



Ana Beatriz Vinagre de Miranda

**THE LAWFULNESS OF INFINITE SCROLL DOWN ON FACEBOOK**

Dissertation to obtain a Master's Degree in  
Law, in the specialty of Law and Technology.

Supervisor:

Doctor Fabrizio Esposito, Professor at NOVA School of Law

March 2025

NOVA SCHOOL OF LAW  
NOVA UNIVERSITY LISBON

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## **ANTI-PLAGIARISM STATEMENT**

I declare that I am the sole author of this dissertation and that the use of contributions or texts of others is duly referenced. I am aware that the use of unidentified elements from others constitutes a serious ethical and disciplinary fault.

To my first true love  
who always believed in me  
and who lifted me up in my darkest hour  
Artur Augusto Velho Mendes Junior,  
nothing was in vain; this work is yours too

\*\*\*

Para o meu primeiro verdadeiro amor  
que sempre acreditou em mim  
e que me ergueu na minha hora mais escura  
Artur Augusto Velho Mendes Junior,  
nada foi em vão; esse trabalho também é seu

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## GENERAL NOTES

**Citation:** Chicago Manual of Style 17th edition was adopted for citations and bibliography.

**Number of characters:** the body of this dissertation, including spaces and footnotes, contains 182.483 characters.

**Abbreviations:** abbreviations are defined throughout the text.

**Table of contents:** at the end of this document, on page 103.

## ABSTRACT

This study explores the lawfulness of infinite scroll down on Facebook under the Unfair Commercial Practices Directive and the Digital Services Act. Infinite scrolling is a hyper-engagement mechanism designed to keep users engaged, raising concerns about user autonomy, digital addiction, and consumer rights. The research examines the psychological and behavioral effects of infinite scroll, demonstrating its role in habit formation, attention manipulation, and compulsive engagement. It further assesses whether infinite scrolling qualifies as a dark pattern, a deceptive design practice that impairs user autonomy. Through legal analysis, the study evaluates how the Unfair Commercial Practices Directive and the Digital Services Act regulate manipulative digital practices, highlighting their strengths, limitations, and enforcement challenges. The findings of the study indicate that infinite scrolling constitutes a type of dark pattern referred to as the hyper-engagement dark pattern. However, this pattern does not readily align with existing legal categories. This research underscores the need for clearer legal frameworks to address hyper-engagement mechanisms such as infinite scroll down and ensure a fair and transparent digital environment.

**Key-words:** infinite scroll - Facebook - social media - dark patterns - hyper-engagement mechanisms - Unfair Commercial Practices Directive - Digital Services Act

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## RESUMO

Este estudo explora a legalidade da rolagem infinita no Facebook de acordo com a Diretiva das Práticas Comerciais Desleais (DPCD) e o Regulamento dos Serviços Digitais (RSD). A rolagem infinita constitui um mecanismo de hiperengajamento concebido para promover a continuidade da conexão dos usuários, o que suscita preocupações relacionadas à autonomia do usuário, ao vício em internet e à violação dos direitos do consumidor. O presente estudo aborda os efeitos psicológicos e comportamentais da rolagem infinita, demonstrando sua função na formação de hábitos, na manipulação da atenção e no envolvimento compulsivo. Ademais, o estudo avalia se a rolagem infinita se qualifica como um padrão obscuro, uma prática de design enganosa que prejudica a autonomia do usuário. A pesquisa também se vale de uma análise jurídica para avaliar como a DPCD e o RSD regulam as práticas digitais manipuladoras, destacando seus pontos fortes, limitações e desafios de aplicação. As conclusões do estudo indicam que a rolagem infinita constitui um tipo de padrão sombrio denominado padrão sombrio de hiperengajamento. No entanto, tal padrão não se alinha imediatamente com as categorias legais existentes. Diante do exposto, este estudo destaca a necessidade de estruturas jurídicas mais claras para lidar com mecanismos de hiperengajamento, como a rolagem infinita, e garantir um ambiente digital justo e transparente.

**Palavras-chave:** rolagem infinita - Facebook - mídias sociais - padrões obscuros -

mecanismos de hiperengajamento - Diretiva das Práticas Comerciais Desleais -  
Regulamento dos Serviços Digitais

## I. INTRODUCTION

How much do people scroll on their devices? A lot! In 2021, the average social media user on platforms with infinite scroll spent approximately 108 minutes per day scrolling. With an estimated scrolling rate of 30 cm every five seconds, this adds up to 38,880 cm or 0.38 km of thumb movement in just one day.<sup>1</sup>

In the digital era, online platforms continuously refine their design strategies to maximize user engagement. In this context, infinite scrolling proved itself to be very efficient.

While this design may appear seamless and convenient, it also raises concerns regarding users' autonomy and well-being. By exploiting cognitive biases and psychological mechanisms, infinite scroll down prolongs users' engagement beyond intentional limits, nudging their behaviour, which could ultimately lead to addiction.

A survey conducted with 2000 (two thousand) British in 2023 revealed that 22% of the respondents were affected by eye strain, 18% of them with cramps in the hands and wrist and 8% with an injury known as cubital tunnel syndrome (tingling or numbness in fingers)<sup>2</sup> as a result of scrolling through their feeds.

Another survey formed the basis for the study *Ethical User Interfaces: Exploring the Effects of Dark Patterns on Facebook*. A total of 116 respondents, with a mean age of 26, from three countries (US, UK, and the Netherlands), participated in

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<sup>1</sup> 'How Far Do We Travel When Scrolling Mobile Apps?', Fasthosts Blog, 25 April 2022, <https://www.fasthosts.co.uk/blog/app-scrolling-distance/>.

<sup>2</sup> 'How Does Mobile Phone Use Impact Our Health?', Uswitch, accessed 13 March 2025, [https://www.uswitch.com/mobiles/compare/sim\\_only\\_deals/how-does-mobile-phone-use-impact-our-health/](https://www.uswitch.com/mobiles/compare/sim_only_deals/how-does-mobile-phone-use-impact-our-health/).

the research. The most significant finding related to the infinite scroll debate is: “32% (n = 30) who think that they do or maybe do spend too much time on Facebook listed the following reasons for why they think this is the case: (...) 4 answered that it is addictive or has addictive features and that they would like to stop using it but still use it every day; 4 mentioned that they often mindlessly scroll and that the infinite scrolling behaviour of the timeline supports this habit.”<sup>3</sup>

These two surveys represent only a glimpse of how infinite scrolling — a feature designed to continuously load new content, can impact on the health of individuals.

In this realm, Facebook is one of the biggest offenders, considering the tremendous reach of the platform and how many kilometres people combined scroll per day on it. “Facebook has 3.07 billion monthly active users (MAUs) worldwide currently. (...) With 5.17 billion social media users globally, Facebook holds a significant share, representing 59.38% of the total social media population.”<sup>4</sup>

Additionally, over 200 million businesses, primarily small enterprises, utilize Facebook's tools, with more than seven million advertisers actively promoting their businesses on the platform.<sup>5</sup> The money involved is as big as Facebook, since the social media generated \$164.5 billion revenue in 2024.<sup>6</sup>

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<sup>3</sup> Thomas Mildner and Gian-Luca Savino, “Ethical User Interfaces: Exploring the Effects of Dark Patterns on Facebook,” in *CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI '21 Extended Abstracts)*, May 8–13, 2021, Yokohama, Japan (New York: ACM, 2021), 7 pages, <https://doi.org/10.1145/3411763.3451659>.

<sup>4</sup> Naveen Kumar, ‘Facebook Users Statistics (2025) — Worldwide Data’, *DemandSage* (blog), 1 January 2025, <https://www.demandsage.com/facebook-statistics/>.

<sup>5</sup> ‘20+ Top Social Platforms to Grow Your Brand in 2025’, *Buffer: All-you-need social media toolkit for small businesses*, accessed 13 March 2025, <https://buffer.com/resources/social-media-platforms/>.

<sup>6</sup> ‘Facebook Revenue and Usage Statistics (2025)’, *Business of Apps*, accessed 13 March 2025, <https://www.businessofapps.com/data/facebook-statistics/>.

The outstanding numbers, not to mention Instagram, which is owned by the same conglomerate, make it an ideal candidate for the approach this work intends to make. Facebook is big, and as being so, it has the power to cause a great good or an even greater harm.

Over the years, Facebook has paved its own way to increase time people spend on its platform by generating new content and interaction forms, which allows the platform to display more ads to users. The maths is really easy here, the more a consumer looks at Facebook's interface, the more they will be exposed to advertisement.

The eligible benefits of infinite scroll, seamless navigation and customized experience, are a smoke screen for increasing revenue through advertising. Facebook growth is related to profits and profits are to advertisement - advertisement only works with consumers seeing them. For that consumers need to be on the platform. They need to scroll.

Having said that, this dissertation aims to answer three questions: is infinite scroll down a dark pattern? Is infinite scroll a dark pattern that can be addressed under the European Union Unfair Commercial Practice Directive? Is infinite scroll a manipulative design choice that can be addressed under the Digital Service Act of the European Union?

This paper will be divided in three chapters: one describing infinite scrolling and the psychological logic behind it, another explaining dark patterns and a final one outlining the EU legal framework. It aims to contribute to the existing literature on consumer protection in the digital age and to provide ideas for those studying the subject and those interested in law and technology.

The first chapter explores the mechanics of infinite scrolling, establishing a foundation for understanding the potential risks associated with it.

Social media platforms like Facebook rely heavily on infinite scroll to keep users engaged and increase ad revenue. But this design strategy has been criticized for exploiting cognitive biases, like loss aversion and FOMO (fear of missing out) and limits users' ability to disengage from digital environments.

The findings in chapter I relate the infinite scroll to the hook model. After presenting the technique behind infinite scrolling, it became clear that infinite scroll down exploits the dopaminergic system of users, creating craving for more content and keeping them hooked to social media, always waiting for the next dopamine dose.

Once the user is captured by the loop, they are dependent on the pleasure it causes (social rewards) and will keep returning for more — this is addiction.

Chapter II follows a tripartite structure, which includes (i) defining what a dark pattern is, a concept extracted from the DSA, (ii) providing examples of dark patterns, and (iii) relating dark patterns that interfere with individuals' autonomous and informed choices or decisions, thereby compromising their autonomy, to design mechanisms such as infinite scrolling.

After acknowledging that dark patterns exist in online platforms and that they have the power to manipulate user behavior, limit autonomy, and undermine informed decision-making through the deliberate design of interfaces that confuse, mislead, or pressure users to make a transactional decision, some examples will be presented.

Nagging, forced continuity, roach motel, sneaking, misdirection and social proof manipulation are just a few of them, as there are many more and different taxonomies of dark patterns, depending on the harm they cause.<sup>7</sup>

Understanding dark patterns is essential to closing Chapter II, where the concept of hyper-engagement dark patterns is introduced and the correlation between dark patterns and infinite scrolling is established.

Therefore, infinite scroll meets the criteria of practices designed to exploit cognitive biases and keep users engaged against their best interests. Infinite scroll down is indeed a hyper-engagement dark pattern because it removes natural stopping points, making content consumption continuous and harder to disengage from. Infinite scroll impairs autonomy as users cannot make the transactional decision of stop scrolling once their brains are hooked in the loop of the slot machine effect.

Chapter III aims to analyze how EU legislation regulates and restricts dark patterns, with a particular focus on the infinite scroll feature used by platforms like Facebook.

As concerns grow over manipulative design practices, scholars and regulators increasingly question whether infinite scrolling aligns with consumer protection and digital fairness principles under European Union (EU) law. And so this work will do, as Chapter III will explore the Unfair Commercial Practices Directive (UCPD) and the Digital Service Act (DSA).

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<sup>7</sup> Directorate-General for Justice and Consumers (European Commission) et al., *Behavioural Study on Unfair Commercial Practices in the Digital Environment: Dark Patterns and Manipulative Personalisation : Final Report* (Publications Office of the European Union, 2022), <https://data.europa.eu/doi/10.2838/859030>.

The Digital Service Act of the European Union, an act that aims to regulate online platforms, ensuring transparency, accountability, and user protection, defines Very large online platforms in Article 33(1) as those platforms that have a number of average monthly active recipients of the service in the Union equal to or higher than 45 million. Facebook is listed<sup>8</sup> by the European Commission as one of them.

The UCPD provides fundamental consumer protections against misleading and aggressive business-to-consumer (B2C) commercial practices. While it does not explicitly mention dark patterns, it prohibits manipulative digital strategies that distort consumer decision-making.

Through the lens of the EU regulatory framework mentioned above, this work will critically examine Articles 5, 6, 7, 8 and 9 UCPD and Article 25 DSA. Both can present solutions to the proposed question of this research, although both carry particular challenges regarding enforcement.

Harm caused by hyper-engagement mechanisms will also be addressed, and, as a consequence the very nature of the UCPD and the DSA will come clear, as they were enacted to protect consumers from malpractices and, ultimately, from mechanisms that impair or distort the freedom of the user on how to use a service provided by an online platform.

By exploring the lawfulness of infinite scrolling on Facebook, this dissertation aims to shed some light on the discussion, not with categorical solutions, but rather by naming infinite scrolling appropriately, which means, by calling it a dark

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<sup>8</sup> 'What it means to be a "Very Large Online Platform"', Text, European Commission - European Commission, accessed 13 March 2025, [https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT\\_23\\_2452](https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_23_2452).

pattern. And, with that, contributing to reveal what it does, why it does it, and why it is important to talk about it and, definitely, to regulate it.

## **CHAPTER I - Get to know the infinite scroll - yes, you have been *hooked* by it**

Infinite scroll down or infinite scrolling is “is a technique that loads more content as you scroll. It allows you to continue scrolling indefinitely and is sometimes known as endless scrolling.”<sup>9</sup> Invented “in 2006, infinite scrolling experienced a steep growth in popularity.

Today, it is mostly used on websites and apps with a flat structure, where content streams constantly and is equally relevant to the user — for example, social-media sites (e.g., TikTok, Instagram, Twitter) but also news or ecommerce websites (e.g., Apple News, Nike.com).<sup>10</sup>

Facebook represents another case study of social media that employs the mechanism of infinite scrolling, and was selected as the primary subject of this investigation.

While some users may think it is a feature which helps them to navigate through connections publications effortlessly, Aza Raskin, who created the mechanism, seems to disagree. During Netflix's documentary “The Social Dilemma”, he revealed his personal opinion on infinite scroll: “optimizing something for ease-of-use does not mean best for the user or humanity.”<sup>11</sup>

Facebook and Instagram are operated by Meta Platforms, Inc, “an American multinational technology conglomerate based in Menlo Park, California.”

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<sup>9</sup> Jack, Bobby (2023). What is Infinite Scrolling and How Does It Work? [website] Retrieved from <https://www.makeuseof.com/what-is-infinite-scrolling-and-how-does-it-work/>

<sup>10</sup> Nielsen Norman Group (2023). Infinite Scrolling Tips. [website] Retrieved from <https://www.nngroup.com/articles/infinite-scrolling-tips/>

<sup>11</sup> Product Principle (2023). Infinite Scroll: The Slot Machine of Content Consumption. [website] Retrieved from <https://productprinciple.co/p/infinite-scroll-slot-machine>

(Wikipedia, 2024, accessed 25 July 2024). With more than 130 billion dollars in revenues in the year of 2023<sup>12</sup> and more than three billion monthly active users only on Facebook as of December 31, same year<sup>13</sup>, Meta is a tech colosso, whose impact can be seen everywhere in the Globe.

It is not fresh news that online platforms which provide “free” services make profits with advertisements. This is no different from how Facebook operates, as “the goal is to get more people to the platform and make them spend more time. This generates more ad views and more money from advertisers. (...) This way, the infinite scroll and any actions to keep users glued to their screen directly benefit the company.”<sup>14</sup>

Infinite Scrolling is based on data provided by users in real time and data collected throughout their use of the service, i.e., since the Terms of Service were accepted by the users, their data is being collected and processed. In other words, by taking into account all of the information that users have previously provided, and keep providing as they engage in their feeds, Facebook is able to create a customized interface that is better suited to the user's needs each time they visit.

Customized, personalized, individualized - every user will receive exactly what they need, and, in return, users will stay, *endlessly*, as they are seeing the type of content that better suits their personal preferences. And Facebook wants users to

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<sup>12</sup> Meta Platforms Inc. (2023, January 26). Meta Reports Fourth-Quarter and Full-Year 2023 Results, Initiates Quarterly Dividend. [press release] Retrieved from <https://www.prnewswire.com/news-releases/meta-reports-fourth-quarter-and-full-year-2023-results-initiates-quarterly-dividend-302051285.html>.

