the game.
Chance	Uncertainty is a key motivating factor through dopamine. Operant Conditioning: Variable Ratio Schedule.	The winner is designated by random chance .	Chance is a factor – even ancillary – for: the conduct of the game; determining the winner; determining his or her gains.
Sub-element: Control	Illusion of Control	Over which the participants cannot exercise a dominant influence .	N/A

This overview showcases that both Dutch and Belgian law cover the three core elements in gambling responsible for the processes that can lead to gambling addiction, albeit in different ways. Still, while the table illustrates the concepts that overlap, there are many that are excluded by the law or overlooked. The coverage is there, but it is partial – the biggest overlooked sections being the near-miss effect and most psychological factors.

5.2 Netherlands – Partial Coverage, Some Loot Boxes Still Legal

Following the provisional Dutch definition of online gambling, loot boxes at first glance seem to fit without a snag: loot boxes are an opportunity to compete, and they can reasonably be assumed to reach the threshold of ‘importance’: after all, the Netherlands was, together with Belgium, the first EU country to throw itself into the legal debate about them.

Loot boxes are a part of online videogames (provided from a distance and via electronic means of communications), they do not include any physical contact, they are determined by complete random chance over which the player cannot exercise any influence (RRM and RNGs), and despite the fact that loot box keys qualify as stakes, Dutch law does not necessitate one. As long as the player is of Dutch nationality and is accessing the game from the Netherlands, it would seem that the definition fits. The only snag that is hit is the ‘prizes or premiums’ part: they may be digital, however they need to have an economic value. That would mean that only RRM Type 2 and 4 would qualify as gambling, as the prizes can be sold on third party websites. Games like *Diablo 3*, *PUBG* and *CS:GO* would therefore qualify as gambling in need of licencing from the KSA, whereas surprisingly, the games that sparked the debate, *Overwatch* and *Star Wars Battlefront II*, would not.

This means that from a Dutch legal perspective, there is only partial coverage of what is to be considered gambling from a scientific perspective.

5.3 Belgium – Covered and Illegal due to Licencing Impossibility

Following Belgian law, the factors that determine something as online gambling are:

Loot boxes are a game, where a player has to pay for a key (ergo committing a stake) for the boxes to open. The consequence of committing the stake can, counterintuitively, be both at the same time: the key (stake) is lost, as it disappears after use, and the player is almost always economically worse off, but he also gains a prize at the same time. Furthermore, loot boxes are completely random (RRM and RNGs) so chance is more than just ancillary.

Technically, this would mean that Belgian law covers loot boxes and considers them gambling. As long as the servers of the game are located in Belgium, the only snag that could stop legal coverage of loot boxes in Belgium is whether the game is licenced. The issue however is that online videogames do not exactly have a land-based gaming venue that could potentially be licenced and then upgraded to a ‘plus’ licence. This means that Belgian law stretches as far as to cover loot boxes and defines them as gambling, however everything grinds to a halt at the structural impossibility of licencing. The result of this is that loot boxes are to be considered illegal. It is no surprise that the KSC already came to that conclusion in 2018.¹⁹¹

5.4 Current Events – “Surprise Mechanics”

Dutch authorities declared in 2018 that they wanted to spread the way they handle loot boxes – ergo treating games with sellable rewards as gambling – across the EU.¹⁹² More recently, it seems that the more sensible game developers are taking steps back and are stopping the sales of loot boxes altogether both in the Netherlands and Belgium – although it seems that this action is more motivated

¹⁹¹ *Belgische Kansspelcommissie* (Belgian Gambling Commission) *Onderzoeksrapport loot boxen* (Research Report on Loot Boxes), April 2018pp.17-18 <https://www.gamingcommission.be/opencms/export/sites/default/jhksweb_nl/documents/onderzoeksrapport-loot-boxen-final-publicatie.pdf> last accessed 29 September 2019.

