Are You Manipulated by Short Video Platforms? A Study on the Performance and Impact of "Dark Patterns"

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Abstract : This paper explores the phenomenon and impact of dark patterns on short video platforms such as TikTok. Dark patterns, like infinite scrolling, manipulative notifications, and disguised ads, aim at enhancing platform engagement by exploiting users' psychology at the cost of user autonomy and well-being, which eventually leads to the benefit of the platforms, These manipulative designs harm multiple stakeholders including users, creators, advertisers and society as a whole, amplifying societal issues like privacy erosion and filter bubbles. In order to mitigate these influences and protect the users' rights, this study advocates for regulatory measures such as cooling-off period, transparency in algorithm design which empower users to control these manipulative features.

Keywords: Dark Patterns; Short Video Platforms; Behavioral Manipulation

1. Introduction

Under the prevalence of Attention Economy, short video platforms such as TikTok and DouYin have changed how people consume information and interact with social content. By utilizing sophisticated algorithms to personalize recommendations for users, these platforms primarily aim at offering better experiences. Nonetheless, these algorithms are also used by the platform operators intentionally, manipulating users' behaviors to maximize their own commercial benefits. This practice gives rise to dark patterns that intend to deceive or force users to make decisions in the ways that they might not otherwise make, which often benefit the platform at the expense of user autonomy and well-being.

These dark patterns constructed by the deceptive interface designs manipulate users into taking actions that benefit the platform operators, often at the cost of the user's time, attention, and personal well-being (Brignull, 2010). They exploit users' psychological triggers and behavioral biases to make them feel addicted and spend excessive time browsing the content without awareness, thereby increasing advertising revenue, data collection, and overall platform engagement. This may also impact fair competition within the short video industry, as consumers may stick to the platforms that have already collected their data and personalized services for them and are less willing to switch to the new platforms that enter the market later. These widespread negative impacts have been largely overlooked by the academic community, making it necessary to analyze their specific manifestations and consequences while implementing targeted and essential regulatory measures.

2. Dark Patterns in Short Video Platforms

Dark patterns, as defined by Brignull (2010), refer to user interface designs that deliberately manipulate and deceive users by exploiting their psychological vulnerabilities, pushing them to behave abnormally and make decisions that disobey their own willingness. These dark patterns prioritize the platforms' profitability as opposed to users' benefit, usually harming the users' autonomy, manipulating them without being aware of. On short video platforms like TikTok, Douyin, and Instagram Reels, the most prevalent dark patterns include Infinite Scrolling, Manipulative Notifications, and Disguised Ads, which subtly capture attention, increase engagement, and maximize revenue. In this section, these three examples will be examined as representatives of dark patterns on short video platforms in our daily lives.

Infinite Scrolling is a design that allows users to scroll and view contents continuously without being interrupted. This feature, often paired with autoplay, removes the traditional pause signs, making it effortless for users to

watch video after video. By eliminating the friction in operations, platforms encourage users to prolong usage, though in a passive way. The relentless and continuous delivery of new information taps into the brain's reward system, offering dopamin hits similar to those triggered by gambling mechanisms like slot machines (Monge Roffarello & De Russis, 2022). Moreover, the unpredicted content of the next video enhances anticipation, making users more inclined to keep scrolling. Over time, this behavior can result in habitual engagement, where the users lose track of time and struggle to disengage. This simplicity of operation, while seems to be harmless or even smoothen the users' experiences, has significant implications for mental well-being, productivity, and digital habits, as it foster overuse and disrupts users' ability to self-regulate their screen time (Toffalini et al., 2024).

