A Comparative study of Dark UX Patterns in Modern Digital Interfaces: A Comprehensive Review and Analysis

Rathindra Dolai[1], Bibhu Kalyan Nayak[2]
Manipal University Jaipur

Abstract—**This paper deals with the consideration of dark UX patterns and their moral issues within digital interfaces, touching upon the ethical issues concerning dark UX patterns-deceptive design techniques used to manipulate user behavior. The paper looks at how deceptive design on mobile platforms, websites along with new technologies like augmented reality affects users - it uses past studies and user comments. The analysis shows and sorts the patterns of these designs. It also points out what is wrong with them.The study reads many publications - it also does research that gathers opinions. This helps it find the common dark user experience patterns. It judges how often they appear - it also inspects why designers use them. As a result, the paper suggests other ways to design - these ways put ethics first; they also help users feel good plus make their own choices.**

Index Terms—**Dark patterns, deceptive design, ethics in UX, mobile and web interfaces, user manipulation, design ethics.**

I. INTRODUCTION

The use of dark UX patterns has emerged as a striking problem in the digital realm. It raises ethical controversy regarding design manipulation and user autonomy. The traps that these deceptive designs set for users exploit behavioral biases, devoid of informed consent. With the surge in the number of digital interfaces on e-commerce and social media, the proliferation of dark patterns is unmatched and requires urgent assessment.

This article will classify the explored patterns, analyze the ethical dimensions of their impact, and reveal the reasons that motivate such actions. The work will evaluate the business objectives and ethical design principles via a literature scan and test focus from users. The approach taken here endorses the assumption that techniques built around users' welfare demand the greatest share of attention.

The results will, consequently, stress the need for UX designers to develop the business and ethics balancing skills. This paper seeks to contribute to responsible design through this new discussion in a world where design manipulation has become overwhelmingly widespread.

Background and Context:

Dark pattern interfaces, also referred to as deceptive designs, are user interfaces crafted with the intention of ensnaring a user in a decision that does not serve their best interests. These designs can evoke specific psychological impressions, cause motor learning on the user's end, which in turn means: the user is made to believe that he is using the product without any deceit. Usually, when cognitive bias is manipulated, the design is bound to violate ethical design standards. People have started to blend work and life by making use of mobile devices and interacting with digital interfaces which raises concerns regarding the autonomy, decision-making ability, and well-being of a user in regard to the user's sustaining effects of dark patterns over time. This paper intends to focus on the design of dark patterns in UX design, their purposes, and examine them in the context of societal impact and ethics.

Since the development of digital interfaces, methods such as hidden subscriptions, deceptive pop-up ads, and other stalling tactics have become more prevalent. In this light, the research aims to analyze the impacts of dark user experience patterns, advocate alternative designs that are more ethical, and promote design frameworks able to prevent implications of dark UX patterns.

Ethical Implications:

Psychology of manipulation like Dark UX norms is unethical since they focus on modifying user's behavior interface—for gaming, shopping, traveling, and even health services. This chapter examines free will, consent, justice, and other fundamental principles in the realm of interaction and decision making in the digital world.

Such design strategies infringe on autonomy and consent towards the user, which can lead to great disadvantage to the user. It justifies the binding case of business motives and unfairness, integrity, and accountability in human-computer interaction (HCI) design.

After analyzing the ethics of dark UX patterns, the chapter sets out to prove that digital service providers have a responsibility to respect user agency by stopping irresponsible design practices and allowing the creation of a balanced ecosystem for user interaction. This turns the focus onto how a business balances its intentions with moral principles so that users are provided with normative and uniform experiences that are fair and equitable.

Aims and Objectives:

To investigate the types and prevalence of dark UX patterns across various service provider platforms.

To analyze the ethical dilemmas posed by these patterns.

To propose alternative design solutions and recommendations for ethical UX practices.

Research Questions:

What are the most common dark UX patterns found in digital interfaces?

How do these patterns affect user behavior and decision-making?

What ethical challenges do designers face when balancing user needs and business goals?

