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Controlling Your Fingertips: Dark Patterns and Invisible Manipulation on Short-Video Platforms

Yijia Cheng*

Shanghai Qibao Dwight High School, Shanghai, 200000, China

Corresponding author: Yijia Cheng, chengangelina91@gmail.com.

Abstract: Short video platforms such as TikTok have become pervasive in daily life, powered by algorithmic systems that enhance entertainment and convenience while embedding manipulative design strategies known as dark patterns. By exploiting cognitive biases and bounded rationality, these designs steer user behavior—encouraging likes and favorites or hindering unfollowing—to maximize engagement and profit at the expense of autonomy. This study examines dark patterns in the context of algorithm-driven, infinite-scroll platforms, categorizes their emerging forms, and evaluates their impacts on users and market competition. It further reviews regulatory responses in China and abroad, proposing governance measures to safeguard consumer rights and promote a sustainable digital ecosystem.

Keywords: Dark Patterns; Short Video Platform; Algorithmic Manipulation

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1.Introduction

In recent years, the rapid advancement of artificial intelligence (AI) and big data algorithms has fueled the rise of the "attention economy," where user engagement time functions as the core currency (Cramer, B. W., 2017). Short video platforms such as TikTok and Douyin have emerged as central actors, profoundly transforming how individuals access information, what types of content they consume, and how decisions are made (Zuboff, S. 2019). While these platforms provide unprecedented convenience and entertainment and have become deeply embedded in everyday life, they also conceal a more troubling reality: the deployment of strategies that subtly manipulate user choices to maximize online engagement and corporate profit (Eyal, N., 2014). These strategies, commonly referred to as dark patterns (Brignull, H., 2010), represent a shift from overt advertising to covert psychological nudging, raising pressing questions about autonomy and free will in the digital era.

Studying dark patterns is crucial in the digital era, as they are concealed, flexible, and continuously evolving with new forms emerging (Nouwens, M., et al., 2020). Unlike traditional deceptive advertising, dark patterns are often embedded in platform design, making them difficult to detect and increasing users' vulnerability to manipulation (Di Geronimo, L., et al., 2020). Their characteristics lead to significant negative consequences: users may waste substantial amounts of time, suffer financial losses, or experience privacy breaches when making decisions under misleading cues (Utz, C., et al., 2019). These risks underscore the urgent need for systematic research to deconstruct the mechanisms of dark patterns, clarify their ethical implications, and inform regulatory frameworks aimed at safeguarding user rights and privacy.

Existing research has collected and categorized various types of dark patterns, predominantly in e-commerce contexts, such

as the use of special icons to nudge users into subscriptions or data sharing. However, a significant research gap remains concerning the unique attributes of short-form video platforms. These platforms often embed subtle dark patterns that are difficult to detect—for example, autoplay features, designs that obscure users' sense of time and progress, and mechanisms that steer user choices—creating a distinct set of manipulative practices that most users fail to recognize (Zhao, W., et al., 2022). This study seeks to address this gap by focusing on dark patterns in TikTok (international) and Douyin (China). Specifically, it aims to: (1) establish a contextualized definition of dark patterns in this domain; (2) identify and categorize the forms observed on TikTok with illustrative examples; (3) analyze their multilayered impacts; and (4) propose regulatory measures to support healthier platform development and protect consumer rights.

2.Definition and types of Dark Patterns

2.1 Definition

Dark patterns, first introduced by British user experience researcher Harry Brignull in 2010, describe deceptive interface designs that deliberately mislead users into actions they did not intend to take (Brignull, H., 2010). Subsequent scholarship has refined the concept to encompass broader forms of manipulation. For instance, Mathur, A., et al. (2019) define dark patterns as "user interface design choices that benefit online services by coercing, steering, or deceiving users into making unintended and potentially harmful decisions".

On short-video platforms—digital platforms that allow users to create, share, and interact with brief video content, often personalized through recommendation algorithms—these practices are particularly pronounced. On platforms such as TikTok and Douyin, dark patterns are operationalized through algorithm-driven systems that leverage detailed insights into user behavior, making disengagement difficult, encouraging compulsive use, and channeling users toward revenue-generating activities, such as in-app purchases, e-commerce links, or content monetization.

The business model of short-video platforms largely relies on high user engagement and massive content consumption, generating revenue through advertising, live-stream tipping, e-commerce promotion, and in-app monetization features. This model incentivizes platforms to maximize user time spent and interaction frequency. Therefore, dark patterns are highly aligned with the platform's profit logic. For example, features such as infinite scroll, autoplay, and algorithmic recommendations create a personalized content loop that keeps users continuously engaged, forming a "attention economy" cycle. By embedding dark patterns into core platform mechanisms, short-video platforms not only enhance revenue efficiency but also reinforce control and manipulation over user behavior.