<sup>13</sup> Meta Platforms Inc. (2023, January 26). Meta Reports Fourth-Quarter and Full-Year 2023 Results, Initiates Quarterly Dividend. [press release] Retrieved from <https://www.prnewswire.com/news-releases/meta-reports-fourth-quarter-and-full-year-2023-results-initiates-quarterly-dividend-302051285.html>.

<sup>14</sup> Product Principle (2023). Infinite Scroll: The Slot Machine of Content Consumption. [website] Retrieved from <https://productprinciple.co/p/infinite-scroll-slot-machine>

stay, the platform urges for their time. And other social media sites are using the same strategy.

It is the golden rush for users' attention. The more time consumers spend on social media, the more receptive they are to advertising. And the more time users spend on social media, the more input they provide (more data is being collected) to help the platform adapt to their individuality, creating a vicious cycle.

The infinite scroll mechanism withdrew stopping cues, inviting users to keep scrolling without noticing the amount of content they went through. Differing from pagination, where the user can see how many pages they searched, endlessly scrolling takes away the decision from the user, who ends up interacting in a passive manner with the feed.

Vikram Bhargava and Manuel Velasquez explain the phenomenon in their study about Ethics of the Attention Economy, as quoted below:

“Prior to infinite scrolls, when a user arrived at the bottom of a webpage, there was a natural stopping cue—that is, the end of the page. The user at that point would have faced some decisions: whether to press the link to load the next page, whether to exit the platform, and so on. Introducing infinite scrolls removed the opportunity to make such decisions. Now, as the user scrolls, the platform automatically populates the next page, thereby removing stopping cues that would have previously given the user the opportunity to reflect, even for a moment, on whether that user should continue using the platform.”<sup>15</sup>

The attention economy is being brought into the discussion, which “is an economic model in which attention is treated as a scarce and highly valuable resource. It is primarily used in the context of digital platforms, where user engagement is the

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<sup>15</sup> Vikram Bhargava and Manuel Velasquez, 'Ethics of the Attention Economy: The Problem of Social Media Addiction', *Business Ethics Quarterly* 31 (6 October 2020), <https://doi.org/10.1017/beq.2020.32>.

primary driver of revenue. This model is based on the concept that people's attention is limited and therefore can be captured and maintained for profit.”<sup>16</sup>

The attention economy refers to a system where attention is the scarce resource, rather than money or goods. In the digital age, with an abundance of information, businesses and platforms compete for people's attention. Attention has become a valuable commodity, monetized through services like social media and streaming.

The term “was coined by Herbert A. Simon, who suggested that attention is the bottleneck of human thought, limiting what we can perceive and do. He also noted that a wealth of information creates a poverty of attention, implying that multitasking is a myth.”<sup>17</sup>

Wealth of information is one of social media's promises, a place where all voices can be heard and freedom of expression will always be preserved, what make social media companies such as Facebook “the most valuable and influential form of attention-economy businesses”<sup>18</sup>.

“Time is a valuable thing<sup>19</sup>”. And time is limited. In a society in which people have the sense that time is always running against them and that there is no time left for what really matters, approaching time and infinite scroll together is a necessity, as they are intertwined. There is no stopping cue in the user’s horizon, and

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<sup>16</sup> MINTZER, ALLY. “Paying Attention: The Attention Economy.” Berkeley Economic Review, March 31, 2020. <https://econreview.berkeley.edu/paying-attention-the-attention-economy/>.

<sup>17</sup> MINTZER, ALLY. “Paying Attention: The Attention Economy.” Berkeley Economic Review, March 31, 2020. <https://econreview.berkeley.edu/paying-attention-the-attention-economy/>.

<sup>18</sup> Vikram Bhargava and Manuel Velasquez, ‘Ethics of the Attention Economy: The Problem of Social Media Addiction’, *Business Ethics Quarterly* 31 (6 October 2020), <https://doi.org/10.1017/beq.2020.32>.

<sup>19</sup> Linkin Park. *In the End. Hybrid Theory*. Warner Bros. Records, 2000.

the chances of leaving social media by realizing how much of their scarce time has been wasted decreases every time they teach the algorithm what they prefer to see.

Time is and always has been the same, it doesn't change, but our perception of it does. Furthermore, our time is being disputed by tech companies, and the mechanisms to do so are becoming more complex each day. One might even say they are trying to steal the user's time.

Steal may be perceived as a strong word to be used in this context. But throughout the discussion that is intended to be outlined in the following paragraphs, one may conclude that the verb steal is not even strong enough to describe what tech companies are doing to users to get their attention. To compete for their time. To make profits by stealing the one asset that was left for the working class in the meantime when workers are not selling their workforce: their spare time.

User engagement metrics and personalized content are used to capture and retain attention. The concentration of attention in certain platforms can lead to significant influence over public discourse and market dynamics. Navigating the attention economy is crucial for businesses and content creators in today's information-rich environment.

The more information society has at its disposal, the more companies will compete to be the ones whose source is chosen so that they can profit from it.

In this scenario, one might argue that a user can choose to abandon the online platform usage at any time given (stop scrolling!), as a result of exercising their autonomy. However, the mechanisms employed by such platforms are complex, since

they combine the data provided by the user (this could be a merely “like” or a comment left on a friend publication) with designed features to hook them.

Some scholars argue that online platforms, such as e-commerces, are mining consumer’s autonomy based in unfair commercial practices, as “These circumstances have enabled traders to develop a wide spectrum of unfair commercial practices such as dark patterns, targeted advertising, manipulative personalisation and other personalised persuasion practices, which are based on consumer data and aim to reduce the autonomy of consumer choice in a digital environment in favour of traders’ economic interests.”<sup>20</sup>

It is true that online markets employ distinct tactics compared to social media. However, both business models ultimately aim to generate profit while minimising costs - they want to convert visits into sales. More about user's autonomy will be addressed later in this study alongside social media addiction, as the two concepts are inextricably linked, reflecting a conflict between the desire for self-directed living (opting not to be part of a social media or deciding upon how much screen time is appropriate) and the reality of compulsive behaviours that undermine it (the addiction created by Facebook).

As far as empirical observation shows, human autonomy cannot compete with mechanisms specifically designed to create addiction. Casinos and gambling are prohibited or strictly regulated in many countries; tobacco is sold with warnings about the presence of addictive substances; alcohol is forbidden for minors

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<sup>20</sup> Zanda Davida, ‘Consumer Decision-Making Autonomy in the Digital Environment: Towards a New Understanding of National Courts’ Obligation to Assess Ex Officio Violations of Fair Commercial Practices’, *European Journal of Risk Regulation*, 19 April 2024, 1–16, <https://doi.org/10.1017/err.2024.11>.

and in some countries completely banned; and even products high in sugar are labeled as such to raise awareness.

Addiction can be defined as “a chronic, relapsing brain disease defined by a physical and psychological dependence on drugs, alcohol, or a behavior. A person with an addiction will often pursue their toxic habits despite putting themselves or others in harm’s way.”<sup>21</sup> As the definition of addiction shows, a behaviour, without any doubt, can turn into a form of addiction.

Internet addiction manifests in different behaviours, such as cybersex addiction, net compulsions, online relationship addiction, compulsive information seeking, computer or gaming addiction and social media addiction, as described by the website [addictioncenter.com](http://addictioncenter.com): “Social media addiction is the obsessive use and focus on social media websites and apps, even though the use causes negative consequences such as relationship issues, anxiety, and low self-esteem.”<sup>22</sup>

According to that website, “psychologists estimate that as many as 5 to 10% of Americans meet the criteria for social media addiction today”. Considering that the population of the United States in 2024 is 345.426.571 - says Google - one can conclude that at least 17 million Americans have social media addiction. This is a matter of public health.

No reason why, recently the New York Governor Kathy Hochul announced the signing of two new laws to protect children's social media usage. At the speech she gave to the press, she pointed out after manifesting her thoughts on

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<sup>21</sup> ‘Addiction’, Addiction Center, accessed 29 August 2024, <https://www.addictioncenter.com/addiction/>.

<sup>22</sup> ‘Social Media Addiction’, Addiction Center, accessed 29 August 2024, <https://www.addictioncenter.com/behavioral-addictions/social-media-addiction/>.

how social media are playing a whole in transforming happy kids into depressed teenagers: "By reining in addictive feeds and shielding kids' personal data, we'll provide a safer digital environment, give parents more peace of mind, and create a brighter future for young people across New York".<sup>23</sup>

Parents are not in the best position to decide on what should appear in their children's social media as they are unaware of how those platforms store and use data to shape users' behaviours or because they are also part of the users that developed some sort of addiction to social media.

It is not uncommon to observe parents sitting their kids with screen time while they are also embedded by their own screens. This pattern is being reproduced as an example, as per, in the past, parents and doctors would smoke in front of their children and patients, while Hollywood was paying big stars to appear smoking their sponsor's products on the big screen.

It is important to note that the autonomy issue was introduced in this discussion because the mechanisms used by Facebook to maintain engagement employ a model, named hook model, that creates addiction. Once this addiction is established, the user's autonomy is compromised, resulting in a lack of self-determination. This, in turn, affects how users engage with the platform, how Facebook responds, and the freedom of choice individuals have about the use of it.

The hook model above mentioned will be deeper addressed in the next paragraphs, due to its importance to the main theme of this piece. This is the reason why users return to the platform with greater frequency. Upon returning to the platform,

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<sup>23</sup> 'Can a Law Make Social Media Less "Addictive"? Politicians Are about to Find Out', accessed 29 August 2024, <https://www.bbc.com/future/article/20240626-can-a-law-make-social-media-less-addictive>.

users employ Facebook's standard infinite scrolling model to navigate through their feeds. The continuous scrolling action results in users being exposed to an increasing number of advertisements.

The Master thesis written in 2022 by Cathoud Ferreira (Hyper-engaging mechanisms and the EU legal framework: An analysis of the lawfulness of practices that increase the time and frequency of use of online platforms<sup>24</sup>) analyses the mechanisms employed by online platforms to create addiction with the scope to demonstrate how design patterns can influence users behaviours.

She expounds that by exploring users' dopaminergic systems, online platforms, such as Facebook, use adaptive algorithms<sup>25</sup> to shape interactions with users, learning what type of content they want to watch throughout the different hours of day. This creates an environment which is shaped to adapt to the necessities and preferences of the users.

Cathoud Ferreira, quoting other scholars, explains how the Hock Model is being employed by tech companies to create and shape behaviours: the Hook Model (HM), (...) was based on consumer psychology, human-computer interaction, behavioural economics, and analyses of today's most successful habit-forming products. (...) the HM is a pattern for building habit-forming technology."<sup>26</sup>

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<sup>24</sup> Thaís Maciel Cathoud Ferreira, 'Hyper-Engaging Mechanisms and the EU Legal Framework' (masterThesis, 2022), <https://run.unl.pt/handle/10362/148934?mode=full>.

<sup>25</sup> An **adaptive algorithm** is a computational procedure or set of rules that dynamically adjusts its behavior or structure in response to varying data inputs, enabling the system to optimize its performance over time. Unlike conventional algorithms with fixed parameters, adaptive algorithms possess a unique ability to modify their configurations autonomously, a trait essential for addressing unpredictable and evolving scenarios in AI applications. Lark Suite (2023). Adaptive Algorithm. Lark Suite AI Glossary. [website] Retrieved from [https://www.larksuite.com/en\\_us/topics/ai-glossary/adaptive-algorithm#what-is-adaptive-algorithm?](https://www.larksuite.com/en_us/topics/ai-glossary/adaptive-algorithm#what-is-adaptive-algorithm?)

<sup>26</sup> Cathoud Ferreira, op. cit.

It must be highlighted that “the Hook Model stimulates humans’ brains need to complete an entire dopamine cycle”<sup>27</sup>. The Hook Model overlaps with the natural dopamine human cycle, generating the perfect scenario to the development of a new habit.

The hook model can be elucidated as a four-step, looped process, comprising a trigger, an action, a reward, and an investment. A trigger is a notification, meaning that the model will call the user to action by sending them automatic messages. However, once the habit is created, the external trigger (sound of a notification for example) will be internalised by the user, who will desire to open the app/access social media starting another cycle of interactions.

Elena Lukyanchikova et al., in the article ‘A Case Study on Applications of the Hook Model in Software Products’, provide details on how the four steps of the looped process occur, which consists in: “a Trigger that actuates a certain user behavior, an Action that the user takes regarding the product, a Reward that the user receives in response to their Action, and an Investment that should encourage future use of the product.”<sup>28</sup>

It is of paramount importance to understand that the final stage of the hook model represents a significant departure from the conventional habit formation model.

This is the reason why social media platforms have incorporated such methodology, as affirmed by scholars: “It is the last step that distinguishes the Hook

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<sup>27</sup> Esposito, F. and Ferreira, T. M. C., ‘Addictive Design as an Unfair Commercial Practice: The Case of Hyper-Engaging Dark Patterns’ (2024) 15 *European Journal of Risk Regulation* 123.

<sup>28</sup> Elena Lukyanchikova et al., ‘A Case Study on Applications of the Hook Model in Software Products’, *Software* 2 (16 May 2023): 292–309, <https://doi.org/10.3390/software2020014>.

model from the traditional habit-creation loop, and this is also the key feature that uses the leverage that digital products have. Investing some effort, social capital, data, money, or time adapts the product to user demand and creates an effect of ownership. Hence, the next time the user wishes to keep the “progress” or Investments, they react to the Trigger, which is not necessarily an external one, and return to the application to obtain their Reward again.”<sup>29</sup>

Think about it: a user creates a Facebook account, that same person does barely nothing, meaning, no photography, no comments, no sharing, maybe added a few friends and checked on their profiles. A second person creates a profile, adds a profile picture, asks to be part of communities, sell products on the Facebook marketplace etc. Which user is more likely to leave the platform according to the model explained in the paragraph above? The answer would be, the first one. And its reasoning lies in the low investment made by them.

Empirically, one can state that the more users add data to their SM, the more they are unlikely to give up on them because there is a sense of property, and it is against human nature to simply give up on what they have built.

Also, the infinite scroll (IS) allows the algorithms to test the users’ daily mood, in other words, as the content is shown and the user decides on which they want to see, the AI will display more of the same, hooking the user to stay in the platform.

Rixen et al., 2023, p. 2283, explain that “IS features can facilitate habitual, repeated use, creating an outer loop of repeatedly opening SM<sup>30</sup> to utilize IS

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<sup>29</sup> Lukyanchikova et al, op. cit. p. 228:3, citation omitted. Emphasis added.

<sup>30</sup> SM stands for social media.

features. Second, the same IS features can then escalate these sessions catching the user in an intra-session, inner loop leading to elongated regretful use. While there is an interplay between the inner and outer loop, IS features can also, detached from the outer loop, trigger a feature tour. Here, they can high-jack other sessions that began through other activities inside the same application, becoming a part of almost all long sessions.”<sup>31</sup>

In the Conference Paper *Designing for Digital Detox: Making Social Media Less Addictive with Digital Nudges*, published in April 2020, Purohit et al remember that the “design of social media platforms is intentionally engineered to be addictive and exploit vulnerabilities in human psychology. This intentional design results in undesirable platform usage that can lead to addictive usage patterns. One model that many companies adopt for the development of habit-forming social media products is the Hook model.”<sup>32</sup>

Cathoud Ferreira<sup>33</sup> analysed the Hook Model (HM) and its relation with the dopaminergic system (the natural reward system of humans) to create lasting interactions between users and social media through the use of internal and external triggers. The author explained that the HM “was based on consumer psychology, human-computer interaction, behavioural economics, and analyses of today’s most successful habit-forming products. (...) the HM is a pattern for building habit-forming technology.”<sup>34</sup>

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<sup>31</sup> Jan Ole Rixen et al., ‘The Loop and Reasons to Break It: Investigating Infinite Scrolling Behaviour in Social Media Applications and Reasons to Stop’, *Proc. ACM Hum.-Comput. Interact.* 7, no. MHC1 (13 September 2023): 228:1-228:22, <https://doi.org/10.1145/3604275>.

<sup>32</sup> Purohit, Aditya & Barclay, Louis & Holzer, Adrian. (2020). *Designing for Digital Detox: Making Social Media Less Addictive with Digital Nudges*, citations omitted, 10.1145/3334480.3382810.

<sup>33</sup> Cathoud Ferreira, op. cit.

<sup>34</sup> Cathoud Ferreira, op. cit, p. 15.

The Hook Model comprises four interconnected stages: the trigger, which initiates user behaviour; the action, the desired user response; the reward, which reinforces the action; and the investment, a small contribution by the user to enhance future experiences. By carefully designing these stages, products can effectively engage users and foster habitual usage.