¹⁹² Vic Hood, ‘Dutch authorities want to spread their loot box regulations across the EU’ [2018] *PCGamesN* <<https://www.pcgamesn.com/dutch-gambling-authority-loot-boxes>> last accessed 21 July 2019.

by a common-denominator reasoning rather than tailoring loot boxes to the two different legal regimes.¹⁹³

In Belgium more interesting things are brewing. A number of large developers (like Activision Blizzard, Valve, Konami and Arenanet) have already taken the Belgian illegality statement seriously and pulled their loot box and embedded currency sales from the Belgian videogame market.¹⁹⁴ EA is the most interesting player at the moment: the videogame giant was reportedly under criminal investigation for not pulling their loot boxes in *FIFA*, but then backed down and finally complied – despite vehemently disagreeing – with Belgian law by pulling the loot boxes.¹⁹⁵

Amusingly enough, during an oral evidence session in June 2019 over an inquiry with the UK Parliament’s Digital, Culture, Media and Sport Committee in the House of Commons,¹⁹⁶ EA representative Kerry Hopkins dubbed loot boxes as ‘surprise mechanics’ which are “quite ethical and fun”.¹⁹⁷ In addition, she implied that Belgium and the Netherlands may be overreacting because they “have taken a different view from every other gambling commission in the world”.¹⁹⁸ Statements that left the Committee unimpressed and the gamers around the world baffled.¹⁹⁹ In October, the same

¹⁹³ Alissa McAloon, ‘Rocket League halts loot box use in Belgium and the Netherlands’ [2019] *Gamasutra* <https://www.gamasutra.com/view/news/340914/Rocket_League_halts_loot_box_use_in_Belgium_and_the_Netherlands.php> last accessed 21 July 2019.

¹⁹⁴ Alissa McAloon, ‘Konami ends sale of in-game currency for PES 2019 in Belgium’ [2019] *Gamasutra* <https://www.gamasutra.com/view/news/336472/Konami_ends_sale_of_ingame_currency_for_PES_2019_in_Belgium.php> last accessed 21 July 2019. Chris Kerr, ‘Report: Guild Wars 2 in-game currency no longer available in Belgium’ [2018] *Gamasutra* <https://www.gamasutra.com/view/news/327147/Report_Guild_Wars_2_ingame_currency_no_longer_available_in_Belgium.php> last accessed 21 July 2019.

¹⁹⁵ Dustin Bailey, ‘EA won’t stop selling loot boxes in Belgium, so regulators are going to court’ [2018] *PCGamesN* <<https://www.pcgamesn.com/ea-loot-boxes-belgium>> last accessed 21 July 2019. Paul Tassi, ‘EA Surrenders in Belgian FIFA Ultimate Team Loot Box Fight, Raising Potential Red Flags’ [2019] *Forbes* <<https://www.forbes.com/sites/insertcoin/2019/01/29/ea-surrenders-in-belgian-fifa-ultimate-team-loot-box-fight-raising-potential-red-flags/>> last accessed 21 July 2019. Chris Kerr, ‘EA amends FIFA loot boxes in Belgium after regulators increase pressure’ [2019] *Gamasutra* <https://www.gamasutra.com/view/news/335422/EA_amends_FIFA_loot_boxes_in_Belgium_after_regulators_increase_pressure.php> last accessed 21 July 2019.

¹⁹⁶ The scope of the inquiry was examining the development of immersive technologies such as virtual and augmented reality, and the potential impact these could have in the world of sport, entertainment and news. The inquiry also looked at how the addictive nature of some technologies can affect users. Digital, Culture, Media and Sport Committee, ‘Oral evidence: Immersive and addictive technologies, HC 1846’ [2019] *House of Commons UK Parliament* <<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/digital-culture-media-and-sport-committee/immersive-and-addictive-technologies/oral/103191.html>> last accessed 7 august 2019.

¹⁹⁷ Full relevant quote: “First, we don’t call them loot boxes. [...] This is what we look at as surprise mechanics. [...] We think the way we have implemented those kinds of mechanics [...] is quite ethical and quite fun; it is enjoyable to people. We agree [...] that they aren’t gambling, and we also disagree that there is evidence that shows it leads to gambling. [People] like the element of surprise.” Digital, Culture, Media and Sport Committee, ‘Oral evidence: Immersive and addictive technologies, HC 1846’ [2019] *House of Commons UK Parliament* <<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/digital-culture-media-and-sport-committee/immersive-and-addictive-technologies/oral/103191.html>> last accessed 7 august 2019.

¹⁹⁸ *Ibid.*

¹⁹⁹ Dustin Bailey, ‘EA: They’re not loot boxes, they’re “surprise mechanics,” and they’re “quite ethical”’ [2019] *PCGamesN* <<https://www.pcgamesn.com/ea-loot-boxes>> last accessed 21 July 2019. Wesley Yin-Poole, ‘This week, Parliament gave a squirming EA and Epic a kicking – and now the noose is tightening around loot boxes, aka “surprise mechanics”’ [2019] *Eurogamer* <<https://www.eurogamer.net/articles/2019-06-22-this-week-parliament-gave-a-squirming-ea-and-epic-a-kicking>> last accessed 21 July 2019.