II. LITERATURE REVIEW

Sl. No.	Year of Publication	Author	Key Concepts
1	2021	Gray et al.	Deceptive design techniques, Moral principles, Accountability in design, Research driven by professionals
2	2020	Di Geronimo et al.	Mobile user interface, Responsible design, User testing
3	2021	Chaudhary et al.	Deceptive design strategies, Excessive viewing, Online wellness
4	2022	Krauss et al.	User experience security, Design that creates obstacles, Confidence
5	2020	Mildner et al.	Mental shortcuts, Misleading design, Ethical design practices
6	2020	Chaudhary et al.	Interface design for users, Online video streaming services, Excessive viewing habits, Deceptive design techniques, Online wellness
7	2024	Krauss et al.	Future-oriented design workshops, Misleading design, Enhanced reality, Immersive virtual environments, Deceptive design techniques, Design frameworks, Data protection, Moral principles, Design training
8	2023	Kowalczyk et al.	User experience design, Deceptive design strategies, Internet of Things, Human considerations
9	2021	Gray et al.	Moral principles, Core beliefs, Deceptive design techniques, Ethical training, Laboratory procedures
10	2020	Di Geronimo et al.	Dark Patterns; Ethical Design; User Experiments
11	2020	Distler et al.	Usable Security, User Experience, Trust, Friction Design
12	2023	Hidaka et al.	Dark patterns, Deceptive design, Persuasive design,

			Ethical design, App design, Japan
13	2023	Hilton et al.	UI, UX, Mental Health, Design Patterns, Marginalized Communitie
14	2024	Traubinger et al.	Dark Patterns · Deceptive Design · Usability Smells · Conversational User Interfaces · Chatbots.
15	2020	Widdicks et al.	anti-patterns, design patterns, backfiring, favouring, design processes, anti-pattern mitigation, culpability, repentant designers
16	2022	Terpstra - AHFE International	Metaverse, Art, Experience design, Inclusion framework, Web3, NFT, Blockchain, Human-centered Design, Service engineering
17	2024	Nie et al.	Dark Pattern, Taxonomy, Detection tools, GUI
18	2024	Gray et al.	Security and privacy → Social aspects of security and privacy; Human-centered computing → Empirical studies in HCI; Empirical studies in interaction design
19	2021	Gray et al.	Dark patterns, consent, GDPR, technology ethics, interaction criticism, transdisciplinary
20	2024	New Frontiers of Customer Strategy	Customer Experience, Consumer Loyalty, Consumer Protection Laws, Consumer Loyalty Consumer Retention, Brand Image, Dark Patterns, Dark Patterns Consequences, Ethical Dimensions, User Experience Techniques.
21	2021	Lukoff et al.	dark patterns, design patterns, privacy, ethics, design education

III. DEFINING DARK UX PATTERNS

Since the topic of humans and computers is broad in scope, let us continue to appreciate the broader consequences of such practices in realms other than digital interfaces. Dark patterns also infiltrate various fields of design: industrial, communication, graphic, and even architecture. In these fields, the very manipulation principles can be used detrimentally against the trust and welfare of users, which are basically ethical matters for designers across the board.

The so-called dark UX patterns do not belong uniquely to digital interfaces: they are equally common in service-provider platforms, particularly in travel. For instance, price hikes suddenly occur in times when tickets for travel or bookings of services are in high demand. The service-provider platforms use psychological tricks by flashing notices of "only a few seats left" or "reservations are filling up fast," even though there are plenty of availabilities. Such tricks induce a fake urgency, pushing a user towards a hurried decision under duress, especially when it is nearing a peak holiday or festive season. These platforms capitalize on stress and anxiety to trap users into making an unplanned purchase, bringing out another shade of how dark patterns creep into various industries.

Thus, with the study of examples of dark patterns, it is also the ethical dilemma of a designer; there is now the strong need to educate more on and to regulate the manipulative tactics that truly have been inflicted

on-a-good number of consumers, with far-reaching consequences.

Categories of Dark UX Patterns:

A deeper exploration of the different categories of dark patterns (e.g., nagging, forced continuity, hidden costs, bait and switch) with extensive examples from real-world applications. Each category will be discussed in detail:

Forced Continuity: Analyzing subscription models and auto-renewals.

Sneak into Basket: Discussing instances of unintended purchases in e-commerce.

Roach Motel: Examining how users get trapped in a situation (e.g., difficult-to-cancel services).

Ethical Concerns in Dark UX Patterns:

This section deals with ethical dilemmas regarding lying, manipulating, causing harm in the context of user experience (UX) design, effectively breaching ethics concerning dark UX patterns. Such tactics undermine the users' capacity to make rational decisions due to active exploitation of their cognitive biases, which poses serious ethical issues concerning the trustworthiness and integrity of digital relations and interactions.