In simple words: with the correct brain stimuli, technology can coach humans to create new habits, such as grabbing their phones to check their social media every other minute, even though there is no new notification for them. This happens after the habit is already formed, as the action (picking up the cell phone automatically) is detached from the human cognitive system, since it is also connected to internal triggers, such as emotions.

Purohit et al explain how triggers operate: it “operates as a foundation on which habits are formed. Internal triggers hinge on thoughts and emotions like boredom, pre-existing routines, and loneliness, prompting the user to take mindless actions. External triggers could be, for instance, notifications indicating the arrival of a new message in the user’s environment. A trigger prompts an individual to take action by supplying cues.”<sup>35</sup>

Yes, social media design can shape habits and such habits are so well constructed (by the companies) and absorbed by human’s biology that it is hard not to compare them with any other kind of addiction.

If online platforms are taking advantage of psychology to hook consumers to their products, and that those new habits (social media use) can evolve

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<sup>35</sup> Purohit et al, op. cit.

to addiction depending on the correct brain stimulus, with potential to affect an indiscriminate number of users, the rule bodies must take part in this process.

The phenomenon of free online social media has already had a significant impact on global consciousness, with a notable shift from traditional forms of communication to this new digital landscape. While this transition has brought about immense benefits in terms of connectivity and accessibility, it has also raised important concerns regarding the underlying business models and their implications on both users and industry.

From a financial perspective, free online social media has become a lucrative avenue for the technology sector, offering a potential showcase for advertisers to reach an expansive audience. However, this has also led to a growing concern about the time spent on digital platforms, particularly among younger demographics who are more prone to spending longer hours engaged with these platforms. This trend has led to the emergence of a new phenomenon: internet addiction, a term used to describe the negative consequences associated with excessive use of digital devices.

It's not hard to conclude that infinite scroll, alongside other engagement mechanisms, shapes the interactions between users (consumers) and online platforms (service providers), as it was designed to increase time people spend using their service, creating addiction and, consequently, causing harm.

Scholars explain the kind of harm social media misuse can cause by: "Scrolling through the news feed would, therefore, fall into the category of social browsing, where we gather information about different topics presented to us by the

social media platform. Such passive usage was found to induce, for example, feelings of loneliness, lower life satisfaction, higher levels of regret, and social anxiety.”<sup>36</sup>

There is no fair relationship between the autonomy of the individual who uses social networks and the companies that invest in science and neurolinguistic programming to keep users hooked without reaching their consciousness.

In other words, a user cannot actually decide on how much time they want to spend facing the social media interface after being triggered by the HM. Leaving the addiction cycle is more a question of understanding the psychology behind the code rather than will-power, once the part of the brain which is responsible for the decision-making process has been kidnaped by the need for another dopamine dose.

And when it comes to engaging users in social media, infinite scrolling plays an important role, as it is a design pattern commonly used in websites and applications to present content to users in a seamless and continuous manner. Unlike traditional pagination, where users navigate through different pages to access more content, infinite scroll allows users to keep scrolling downward, dynamically loading additional content as they reach the end of the current view.

The concept behind infinite scroll is to create a more engaging and immersive user experience by eliminating the need for users to click through pages. As users scroll down, new content is loaded and seamlessly appended to the existing content, providing a continuous flow of information. This design pattern is often applied

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<sup>36</sup> Jan Ole Rixen et al., 'The Loop and Reasons to Break It: Investigating Infinite Scrolling Behaviour in Social Media Applications and Reasons to Stop', *Proc. ACM Hum.-Comput. Interact.* 7, no. MHCI (13 September 2023): 228:1-228:22, citations omitted, <https://doi.org/10.1145/3604275>.

to social media feeds, image galleries (ex. Pinterest), news websites, and other platforms with a vast amount of content.

One may argue that one of the primary advantages of infinite scroll is its ability to keep users engaged and encourage prolonged interaction with the platform. This continuous flow of content can be visually appealing and addictive, prompting users to explore more and spend extended periods on a website or application. Additionally, infinite scroll is well-suited for touch-based devices, as it simplifies navigation and enhances the overall user experience on smartphones and tablets.

However, said advantage can lead to serious damage, as users experience feelings of regret after scrolling sessions on social media: "In a survey on SM usage, 25% of participants stated that they regretted spending too much time on Facebook's IS "news feed". Further study found that IS in general lead to the highest amounts of retrospective regret. Participants in other studies noted that a common reason for an unwillingly elongated social media session was "endless scrolling" through their social feeds. They named this feeling for being "caught in a loop".<sup>37</sup>

Another notable concern related to infinite scrolling is the potential for information overload, as described by Kai Li et al. in a study published in 2023: "Social media overload includes three main forms: information overload, communication overload and social overload. Information overload refers to a kind of subjective

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<sup>37</sup> Jan Ole Rixen et al., 'The Loop and Reasons to Break It: Investigating Infinite Scrolling Behaviour in Social Media Applications and Reasons to Stop', *Proc. ACM Hum.-Comput. Interact.* 7, no. MHC1 (13 September 2023): 228:1-228:22, citations omitted, <https://doi.org/10.1145/3604275>.

perception caused by the continuous influx of massive information to users and the information touched by users beyond their own processing ability.”<sup>38</sup>

Although infinite scroll may be seen, at least in a first glance, as a design pattern that offers a dynamic and engaging way to present content seamlessly to users, its drawbacks cannot be ignored, as frequently users lose track of the time spent on social media that employ such technique.

Social media use, as we know today, has significant negative impacts on individuals' self-determination. However, the field requires further research to refine methodologies and to explore potential protective factors due to its novelty and complexity. Policymakers and mental health professionals should consider these findings in their efforts to mitigate the negative effects of social media on mental well-being.

It is not through self-management of time by the user that society will be able to combat the downside caused by social networks, but through regulation. In this tug-of-war, we need a balance of power so that there is no unfairness. Asking users to self-regulate is like asking a child to fight an MMA professional. In the Internet ring, the state and private enterprise must face off under the watchful eye of the judge - society.

There are regulations in force that could be presented as remedies to combat this issue, such as the Digital Services Act (DSA) and the Unfair Commercial Practice Directive (UCPD), although this multifaceted phenomenon, as per its

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<sup>38</sup> Kai Li et al., 'Mechanism Study of Social Media Overload on Health Self-Efficacy and Anxiety', *Heliyon* 10, no. 1 (5 December 2023): e23326, citations omitted, <https://doi.org/10.1016/j.heliyon.2023.e23326>.

specificities, might need a complete different approach from legislators and extra effort from scholars to be totally addressed and as a consequence regulated.

Again, if it has already been proven that social media are using a model to create more engagement and increase the time people spend on their platforms, infinite scroll down is one of the employed mechanisms, which affects the mental health of users.

This chapter showed evidence on how infinite scroll down overlaps with the dopaminergic human cycle, creating addiction. In the next chapter, it will be explored if infinite scroll can be considered as a dark pattern.

## CHAPTER II - To be or not to be... a dark pattern

As the present study progresses, the discourse surrounding the potential illegality of the infinite scroll mechanism persists. The objective of this chapter is threefold: first, to elucidate the concept of dark patterns; second, to furnish illustrative examples of these practices; and third, to address the question of whether infinite scroll constitutes a dark pattern.

### 1. What are "dark patterns"?

Dark patterns encompass a range of deceptive design techniques aimed at manipulating user behavior - that is why they are also known as deceptive patterns. These unethical practices leverage cognitive biases, prompting users to engage in actions they may not have originally intended.

Outside Europe, legislators have their eyes right open, which happened in 2020 in California, when a law defined dark patterns as “a user interface designed or manipulated with the substantial effect of subverting or impairing user autonomy, decision-making, or choice, as further defined by regulation”<sup>39</sup>.

The European Commission study published in April 2022 revealed “that dark patterns are prevalent and increasingly used by traders of all sizes, not only large platforms. According to the mystery shopping exercise, 97% of the most popular websites and apps used by EU consumers deployed at least one dark pattern”.<sup>40</sup>

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<sup>39</sup> The California Privacy Rights and Enforcement Act of 2020.

<sup>40</sup> Directorate-General for Justice and Consumers (European Commission) et al., *Behavioural Study on Unfair Commercial Practices in the Digital Environment: Dark Patterns and Manipulative*

In October 2022, The European Union Digital Services Act (DSA) was published, incorporating a definition of dark patterns in Recital n. 67:

“Dark patterns on online interfaces of online platforms are practices that materially distort or impair, either on purpose or in effect, the ability of recipients of the service to make autonomous and informed choices or decisions. Those practices can be used to persuade the recipients of the service to engage in unwanted behaviours or into undesired decisions which have negative consequences for them.”<sup>41</sup>

More about the DSA will be discussed in Chapter III.

More recently, in October 2024, a different definition of dark patterns was presented at the Commission Staff Working Document Fitness Check of EU Consumer Law on Digital Fairness, which “refers to commercial practices deployed through the structure, design or functionalities of digital interfaces or system architecture that can influence consumers to take decisions they would not have taken otherwise”.<sup>42</sup>

Let's break down the DSA definition, considering its regulatory nature and enforcement power. First, dark patterns depend on online platforms to exist. This means they can be only spotted in the online world since they manifest through online platforms interfaces.

What is an online interface? An online interface is the digital environment through which users interact with a website, application, or online service. It serves as the bridge between humans and technology, enabling users to perform actions,

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*Personalisation : Final Report* (Publications Office of the European Union, 2022), <https://data.europa.eu/doi/10.2838/859030>.

<sup>41</sup> 'Regulation - 2022/2065 - EN - DSA - EUR-Lex', accessed 10 February 2025, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R2065>.

<sup>42</sup> Commission Staff Working Document Fitness Check of Eu Consumer Law on Digital Fairness, {SEC(2024) 245 final} - {SWD(2024) 231 final}.

access information, and communicate with systems over the internet. In other words, an online interface is what the final user sees, clicks, writes, and overall interacts with.

Some examples of online interfaces are e-commerce platforms, social media platforms, such as Facebook, streaming services like Netflix and Spotify, and online banking.

Secondly, dark patterns are best characterized as practices, specifically design practices or design choices related to the graphical design of the online platforms. The following concept approaches this particular characteristic of dark patterns:

“Dark patterns are interactive design patterns that influence technology users through deception, trickery or hostility, that make their lives difficult or contribute a negative impact, through intended or unintended design practices that represent unethical applications [of] persuasive technology.”<sup>43</sup>

Moving forward, it is important to note that they can be a discretionary choice or happen as a result of bad design options. Some scholars, however, affirm that such design choices must be intentional.

For Amit Zac et al, “Dark patterns are online user interfaces which seek to subvert, manipulate or impair user autonomy, decision-making or choice.”<sup>44</sup>

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<sup>43</sup> Uncovering Dark Patterns in Persuasive Technology Agnis Stibe Published 2018, citation omitted, [https://www.academia.edu/43531788/Uncovering\\_Dark\\_Patterns\\_in\\_Persuasive\\_Technology](https://www.academia.edu/43531788/Uncovering_Dark_Patterns_in_Persuasive_Technology)

<sup>44</sup> Amit Zac et al., ‘Dark Patterns and Consumer Vulnerability’, *Behavioural Public Policy*, 3 February 2025, 1–50, citation omitted, <https://doi.org/10.1017/bpp.2024.49>.

According to Meng Li et al., the term "dark patterns" refers to a form of manipulative design strategy "with the aim of guiding user behavior to achieve outcomes favorable to service providers, often at the expense of users."<sup>45</sup>

Nevertheless, in the DSA, regulators opted for a more comprehensive definition, as dark patterns do not depend on intention to be considered as such, as per can be concluded by the choice of words in Recital n. 67: "either on purpose or in effect".

The rights at stake are too valuable to limit the concept of dark patterns to an intended decision of causing harm.

Dark patterns, according to the DSA definition, must be able to "distort or impair" "the ability of recipients of the service to make autonomous and informed choices or decisions". In law, there is no room for unnecessary words.

The verb impair relates to autonomy. When a dark pattern is impairing the user experience, it is reducing their autonomy and making it harder for them to make free and informed choices. Distort, however, refers to the manipulation of information or competition, often leading to unfair advantages or misleading outcomes.

What are the distorting effects of dark patterns? A way to better understand how a consumer can be distorted or impaired while engaging in an online platform which employs dark patterns is inverting the terms. Imagine a situation in which a design that benefits the user, informing properly without creating triggers that affect their autonomy, occurs.

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<sup>45</sup> Meng Li et al., *A Comprehensive Study on Dark Patterns*, 2024, citation omitted, <https://doi.org/10.48550/arXiv.2412.09147>.

In this context, the work of Amit Zac et al. is once again cited, as their research exemplifies the manner in which dark patterns, and their counterpart, benign patterns, influence consumers while they engage with platform interfaces. As the researchers themselves articulate:

“In broad terms, ‘dark patterns’ can be distinguished from other benign or beneficial online nudges based on two criteria: the purpose for which the pattern is being used and the principal beneficiary. The principal purpose of online nudging (or benign ‘patterns’) is arguably to assist consumers in overcoming or mitigating decision-making biases in ways that are ‘welfare enhancing’ and are in their long-term interests. In contrast, the principal purpose of dark patterns is to complicate or obscure consumer decision-making in ways which directly benefits a seller or online service provider and may not benefit the consumer.”<sup>46</sup>

In other words, dark patterns do not serve the consumer, they serve the business and they do that by distorting reality and impairing autonomy, as they “can affect a wide range of transactional decisions and many of them have been empirically proven to appreciably impair the consumers’ ability to take an informed decision. In the public consultation, 89% of consumers reported being confused by dark patterns in website/app design and 76% felt pressured to buy something due to the language or design that was used. BEUC’s 2023 survey found that 61% of consumers have felt under pressure when buying online and 41% ended up buying things they did not intend to due to confusing design.”<sup>47</sup>

It was empirically proven that dark patterns affect consumer behaviour and have the power to “increase one’s revenue by tricking consumers into buying products or services they may not need, buying more than they need, or, in case of

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<sup>46</sup> Amit Zac et al., ‘Dark Patterns and Consumer Vulnerability’, *Behavioural Public Policy*, 3 February 2025, 1–50, <https://doi.org/10.1017/bpp.2024.49>.

<sup>47</sup> European Commission. Commission Staff Working Document: Fitness Check of EU Consumer Law on Digital Fairness. Brussels: European Commission, 2024.

advertising-based business models, spending more time and attention or giving up more personal data than they would otherwise do.”<sup>48</sup>

In the book *A Comprehensive Study on Dark Patterns*, Meng Li et al. created a framework capable of identifying deceptive patterns from their advantage points (to the business). They labeled six “unique vantage points”, as they call, of dark patterns, and divided them into three categories: Harm to User Autonomy, Personal User Detriment and Structural User Detriment.<sup>49</sup>

Harm to User autonomy represents the compromise (impairment) of user’s autonomy “by forcing consumers to make choices they would not otherwise make, limiting the available options, and obfuscating the decision-making process.”<sup>50</sup>

The Personal User Detriment is divided into three different forms of causing harm to users: Financial Loss, Privacy Harms, and Psychological Detriment and Time Loss.

For the purpose of this study, the Privacy Harms and Psychological Detriment and Time Loss will be emphasized. Here is how the author described them:

“H3 [Privacy Harms] emphasizes how dark patterns could induce users into unintentionally disseminating excessive personal information, thereby elevating their risk exposure. H4 [Psychological Detriment and Time Loss] reflects on dark patterns that place emotional and cognitive strain on users, exploiting their vulnerabilities and potentially leading to time wastage.”<sup>51</sup>

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<sup>48</sup> Inge Graef, ‘The EU Regulatory Patchwork for Dark Patterns: An Illustration of an Inframarginal Revolution in European Law?’, SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, 3 April 2023), <https://doi.org/10.2139/ssrn.4411537>.

<sup>49</sup> Meng Li et al., *A Comprehensive Study on Dark Patterns*, 2024, <https://doi.org/10.48550/arXiv.2412.09147>.

<sup>50</sup> Meng Li et al, op. cit. p.10.

<sup>51</sup> Meng Li et al, op. cit. p.10.

This quote adds an important topic to the discussion: dark patterns are not limited to the final goal of selling a product or a service, they can also be employed to make users spend more time and attention while inputting more personal data. Those practices can be used to persuade the recipients of the service to engage in unwanted *behaviours*. They can forge habits and influence lifestyles.

Moving forward, it is necessary to approach the meaning of “autonomous and informed choices or decisions”, a crucial part of the dark pattern concept being analysed.

Let's first remember that:

“The strategic combination of dark patterns profoundly impacts user autonomy, raising significant ethical concerns. These patterns exploit cognitive biases and limit users' ability to make informed decisions, effectively stripping them of their freedom of choice. This is especially troubling when users face crucial decisions regarding personal data management, where deceptive practices can lead to serious consequences.”<sup>52</sup>

What would be, in a perfect scenario, free of dark patterns, an autonomous and informed choice?