2.2 Cause analysis: The role of Bounded Rationality

These strategies are effective because they are carefully engineered using data-driven insights, deliberately exploiting cognitive biases and heuristics rooted in human psychology, and are often embedded in areas of the interface that users tend to overlook. Key mechanisms include scarcity bias, which creates an artificial sense of limited availability to induce urgency and stimulate purchasing behavior (e.g., "Only 2 left!"), and social proof, which provides subtle cues about others' behavior to influence decision-making (e.g., "1,000 people bought this in the last hour"). In essence, dark patterns represent an integration of psychological manipulation and interface design, primarily aimed at maximizing user engagement, views, revenue, or data extraction. While these strategies may yield short-term business benefits, they often compromise user autonomy, erode trust, and can ultimately undermine the long-term sustainability of platforms and brands.

In fact, the effectiveness of dark patterns is largely explained by Herbert Simon's concept of "bounded rationality," which posits that individuals cannot make perfectly rational decisions due to time constraints, limited information, and cognitive processing capacity (Simon, H. A., 1955). Platforms exploit these limitations by creating environments characterized by information overload and rapid interactions. Under such conditions, users commonly rely on cognitive shortcuts, which dark patterns are deliberately designed to trigger. For instance, features such as autoplay and infinite scroll leverage the endowed progress effect, making disengagement a conscious effort rather than the default behavior, thereby subtly steering user engagement.

2.3 Types of Dark Patterns

Although dark patterns are present across various digital services, their manifestation on short-video platforms such as TikTok

is distinctive, reflecting the platforms' core design principles: infinite scroll, algorithmic steering, and a strong emphasis on video and social metrics. Based on these observations, the primary dark patterns on these platforms can be categorized into four main types, as summarized in Table 1.

The taxonomy presented in Table 1 illustrates different types of dark patterns on TikTok and highlights how they exploit various aspects of user psychology. Patterns of Engagement and Addiction (e.g., autoplay) undermine users' self-control by eliminating obvious stopping cues. Algorithmic Steering shapes the way users process information, using keywords or contextual cues to capture attention. Social Coercion tactics exploit social anxiety and the desire for validation to drive measurable engagement metrics. Finally, Monetization and Data Extraction patterns lower friction for profit-generating actions while increasing it for privacy-preserving ones, creating an asymmetry that primarily benefits the platform.

Table 1: A Category of Dark Patterns on TikTok/Douyin

Category	Dark Pattern	Description &Purpose	Example on TikTok
Patterns of engagement	Autoplay	Removes all natural stopping cues, making disengagement a conscious act of will. Designed to maximize the time user spend on the platforms.	A new video automatically loads and plays immediately after the previous one finishes, with no obvious "pause" button.
Algorithmic Steering & Misdirection	Algorithmic Rabbit Holes	The algorithm intentionally steers users from mild content towards more extreme, emotional, or addictive topics to boost engagement. (The new topic is similar with the old(mild)one.	Pretending a user watching normal and harmless cooking videos is gradually fed content about extreme gourmet diets, leading to body image anxiety or misinformation.
	Fabricated Urgency	Creates a false sense of liveliness or immediacy to prevent users from leaving.	Displaying "LIVE" labels or " trending" badges on pre-recorded videos, or showing "X is typing..." in DMs when they are not.
Social Coercion & Pressure	Vanity Metrics Obfuscation	Highlighting metrics like views and likes primes social validation, and achieve a sense of self satisfaction, encourages constant posting and checking.	The immediate and prominent display of like counts and follower notifications creates pressure to seek validation and compare oneself to others.
	Gamified Reciprocation	Pressuring users to engage in a "transaction" of social capital	When a user is followed, a large red "Follow Back" button is prominently displayed, while the smaller grey "Dismiss" icon conveys a less positive option. This subtle design nudges users toward reciprocating the follow.
Monetization & Data Extraction	Frictionless Spending	Minimizes the cognitive steps between watching a video and spending money, exploiting impulse.	In LIVE streams, large, glowing "Gift" buttons with one-tap purchasing (linked to pre-saved payment methods) encourage impulsive spending on digital gifts.
	Privacy Zuckering	Making privacy controls complex and burdensome to navigate, nudging users toward the default, data-sharing option.	Burying privacy settings for personalized ads deep within multiple menus with confusing language, making it easier to just leave them on.