At least, Immanuel Kant's philosophical frameworks pose critical challenges and critiques concerning the matters at hand. Kant's law of an ultimate aim, which affirms the proposition that users must in all possibilities be accorded respect as autonomous and dignified beings, is gravely neglected. For an action to be morally permissible it has to be capable of being conceived of accepted as a universal law and has to pertain to the worth of every person according to the Kantian ethics. Dark UX patterns violate this law by using the user as a means to achieve business objectives devoid of free will for autonomy.

These azic plans usually, once executed, shatters a user's trust in the digital platforms forcing them to conclude that the devoid user base is a definite ethical issue. More often than not, financial self-destruction is the logical expectation. For example, a client can be persuaded to spend money that he/she does not wish to spend using services that they don't even wish to purchase. Harm to the self is usually the motive and the result is self-destructive psychologically, but most often defines itself within restrictions of finances.

Review of Empirical Studies:

Gray et al. (2021): Discuss how UX practitioners perceive ethical challenges.

Di Geronimo et al. (2020): A study that examines the prevalence of dark patterns in mobile apps.

Mathur et al. (2021): This large-scale analysis identifies thousands of websites using dark patterns to influence user behavior.

Emerging Trends and Technologies:

Growing technologies such as AI, AR, and VR now allow the rise of new manipulations concerning user autonomy and informed consent when abused with dark UX.

When it comes to AI-generated user interfaces, the most convincing implementation is to create wondrous mixtures or uniquely personal experiences capable of influencing behavior by tailoring content and recommendations. For illustration, in e-commerce, AI images might mislead a genuine customer into believing that they are viewing real products, only to be disappointed when the actual products differ from these images; or in another example, such chatbots could impersonate conversations with genuine assistance, leading a user to share private data under the forlorn hope of being truly assisted.

The ethical loads of AI dark patterns in particular are high for companies benefit at the expense of users who bear the brunt in sign-ups for unwanted subscriptions, the revelation of private data without seeing or feeling the disadvantages or implications. This leads to erosion in the developments of digital trust platforms since victims, who feel cheated upon, grow wary about any engagement with technology, thus doubling the bad effects on user experiences and brand loyalty.

On the other hand, AR and VR technologies upgrade the power of dark patterns by immersing users in experiences that may alter their perceptions and finally their decisions. Spatial cues in VR environments might be the reason behind rushed decisions meltdown variation, furthering the ethical concern.

The continuous evolution of technology pours new ethical dilemmas for designers to tread carefully upon. Any choice would have to be in favor of transparency and putting power in the hands of users to nurture an environment of trust and hence positive digital

experiences. Ultimately, as dark patterns keep rising in complexity and prevalence, this matter becomes ever more pressing, urging a solution to counteract this problem, which will, in turn, perform designers' service in establishing a more ethical and user-friendly digital world.

IV. METHODOLOGY:

This paper utilizes a systematic literature review to study dark UX patterns used in mobile, web, and social networking platforms. The literature review period stretches between 2018 and 2024, and accessibility to times and periods is made through a combination of academic databases and practitioner reports on dark patterns. Thematic analysis is applied for categorization of the various categories of dark patterns deployed in different modalities such as mobile application, social media interface, and augmented reality environment. This analysis facilitates a more thorough understanding of manifestations of design manipulations across these various platforms.

In addition to thematic analysis, comparative analysis was conducted with the attempt of previous authors to compare the similarities and differences of the distribution of dark patterns in the different platforms. From this, it shows how dark patterns have been designed in the context of use and how much this affects them, giving a somewhat fragile inference to the motivation for implementing these dark patterns. The data sources for this review included qualitative interviews with users, providing their firsthand accounts of experiences with dark patterns, together with quantitative surveys that measured the existence of dark patterns on different platforms. Through this mixture of qualitative and quantitative approaches, the study attempts to offer a holistic view of dark UX patterns, their effects on human behavior, and their ethical dilemma.

Ultimately, the paper, through this systematic review, seeks to add to the existing knowledge base on dark UX patterns so as to provide useful insight to designers, researchers, and policymakers. Knowledge of the dark pattern arena makes stakeholders ready to align their efforts towards inculcating a more ethical design practice that promotes user autonomy and well-being during digital interactions.

Research Design:

The qualitative-exploratory research methodology is best suited here to comprehend the scale of the dark UX pattern issue and to address its ethical implications as an investigation when one is interested in a deep insight into a multi-layered, human-centered problem. Quantitative methods are concerned with numbers, statistics, and trends, while qualitative methods aim to uncover the internal aspects that constitute user motivations pertaining to perception and experience which can indeed be shaped towards a dark UX perspective. By their very nature, deceptive design interventions require these subtle contextual nuances to be explored; quantitative approaches cannot handle such investigations.