Ideally, a platform would present options in a clear and neutral way, so users can easily understand the consequences of their choices. There would be no deceptive design elements, pre-selected options that favor the platform's interests, or complex processes that discourage users from opting out of services like data tracking or subscriptions. Instead, users would have direct access to relevant information in plain language, allowing them to make decisions that align with their true preferences.

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<sup>52</sup> Hansika Ukgoda, 'The Dark Side of Social Media: Analysing Dark Pattern Combinations and Their Impacts', *IJIE (Indonesian Journal of Informatics Education)* 8 (31 December 2024): 101, <https://doi.org/10.20961/ijie.v8i2.91666>.

Additionally, an informed choice requires transparency about how a service works, including data usage, algorithmic recommendations, and potential risks. Users should have access to clear explanations of privacy settings, personalized advertising mechanisms, and content curation practices without hidden trade-offs. They should also be given the tools to easily review, modify, or revoke their decisions at any time. In this ideal scenario, users are not subtly pushed toward a specific outcome but are instead empowered to act based on their own needs and values.

The final part of the DSA definition addresses the consequences of dark patterns to users, in other words, the harm they inflict on them, varying from financial loss, psychological damage, time loss and privacy detriment.

Dark patterns represent a substantial challenge in the digital realm, as they manipulate user behavior, limit autonomy, and undermine informed decision-making. By deliberately designing interfaces that confuse, mislead, or pressure users, companies prioritize profits over transparency and fairness, ultimately eroding trust in digital services.

These deceptive practices have the power to reduce consumer control over personal data and online choices, challenging autonomy in the online environment.

What is important to note is, no matter the definition, all dark patterns share a manipulative aspect in their design, which can be physical (impairment) or psychological (distortion). This is because they impair users in some way, restricting their freedom of choice or they distort the online environment, ultimately leading to user manipulation.

The DSA has been proposed as a means to address the issue of dark patterns by ensuring transparency, accountability, and user protection. However, achieving substantial progress in this area necessitates a multifaceted approach that incorporates stringent regulations, corporate responsibility, and enhanced digital literacy among users.

Alongside the DSA, the UCPD (Unfair Commercial Practices Directive) plays an important role in defining manipulative (misleading and aggressive) practices in B2C relations and could be a better fit to tackle the infinite scroll issue, considering its regulatory nature and infinite scroll in Facebook as part of a consumerist relation. Both regulations will be analyzed together in the next chapter.

Users might not be familiarized with academic studies, but they understand how dark patterns work as they deal with them thoroughly the day, reason why some examples of common dark patterns will be presented now to provide more clarity over the issue.

## **2. Examples everywhere**

Have you ever tried to buy a flight ticket and noticed that after moving forward with your purchase, the price was fairly different (higher, surely) from the one you had chosen at the beginning of the search? Well, of course you have. What happened was that a dark pattern passed unnoticed during the buying process, probably one box sneakily ticked by default upgrading the offer.

The goal of this topic is not to present all the dark patterns that were cataloged because they are vast and constantly adapting, as “Mathur et al. (2022) laid

the groundwork by developing an ontology that identifies and classifies 65 distinct dark patterns. Gunawan et al. (2022) further expanded this understanding by conducting comparative research on user interactions across mobile and web interfaces. Chaudhary et al. (2022) examined video streaming platforms, revealing how features such as autoplay and personalized content recommendations are strategically designed to maximize user engagement.”<sup>53</sup>

A few of them, nevertheless, will be listed in the next paragraphs as a way to facilitate understanding of their almost omnipresence in the internet environment.

Disguised Ads involve camouflaging advertisements to resemble regular content, deceiving users into unintentionally clicking on ads.

Friend Spam leverages users' contact lists to disseminate invitations or messages to friends without explicit consent, resulting in the proliferation of spam.

Examples of dark patterns include getting people to purchase unnecessary insurance; signing up for products without knowing they are on recurring billing; exposing users to content that makes them feel bad about themselves in order to influence their behavior; environmental designs that are effectively 'hostile' to particular groups such as the homeless, cyclists or pedestrians.

The dark pattern related to the example that opened this topic is known as sneaking or sneak into basket and can happen when “the site adds additional products into the 'customers' basket without their consent through, for example, an

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<sup>53</sup> Hansika Ukgoda, 'The Dark Side of Social Media: Analysing Dark Pattern Combinations and Their Impacts', *IJIE (Indonesian Journal of Informatics Education)* 8 (31 December 2024): 101, <https://doi.org/10.20961/ijie.v8i2.91666>.

opt-out radio button or checkbox on a previous page. The Sneak into Basket dark pattern exploits the default effect cognitive bias in users" to trick consumers into sticking with the products it adds to basket".<sup>54</sup>

In this category, extra items or services are automatically included during checkout. Users have to actively deselect these items to avoid making unintended purchases. Unnecessary items are also included in the shopping cart without clear disclosure, which leads users to accidentally add more items to their carts.

This kind of dark pattern imposes an extra action from the user, as well as an extra dose of attention, as they must uncheck a box or radio button to avoid additional charges.

Alongside sneaking, "hidden costs" carry out a similar result. The consumer searches for a product, but the result shown by the e-commerce interface does not include some costs such as shipping fees, those "non-optional costs are disclosed late in a transaction or only added to the price at the final stage of a transaction."<sup>55</sup>

Hidden costs can result in unforeseen financial implications (financial loss) and potentially lead to abandoned transactions (time loss).

"Hard to cancel" is a type of dark pattern that literally makes the user's life more difficult, which might lead to frustration and anxiety. It happens when the

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<sup>54</sup> M. R. Leiser and Mireille M. Caruana, 'Dark Patterns: Light to Be Found in Europe's Consumer Protection Regime', *Journal of European Consumer and Market Law* 10, no. 6 (1 February 2021), <https://kluwerlawonline.com/api/Product/CitationPDFURL?file=Journals\EuCML\EuCML2021047.pdf>.

<sup>55</sup> M. R. Leiser and Mireille M. Caruana, op. cit.

“consumer is encouraged to subscribe to a service, but finds it difficult to withdraw or unsubscribe at a later date.”<sup>56</sup>

Misdirection is a type of “aesthetic manipulation”<sup>57</sup>. This dark pattern tricks users by distracting them from important information or choices that might not be in the service provider's best interest. It does this by focusing on one thing and making another less noticeable, which makes users make decisions they might not have made if all information was clear and easy to find.

In the Conference Paper named “Getting Trapped in Amazon's "Iliad Flow": A Foundation for the Temporal Analysis of Dark Patterns”, the authors explain how misdirection works in practice by analyzing the Amazon Prime Membership case, in their own words:

“Different forms of Interface Interference are used in each portion of the task flow, but all pages contain evidence of manipulation of the choice architecture and two pages make use of emotional or sensory manipulation. The most consistent dark pattern is the use of false hierarchy and visual prominence in the choice architecture, making it more likely for a user to become confused by the array of options or accidentally make a choice which is not aligned with their goal of cancellation.”<sup>58</sup>

Confirmshaming utilizes social engineering to compel users to take action otherwise they would not do. By using guilt or shame, this persuasive tactic influences users towards a specific course of action, often by framing alternative choices as socially unacceptable or morally objectionable.

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<sup>56</sup> Amit Zac et al., ‘Dark Patterns and Consumer Vulnerability’, *Behavioural Public Policy*, 3 February 2025, 1–50, <https://doi.org/10.1017/bpp.2024.49>.

<sup>57</sup> Colin Gray et al., *The Dark (Patterns) Side of UX Design*, 2018, <https://doi.org/10.1145/3173574.3174108>.

<sup>58</sup> Colin Gray et al, op. cit.

This dark pattern makes “users feel guilty for choosing the option to decline by wording the choice in a way as to shame users into compliance. For example, 'No thanks, I don't care about my 'cat'”<sup>59</sup>, when a business tries to sell pet insurance.

For better comprehending the effects on users' psychology inflicted by the confirmshaming dark pattern, it is important to keep in mind that deceptive patterns “take advantage of the psychological concept of loss aversion, which states that people prefer to avoid losses than achieve benefits of equal or greater value. Dark patterns influence users to make decisions that appear to protect them from losses, even if such losses are fictitious or exaggerated, by framing choices in ways that make users fear missing out on prospective advantages.”<sup>60</sup>

In the cat example, a person will be pruned to buy the insurance and compromise its own budget (they will not think about the benefit of saving money) to avoid the loss of their cat. There is also social pressure implied (to care about animals) and social imprints that humans have and experience even though they are alone in their houses.

Forced continuity includes enrolling users in subscription services or memberships without explicit consent and rendering the process of canceling a subscription deliberately intricate, dissuading users from opting out. For example: “When your free trial with a service comes to an end and your credit card silently starts

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<sup>59</sup> M. R. Leiser and Mireille M. Caruana, ‘Dark Patterns: Light to Be Found in Europe’s Consumer Protection Regime’, *Journal of European Consumer and Market Law* 10, no. 6 (1 February 2021), <https://kluwerlawonline.com/api/Product/CitationPDFURL?file=Journals\EuCML\EuCML2021047.pdf>.

<sup>60</sup> Bhargav Reddy Piduru, ‘DARK PATTERNS IN CUSTOMER EXPERIENCE: TECHNIQUES, CONSEQUENCES, AND ETHICAL DIMENSIONS’, 2023, <https://doi.org/10.17605/OSF.IO/N3T4D>.

getting charged without any warning. In some cases this is made even worse by making it difficult to cancel the membership.”<sup>61</sup>

Similarly to “hard to cancel”, “roach motel” is a dark pattern that refers to a broader category of design strategies that make it easy for users to get into a situation but extremely difficult to get out. This design allows users to easily sign up for an account but makes it hard to cancel afterwards, by making it difficult, for example, for users to find the unsubscribe button, essentially trapping users in a service.<sup>62</sup>

In other words, while the online platform facilitates a straightforward sign-up process, the same web environment complicates or obfuscates the account cancellation procedure, discouraging user disengagement, taking “advantage of consumers’ impatience or inertia and seeks to exploit the bias which arises from hyperbolic discounting where individuals care more about their present rewards or feelings than those that could arise in the future.”<sup>63</sup> Again, emotions are crucial to the success of this dark pattern.

Our final example uses Facebook CEO Mark Zuckerberg's name in a play on words.

Privacy Zuckering (you read it right) exploits users' susceptibilities to manipulate them into oversharing personal information through convoluted or

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<sup>61</sup> Colin Gray et al., *The Dark (Patterns) Side of UX Design*, 2018, <https://doi.org/10.1145/3173574.3174108>.

<sup>62</sup> Colin Cray et al, op. cit.

<sup>63</sup> Amit Zac et al., ‘Dark Patterns and Consumer Vulnerability’, *Behavioural Public Policy*, 3 February 2025, 1–50, <https://doi.org/10.1017/bpp.2024.49>.

misleading interface designs, often through data brokering where users agree to terms that allow companies to sell their data.

The term Privacy Zuckering was first introduced by Tim Jones in an article about “deliberately confusing jargon and user-interfaces”<sup>64</sup>, and was later listed on darkpatterns.org as a UI dark pattern.

Scholars explain that this design practice can be observed in interaction with the online interfaces when the users are tricked into publicly sharing more information about themselves than intended.<sup>65</sup>

Not too long ago, “Facebook has been accused of applying Privacy Zuckering to their users’ privacy setting pages, which termed the mechanism in the first place. For instance, in August 2010, an updated privacy settings page of Facebook allowed for highly customized settings, but required users to change dozens of settings on multiple pages to maximize personal privacy.”<sup>66</sup>

As of May 26, 2022, Facebook announced an update to its Privacy Policy, previously known as the Data Policy.<sup>67</sup> This revision aimed to provide clearer information about how Meta collects, uses, and shares user data across its platforms, including Facebook, Instagram, and Messenger.

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<sup>64</sup> Christoph Bösch et al., ‘Tales from the Dark Side: Privacy Dark Strategies and Privacy Dark Patterns’, citation omitted, *Proceedings on Privacy Enhancing Technologies* 2016 (14 July 2016): 237–54, <https://doi.org/10.1515/popets-2016-0038>.

<sup>65</sup> Colin Gray et al., *The Dark (Patterns) Side of UX Design*, 2018, <https://doi.org/10.1145/3173574.3174108>.

<sup>66</sup> Christoph Bösch et al., ‘Tales from the Dark Side: Privacy Dark Strategies and Privacy Dark Patterns’, *Proceedings on Privacy Enhancing Technologies* 2016 (14 July 2016): 237–54, citation omitted, <https://doi.org/10.1515/popets-2016-0038>.

<sup>67</sup> ‘Here’s What You Need to Know About Our Updated Privacy Policy and Terms of Service’, *Meta* (blog), 26 May 2022, <https://about.fb.com/news/2022/05/metas-updated-privacy-policy/>.

While Facebook allegedly provides users with some control over their data through various privacy settings and ad preferences, the system complexity requires a high level of motivation from users to customize the available settings, which leads to a low number of adherence, with psychological consequences as described by scholars:

“Overly complex settings and inappropriate terminology requires System 2 thinking. When a user is motivated to change their settings, but is overwhelmed at the same time, and hence lacks the opportunity to do so purposefully, the user may either switch back to System 1 thinking and make vague changes, or the user may refrain from doing so at all.”<sup>6869</sup>

While these tools offer some degree of privacy management, Facebook’s business model still relies on extensive data collection, making it difficult for users to fully prevent tracking and targeted advertising.

One may argue that manipulative techniques that take advantage of human psychology exist since humanity started to trade products and services, as competition between sellers arose, practices of convincing customers were created to lead to the expected outcome: the sale.

In supermarkets, for example, products are displayed in a way that maximizes sales, taking into account everything from where in the store they will be displayed, to what colors they will be, to what emotions the product can evoke in the customer, and so on.

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<sup>68</sup> Christoph Bösch et al., ‘Tales from the Dark Side: Privacy Dark Strategies and Privacy Dark Patterns’, *Proceedings on Privacy Enhancing Technologies* 2016 (14 July 2016): 237–54, <https://doi.org/10.1515/popets-2016-0038>.

<sup>69</sup> According to Christoph Bösch et al., system 1 thinking process takes place automatically, unconsciously, and with little effort, while system 2 behavior is driven by a deliberative, effortful decision-making process, resulting in the relatively slow execution of behavior.

In other words, “every product placement, pricing label, and promotional display is strategically designed to influence consumer behavior. However, behind these seemingly simple arrangements lies a complex science that delves into the depths of consumer psychology and decision-making processes. From the subtle use of color to the strategic placement of products, every aspect of supermarket merchandising techniques is meticulously crafted to capture attention and sway purchasing decisions.”<sup>70</sup>

What may differ, however, is that grocery stores will not sneakily add something to a customer’s cart or add hurdles that prevent the client from leaving the store. On top of that, physical stores don’t rely on large databases to predict a particular behaviour from a customer who just entered their environment.

Dark patterns, in the given example, make decisions on behalf of the user, which requires an action from the consumer to undo what the malicious design had preselected for them.

The big shift in the manipulative practices compared above concerns the availability of big data, as e-commerce companies are more likely to have access to this vast collection of data than physical stores. Although physical stores also collect information about customers in other ways, such as with loyalty cards.

Yeung, in the paper called *‘Hypernudge’: Big Data as a mode of regulation by design*, compared automated decision-making processes (the machine decides according to previous codes what is the outcome depending on the individual’s input) and digital decision-guidance processes (the underlaid technology

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<sup>70</sup> Gina Joseph, ‘The Science of Shopping: Analyzing the Effectiveness of Supermarket Merchandising Techniques’, *InContext Solutions* (blog), 18 March 2024, <https://incontextolutions.com/blog/supermarket-merchandising-techniques/>.

directs the individual through their decision process), introducing the concept of hypernudge.<sup>71</sup>

The concept of hypernudge will be addressed in the next session of this chapter. However, the digital decision-guidance process enhances the debate on how technology and access to large amounts of user data, alongside manipulative design choices, can lead to the most desirable outcome for the business.

The digital decision-guidance process is only possible thanks to the data collected before the final decision is made and also to the data that is collected during the decision that anticipates the final transaction. This collection of data, combined with obscure patterns that can be generated from the user's real-time interaction with the digital platform, leads the consumer to a final decision that is completely forged by technology.