Committee spoke out their judgement and likened loot boxes to gambling, something that the UK had not acknowledged before.²⁰⁰

Even more recently, the three current leading videogame consoles' makers – Sony, Microsoft and Nintendo's respective PlayStation, Xbox and Switch – reportedly promised to disclose loot box items odds of all games supported by said consoles,²⁰¹ a solution analogous to the one taken by China's Ministry of Culture.²⁰² Other big players of the industry – Activision Blizzard, BANDAI NAMCO Entertainment, Bethesda, EA and Ubisoft to name a few – have also reportedly promised to follow those footsteps.²⁰³

5.5 Conclusion

This chapter set out to gain further insight on whether Dutch or Belgian law cover loot boxes, and to which extent.

It was found that both legal systems cover gambling as a concept but leave out a number of relevant psychological aspects. After explaining RRM's and analysing the different types of loot boxes, the findings of Chapter 2 were applied to them. After realizing that most loot boxes are gambling, the legal definition of online gambling was applied to them as well, and it was found that while Belgian law allows to declare all loot boxes illegal – which is in fact what Belgium did – Dutch law has only partial coverage of the phenomenon. This partial coverage is what will be addressed in the next chapter.

²⁰⁰ Michael Rosen, 'Loot boxes back in the news, as UK House of Commons likens them to gambling' [2019] *AEIdeas* <<https://www.aei.org/technology-and-innovation/loot-boxes-back-in-the-news-as-uk-house-of-commons-likens-them-to-gambling/>> last accessed 5 October 2019.

²⁰¹ 'Video Game Industry Commitments To Further Inform Consumer Purchases' [2019] *ESA – Entertainment Software Association* <<https://www.theesa.com/perspectives/video-game-industry-commitments-to-further-inform-consumer-purchases/>> last accessed 9 August 2019.

²⁰² Unofficial English translation from Chinese regarding the relevant articles provided by: Felix Hilgert and Benjamin Dankert, 'New Regulation for "Loot Boxes" in China – International Impact for all Online Games?' [2017] <<http://gameslaw.org/new-regulation-for-loot-boxes-in-china-international-impact-for-all-online-games/>> last accessed 6 December 2018.

²⁰³ 'Video Game Industry Commitments To Further Inform Consumer Purchases' [2019] *ESA – Entertainment Software Association* <<https://www.theesa.com/perspectives/video-game-industry-commitments-to-further-inform-consumer-purchases/>> last accessed 9 August 2019.

■ 6. CONCLUSION – WEAK POINTS

This final chapter will cover the final sub-question: Where are the weak points in the law? Could they be covered by new regulation?

Belgian law seems to have no discernible gaps in covering online gambling. The obligation of having a licenced physical establishment in Belgian territory before allowing licenced online gambling websites or games gives Belgian authorities a strong advantageous position on the matter. To reiterate, the end point of such regulation is that any type of gambling – and it has been established that loot boxes are gambling – in video games is automatically illegal due to the structural impossibility of having a physically established online videogame venue.²⁰⁴

To achieve the result of making (most) loot boxes illegal in other jurisdictions, it is perhaps the best course of (legal) action to single out videogames simply when they involve real-life currency in loot boxes, as this would include Type 2, 3 and 4 of the RRM table – and therefore cover the type of gambling that is harmful to the player/consumer.²⁰⁵ It would not strike microtransactions as a whole, since they are still necessary for F2P games to generate revenue and necessary for P2P games to continue developing new things for players.

The Dutch legal system, however, does have gaps in its coverage of loot boxes as gambling.

5.1 Dutch Law Weakness

Following the provisional Dutch definition of online gambling, the coverage of loot boxes is dependent on the ‘prizes or premiums’ part. Said prizes may be digital, however they need to have an economic value. The result of this is that only RRM Type 2 and 4 would qualify as gambling, as the prizes can be sold on third party websites.

The two protagonists that started this ordeal, *Overwatch* and *Star Wars Battlefront II*, would not qualify as gambling under Dutch law. That is a glaring oversight and an ironic twist based on a mere technicality. RRM Type 3 has all the same pitfalls, techniques and hooks that games like *CS:GO* or *PUBG* have – but they may also be even worse, since there is no financial recovery from them for players. While at least in games like *CS:GO* there is the slight chance of hitting the jackpot and earning that legendary skin that can be sold for hundreds or thousands of dollars on third party websites, in games like *Overwatch* nothing of economic worth can be gained. Yet players can still bleed themselves dry and pump hundreds of euros, dollars or pounds into these games with a structure which is similar to gambling from a scientific perspective, in return for what amounts to nothing but ones and zeros without real economic value. Thousands of vulnerable individuals – anyone under the age of 18, or adults that are more sensitive to the effects of gambling – would still be exposed to the gambling-like characteristics of loot boxes unguarded.