3.The impact of Dark Patterns on platforms

3.1 The impact on users

Dark patterns pose a significant threat to user autonomy by systematically eroding individuals' capacity for intentional and rational decision-making. By exploiting cognitive biases, these designs can escalate into compulsive usage patterns, leading to time overuse and a profound sense of loss of control (Di Geronimo, L., et al., 2020). Users often find themselves scrolling mindlessly for hours on platforms such as TikTok, driven by features like infinite scroll and autoplay. The erosion of autonomy is not uniform across all user groups; its negative impacts are disproportionately severe for vulnerable populations,

particularly children and the elderly.

For children and adolescents, whose brains are still developing and whose impulse control and risk-assessment abilities are immature, dark patterns can have especially severe consequences (Arain, M., et al., 2013). The gamified, reward-based structures of platforms like Douyin—such as pull-to-refresh mechanics and vanity metrics—manipulate neural circuits related to social recognition and reward, potentially fostering compulsive use, sleep disruption, academic decline, and premature social exposure (Meshi, D., et al.,2015; Twenge, J. M., & Campbell, W. K., 2018). Children are also highly susceptible to financial exploitation through hidden spending mechanisms and deceptive one-click purchase options, often linked to parental accounts, as they have limited understanding of money and difficulty distinguishing content from advertisement.

For elderly users, cognitive and sensory declines—such as slower reaction times and deteriorating eyesight—make it difficult to detect subtle dark patterns. Complex or ambiguous prompts can confuse users, leading them to select the more obvious option, which may inadvertently consent to extensive data tracking or subscriptions (Vroman, K. G., et al., 2015). Algorithmic steering further traps elderly users in "information cocoons," exposing them to false information or conspiracies. Their high trust in digital content, combined with limited interface literacy, increases susceptibility to misinformation, which can affect health decisions and civic engagement (Vosoughi, S., et al., 2018).

Ultimately, dark patterns do more than manipulate choices—they exploit inherent vulnerabilities, exacerbating digital inequality. While all users experience a loss of autonomy, children face developmental and financial harms, and the elderly encounter cognitive confusion and misinformation risks, creating an unsustainable digital environment with persistent threats to privacy.

3.2 Impact on Fair Competition

Dark patterns not only manipulate user choices but also significantly distort market dynamics, creating an environment of unfair competition that undermines innovation. A central driver of this anti-competitive effect is the platform's dual role as both marketplace regulator and competitor, enabling them to design rules through dark patterns that disproportionately favor their own interests (Khan, L. M., 2017).

One clear manifestation is self-preferencing and interface bias. Platforms can design interfaces to highlight their own products, providing them with a structural advantage. For example, TikTok's e-commerce service, TikTok Shop, prominently displays "Add to Cart" or "Buy Now" buttons for in-platform products, often in bright colors and with a single-click purchase feature. In contrast, links to external websites are presented with small, ambiguous "Learn More" buttons accompanied by warnings such as "You are leaving TikTok. This link may be unsafe." Such design choices nudge users toward in-platform purchases, generating profit while marginalizing external competitors.

Another related issue is the emergence of a pay-to-play prominence model. Success on major platforms increasingly depends on creators' ability to pay for favorable placement rather than on product quality. Wealthy creators can integrate products seamlessly into popular content with one-click purchase features, whereas independent creators with high-quality but niche products face cumbersome barriers—requiring users to manually search for and purchase items externally. This "obstacle gap" engineered through dark patterns effectively determines market winners and losers.

If such ecosystems persist, long-term consequences are severe. Innovation is stifled as new and small enterprises often cannot afford platform fees, potentially forcing them out of the market or into acquisition by larger firms, thereby reducing consumer choice, market diversity, and product quality. Product prices may also rise, as platform fees and advertising costs are ultimately passed on to consumers. Over time, a few dominant platforms may consolidate control, making it nearly impossible for ethical competitors to emerge and forcing consumers to rely on these dominant services.

3.3 Impact on Creators

Beyond the commercial marginalization discussed earlier, dark patterns and the opaque algorithmic systems that support them create a psychological "panopticon" for creators, fundamentally reshaping creative expression. Continuous pressure to conform to engagement-oriented metrics traps creators in a passive cycle, optimizing their content primarily to satisfy the algorithm rather than for artistic value or audience connection (Bucher, T., 2018). For instance, a creator interested in producing content on women's rights may find such topics poorly promoted or even restricted due to varying cultural

acceptance. Consequently, to maintain visibility and income, creators may pivot toward popular but personally unappealing topics, such as beauty products or trending challenges.

This environment suppresses experimentation and innovation. Platform dependency introduces financial instability, making the pursuit of novel forms or niche themes risky. Predictable, viral content ensures exposure, while innovative long-form series or unconventional works are unlikely to gain traction. As a result, creators without substantial financial backing often tailor their output to algorithmic recommendations, leading to widespread content homogenization. Users are consequently presented with repetitive, superficial, and imitative works, diminishing the visibility of unique creative voices and limiting the Internet's potential to broaden perspectives.