In the paper *“Algorithmic Price Personalization: From Laesio Enormis to Laesio Algorithmica?”*, the authors demonstrated the importance of big data in generating tailored offers to their customers, including the price someone is more likely to pay, in their words:

“For many firms, the availability of big data and refined algorithmic tools has opened unprecedented avenues to learn about consumers’ financial and personal standing, market preferences, and transactional behaviour patterns. Building on these insights, firms have (at least to some degree) obtained an ability to make behavioural predictions about the future conduct of their clients, including their interest in a particular assortment of products, responsiveness to certain forms of advertising, and – not least importantly – their willingness to pay a certain price.”<sup>72</sup>

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<sup>71</sup> Karen Yeung, “Hypernudge”: Big Data as a Mode of Regulation by Design’, *Information, Communication & Society* 20 (22 May 2016): 1–19, <https://doi.org/10.1080/1369118X.2016.1186713>.

<sup>72</sup> Mateusz Grochowski and Fabrizio Esposito, ‘Algorithmic Price Personalization: From Laesio Enormis to Laesio Algorithmica?’, SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, 10 April 2024), <https://papers.ssrn.com/abstract=4790672>.

The same idea can be found in the final report of the *Behavioral Study on Unfair Commercial Practices in the Digital Environment: Dark Patterns and Manipulative Personalization*, where it was concluded that “Thanks to big data and big data analytics, the marketing industry is able to target group and individual preferences, which means they are able to target the preferences of groups/categories of consumers or individual consumers directly. *Connecting an established set of dark patterns to personalisation demonstrates how an already problematic strategy can be turned into an even more powerful tool to exploit situational vulnerabilities* (BEUC, 2021). Through the collection of large amounts of data, traders can establish on whom a trick works or not, to detect consumers who can easily be trapped, etc. They can then personalise dark patterns to exploit these specific vulnerabilities.”<sup>73</sup> (emphasis added)

The relationship between dark patterns, big data, and nudges is deeply intertwined, as all three elements contribute to shaping user behavior in digital environments. Big data enables platforms to collect and analyze vast amounts of user information in real time (what one may argue is not so easy to do in a grocery store), allowing companies to predict, influence, and manipulate decision-making as the process goes by. This data-driven approach enhances the effectiveness of dark patterns.

On the whole, online platforms benefit from users’ time exploitation and biases and “are often used by organizations to achieve short-term goals, such as increasing user accounts or sales, but they can have long-term negative impacts on

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<sup>73</sup> Directorate-General for Justice and Consumers (European Commission) et al., *Behavioural Study on Unfair Commercial Practices in the Digital Environment: Dark Patterns and Manipulative Personalisation : Final Report* (Publications Office of the European Union, 2022), <https://data.europa.eu/doi/10.2838/859030>.

user experiences”<sup>74</sup>. Trust in the service can be eroded after the user starts to feel betrayed by the business and some (dark) consequences of the employment of dark patterns could start to emerge: loss of reputation (for the business), break of relationships, unpleasant experiences, loss of trust and negative impact on the revenues<sup>75</sup>.

That being said, dark patterns represent more than just an unlawful design choice; they are also a strategic choice that is suboptimal for fostering long-term relationships with users. Moreover, they have the potential to result in legal implications.

This part of the chapter delineated various types of dark patterns prevalent in digital interfaces, shedding light on their intricate mechanisms and potential ramifications.

### **3. The disguised dark pattern - hyper-engagement mechanisms**

Hyper-engagement mechanisms and dark patterns are two concepts that, at least at first glance, might sound unfamiliar, however after being presented and briefly explained will certainly be easily relatable by all social media users.

As dark patterns were explained and examples provided above, the concept of hyper-engagement mechanisms will be now explored.

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<sup>74</sup> Jasmine McNealy, 'What Are Dark Patterns? An Online Media Expert Explains', The Conversation, 3 August 2021, citations omitted, <http://theconversation.com/what-are-dark-patterns-an-online-media-expert-explains-165362>.

<sup>75</sup> Bhargav Reddy Piduru, 'DARK PATTERNS IN CUSTOMER EXPERIENCE: TECHNIQUES, CONSEQUENCES, AND ETHICAL DIMENSIONS', 2023, <https://doi.org/10.17605/OSF.IO/N3T4D>.

For a start, dark patterns differ from hyper-engagement mechanisms in essence because the first can be identified as design strategies built to induce the user in error during the process of acquiring a product or a service via an online platform, for example, when, by default, the box for purchasing an extra service is already ticked and the user has to act to remove the tick from the box.

In turn, “Hyper-engaging Mechanisms harm users’ autonomy and are likely to significantly impair the average consumer’s freedom of choice and conduct regarding the decision on how often and for how long they want to use online platforms.”<sup>76</sup>

Hyper-engaging mechanisms are design strategies used by digital platforms to maximize user attention and keep them engaged for extended periods.

A significant distinction can be discerned between these two phenomena. Dark patterns are designed to deceive or mislead users, resulting in harm. In contrast, hyper-engagement mechanisms are deliberate design practices aimed at prolonging users' engagement with a platform.

Key techniques include infinite scroll (Facebook), which removes stopping points by continuously loading new content, and auto-playing videos (YouTube), which keep users watching without requiring action. Personalized algorithms, like TikTok’s For You Page, analyze user behavior to serve highly relevant content, making it difficult to stop scrolling.

Additionally, variable rewards — such as likes, comments, and unpredictable notifications — trigger dopamine responses (as explained in Chapter I,

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<sup>76</sup> Thaís Maciel Cathoud Ferreira, ‘Hyper-Engaging Mechanisms and the EU Legal Framework’ (masterThesis, 2022), <https://run.unl.pt/handle/10362/148934?mode=full>.

when the Hook Model was presented), reinforcing compulsive engagement. Push notifications further exploit FOMO (Fear of Missing Out) by creating urgency, drawing users back to check updates.

Other common engagement strategies include social validation loops, where likes and comments encourage constant interaction, and content loops, where platforms suggest trending or similar content to keep users from leaving.<sup>77</sup>

These mechanisms drive user retention, ad revenue, and data collection, but they also contribute to digital addiction, reduced attention spans, and loss of autonomy.<sup>78</sup>

In this context, the average consumer has no immunity against hyper-engaging mechanisms, as far as they interact directly with their subconscious, as they take advantage of users' cognitive vulnerabilities.<sup>79</sup>

However, scholars recently carved a new term that encompass both dark patterns and hyper-engaging mechanisms, named hyper-engaging dark patterns (HEDPs)<sup>80</sup>, a “complex dark pattern that is hidden in plain sight”<sup>81</sup>.

See below its definition:

“HEDPs are tactics that deplete users' attentional resources, reinforce their behavior, and manipulate them through the interface to develop the habit of using the service. These patterns are effective due to the use of adaptive algorithms and the interface's data-driven design.

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<sup>77</sup> Brignull, H. (2010). *Dark Patterns: Deceptive User Interfaces*. Retrieved from <https://www.darkpatterns.org>

<sup>78</sup> Mathur, A., Acar, G., Friedman, M., Lucherini, E., Mayer, J., Chetty, M., & Narayanan, A. (2019). *Dark Patterns at Scale: Findings from a Crawl of 11K Shopping Websites*. Proceedings of the ACM on Human-Computer Interaction, 3(CSCW), 1-32. <https://doi.org/10.1145/3359183>

<sup>79</sup> Cathoud Ferreira, op. cit, p. 57.

<sup>80</sup> Fabrizio Esposito and Thaís Ferreira, 'Addictive Design as an Unfair Commercial Practice: The Case of Hyper-Engaging Dark Patterns', *European Journal of Risk Regulation*, 25 March 2024, 1–18, <https://doi.org/10.1017/err.2024.8>.

<sup>81</sup> Fabrizio Esposito and Thaís Ferreira, op. cit.

Infinite scroll, autoplay, push notifications, pop-ups, likes, emojis, number of visualisations of one's contents, stories that disappear in a short period of time, and even followers are all part of very sophisticated ways to capture and retain users' attention."<sup>82</sup>

As engagement is necessary for the business continuity, hyper-engagement relates to a habit forming that might lead to addiction. Reason why some scholars are discussing an ethical form of fostering engagement without causing detriment to users' health and life balance.

In the study *Dark Design Patterns: An End-User Perspective*, a few examples of given: "In their paper on ethical mediation in user experience (UX) practice, Gray and Chivukula (2019, p. 9) contended that fostering ethically aware design practices requires an "ecological model of ethical engagement" that—beyond ethical practices—considers both personal and organizational factors to model the mediating relationships that will potentially lead to "lasting and sustainable change." Mulvenna et al. (2017) created an "ethical by design" manifesto that presented a set of principles intended to establish an understanding of how design can address ethical concerns. Berdichevsky and Neuenschwander (1999) developed a set of eight ethical principles of persuasive design, including the "golden rule of persuasion" in which someone seeking to persuade others should do so only if they would consent to be persuaded that way themselves."<sup>83</sup>

It is also important to add that a hyper-engagement is so called because it is derived from a hyper-nudge.

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<sup>82</sup> Fabrizio Esposito and Thaís Ferreira, op. cit.

<sup>83</sup> Maximilian Maier and Rikard Harr, 'Dark Design Patterns: An End-User Perspective', *Human Technology* 16 (31 August 2020): 170–99, <https://doi.org/10.17011/ht/urn.202008245641>.

A nudge is a subtle intervention designed to steer people toward a particular choice without restricting their freedom. This concept, introduced by Thaler and Sunstein (2008) in *Nudge: Improving Decisions About Health, Wealth, and Happiness*, is based on behavioral economics and choice architecture.

Nudges exploit cognitive biases to encourage beneficial behaviors, such as setting default options (e.g., automatic enrollment in pension plans) or using framing effects (e.g., presenting healthy food more prominently in cafeterias).<sup>84</sup> While nudges guide decisions, they do not eliminate alternatives, ensuring that individuals remain free to choose.

A hyper-nudge, on the other hand, is a more sophisticated and dynamic form of nudging that relies on big data, real-time analytics, and AI-driven algorithms to continuously shape user behavior<sup>85</sup>. Unlike traditional nudges, which are static, hyper-nudges adjust personalized digital environments based on user activity, often in ways that are invisible to the user.

Social media platforms, for example, use algorithmic curation to influence user engagement, tailoring feeds and notifications to maximize attention.

As a result of the distinguishment between nudge and hyper-nudge, scholars developed a more “intensional definition”<sup>86</sup> of a HEDP, being: “An effect of a particular type of choice architecture, namely a digital interface, that makes users

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<sup>84</sup> Fabrizio Esposito and Thaís Ferreira, ‘Addictive Design as an Unfair Commercial Practice: The Case of Hyper-Engaging Dark Patterns’, *European Journal of Risk Regulation*, 25 March 2024, 1–18, <https://doi.org/10.1017/err.2024.8>.

<sup>85</sup> Karen Yeung, “Hyper-nudge”: Big Data as a Mode of Regulation by Design’, *Information, Communication & Society* 20 (22 May 2016): 1–19, <https://doi.org/10.1080/1369118X.2016.1186713>.

<sup>86</sup> Fabrizio Esposito and Thaís Ferreira, op. cit.

spend more time interacting with the service by making use of big data analytics and one or more behavioural trait.”<sup>87</sup>

The discussion above proved that hyper-engagement mechanisms can be considered as dark patterns as they explore the user dopaminergic cycle, creating a habit that can lead to fatigue, time loss and even addiction.

About the consequences for the users, “research has found that individuals who engage in cognitive activities for extended periods of time experience mental fatigue. Social media use can be a continuous drain on one's cognitive energy, and the current significant increase in the length and frequency of social media use in people's daily lives has led to the phenomenon of social media fatigue becoming increasingly common. The intensity of fatigue experienced by different individuals in the same situation varies, and may be either a mild sense of fatigue or a state of severe fatigue.”<sup>88</sup>

The main definition of dark patterns adopted by the European Union refers to “practices that materially distort or impair (...) the ability of recipients of the service to make autonomous (...) choices or decisions”.

Infinite scroll is a hyper-engagement mechanism because it removes natural stopping points, making content consumption continuous and harder to disengage from. If the user is already addicted, there is no room for an autonomous

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<sup>87</sup> Directorate-General for Justice and Consumers (European Commission) et al., *Behavioural Study on Unfair Commercial Practices in the Digital Environment: Dark Patterns and Manipulative Personalisation : Final Report* (Publications Office of the European Union, 2022), <https://data.europa.eu/doi/10.2838/859030>

<sup>88</sup> Kai Li et al., ‘Mechanism Study of Social Media Overload on Health Self-Efficacy and Anxiety’, *Heliyon* 10, no. 1 (5 December 2023): e23326, citations omitted, <https://doi.org/10.1016/j.heliyon.2023.e23326>.

choice or decision, since they will only leave the loop when an external factor is involved. For example, when somebody calls them.

The infinite scroll emulates a slot machine, meaning that the user never knows exactly what they will get and is unconsciously driven to keep scrolling as something of value would appear at any time.

Moreover, infinite scroll leverages real-time data and personalization algorithms, making it a form of hyper-nudge.<sup>89</sup> The constant flow of information, tailored to individual preferences (big data), keeps users in a passive consumption loop, maximizing their time spent on the platform and, consequently, increasing ad impressions and data collection - the user, ultimately, is not even aware of the data that is being collect through the scrolling activity they are carrying out.

Because of all that, infinite scroll clearly reduces user autonomy, encourages compulsive behavior, and contributes to digital addiction<sup>90,91</sup>, especially when combined with other dark patterns.

In other words, infinite scroll causes harm to users as no stopping clues are presented and they keep engaging in the platform, hooked in the loop of the slot machine effect.

### **CHAPTER III - EU Unfair Commercial Practices Directive (UCPD) and Digital Service Act (DSA) - is there a hidden solution?**

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<sup>89</sup> Karen Yeung, "Hyper-nudge": Big Data as a Mode of Regulation by Design', *Information, Communication & Society* 20 (22 May 2016): 1–19, <https://doi.org/10.1080/1369118X.2016.1186713>.

<sup>90</sup> Harry Brignull, *Dark Patterns: Deception in Digital Design* (London: UX Brighton, 2010).

<sup>91</sup> Arunesh Mathur et al., "Dark Patterns at Scale: Findings from a Crawl of 11K Shopping Websites," *Proceedings of the ACM on Human-Computer Interaction* 3, no. CSCW (2019): 81–99.

After studying the science behind infinite scroll down and the meaning of dark patterns, relating both as infinite scroll is a type of dark pattern that can be called as hyper-engagement dark pattern, this study will now address the European legislation in force to frame the referred mechanism and present possible solutions to address the phenomenon — namely, the UCPD and the DSA.

In the next sessions, an analysis of how EU legislation regulates and restricts dark patterns will be conducted, with a particular focus on the infinite scroll feature used by platforms like Facebook. Specifically, the chapter will (i) examine the applicability of existing consumer protection laws to manipulative digital practices; (ii) assess the potential impact of these regulations on social media platforms and their design strategies; and (iii) evaluate the challenges and effectiveness of enforcing these regulations in an evolving digital landscape.

This chapter also refers to the results of qualitative research on the impact of infinite scrolling on users, as they can provide a better understanding of how empirical research has collected evidence supporting the widely-shared belief that infinite scroll raises serious social concerns.

## **1. Key UCPD and DSA provisions relevant to dark patterns**

While the UCPD was originally intended to regulate traditional advertising and sales techniques, its broad definitions have allowed for its application

to digital environments as explained in the recent UCPD Guidance<sup>92</sup> “focuses on the application of the UCPD in specific fields, “and the digital sector is prominent amongst them. In particular, it tackles novel issues, such as dark patterns and gaming practices to address how the UCPD can be applied in these circumstances.”<sup>93</sup>

Article 5 UCPD is a general clause and prohibits unfair commercial practices, particularly those that materially distort or are likely to distort the economic behavior of consumers, by significantly impairing their ability to make an informed decision. This includes practices that, in the case of dark patterns, manipulate or mislead consumers into making choices they would not have made otherwise.

Article 6 UCPD defines misleading actions as those containing deceptive or false information that influences consumer choices, while Article 7 UCPD defines misleading omissions on commercial practices when the trader omits material information that the average consumer needs to make an informed decision.

Article 8 UCPD addresses aggressive practices, particularly those that coerce, harass, or unduly influence consumers. Article 9 UCPD determines which practices can be considered as aggressive, showcasing a list of elements that shall be considered when categorizing a commercial practice as such.

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<sup>92</sup> ‘Commission Notice – Guidance on the Interpretation and Application of Directive 2005/29/EC of the European Parliament and of the Council Concerning Unfair Business-to-Consumer Commercial Practices in the Internal Market (Text with EEA Relevance)’ (2021), [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC\\_2021\\_526\\_R\\_0001](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2021_526_R_0001).

<sup>93</sup> ‘Aggressive commercial practices 2.0: Is the UCPD fit for the digital age? - ProQuest’, accessed 7 March 2025, citations omitted, <https://www.proquest.com/openview/8652401e50569c3a9e7a7fd79b0d6138/1?pg-origsite=gscholar&cbl=7100261>.