This is a gap that can be exploited in the future, unless more European Member States start following the Belgian example.

²⁰⁴ Arcades are not what is meant here. What is meant is, hypothetically, a video-game venue owned by Activision Blizzard that only offers players to open loot boxes in *Overwatch* on Belgian soil; or, alternatively, a venue owned by EA that only offers to open loot boxes on *Star Wars Battlefront II*.

²⁰⁵ This is the approach that the Danish Gambling Authority took. ‘Report on illegal gambling’ [2018] *Spillemyndigheden* pp.7-8 <<https://www.spillemyndigheden.dk/uploads/2018-12/Report%20on%20illegal%20gambling%202018.pdf>> last accessed 17 July 2019.

Possible Solution(s) Regarding Loot Boxes

As already stated, example could be drawn from the Belgian example. Another way to go about this is following the Danish example: to single out videogames simply when they involve real-life currency in loot boxes, as this would include Type 2, 3 and 4 of the RRM table.²⁰⁶

Due to recent developments, it may be that the direction loot boxes will take in the western world is similar to the Chinese solution: an obligation to show the odds of loot boxes. This is what the giants of game development have promised to do, however it remains to be seen whether it will actually happen.²⁰⁷

Another option to consider is to warn the players: a European PEGI²⁰⁸ or American ESRB²⁰⁹ warning on the physical copies of games may already be a step in the right direction. It may be a wholly new content descriptor warning – ‘Contains Loot Boxes’ – or an adaptation of the current ‘Gambling’ icon and warning. However, both PEGI and ESRB seem reluctant to do so or to consider loot boxes as gambling until gambling commissions take a decision.²¹⁰

The gap in Dutch legislation may definitely be exploited. It can, however, be covered by a multiple different solutions. Only time will tell which one will be employed, however. Perhaps game developers will keep their promise and show their boxes’ odds. If, however, multiple EU gambling commissions come to the same conclusion and opinion about loot boxes before that, a new PEGI warning may be issued instead.

New forms of gambling

Technology keeps improving, sometimes at break-neck speeds. Gambling has evolved and moved to the online world and will keep changing. A journey that has branched from physical casinos to digital ones, from digital simulations of casinos in videogames to loot boxes, the last of which have evolved beyond the traditional gambling iconography. Videogames, on their end, have grown from a niche hobby to a multi-billion-dollar worldwide industry, to the level that world championships are being held. In order to protect vulnerable consumers, it is not enough to conclude that *Kompu Gacha* or loot box mechanics can be identified as gambling. New forms of gambling will most likely emerge in the future, and once again the debate on whether this new phenomenon is to be considered gambling will repeat itself.

The things that need to be considered when assessing whether something is gambling are, as a *conditio sine qua non*, the three basic elements (Consideration, Prize, Chance). Even so, these are not enough to give a clear-cut answer, and the possible weak points that need to be taken into account in the future are the psychological effects tied to gambling, and whether they manifest in the activity in question.

This thesis has tried to illustrate, in the most scientifically objective way possible, what gambling consists of and what it does inside the brain. Hopefully it will be of use in the future when analysing some new form of gambling that lays in a grey area.

²⁰⁶ ‘Report on illegal gambling’ [2018] *Spillemyndigheden* pp.7-8 <<https://www.spillemyndigheden.dk/uploads/2018-12/Report%20on%20illegal%20gambling%202018.pdf>> last accessed 17 July 2019.

²⁰⁷ ‘Video Game Industry Commitments To Further Inform Consumer Purchases’ [2019] *ESA – Entertainment Software Association* <<https://www.theesa.com/perspectives/video-game-industry-commitments-to-further-inform-consumer-purchases/>> last accessed 9 August 2019.

²⁰⁸ Pan European Game Information.

²⁰⁹ Entertainment Software Rating Board.

²¹⁰ Mark Griffiths, *Is the buying of loot boxes in videogames a form of gambling or gaming?* (Paper, International Gaming Research Unit, Psychology Department Nottingham Trent University 2018) pp.4. Vic Hood, ‘Are Loot boxes gambling? Crate escape’ [2017] *EuroGamer* <<https://www.eurogamer.net/articles/2017-10-11-are-loot-boxes-gambling>> last accessed 12 August 2019.