An exploratory methodology allows for flexibility and openness, both of which stand out as crucial for dark UX patterns as a relatively under-researched topic. Since there is not one single universally agreed-upon definition or categorization of these patterns, qualitative methods--interview methods, case study methods, and thematic analysis--become relevant in that they investigate how users perceive and respond to manipulative interface designs and explain how designers actively justify or condemn these practices. The method allows the researcher the multitude of considerations in viewing the ethics involved from various stakeholder perspectives ranging from those of users to designers and business executives.

The qualitative approach, in contrast, fosters the development of a critical understanding of the social, cultural, and psychological ramifications of dark UX patterns. This further created an ethical dilemma between the commercial interest and user welfare, thereby focusing attention on justifications behind the pattern's application and its effects on trust, consent, and user autonomy. These engagements are expected to bring forth rich information about the participants lived experiences and moral evaluation that remain concealed behind pure quantitative accounts.

In short, the qualitative, exploratory approach best suits this study because it allows a comprehensive and context-sensitive examination of dark UX patterns. It provides the means by which the researcher will examine issues of prevalence and ethical implications related to the patterns in a manner that is meaningful, reflective, and deeply informative.

Data Collection:

Primary Data: Interviews with UX designers, HCI researchers, and end-users will be conducted to gather insights on dark patterns.

Secondary Data: Review of academic papers, industry reports, and case studies that discuss dark patterns.

Data Analysis:

A thematic analysis method will be used to categorize the collected data. The focus will be on identifying common themes related to dark patterns, ethical concerns, and user experiences. Additionally, a comparative analysis will examine how different sectors (e-commerce, social media, gaming) use these patterns.

Limitations:

This section will highlight the limitations of the research, such as sample size, potential biases in self-reporting by interviewees, and the focus on certain industries over others.

Findings:

While dark design patterns in UX design were traditionally limited to desktop environments, they have now found their way into mobile applications and social media platforms. Research shows how dark patterns are in use in most mobile applications, especially in the gaming and streaming sectors, to hold the attention of a user for as much time as possible (Chaudhary et al., 2021). Such mechanisms as autoplay and endless scrolling compel users into a continuous consumption of content, often without their explicit consent; mechanisms that might have an adverse consequence on productivity and further engorge screen time considered to be bad for human well-being.

Conversely, these social networking services deploy a variety of deceptive designs to dark pattern users-who bring to mind annoying pop-ups or notifications to trick the user into spending more time on their respective platforms. Mildner et al. (2022) argue that such exploitative patterns prey on the vulnerabilities of users-factors such as fear of missing out (FOMO) or the need for social validation-increasing the time duration of engagement, which mostly advantage the platform to the detriment of user well-being. The ramifications stemming from these manipulative techniques are so grave that they can lead to addictive tendencies and a misrepresented concept of social interaction.

There is further demand for future studies to explore the differential impact across demographics. After being focused on those considered to be experienced users, the current state of research offers hardly any understanding of how new users, children, or other vulnerable groups get affected by these manipulative designs. By looking into the impact of dark patterns on different user categories, researchers are better endowed with design recommendations that incorporate user well-being and ethics.

Prevalence of Dark UX Patterns:

Based on an extensive assessment of data sourced from both primary and secondary fields, it appears that there are certain types of dark patterns rather commonly observed in UX design. The present segment will thus present a detailed discussion of these findings, focusing especially on the kind of dark patterns that surfaced in surveys and interviews with UX professionals. Data from these sources can best be put forth in the form of tables and graphs to better illustrate a picture of how often various dark patterns actually occur and with what kind of impact. For example, the prominence of patterns such as "hidden costs," "forced continuity," and "misleading interface design" in applications and platforms can be represented numerically.

The analysis will see in what specific contexts, if any, these dark patterns more commonly appear or provide some indication why they are used. With a classification, we better recognize design decisions in relation to human behavior, thus bringing ethical considerations surrounding that practice to light.

User Behavior and Manipulation:

The section will place emphasis on the way dark patterns affect the user decision-making process and about the underlying psychology behind them. Illuminating specific cases of manipulation, one can present examples of Facebook's "nudge" strategies to keep its users engaged. These nudges work through notifications that remind too to lure back users to the site or remind users of certain activities undertaken by their friends as a kind of bait pulling the users back into the platform's ecosystem.