The Digital Services Act (DSA; (Regulation (EU) 2022/2065), in turn, explicitly addresses manipulative design choices in online platforms, including dark patterns, which are commonly associated with infinite scroll.

Article 25 DSA establishes a general prohibition for online platform providers. These providers are prohibited from creating interfaces for their platforms that are designed, organized, or operated in a manner that deceives or manipulates the recipients of the service. Additionally, these interfaces are prohibited if they are configured in such a way as to distort or materially impair the recipients' ability to make free and informed decisions.

Article 25(2) limits the *caput's* application for practices covered by the UCPD, considering its specialization. A next section will provide a more thorough examination of these articles, in conjunction with other pertinent provisions outlined in the aforementioned regulations.

## **1.2 Some insights on how the UCPD can protect users against infinite scroll**

Enacted in 2005, the UCPD (Directive 2005/29/EC) provides fundamental consumer protections against misleading and aggressive business-to-consumer (B2C) commercial practices. While it does not explicitly mention dark patterns, it prohibits manipulative digital strategies that distort consumer decision-making.

Article 1 of the UCPD defines the purpose of the norm by stating that the “purpose of this Directive is to contribute to the proper functioning of the internal market

and achieve a high level of consumer protection by approximating the laws, regulations and administrative provisions of the Member States on unfair commercial practices harming consumers' economic interests.”

From this, it is possible to discern the Directive's broader objective, which is a *high level* of consumer protection against unfair commercial practices that harm consumers' economic interests.

But what are the economic interests of consumers? The UCPD does not define them, but rather gives one example. Whereas n. 6 mentions unfair advertising as a practice that directly harms consumers' interests. The underlay definition that can be spotted in this guidance is regarding transparency, in other words, being well informed is under consumers' best (economic) interest to make a transactional decision.

However, consumer's economic interests is a category that includes more than the right to be well informed with a view to a transactional outcome. In the Chapter “Consumer Interests and Economic Wellbeing (sic)”, Jing Jian Xiao discusses the meaning of consumer's economic interests, highlighting that a “straightforward definition of consumer interest is difficult to find in the literature.”<sup>94</sup>

By quoting the economic scholar Scott Maynes (1988), he articulates that “consumer interest can be considered from several alternative interpretations: 1) anything that furthers the attainment of consumer rights; 2) any policies, practices, institutions, and ideas that are based on the approval of informed consumers, an idea originated in Maynes (1976); 3) cost-benefit assessments of proposals or institutions as a means

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<sup>94</sup> Jing Jian Xiao, 'Consumer Interests and Economic Wellbeing', 2015, 23–44, p. 01, [https://doi.org/10.1007/978-1-4939-2821-7\\_2](https://doi.org/10.1007/978-1-4939-2821-7_2).

of assessing efficiency and considerations of fairness proposed by Morgan (1985); and 4) Removing consumer concerns and problems.”<sup>95</sup> Scott Maynes' ideas place the consumer at the center of all relevant discussions, although he does not create categories of economic interests.

The same understanding can be extracted from Article 169, n. 1, of the Treaty on the Functioning of the European Union, which states:

“In order to promote the interests of consumers and to ensure a high level of consumer protection, the Union shall contribute to protecting the health, safety and economic interests of consumers, as well as to promoting their right to information, education and to organise themselves in order to safeguard their interests.”

A way to protect online platform users from harm is increasing the transparency in B2C relations, and this can be done by “Having in mind that right to information is one of the basic consumer rights”<sup>96</sup> and that “a substantial part of the Directive aims namely at ensuring that information on the main characteristics of a product or service, on the price and key conditions are provided to consumers in a truthful, complete and timely manner.”<sup>97</sup>

The importance of bringing these concepts into the discussion is to shed light on the ethos of the UCPD, which is the ultimate protection of consumers from harm, as defined in Article 1.

Moving forward, the central issue of infinite scrolling, as seen in the previous chapters, is not to get the user to make a traditional commercial decision<sup>98</sup>

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<sup>95</sup> Jing Jian Xiao, op. cit. p. 02.

<sup>96</sup> Saulius Katuoka and Ieva Navickaitė-Sakalauskienė, ‘Misleading Actions vs. Misleading Omissions under Unfair Commercial Practices Directive. National Approach in Context’, *International Comparative Jurisprudence*, 1 July 2016, <https://doi.org/10.1016/j.ici.2016.07.002>.

<sup>97</sup> Saulius Katuoka and Ieva Navickaitė-Sakalauskienė, op. cit.

<sup>98</sup> The intentional choice of the expression “traditional commercial decision” is aimed at opposing the primary nature of the activity of infinite scrolling down, prolonging the time spent on the online

(which could arguably happen in an empirical scenario - by clicking on an advertisement pop-up and actually buying a good or service), but to keep the user hooked to the platform.

It is a matter of usage time. And time, as was explained in Chapter I, has economic value, especially in the era of attention economy.

Cathoud Ferreira, citing the Guidance on the Interpretation and Application of the UCPD, published in 2021, highlights that the Guidance “says that the use of algorithms to capture “the consumer’s attention, which results in transactional decisions such as continuing to use the service (e.g., scrolling through a feed), to view advertising content or to click on a link” is a problematic commercial practice under the UCPD.”<sup>99</sup>

The word chosen by the Guidance for a practice such as infinite scrolling is *problematic*, as it leaves a lot of room for interpretation. It seems that infinite scroll down is an issue that lawmakers and politicians are struggling to frame, as platforms such as Facebook have a global positioning and, much likely, a powerful lobby.

In 2022, an advance on the matter can be identified in the final report of the Behavioural study on unfair commercial practices in the digital environment: dark patterns and manipulative personalisation sponsored by the EU, as it accommodates infinite scroll as a potential misleading dark pattern in “Table 11 Overview of practices, legislation and cases”.<sup>100</sup>

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platform, and refers to the acquisition of goods and services as a direct result of an interaction with an e-commerce interface.

<sup>99</sup> Cathoud Ferreira, op.cit, p. 48.

<sup>100</sup> Directorate-General for Justice and Consumers (European Commission) et al., *Behavioural Study on Unfair Commercial Practices in the Digital Environment: Dark Patterns and Manipulative Personalisation : Final Report* (Publications Office of the European Union, 2022), p.61, <https://data.europa.eu/doi/10.2838/859030>.

In the report, it was said that indefinitely scrolling to reveal more content, depending on the context and specific circumstances, is possibly in breach of Articles 6/7 (misleading practices) and 8/9 (aggressive practice - undue influence) UCPD.<sup>101</sup>

### **1.3 Exploring Articles 6 and 7 UCPD**

Firstly, both heads of articles 6 and 7 UCPD finish with the same sequence of words, which is “causes or is likely to cause him/average consumer to take a transactional decision that he would not have taken otherwise”, therefore the meaning of transaction decision will be discussed in the sequence.

The UCPD's definition of a transactional decision, Article 2, "k", can itself be misleading, as it apparently focuses on the purchase of a product. See below:

“‘transactional decision’ means any decision taken by a consumer concerning whether, how and on what terms to purchase, make payment in whole or in part for, retain or dispose of a product or to exercise a contractual right in relation to the product, whether the consumer decides to act or to refrain from acting”

This is not helpful in understanding how a consumer's economic interest can be harmed by a manipulative technique such as infinite scrolling, since the purchase of a goods does not occur in this scenario.

However, the Guidance on the interpretation and application of UCPD amplifies the range applicability of the expression “transactional decision”, as “the Directive has a broad scope of application: it covers all business-to-consumer

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<sup>101</sup> Directorate-General for Justice and Consumers (European Commission) et al, op. cit., content extracted from Table 11.

commercial practices and does not require the existence of a contractual relationship or the purchase of a product. For example, the Directive would also cover commercial practices such as capturing the consumer's attention, which results in transactional decisions such as continuing to using the service (e.g. scrolling through a feed), to view advertising content or to click on a link."<sup>102</sup>

This broader definition could frame infinite scroll as a misleading practice, covered by Articles 6 and 7 of the UCPD, which describe misleading actions and omissions; unfortunately, there are some interpretation issues that appear in the articles' letters that might compromise its applicability to infinite scrolling, as they clearly refer to the purchase of products.

Some examples extracted from Article 6, UCPD: letter "a" refers to "existence or nature of the product"; letter "b" to the main characteristics of the product; letter "d" to pricing; and letter "g" to "the consumer's rights, including the right to replacement or reimbursement".

For Cathoud Ferreira, however, the real problem relies on the last part of the articles' heads, as the author explains that Section 1 (which includes Articles 6 and 7) of the Directive is intended to protect consumers from making an uninformed transactional decision that they *would not take otherwise*.

The author emphasized that "misleading practices refer somehow to failing to provide material information to consumers clearly and truthfully. (...) In both cases, the action or omission has to cause or be likely to cause the consumer to take

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<sup>102</sup> Commission Notice – Guidance on the Interpretation and Application of Directive 2005/29/EC of the European Parliament and of the Council Concerning Unfair Business-to-Consumer Commercial Practices in the Internal Market (Text with EEA Relevance) (2021), [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC\\_2021\\_526\\_R\\_0001](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2021_526_R_0001).

a transactional decision that they would not have taken otherwise.”<sup>103</sup> It is implicit here that the consumer is vigilant during the act of infinite scrolling, nurturing their brain every time they scroll with the option of not doing such finger movement. Reality, and studies, revealed the opposite, as infinite scroll has the power to numb users’ decision-making systems (Chapter I).

Quoting Helberger et al., the mentioned author remembered that clear information cannot protect users from hyper-engagement mechanisms that are embedded in the architecture of online platforms. Therefore, the articles in comment do not serve to protect consumers from the harms caused by hyper-engagement mechanisms.

While Article 7 of the UCPD prohibits misleading omissions, it is not well-suited to directly regulate infinite scrolling. This limitation arises because Article 7 is primarily concerned with omissions of essential information in commercial transactions, while infinite scroll is *a design choice related to user engagement*, not necessarily a failure to disclose key consumer information.

Article 7(1) defines misleading omissions as the failure to provide essential information that consumers need to make an informed transactional decision; The norm clearly states that “a commercial practice shall be regarded as misleading if it omits material information that the average consumer needs”.

However, infinite scrolling does not involve a commercial transaction in itself — it is a user interface feature rather than a direct omission of material facts like pricing, terms, or product characteristics. Unless infinite scrolling is tied directly to a

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<sup>103</sup> Cathoud Ferreira, op. cit, p. 48.

misleading sales or subscription practice, it is doomed to fall outside the core scope of Article 7.

Once again, one could argue that the Guidance includes infinite scrolling in the category of transactional decision, so Article 7 could be called into action.

This idea is also supported by the work of Helberger et al. who studied non-monetary forms of exchange (like data) in the context of the UCPD, as they put it:

“Art. 6 and 7 includes information on the price, and that in a digital environment the notion of ‘price’ must be interpreted broadly, including non-monetary forms of exchanges, such as data, but also attention, intellectual property rights to user generated content, etc. This interpretation is further supported by the qualification in Art. 7(2), namely that a misleading omission can have taken place if a trader fails to identify the commercial intent of the commercial practice (if not already apparent from the context).”<sup>104</sup>

Infinite scroll does not necessarily "distort a transactional decision" through misleading omissions, such as failing to disclose a price. This is because determining the "price" of user data — assuming data could be converted into currency — is highly complex. Providing such information to users in a clear and actionable way would be impractical and could significantly impair the usability of social media platforms.

While infinite scrolling affects user behaviour, it does not force a purchase, contract, or financial commitment, making it difficult to argue that infinite scroll alone constitutes a misleading omission in a commercial transaction and that its prevalence would “likely to cause the average consumer to take a transactional

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<sup>104</sup> Natali Helberger, ‘Profiling and Targeting Consumers in the Internet of Things – A New Challenge for Consumer Law’, SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, 6 February 2016), <https://doi.org/10.2139/ssrn.2728717>.

decision that they would not have taken otherwise. This implies that the average consumer would make a different choice if the material information on these mechanisms were clearly provided.”<sup>105</sup>

It is worth bearing in mind that the rule being analyzed was enacted in 2005, a year before the invention of infinite scrolling. Although rules, in general, always offer some room for stretching, as a need to adapt to the constant changes in human interactions and legal business, there is a limit to this.

Interpretation is a tool that has always been used by legal operators to subsume rules to specific cases, but even the most experienced specialist can only go so far when the regulation being analyzed determines its own scope of application.

Misleading commercial practices do not address hyper-engagement mechanisms such as infinite scrolling. They serve as an additional layer of protection for consumers, but were not written with the intent of protecting users from practices that interfere with the user's ability to determine when to stop navigating the online platform.

Although infinite scrolling can be considered a manipulative design choice, as explained in the previous chapters, it does not fit neatly within the scope of Article 7 UCPD, which addresses omissions of essential information in commercial transactions.

To sum up the issues around the informational nature of Articles 6 and 7 UCPD, bearing in mind that infinite scroll is a modality of hyper-engagement dark pattern, take a look at the following excerpt:

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<sup>105</sup> Cathoud Ferreira, *op. cit.*, p. 49.

“At first glance, it may appear that HEDPs constitute a misleading practice. Nevertheless, applying Articles 6 and 7 to HEDPs implies that the average consumer would make a different choice if they were properly informed about these patterns, which is not the case. HEDPs cannot be overcome by providing information, because information can neither remedy digital asymmetry nor protect users’ brains from manipulation. What distorts user behaviour in this case is the manipulative practice itself, not the lack of or the deceptive information about it, so the legal solution must tackle the structural side, the digital architecture, by means other than information.”<sup>106</sup>

Finally, it is worth remembering that Articles 6 and 7 of the UCPD were written to try to cover phenomena that existed at the time the Directive was drafted. And no rule can be interpreted in isolation from its context and time, especially specific norms. General clauses, on the other hand, by their very nature have more room for interpretation.

#### **1.4 The UCPD general clause of Article 5**

A general clause is a “legal rule, term or concept which is not precisely formulated and in fact does not even have a clear core (see Grundmann 2005, 1–4). Thus, the issue of general clauses can be located between the axiological and the legal sphere.”<sup>107</sup>

Article 5 UCPD is the general clause of the Directive which serves as the foundational rule for identifying unfair commercial practices within the European

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<sup>106</sup> Fabrizio Esposito and Thaís Ferreira, ‘Addictive Design as an Unfair Commercial Practice: The Case of Hyper-Engaging Dark Patterns’, *European Journal of Risk Regulation*, 25 March 2024, 1–18, citations omitted, <https://doi.org/10.1017/err.2024.8>.

<sup>107</sup> Anna Kalisz and Adam Szot, ‘The General Clause a Measure of Universalizing the Content of Law or an Expression of Its Diversity on “Public Interest” and “Public Moral” Clauses (Klauzula Generalna - Środek Do Uniwersalizacji Prawa Czy Wyraz Jego Zróznicowania? O “interesie Publicznym” i “Klauzulach Moralności Publicznej”’, SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, 21 February 2018), <https://doi.org/10.2139/ssrn.3127542>.

Union. This provision lays down the overarching criteria for determining whether a business practice is unfair, ensuring broad applicability across various forms of consumer interactions, requiring a case analysis to be enforced.

In order to facilitate comprehension regarding its implementation, let's examine the Guidance on the UCPD's interpretation of the subject matter:

“Article 5(2) provides a general clause setting two cumulative criteria for assessing whether commercial practices should be deemed unfair. It functions as a ‘safety net’ to make sure that any unfair practice which is not caught by other provisions of the UCPD (i.e. that is neither misleading, aggressive or listed in Annex I) can still be penalised. The provision is also future proof as it allows for emerging unfair practices to be tackled. Article 5(2) prohibits commercial practices that are contrary to the requirements of professional diligence if they are likely to materially distort the economic behaviour of the average consumer.”<sup>108</sup>

The general nature of Article 5 allows it to capture a wide range of deceptive, misleading, or aggressive business practices, even when they are not explicitly listed in the directive's annex or specific articles.

According to the article, a practice to be deemed as unfair is likely to materially distort the economic behaviour of the average consumer. Although there is plenty of discussion in academia about the meaning of the average consumer and its consequences to the enforcement of this rule, a different aspect of this article will be explored onwards. And it regards the economic interests of users, as discussed previously in the beginning of this chapter.