5.2 Conclusion

This thesis has attempted to tackle the issue surrounding the nature of loot boxes. A heated and still-ongoing debate about whether or not they are to be considered as gambling has sparked about them in recent years. Due to the novelty of the phenomenon, extensive amounts of news and scientific articles exist on the subject matter, while legal literature on this is still severely lacking. This thesis has addressed the problem from both a scientific and a legal perspective – and is so far if not the only, at least one of the very few to have done so.

The main research question of this thesis was: “To what extent are loot boxes covered by existing regulation applicable to online gambling in the Netherlands and Belgium, and which weak points could be covered by new regulation?”

It was found that loot boxes are a form of gambling from a scientific point of view, and there is only partial coverage on them from the examined legal perspective. While Belgian law defines and covers all loot boxes as gambling, Dutch law has a gap in the legislation, where one type of still-harmful loot boxes is not taken care of. This weak point is something that can be exploited in the future, however it can definitely be covered by new regulation.

What the future will hold, depends on a wide variety of factors and actors: the actions of game developers, the actions of PEGI and ESRB, the actions of gambling commissions together with legislators – both at a national and at a European level.

This thesis is, to the author’s knowledge, the first of its kind. It tries to find the discrepancy between reality – what happens within a gambler’s brain – and the letter of the law. It has found such discrepancy, mainly in the lack of consideration of all the psychological effects that surround gambling, which can, every single one, be applied to loot boxes. As highlighted before, this is a very current topic, and changes are still being made while this thesis is being written. Regardless of what may be decided in the future, hopefully this thesis will be of help when discussing the subject – or when trying to define whether a new form of gambling has arisen. More research will undoubtedly be necessary, but nonetheless this thesis will positively influence future analysis and exploration.

Gambling in games has been a part of human history for millennia and will continue to be for a very long time. Loot boxes are a brand-new phenomenon, but not irreplaceable, and only add dangerous risks to something that should be fun and safe for everyone to enjoy. If left unchanged, thousands of individuals, especially vulnerable ones, will remain exposed to the same tactics and effects of gambling.

Will we take that chance?

■ 7. ADDITIONAL TABLES AND APPENDIX

List of Abbreviations

Gaming (alphabetical)

AAA	Triple A, an informal classification term used to indicate videogames with high quality standards that are distributed by a medium- or major-sized publisher, across multiple platforms, under direct control of an experienced producer, and expected to sell by the millions.
EA	Electronic Arts
ESRB	Entertainment Software Rating Board
F2P/FtP	Free-to-Play
FPS	First-Person-Shooter: a genre centred around gun- and other weapon-based combat in first-person perspective.
MMO	Massive Multiplayer Online
P2P/PtP	Pay-to-Play
PEGI	Pan European Game Information
RNG	Random Number Generator
RRM	Random Reward Mechanism

Legal (alphabetical)

CRUKS	<i>Centraal Register Uitsluiting KansSpelen</i>	Central Register Exclusion of Gambling
KOA	<i>Kansspelen Op Afstand</i>	Remote Gaming Bill
KSA	<i>Kansspelautoriteit</i>	Dutch Gambling Commission
KSC	<i>Kansspelcommissie</i>	Belgian Gambling Commission
WOK	<i>Wet op de Kansspelen</i>	Betting and Gaming Act

Scientific (alphabetical)

DSM	Diagnostic and Statistical Manual of Mental Disorders. The numbers in DSM-III, DSM-IV and DSM-V relate to their editions.
fMRI	Functional Magnetic Resonance Imaging
ICD	Impulse Control Disorder
ICD-11	International Classification of Diseases (or: International Statistical Classification of Diseases and Related Health Problems), 11 th version.
RPE	Reward Prediction Error
PFC	Prefrontal Cortex
VTA	Ventral Tegmental Area
WHO	World Health Organisation

Technical (alphabetical)