Moreover, this system institutionalizes a profound power imbalance. Creators are effectively tenants or employees of the platform rather than partners, subject to arbitrary rule changes and algorithmic adjustments beyond their control. Non-compliance results in restricted publication and visibility, generating anxiety and creative fatigue. Continuous optimization for engagement metrics becomes an urgent, overriding task, displacing sustainable artistic practices. In this sense, creators' labor is alienated: their works function primarily as data points for platform growth, while their livelihoods depend on appeasing a black-box system designed to serve the platform's interests rather than their own.

4.Regulatory Experience and Governance Measures for Dark Patterns

4.1 Regulatory and Legislative Status Quo

To date, global regulatory efforts addressing dark patterns remain fragmented, inconsistent, and largely lacking enforceable power. While some jurisdictions have recognized the problem, most rely on general legal guidelines rather than establishing dedicated frameworks, reflecting limited regulatory motivation.

The United States and the European Union are relatively more proactive, yet their approaches remain insufficient. In the U.S., the Federal Trade Commission (FTC) has acted against severe cases under Section 5 authority concerning unfair or deceptive practices. However, such interventions are reactive and case-specific, lacking broad deterrent effect (Chopra, R., & Groom, C., 2020). In the EU, the General Data Protection Regulation (GDPR) and the Digital Services Act (DSA) provide legal tools applicable to dark patterns, particularly regarding user consent and manipulative design. Nonetheless, enforcement is uneven across member states, and many platforms implement only superficial changes rather than comprehensive redesigns.

A critical observation is the near-absence of strong, deterrent enforcement worldwide. Platforms continue to employ dark patterns because the perceived risk of sanction is low. Guidelines alone constitute a positive first step but are insufficient without meaningful legal and financial consequences.

China faces a similar situation. There is no legislation explicitly targeting dark patterns, although the Ministry of Industry and Information Technology (MIIT) has launched campaigns against specific deceptive practices, such as forced download buttons. Most regulations rely on general consumer protection and administrative laws, lacking specificity for manipulative design. Consequently, China needs to intensify efforts to establish targeted laws and precise rules to regulate dark patterns effectively.

Globally, a key challenge remains inconsistency. Various countries (e.g., the UK, France, India) define and classify dark patterns differently, prescribing heterogeneous compliance standards. This divergence creates confusion, particularly for multinational companies, and prevents the establishment of a universal baseline for ethical interface design.

4.2 Governance Measures and Suggestions

Effectively addressing the transnational challenge of dark patterns requires coordinated global cooperation to establish a balanced and consistent regulatory baseline. The following measures are proposed:

Firstly, establish a global normative framework. Countries should collaborate to form an international committee tasked with developing universal guidelines against dark patterns. Such a framework would provide standardized definitions, clear categorizations, and explicit prohibitions, creating a fairer and more transparent digital environment for global users.

Secondly, enact targeted legislation and strengthen enforcement. National governments should translate international standards into domestic law with clear legal consequences. Regulators must be empowered to impose significant sanctions, including substantial financial penalties and, in severe cases, temporary suspension of platform operations for one to five

years. Penalties should be substantial enough to serve as genuine deterrents, moving beyond symbolic reprimands. Thirdly, promote ethical design by default. Regulations should mandate that major platforms conduct “Ethical Design Audits” to proactively identify and mitigate manipulative practices. This approach reduces risks for vulnerable user groups, shifts responsibility from users to platforms, and encourages the integration of user-centric principles into design processes. Finally, China should assume a leadership role in global governance. As a major player in digital innovation, China is well-positioned to contribute to the development of sustainable internet governance. Domestically, China should build upon its existing campaigns, establish targeted standards and implementation rules addressing specific dark patterns, and ensure effective enforcement. Such initiatives would protect Chinese consumers while providing a replicable model for other jurisdictions, reinforcing China’s role as a key contributor to global digital governance.

5.Conclusion

This study finds that Dark Patterns on short-video platforms such as TikTok represent a form of “invisible manipulation”, exploiting cognitive biases to undermine user autonomy, distort market competition, and suppress creators’ innovation. Current regulatory efforts, though increasing, remain fragmented and lack a consistent global baseline, allowing these deceptive practices to persist. To address this challenge, a cohesive international approach is urgently needed, including the establishment of global guidelines and targeted legislation with strong deterrents. Sustainable development of the digital ecosystem requires collaborative action to ensure platforms prioritize user welfare over profit, thereby fostering a healthier, more transparent, and accountable online environment.

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