While Recital 13 establishes: “The single, common general prohibition established by this Directive therefore covers unfair commercial practices distorting

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<sup>108</sup> ‘Commission Notice – Guidance on the Interpretation and Application of Directive 2005/29/EC of the European Parliament and of the Council Concerning Unfair Business-to-Consumer Commercial Practices in the Internal Market (Text with EEA Relevance)’ (2021), p. 37, [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC\\_2021\\_526\\_R\\_0001](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2021_526_R_0001).

consumers' economic behaviour. *In order to support consumer confidence the general prohibition should apply equally to unfair commercial practices which occur outside any contractual relationship between a trader and a consumer or following the conclusion of a contract and during its execution.* The general prohibition is elaborated by rules on the two types of commercial practices which are by far the most common, namely misleading commercial practices and aggressive commercial practices.” (emphasis added)

Understanding the placement of consumer’s economic behaviour in the UCPD is key to acknowledge how such a norm can serve as a shield for protecting users from the harms caused by hyper-engagement mechanisms such as infinite scrolling.

Again, the UCPD gives the meaning of “to materially distort the economic behaviour of consumers” and “transactional decision” in Article 2, letters “e” and “k”. The general rule of Article 5(2), “b”, combines both definitions as it states that a commercial unfair practice will be considered as such as it “materially distorts or is likely to materially distort the economic behaviour with regard to the product of the average consumer whom it reaches or to whom it is addressed, or of the average member of the group when a commercial practice is directed to a particular group of consumers.”

That being said, the following exercise of interpretation can be applied:

Under Article 5(2) UCPD, a commercial practice is deemed unfair if it meets the following two conditions: (i) it is contrary to the requirements of professional diligence, meaning that it does not meet the standard of honest market practice and

good faith expected in business-to-consumer relations; (ii) it materially distorts or is likely to materially distort the economic behaviour of the average consumer<sup>109</sup>.

It is known that the meaning of materially distorting the economic behavior of the consumer is to influence a transactional decision they would not likely make otherwise, meaning it significantly impairs their ability to make an informed decision and thereby influences their choice in a way they would not have otherwise chosen.

The concept of transactional decision is included in the meaning of “distort economic behaviour” as “what determines whether a commercial practice ‘materially distorts or is likely to materially distort’ the consumer’s economic behaviour is whether the commercial practice causes or is likely to cause the consumer to ‘take a transactional decision that he would not have taken otherwise’.”<sup>110111</sup>

As examined previously, a transactional decision does not necessarily include the purchase of a good or service, as it could be the decision to keep engaging in an online platform.

Therefore, Article 5(2), “b”, first part, could be rewrote is this manner:

A commercial practice shall be unfair if it elongates the usage time or is likely to elongate the usage time with regard to the product of the average consumer whom it reaches or to whom it is addressed.

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<sup>109</sup> Recital 18 UCPD defines average consumer as a person “who is reasonably well-informed and reasonably observant and circumspect, taking into account social, cultural and linguistic factors.”

<sup>110</sup> ‘Commission Notice – Guidance on the Interpretation and Application of Directive 2005/29/EC of the European Parliament and of the Council Concerning Unfair Business-to-Consumer Commercial Practices in the Internal Market (Text with EEA Relevance)’ (2021), p.32, [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC\\_2021\\_526\\_R\\_0001](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2021_526_R_0001).

<sup>111</sup> Article 5(2) UCPD.

These broad conditions allow Article 5 to cover emerging and evolving business strategies like infinite scroll down, including manipulative digital practices and/or hyper-engagement mechanisms that were not explicitly foreseen when the directive was adopted, functioning as a catch-all clause.

### **1.5 Articles 8 and 9 UCPD**

Article 8 UCPD addresses aggressive practices, stating that a “commercial practice shall be regarded as aggressive if, in its factual context, taking account of all its features and circumstances, by harassment, coercion, including the use of physical force, or undue influence, it significantly impairs or is likely to significantly impair the average consumer's freedom of choice or conduct with regard to the product and thereby causes him or is likely to cause him to take a transactional decision that he would not have taken otherwise.”

The term “undue influence” is the most relevant in the article as far as the infinite scrolling mechanism is concerned, because the other terms don't fit its mechanics. There is no harassment or coercion that affects the consumer's freedom of choice when it comes to infinite scrolling, a HEDP.

That's the understanding of Esposito et al. in the article Addictive Design as an Unfair Commercial Practice: The Case of Hyper-Engaging Dark Patterns, in their own words:

“It is in Articles 8 and 9 UCPD, establishing the prohibition of aggressive practices, that HEDPs are best placed. (...) The factual context of a practice has to be considered when assessing it. The UCPD only defines ‘undue influence’, which requires: the trader to be in a position of power over the consumer; the trader to exploit such position to put pressure on

the consumer; and this significantly limits the consumer's ability to make an informed decision."<sup>112</sup>

Article 9 provides a non-exhaustive factor's list<sup>113</sup> that must be considered when assessing whether a practice exerts undue influence, including timing, location, the use of threats or exploitative pressure, and the potential for the consumer to make an informed choice. This broad framework allows enforcement authorities to evaluate not just explicit coercion, but also more subtle forms of manipulation that create psychological pressure on consumers in a case specific assessment.<sup>114</sup>

In the study called 'A Theory of Exploitation for Consumer Law: Online Choice Architectures, Dark Patterns, and Autonomy Violations, the author explore the concept of undue influence under the criteria adopted by the UCPD, as he explains that the "definition of undue influence captures a very specific form of exploitation: exploitation which enables the application of pressure."<sup>115</sup>

After analyzing the meaning of exploitation, he defends that the "position of power in relation to the consumer" in Article 2(j) UCPD, which is the exploitable circumstance, is causal for enabling the exploiter to apply pressure. The wrongness of exploitation-enabled pressure requires the violation of a normative benchmark. Article 2(j) UCPD calls this a significant limitation of "the consumer's ability to make an informed decision". This is a procedural defect in a B2C transaction, since the defect

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<sup>112</sup> Fabrizio Esposito and Thaís Ferreira, 'Addictive Design as an Unfair Commercial Practice: The Case of Hyper-Engaging Dark Patterns', *European Journal of Risk Regulation*, 25 March 2024, 1–18, <https://doi.org/10.1017/err.2024.8>.

<sup>113</sup> Fabrizio Esposito and Thaís Ferreira, op. cit.

<sup>114</sup> 'Commission Notice – Guidance on the Interpretation and Application of Directive 2005/29/EC of the European Parliament and of the Council Concerning Unfair Business-to-Consumer Commercial Practices in the Internal Market (Text with EEA Relevance)' (2021), [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC\\_2021\\_526\\_R\\_0001](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2021_526_R_0001).

<sup>115</sup> 'A Theory of Exploitation for Consumer Law: Online Choice Architectures, Dark Patterns, and Autonomy Violations', *Journal of Consumer Policy* 47 (15 December 2023): 1–38, <https://doi.org/10.1007/s10603-023-09554-7>.

does not lie in the substantive terms of the transaction but in the way in which the trader treats the consumer (with undue influence). However, it is exploitation-enabled pressure that violates this benchmark.”<sup>116</sup>

It is about the way the trader, who is in a position of power in relation to the receptor of the service, treats the consumer and the goal of exercising undue influence over them, “what matters are the potential effects of the trader’s conduct and not the intention or awareness behind it”<sup>117</sup>, to reach the business ultimate outcome: profits.

That being said, the relevance of Articles 8 and 9 remains in how this feature indirectly coerces users into staying more time on the platform, what they would not do otherwise (without the feature). Infinite scroll, as a HEDP harms “users’ autonomy and (...) significantly impair the average consumer’s freedom of choice and conduct regarding the decision on how often and for how long they want to use online platforms.”<sup>118</sup> As a result, infinite scroll is a form of undue influence, which allows it to be framed as an aggressive commercial practice under Articles 8 and 9 UCPD.

## **1.6 Article 25 DSA**

The DSA, a UE Regulation enacted in 2022 (Regulation (EU) 2022/2065) explicitly addresses manipulative design choices in online platforms, including dark patterns, which are commonly associated with infinite scroll.

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<sup>116</sup> Op. cit.

<sup>117</sup> Cathoud Ferreira, op. cit, p. 51.

<sup>118</sup> Cathoud Ferreira, op. cit. p. 54.

Article 25(1) DSA prohibits online platforms from deceptively influencing user behavior in ways that impair informed decision-making. The norm says: “Providers of online platforms shall not design, organise or operate their online interfaces in a way that deceives or manipulates the recipients of their service or in a way that otherwise materially distorts or impairs the ability of the recipients of their service to make free and informed decisions.”

Although the term dark pattern is not mentioned in Article 25, Recital 67 describes it as “practices that materially distort or impair, either on purpose or in effect, the ability of recipients of the service to make autonomous and informed choices or decisions. Those practices can be used to persuade the recipients of the service to engage in unwanted behaviours or into undesired decisions which have negative consequences for them.”

The straightforwardness of Article 25(1) clashes with the exception defined in Article 25(2), as the general rule shall not apply to practices covered by the UCPD. Instead of harmonizing both Directives, the legislator opted to restrict their application scope, as one excludes the other.

This approach has been the subject of scholarly critique. The prevailing opinion among scholars is that, in order to ensure optimal consumer protection, both rules must be enforced in a complementary manner.<sup>119120</sup>

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<sup>119</sup> Marie Jull Sørensen, Peter Rott, and Karin Sein, *European Commission’s Public Consultation on Digital Fairness: Fitness Check on EU Consumer Law: Response of the European Law Institute* (Vienna: European Law Institute, 2023).

<sup>120</sup> Fabrizio Esposito and Thaís Ferreira, ‘Addictive Design as an Unfair Commercial Practice: The Case of Hyper-Engaging Dark Patterns’, *European Journal of Risk Regulation*, 25 March 2024, 1–18, <https://doi.org/10.1017/err.2024.8>.

According to Sørensen et al, the exclusionary nature of Article 25 DSA “will affect enforcement massively. The DSA enforcers will have to first consider whether or not a particular practice is ‘covered by’ the UCPD. (...) This would trigger the question as to how article 25(1) DSA and article 5 UCPD differ, and one possibility could be that the UCPD (still) clings to the image of the average consumer, whereas the DSA seems to recognise consumers’ cognitive biases.”<sup>121</sup>

This discussion brings up a question that needs to be answered in relation to the standard capable of legally framing the hyper-engagement mechanism that is infinite scrolling. After all, is it the DSA or the UCPD that should be called in when it comes to this dark pattern? The excerpt below sheds some important light on the subject:

“Article 25(1) DSA is the most significant provision that expressly regulates behavioural exploitation in online choice architectures. (...) The prohibition protects all recipients of a service, which includes consumers and business users (Recital 2 DSA). Even though the protective scope of Article 25(1) DSA seems very wide, this is limited by the fact that the UCPD is *lex specialis* (Article 25(2) DSA). What this means is that deceiving, manipulating, or coercing rational consumers with the design of online interfaces should in most instances be captured under the terms of the UCPD. Article 25(1) DSA should have its biggest impact for those online interface designs that exploit consumer biases such as dark patterns, since the ability of the UCPD to capture such forms of influence on decision-making and to protect biased consumers is uncertain (Sørensen et al., 2023, pp. 8–10), even though difficult issues of demarcation between the DSA and the UCPD (and the GDPR) remain.”<sup>122</sup>

Considering that infinite scroll intentionally prevents users from stopping their engagement by exploiting psychological vulnerabilities (“reference to “bias” in

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<sup>121</sup> Marie Jull Sørensen et al, op. cit.

<sup>122</sup> ‘A Theory of Exploitation for Consumer Law: Online Choice Architectures, Dark Patterns, and Autonomy Violations’, *Journal of Consumer Policy* 47 (15 December 2023): 1–38, <https://doi.org/10.1007/s10603-023-09554-7>.

Recital 67 DSA therefore indicates that Article 25(1) DSA captures only those nudges that take advantage of consumer biases in order to steer consumer decisions in a certain direction”<sup>123</sup>), it could be classified as a dark pattern under the DSA definition and therefore be prohibited.

However, the issue is not that simple, as Article 25 DSA requires the online platform provider to act in a way that materially distorts or impairs the ability of the recipients of their service to make free and informed decisions. It requires evidence that the user cannot act otherwise because of the chosen design, “which also includes the question as to whether consumer choice in the digital environment has not been unfairly influenced by a trader, even in situations in which a consumer has not asserted it.”<sup>124</sup>

Would users spend less time on Facebook if its architectural choice did not include infinite scroll down? Let’s take a look at some studies about usage time of online platforms and the main consequences of it.

## **2. Substantive challenges: likelihood and damage quantification**

The UCPD benchmark which says that an unfair commercial practice is likely to materially distort consumer’s economic behaviour is addressing the harm caused by such practices. Equally, Article 25 DSA addresses the harm that online

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<sup>123</sup> Op. cit, p. 141.

<sup>124</sup> Zanda Davida, ‘Consumer Decision-Making Autonomy in the Digital Environment: Towards a New Understanding of National Courts’ Obligation to Assess Ex Officio Violations of Fair Commercial Practices’, *European Journal of Risk Regulation* 15 (19 April 2024): 1–16, <https://doi.org/10.1017/err.2024.11>.

interface design and organization can cause to users if they materially distort or impair the ability of the recipients of their service to make free and informed decisions.

Describing the harm caused by infinite scroll down in Facebook is not an easy task, but some researchers have worked on it.

It is worth remembering that the more time a user spends in social media the more they are likely to experience bad emotions, both from seeing content that triggers feelings such as isolation, comparison and missing out and from regretting wasting time in mindless scrolling activities instead of a most fulfilling activity.

Many studies have addressed the correlation between time spent in social media and side effects to an individual's mental health. In the study named *Social Media Addiction, Depression and Aggression in Young Adults*, the authors unveil a list of previous researches that confirmed the above statement, mentioning that "studies have explained that social media adversely impact mental health like feeling lonely, or depressed, across developing countries (Shensa et al., 2018; Waqas et al., 2018). It is clear from studies that spending multiple hours on social media can leads (*sic*) to depressive mood, thoughts of self-harm, trouble sleeping, and getting asocial (Shensa et al., 2017). Thus, spending longer hours on social media is linked to down feeling, and inclination towards depressive symptoms (Dhir et al., 2018). Depressive tendencies in turn leads (*sic*) towards aggressive behaviour (Roberts et al., 2010)."<sup>125</sup>

Two studies will be cited in the sequence because they specifically relate time spent in social media with the feelings users experience after ending a scrolling

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<sup>125</sup> Rida Yousaf and Havaida Munir, 'Social Media Addiction, Depression and Aggression in Young Adults', *Journal of Professional & Applied Psychology* 5 (30 June 2024): 276–85, <https://doi.org/10.52053/jpap.v5i2.297>.

session. The reason to bring them to the discussion is to highlight the likeness of excessive scrolling to affect peoples' health, in other words, to work on the hypothesis that infinite scroll can lead to harm for consumers.

First of the couple, in the study called "Infinite Scrolling, Finite Satisfaction: Exploring User Behavior and Satisfaction on Social Media in Bangladesh", scholars focused on comprehending the effects of mindless social media scrolling and answers were obtained from 67 social media users from Bangladesh.

The result for the question "Does the nature of the content encountered during infinite scrolling such as negative news, triggering posts, etc. - impact users' anxiety and fatigue levels?" is the following:

"On a scale of 1 to 10, with 1 being "not at all" and 10 being "extremely," the respondents were asked to rate their typical level of anxiety and fatigue after engaging stressful and negative content in infinite scrolling on social media. 16.4% of respondents rated for 5, 16.4% of were for 6, 16.4% of were for 7, and 13.4% were rated for 8 which indicates the increasing fatigue and anxiety level of users for infinite scrolling of stressful content. (...) Repeated exposure to unpleasant news items, distressing images, or triggering news can cause significant negative emotions. As users receive and absorb unpleasant information, they can experience increased anxiety, sadness, or even anger. 55.2% of respondents reported that they have a significant impact on their anxiety and fatigue levels due to triggering posts. The proportion is 53.7% for negative news articles."<sup>126</sup>

Another study, called "Mechanism study of social media overload on health self-efficacy and anxiety" focused on social media fatigue, which can be defined as a user's "tendency to back away from social media usage when they become

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<sup>126</sup> Sanzana Lora et al., *Infinite Scrolling, Finite Satisfaction: Exploring User Behavior and Satisfaction on Social Media in Bangladesh*, 2024, <https://doi.org/10.48550/arXiv.2408.09601>.

overwhelmed with too many sites, too many pieces of content, too many friends and contacts and too much time spent keeping up with these connections.”<sup>127</sup>

The results show that when in a state of social media fatigue, users are prone to psychological anxiety because they are physically and mentally exhausted due to excessive cognitive energy and have difficulty in adequately regulating or controlling their emotions.<sup>128</sup>

Bringing this study to our discussion is relevant as it shows the long and medium term consequences of excessive social media interactions, such as the ones that are facilitated and encouraged by the infinite scroll mechanism. This could be read as the ultimate harm of elongated sections - the rejection of engaging in social media.