This will lead the analysis to the study of the long-term effects of these manipulative strategies on user behavior formation, including addiction and trust erosion between the users and platform. By understanding the nuances in dark pattern operations, design ethics can merge into practices that champion

transparency and user empowerment, culminating into an environment that nurtures a healthier digital space.

The study tries to highlight the urgent need for attention and action on dark patterns in UX design. By shedding light on the frequency of manipulative strategies and their consequences, there may be an opportunity to spur designers, researchers, and policymakers to join forces in forging ethical, user-centered digital experiences.

Sector-Specific Analysis:

Electronic commerce:

In e-commerce, dark UX patterns are employed as tools to perpetrate impulse buying and foster a false sense of urgency in consumers. Other common examples are "limited-time offers" or "low stock warnings." Such strategies are intended to coerce users into making decisions onto their own, thereby cutting short the evaluation of options. A countdown timer could very well claim that the discount is about to expire, knowing well that the offer could be renewed again after some time. Likewise, the notification that says "Only 2 left in stock!" may very well be fabricated as per the actual stock quantity, thereby creating anxiety and an ultimatum in the buyer's mind. Such strategic behavioral interventions of consumers aim to manipulate psychological variables like scarcity and loss aversion and blatantly ignore transparency and informed consent, putting a grave question mark on the ethics of such practices.

Social media:

Dark patterns on social media work exploitably on notification systems built upon users' FOMO. Alerts concerning likes, comments, or trending topics are sent at inopportune moments to lure such users into returning to the platform repeatedly, to engagement levels sometimes detrimental to their mental health. The notifications make very little to no attempt to maintain a neutral stance; every single one is built to maximize screen time and user interaction without user-understood control. Such an addictive loop smudges the boundary of engagement and manipulation.

Gaming:

The mechanisms by which dark UX patterns in digital gaming settings present themselves are, to some extent, loot boxes and microtransactions. These features promote an act of simulated gambling where players spend real money in exchange for randomized virtual rewards. The uncertainty and excitement called forth by the operation of these mechanisms can foster compulsive spending, particularly for young or otherwise vulnerable users. Because these mechanics exhibit such addictive capabilities, one ought to view the entire practice with candid ethical concern when the games are targeted toward children. Analyzing such practices provides insight into how design choices intentionally exploit psychological tendencies and speaks to the immediate need for an ethical framework and potential regulatory intervention.

User Awareness and Reaction:

A deep dive into the human awareness shall follow, basing it upon interview and survey data. The recognition of, and reaction to, manipulative design techniques will be explored to seek out the psycho-social and behavioral effect of dark UX patterns in the normal digital encounters we face in our everyday lives.

Interviews will elicit rich and personal qualitative learning in regard to deceptive interfaces, including those mechanisms that confuse opt-out options, misleading calls to action, or pressure messages. People might recount situations when they felt tricked or pressured into decisions they would otherwise not have engaged in: unsubscribing to, or otherwise signing up for, a service; knowingly purchasing an item; and so on-the pressure was just the perceived assurance of urgency. These stories will illuminate the emotional state of users surrounding these interactions: frustration, distrust, and helplessness.

Survey data will provide a broader view of the awareness of different demographics. Questions will test whether users can identify common dark patterns, how often they face them in the wild, and what kind of action they take upon being subjected to these kinds of manipulations-whether it will be to abandon the service, consciously adjust their usage, or just disregard it. This hybrid approach allows the research to name and measure both the subjective experience and general awareness trends.

V. CONCLUSION

The question of the ethics of uses comes up with design that consciously infringes on user autonomy in some way. The overt or covert design strategies manipulate the user-interface into forcing decisions that the user would not otherwise have taken sharing personal data, made unintentional purchases, or subscribed unwillingly. The pursuit of short-term profits and increased conversion rates leads to them violating the essential aspects of an ethical design, i.e., transparency, consent, and respect for the user.

Despite the growing awareness of the public regarding dark patterns-aided by media, studies, and an active group of advocates-few regulations and much less enforcement of any sort are binding upon the digital design area. The sanctions in place for design mechanisms are simply insufficient for the complexity and rapidly evolving nature of manipulative means, leading users to be at risk and mostly unaware about the choices that are being influenced.

With the spotlight on deeply concerning issues and moving to shift toward a more ethical approach in UX centered on one's well-being and free choice, designers and researchers, together with policymakers, must set forth standards discouraging deceptive designs while promoting trust, fairness, and inclusiveness. Ethical design should assist the users as opposed to creating systems that exploit them and that the digital realm becomes open and human centered.