EGM	Electronic Gambling Machines
ISP	Internet Service Provider

Gaming Terms (alphabetical)*

Battle royale game	A genre of online multiplayer video game. It involves a large number of players (ranging from dozens to hundreds), blending the survival, exploration, and scavenging elements of a survival game with a last-man-standing gameplay.
Console	It is a computer device designed specifically for videogames, to be distinguished from arcade machines or personal computers.
Developer	The production company which makes a video game.
Drop	What is left behind in videogames by a defeated enemy, or what can be found on a quest or in a chest.
Gameplay	A player's interaction with a videogame, defined through: rules, player-game interface, challenges, plot, and the player's connection with the game.
Grinding/Farming	It means repeating battles, quests or other parts of a game multiple times in order to gain either money ('gold farming'), specific items or experience/level.
Loot	Items and drops.
Microtransactions	It is a business model where users can purchase virtual goods via micropayments as small as 0.99\$. Sometimes called MTX.
Playthrough	The act of playing a game from start to finish, in one or several sessions.
Power-Up	Objects that instantly benefit or add extra abilities to the game character, usually temporarily. (Persistent power-ups are called 'Perks').
Publisher	The company that – in whole or in part – finances, distributes and markets the game. Distinct from the 'Developer', although the publisher may own the developer.
Skin	Customization option for a player's in-game avatar or equipment that changes its appearance.

* Definitions provided by the author, unless otherwise specified.

List of cited or mentioned videogames (by RRM type)

Type	Title	Currency	Reward	Loot Boxes?	Loot Box Contents	Business Model
Type 1	<i>Diablo 1</i>	Isolated	Isolated	No	N/A	P2P
	<i>Diablo 2</i>	Isolated	Isolated	No	N/A	P2P
	<i>Final Fantasy VII</i>	Isolated	Isolated	No	N/A	P2P
	<i>Mario Party</i>	Isolated	Isolated	No	N/A	P2P
	<i>Pac-Man</i>	Isolated	Isolated	No	N/A	P2P
	<i>Street Fighter</i>	Isolated	Isolated	No	N/A	P2P
	<i>Tekken</i> (series)	Isolated	Isolated	No	N/A	P2P
	<i>Tetris</i>	Isolated	Isolated	No	N/A	P2P
	<i>Forza Motorsport 7</i>	Isolated	Isolated*	Yes***	Cosmetic, GI**	P2P
Type 2	<i>Diablo 3</i>	Isolated	Embedded	Yes***	Cosmetic, GI**	P2P
Type 3	<i>Battlefield 4</i>	Embedded	Isolated*	Yes	Cosmetic, GI**	P2P
	<i>Call Of Duty: WWII</i>	Embedded	Isolated*	Yes	Cosmetic, GI**	P2P
	<i>Candy Crush</i>	Embedded	Isolated	Yes	GI**	F2P
	<i>Clash of Clans</i>	Embedded	Isolated	Yes	GI**	F2P
	<i>For Honor</i>	Embedded	Isolated*	Yes	Cosmetic, GI**	P2P
	<i>Guild Wars 2</i>	Embedded	Isolated*	Yes	Cosmetic	F2P / P2P combo
	<i>Mass Effect Andromeda</i>	Embedded	Isolated	Yes	GI**	P2P
	<i>Middle-Earth: Shadow of War</i>	Embedded	Isolated*	Yes***	GI**	P2P
	<i>NBA 2k18</i>	Embedded	Isolated*	Yes	Cosmetic, GI**	P2P
	<i>Overwatch</i>	Embedded	Isolated*	Yes	Cosmetic	P2P
	<i>Star Wars Battlefront II</i>	Embedded	Isolated*	Yes	Cosmetic, GI**	P2P
Type 4	<i>Counter Strike: Global Offensive (CS:GO)</i>	Embedded	Embedded	Yes	Cosmetic	P2P
	<i>Destiny 2</i>	Embedded	Embedded	Yes	Cosmetic	P2P
	<i>FIFA Ultimate Team 17</i>	Embedded	Embedded	Yes	Cosmetic, GI**	P2P
	<i>FIFA Ultimate Team 18</i>	Embedded	Embedded	Yes	Cosmetic, GI**	P2P

	<i>Players Unknown Battle Grounds (PUBG)</i>	Embedded	Embedded	Yes	Cosmetic	P2P
	<i>Rocket League</i>	Embedded	Embedded	Yes	Cosmetic	P2P
	<i>Team Fortress 2</i>	Embedded	Embedded	Yes	Cosmetic	F2P
	<i>The Elder Scrolls Online</i>	Embedded	Embedded	Yes	Cosmetic, GI**	P2P

* Isolated, however a player can still sell the whole account and its contents for real money.

** GI: Game-Influencing, in the sense that they affect the gameplay, for example by making the game easier.

*** Loot boxes were present but have been removed. *Forza Motorsport 7* in November 2018; *Middle-Earth: Shadow of War* in July 2018. *Diablo 3*'s auction house was removed in March 2014.

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