It is worth noting that the research mentioned above was carried out during the COVID-19 pandemic. But its findings are still important to understand how social media affects people's health. Social media is a big part of many people's lives, especially among younger demographics, and it became even more prominent after the pandemic.

In the article *Scrolling in the Deep: Analysing Contextual Influences on Intervention Effectiveness during Infinite Scrolling on Social Media*, studies were conducted with 72 participants over seven days with the assistance of an Android application called InfiniteScape, used to track their infinite scrolling behavior. Every time participants engaged in prolonged scrolling (more than 15 minutes), the application would interfere in their behaviour, prompting them to take a break.

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<sup>127</sup> Laura F. Bright, Susan Bardi Kleiser, and Stacy Landreth Grau, 'Too Much Facebook? An Exploratory Examination of Social Media Fatigue', *Computers in Human Behavior* 44 (1 March 2015): 148–55, citation omitted, <https://doi.org/10.1016/j.chb.2014.11.048>.

<sup>128</sup> Kai Li et al., 'Mechanism Study of Social Media Overload on Health Self-Efficacy and Anxiety', *Heliyon* 10, no. 1 (5 December 2023): e23326, p. 8, <https://doi.org/10.1016/j.heliyon.2023.e23326>.

Following this, participants completed a questionnaire capturing their current context, including valence, social situation, activity, location (home or elsewhere), multitasking behavior, sleepiness level, and reactance to the intervention.

One of their findings revealed that “while people may be aware of the negative effects of bedtime procrastination and thus more receptive to interventions, they still find it challenging to disengage from infinite scrolling when tired. This suggests an internal conflict between awareness of habits and the difficulty in altering them, particularly in the context of infinite scrolling at bedtime.”<sup>129</sup>

The results show that although people are aware of bedtime procrastination (mentioned in the example above), they still find it hard time to stop scrolling, which can suggest that scrolling captured their self-vigilance, also suggesting that self-regulation is not a good approach to it.

The internal conflict of the users experience while scrolling, knowing they would rather use their time doing something different, like working, exercising, reading, relates to their inability of making a free decision once they were encapsulated by the loop. What happens, ultimately, is a compulsive social media use, meaning the user cannot control how frequently they use the platform or how long they spend on it.”<sup>130</sup>

Conclusions about the amount of time users spend scrolling can be found in the study *The Loop and Reasons to Break It: Investigating Infinite Scrolling Behaviour in Social Media Applications and Reasons to Stop* as they “found a

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<sup>129</sup> Luca Meinhardt et al., *Scrolling in the Deep: Analysing Contextual Influences on Intervention Effectiveness during Infinite Scrolling on Social Media*, 2025, <https://doi.org/10.48550/arXiv.2501.11814>.

<sup>130</sup> Aditya Kumar Purohit et al., *Starving the Newsfeed for Social Media Detox: Effects of Strict and Self-Regulated Facebook Newsfeed Diets*, 2023, citation omitted, <https://doi.org/10.1145/3544548.3581187>.

tendency that the longer the session gets, the more likely it is that IS becomes part of it. In line with this, we found that sessions that ended because the user finished the initial task (e.g., looking at a notification or the need for interaction) appeared more often in shorter sessions than in longer sessions.”<sup>131</sup>

The scholars explained that “when not looking at IS separate activity but part of a social media session, we can see that longer sessions (Medium Session and Long Session) mostly (~90%) contain some scrolling. These findings indicate that combining with another feature (“feature tour”) leads to longer sessions. We also found a significant rise in scrolling Proportion when sessions become longer”.<sup>132</sup>

Lastly, the research called *Ethics of the Attention Economy: The Problem of Social Media Addiction*, mentions a variety of harms caused by social media addiction which are correlated to social media usage, to cite a few:

“Life: Several studies (citation omitted) have shown that those who manifest an internet addiction, including a social media addiction, are more likely than others to have suicidal ideation. A recent meta-analysis of these studies by Cheng et al. (2018) showed that persons who have any kind of internet addiction not only think of suicide but also have significantly higher rates of planning and of actually attempting suicide. Bodily health: A number of studies (citation omitted) found that compared to nonaddicts, adolescents who had a social media addiction, as well as those with other forms of internet addiction, suffered from poor sleep quality, used more alcohol and tobacco, ate irregularly, and had poor diets. Emotions: Those who are addicted to social media, and to the internet in general, suffer a number of emotional deficits, including

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<sup>131</sup> Jan Ole Rixen et al., ‘The Loop and Reasons to Break It: Investigating Infinite Scrolling Behaviour in Social Media Applications and Reasons to Stop’, *Proc. ACM Hum.-Comput. Interact.* 7, no. MHCI (13 September 2023): 228:1-228:22, <https://doi.org/10.1145/3604275>.

<sup>132</sup> Jan Ole Rixen et al, op. cit. p. 228:17.

depression, low self-esteem, social anxiety, alienation from family and peers, hostility toward others, and poor interpersonal relationships.”<sup>133</sup>

Those studies reveal the likeability of infinite scrolling to impair users' decisions to stop engaging with online platforms (remember the hook model explored in Chapter I) as well suffer with negative emotions and regrets after a session of mindlessly scrolling, a design feature created to be addictive. The very nature of infinite scroll, however, brings challenge to law enforcement.

The evidence shown above confirms that the infinite scroll design feature is likely to cause harm to users (both from the content they are exposed to and loss of time), meeting the likelihood test proposed by the UCPD, because its employment in social media is likely to significantly impair the average consumer's freedom of choice.

The average consumer will not be discussed deeply in this work, however it is important to highlight that all consumers are exposed to the risks posed by infinite scrolling, as the mechanism acts in the dopaminergic system of individuals, being non-related to how well-informed or circumspect they are while performing a transactional decision. Social media platforms are intentionally engineered to be addictive as they exploit vulnerabilities in human psychology - as explained in Chapter I.

That being said, there is a shared understanding that the “average consumer” standard should be interpreted more flexibly or even abandoned to mirror consumer behaviour more effectively. We believe that regulators and scholars in the EU consumer law field should dedicate more attention to behavioural assessments

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<sup>133</sup> Vikram Bhargava and Manuel Velasquez, 'Ethics of the Attention Economy: The Problem of Social Media Addiction', *Business Ethics Quarterly* 31 (6 October 2020), p. 10, <https://doi.org/10.1017/beq.2020.32>.

and develop a more realistic consumer test guided by the experience of the “cognitive revolution.”<sup>134</sup>

The average consumer cannot serve as a reference when manipulation is not based on information, but rather on cognitive biases, emotions and neurotransmitters.

### **3. Final considerations**

As seen along this chapter, there is plenty of regulation in force in the EU that could frame infinite scroll as a dark pattern. However, for each legal solution presented, a dialectic exercise is necessary.

Neither the UCPD nor the DSA are straightforward in relation to HEDP. There are, still, possible approaches and solutions to face this dark pattern under the law in the way it was written. Once the harm is demonstrated, the very nature of the UCPD and the DSA is brought to the surface, as they were enacted to protect consumers from malpractices and, ultimately, from harm.

With the rise of digital consumer manipulation, Article 5 UCPD plays a key role in evaluating online business practices case by case. For example, it can be argued that infinite scroll impairs consumer autonomy by making it difficult to

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<sup>134</sup> Poncibò, Cristina and Incardona, Rossella, The Average Consumer, the Unfair Commercial Practices Directive, and the Cognitive Revolution. *Journal of Consumer Policy Issue*, Vol. 30, No. 1, pp. 21-38, March 2007, citations omitted, Available at SSRN: <https://ssrn.com/abstract=1084038>

disengage from a platform, and this practice could be assessed under Article 5's criterion of "materially distorting the consumer's economic behavior."

Article 5 UCPD acts as a general fairness clause, ensuring that all commercial practices meet basic standards of honesty and transparency. Its broad and flexible nature allows regulators to address new forms of consumer manipulation, such as dark patterns and infinite scrolling, even if they are not explicitly covered in other UCPD provisions. As digital markets continue to evolve, Article 5 remains central to combating unfair commercial practices and ensuring consumer autonomy.

Article 25 DSA, on the other hand, applies directly to online platforms, making it better suited for regulating digital services than consumer protection laws designed for traditional commerce.

It establishes clear obligations for platforms to design interfaces that support user autonomy and informed decision-making, meaning infinite scroll could be challenged if it limits user control over engagement, encourages compulsive use, or obscures options to stop scrolling. Given its focus on platform responsibility, Article 25 DSA offers stronger enforcement tools for tackling the manipulative effects of infinite scroll compared to broader, less targeted provisions in the UCPD.

There is always a fit reasoning for tackling infinite scroll, specially contextualizing it, acknowledging it and naming it as what it is: a hyper-engagement mechanism capable of causing harm to users that was created with user retention metrics in mind rather than user well-being.

The combination of loss of time perception, lack of control, and exposure to emotionally intense content makes infinite scroll a powerful and harmful mechanism.

Since consumer time has economic value, practices that unfairly exploit or waste consumers' time can be seen as a violation of economic consumer interests under EU law. This perspective strengthens the argument for regulating hyper-engagement mechanisms, such as infinite scroll, under consumer protection frameworks.

Studies presented in this chapter indicate that infinite scrolling can impair users' ability to disengage from online platforms, leading to negative emotions and regret due to its addictive design. However, its very nature poses challenges for legal enforcement.

Despite the broad legal scope of the UCPD and the specialty of the DSA, enforcement in the digital sector remains a challenge, although it is pretty clear the HEDP are capable of creating addiction, the norms in force are not a perfect fit for its specificities. As dark patterns become increasingly sophisticated, proving harm and holding platforms accountable for deceptive UI strategies requires consistent legal interpretation and rigorous enforcement mechanisms.

## II. CONCLUSION

Writing this thesis was motivated by one question: can infinite scroll down be considered unlawful under the European Union legislation in force, namely the UCPD and the DSA? In order to answer this question, some premises needed to be established, such as determining why infinite scrolling can be deemed as a dark pattern.

The first chapter presented some evidence of how infinite scrolling overlaps with the human dopaminergic cycle and creates addiction. The design technique behind infinite scroll down was explained and its features highlighted, such as its ability to create an individualised experience for the user by combining different inputs (those predetermined in the account settings, such as gender and age, and others that vary according to the time the user accesses the feed or their tendency to see a certain type of content) and removing stopping cues.

One of the most powerful features of infinite scroll down is its capacity of capturing and retaining attention. Infinite scrolling is like a friend who knows you very well, understands your moods, knows your preferences and is always willing to give another shot of pleasure if you stay a little more — in the newsfeed.

By exploring emotional triggers, such as fear of missing out, a personalized feed is always one scroll away from the information the user 'needs'. But it is always like that, one scroll away, always away.

As time passes, the consumer loses time, and time is a precious commodity in the attention economy, given its scarcity. Besides that, prolonged use of

social media is frequently related to users experiencing bad emotions, such as regret, and ultimately can cause addiction.

There is no question about the capability of infinite scrolling to shape habits, as the mechanism explores users' dopaminergic system, which is related to reward and pleasure.

Chapter II in turn first defined and provided examples of dark patterns, then demonstrated that infinite scroll qualifies as a dark pattern by introducing the concept of hyper-engagement dark patterns (HEDP). This recently coined term refers to design practices intentionally crafted to prolong user engagement by exploiting their dopaminergic cycle, creating a loop. Since infinite scrolling is specifically designed to keep users continuously engaged, it fits within this category as a clear example of a hyper-engagement mechanism.

Thus, infinite scrolling is a HEDP because it directly affects consumers' behaviour, preventing them from making an autonomous transactional decision, which is disengaging from their online activities when they want.

It became clear that like well-known dark patterns, infinite scroll affects consumers' behaviours and leads to time loss (time has monetary value), which is a harmful consequence of their employment by online platforms.

However, there is ongoing debate about whether self-regulation is sufficient, as consumers technically have the option to disengage on their own, without requiring regulatory intervention in private business relations.

It is important to keep in mind, though, that while individuals have the theoretical ability to disengage from social media, the repetitive cycle of triggers,

actions, variable rewards, and investment (the Hook Model) makes it difficult for them to exercise full autonomy. This is especially true when these mechanisms tap into dopamine-driven feedback loops, reinforcing compulsive behavior without users being fully aware of the influence exerted on them.

As a result, while autonomy exists in principle, it is significantly impaired in practice due to the psychological mechanisms that subtly nudge users toward prolonged engagement.

The question of how much autonomy can resist the Hook Model remains open, as further research is needed to deepen the debate on the manipulative effects of user interface design. In other words, rather than simply stating that infinite scrolling is addictive, it is essential to develop ways to measure its actual harm and impact on user behaviour.

Finally, while this thesis provides a legal analysis of infinite scrolling under the UCPD and the DSA in Chapter III, some limitations must be acknowledged.

This study focused on the UCPD and the DSA, leaving aside other important frameworks such as the General Data Protection Regulation, especially because hyper-engagement mechanisms rely in big data bases to achieve their primary goals, and the recently published Artificial Intelligence Act, which is a regulatory framework aimed at ensuring that artificial intelligence systems are trustworthy, transparent, and aligned with fundamental rights, also restricting deceptive and exploitative artificial intelligence (AI) practices.

Discussions as “is infinite scrolling an AI mechanism?” and, if so, “how does the AI Act govern it?”, and “what is the range of consent given in relation to the

use of consumer's data by online platforms such as Facebook?" were deliberately left behind due to their complexity and the scope chosen for this work.

Undoubtedly, a broader legal perspective could provide a more comprehensive understanding of the issue and generate more insights to answer the question "is infinite scroll unlawful?".

In addition, the analysis conducted was based solely on a literature review, relying on existing articles, dissertations, studies, and legislation rather than empirical data. Studies showing how users feel after scrolling sessions were presented, but studies related to the decision to stop scrolling are lacking.

The article *The Loop and Reasons to Break It: Investigating Infinite Scrolling Behaviour in Social Media Applications and Reasons to Stop* elaborates on how people feel after scrolling, however it does not address the process behind the individual's option (if there is an option!) to keep scrolling.

The complexity of hyper-engagement mechanisms is itself challenging for conducting empirical studies. How can scholars measure something negative? In other words, how can the inability of making a decision be measured?

Chapter III looked at the regulations in force and tried to fit infinite scroll in their articles. Combined, Article 25 DSA and Articles 5, 8 and 9 UCPD can frame infinite scroll as a dark pattern, as the DSA refers to manipulative design and the UCPD to undue influence that significantly impairs or is likely to significantly impair the average consumer's freedom of choice. However, as one excludes the other, it becomes clear that legal operators will have to choose wisely their battles.

It is possible, nevertheless, to frame infinite scroll in both regulations, as shown in Chapter III. A good rhetoric and more empirical studies on users behaviour, especially when it comes to the likelihood of impairment of the average consumer's freedom of choice, are most welcome to evaluate how infinite scrolling affects decision-making in real-world scenarios, thus they will facilitate the enforcement of the norm(s).

The DSA is still in its early stages, and its enforcement mechanisms remain uncertain. It is unclear how regulators will interpret and apply its provisions to infinite scrolling, which makes it difficult to predict its long-term legal consequences. Similarly, the UCPD's applicability to infinite scrolling is debatable, as the concept of economic harm and transactional decision does not neatly fit into existing legal categories.

There is room to keep investigating infinite scroll as a HEDP while the issue is not addressed by the European Court of Justice.

Another possibility for infinite scroll might come with the Digital Fairness Act<sup>135</sup>. Announced in 2023 and set for full implementation by 2025, it aims to define and regulate dark patterns in digital services, enhance transparency and consumer protection in online transactions, and establish clear guidelines for ethical user interface and user experience to reduce deceptive engagement tactics.

After all, is infinite scroll unlawful under the EU legislation analyzed in this thesis? While this work provides a strong legal foundation for considering infinite scroll a HEDP and, thus, unlawful, enforcement mechanisms remain a challenge as

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<sup>135</sup> 'The Digital Fairness Act (DFA) of the EU', accessed 12 March 2025, <https://www.digital-fairness-act.com/>.

the likelihood of infinite scroll down to interfere in the behaviour of users is still challenging to be demonstrated in the real-world.

Future developments in case law, regulatory actions, and policy discussions will determine whether infinite scrolling is effectively addressed under the current framework or if additional regulations will be needed.

That said, something that cannot be disputed is the general feeling that infinite scrolling is not beneficial. The function is commented on by everyone, digital influencers, authors of books on human behavior, scholars and ordinary people at bar tables. The general feeling of its harmfulness is palpable and cannot be ignored. The regulatory flaws should not be a hurdle to protect human rights in this context.

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