The next generation of research should then focus on identifying clear and actionable guidelines for ethical design, which are implementable by various industries. Furthermore, there is an undoubted need to observe the long-term psychological, behavioral, and social effects of dark patterns, especially concerning vulnerable groups such as children, the elderly, and the cognitively impaired. The key to resolving instances of ethical dilemmas for all lies in understanding how the different groups are impacted and perceive these dark patterns.

The Role of UX Designers in Ethical Practices:
Examining how UX designers confront the ethical challenges raised by dark patterns on the basis of interview data, one finds that designers often find themselves conflicted between the business goals of conversion and their responsibility to protect user autonomy. Many acknowledge that deceptive design practices are unethical and undesirable, and yet feel coerced by stakeholders and performance metrics to carry them out. Especially junior designers talk about having little power to challenge these harmful practices. Some practitioners advocate ethical alternatives; however, lack of organizational support makes it difficult. These findings call for larger ethical frameworks and culture so as to make the power of designing for user well-being reside in design teams.

Implications for the Industry:
The section goes on to analyze the broader implications dark patterns bear on the profession and the growing responsibility for accountability and ethical code. If manipulated design becomes a matter of public record, companies in question stand to undergo an undeserving reputational damage, distrust from potential users, and an erosion of long-established brand recognition. Owing to the lack of explicit professional standards, unethical practices are able to prosper, and this is a-priori an urgent need for an ethical code in the industry. Regulatory measures are stopping being a mere figment of the imagination and are coming to life as governments and watchdog agencies jump into the arena of deceptive digital design. Such developments herald transparent experiences for end-users and cast a shadow of necessity on the UX community for adopting ethics into standard practice.

Potential Solutions:
In the current section, an attempt is made to review the ethical dilemmas dark pattern designers have to grapple with. Interview data reveal that most design practitioners are cognizant of the manipulative nature of such devices but feel pressured by business and sometimes metrics. Unethical behavior is rarely opposed on behalf of junior designers. They hold proposals for ethical alternatives, but such efforts rarely get corporate legitimacy in particular cases. Due to economic interest versus respect for their consumers, this issue has stood at the forefront. This calls for a more reinforced sense of ethics and workplace cultures automating user-first solutions.

REFERENCES

[1] Fansher, M., Chivukula, S.S. and Gray, C.M. (2018) '#darkpatterns', Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems [Preprint]. doi:10.1145/3170427.3188553.

[2] Gray, C.M. et al. (2018) 'The dark (patterns) side of UX Design', Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems [Preprint]. doi:10.1145/3173574.3174108.

[3] Mildner, T. et al. (2023) 'About engaging and governing strategies: A thematic analysis of dark patterns in social networking services', Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems, pp. 1–15. doi:10.1145/3544548.3580695.

[4] Gray, C.M. et al. (2021) 'End user accounts of dark patterns as felt manipulation', Proceedings of the ACM on Human-Computer Interaction, 5(CSCW2), pp. 1–25. doi:10.1145/3479516.

[5] Chivukula, S.S., Brier, J. and Gray, C.M. (2018) 'Dark intentions or persuasion?', Proceedings of the 2018 ACM Conference Companion Publication on Designing Interactive Systems [Preprint]. doi:10.1145/3197391.3205417.

[6] Gray, C.M., Santos, C., et al. (2021) 'Dark patterns and the legal requirements of consent banners: An interaction criticism perspective', Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems [Preprint]. doi:10.1145/3411764.3445779.

[7] Gray, C.M. et al. (2023) 'Dark patterns and the emerging threats of deceptive design practices', Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems [Preprint]. doi:10.1145/3544549.3583173.

[8] Gray, C.M. et al. (2021) 'Dark patterns and the legal requirements of consent banners: An interaction criticism perspective', Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems [Preprint]. doi:10.1145/3411764.3445779.

[9] Mildner, T. et al. (2023a) 'Defending against the dark arts: Recognising dark patterns in social media', Proceedings of the 2023 ACM Designing Interactive Systems Conference [Preprint]. doi:10.1145/3563657.3595964.

[10] Mildner, T. et al. (2024) 'Dark patterns: Manipulative designstrategien in Digitalen Gesundheitsanwendungen', Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz, 67(3), pp. 308–315. doi:10.1007/s00103-024-03840-6.

[11] Mathur, A., Kshirsagar, M. and Mayer, J. (2021) 'What makes a dark pattern... dark?', Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems [Preprint]. doi:10.1145/3411764.3445610.