Manipulative notifications, as another representation of dark patterns, exploit users' fear of missing out (FOMO) through frequent alerts designed that seem to be urgent but actually not to trigger emotional responses, such as likes or new content, seducing the users to click the app more frequently. A common tactic is false activity notifications, where platforms exaggerate or fabricate engagement, claiming a post is receiving an unusually high number of likes or views. This strategy utilizes the psychological principle of social proof, where individuals tend to follow behaviors they believe others are engaging in (Nouwens et al., 2020). Notifications of unpredictable feedback, such as likes, comments, or shares also trigger addictive behaviors by activating dopamine responses (Mathur et al., 2019). These tactics reinforce compulsive usage patterns, maximizing user retention while eroding trust and fostering digital dependency.

Disguised Ads blur the line between real content and advertisements, making it difficult for users to distinguish. Content creators often involve promotions seamlessly into their videos, such as using sponsored items without clear disclosure to the audience. Platforms further disguise these advertisements by embedding interactive elements that appear functional, such as "exit" buttons or swipe features, which redirect users to click on the ads instead of where they expected. This exploitation of anchoring and intuitive cues manipulates users into engaging with promotional content unknowingly (Gray et al., 2018). By concealing ads into regular posts and functions, platforms ensure higher ad engagement and bypass user resistance to overt advertising.

3. Impact of Dark Patterns on Short Video Platforms

3.1 Impact on Users

The psychological consequences of dark patterns are profound. Prolonged usage of short video platforms can lead to mental health issues, including anxiety, depression, and emotional exhaustion. Users may also frequently experience cognitive fatigue from continuous content consumption, which reduces their ability to focus and recover mentally. Hounsell (2020) notes that autoplay aggravates this issue by removing decision-making friction, trapping users into a malignant passive consumption cycle. Lorusso et al. (2024) also emphasize that compulsive engagement deepens feelings of regret and frustration, further deteriorating users' mental well-being.

From a platform perspective, these manipulative strategies are intentionally designed to increase users' engagement, leading to maximization of profitability. Platforms prioritize sustained user interaction because it drives advertising revenues and data collection, which are critical to their business models (Mathur et al., 2019). While platforms are benefiting from the designs, users face an escalating cycle of psychological stress, diminished self-control, and reduced autonomy, amplifying mental health challenges.

Dark patterns also undermine user privacy through deceptive consent mechanisms and covert data extraction. Platforms use manipulative interfaces, such as pre-ticked checkboxes, hidden settings, and complex opt-out processes, to coerce users into sharing personal data. These strategies exploit cognitive biases, such as the status quo bias, which makes users more likely to accept default options rather than actively searching for alternatives (Nouwens et al., 2020).

Emotionally charged notifications like "Don't miss out!" create urgency and exploit FOMO

(fear of missing out), further driving engagement and data collection. Users, often unaware of the implications, inadvertently consent to extensive data sharing under vague or inaccessible terms and conditions (Lorusso et al., 2024). Platforms like TikTok and Douyin are particularly criticized for these practices, as their algorithms capitalize on the collected data to optimize recommendations and increase user retention.

This erosion of privacy has systemic consequences. It not only compromises user autonomy but also contributes to broader societal issues such as filter bubbles and diminished trust in digital platforms. Filter bubbles, created by data-driven algorithms, reinforce user preferences and limit exposure to diverse content, further isolating individuals within their own perspectives (François & de Souza, 2020; Pariser, 2011). Addressing these challenges requires a combination of ethical platform design, regulatory oversight, and improved transparency to protect user privacy and rebuild trust.

Certain demographic groups, such as teenagers and older adults, are particularly vulnerable to dark patterns due to cognitive, emotional, and digital limitations (Lorusso et al., 2024). Teenagers are highly susceptible to manipulative features like social proof, which leverages likes, comments, and shares to create a perception of popularity. This fosters a "like culture," where teenagers seek validation through platform engagement, driving compulsive behaviors. Monge Roffarello and De Russis (2022) note that social validation triggers are particularly powerful for younger users, as they rely on peer approval for identity formation and self-esteem. The combination of autoplay, infinite scrolling, and social proof makes teenagers especially prone to overuse and addiction.

Older adults face challenges related to digital literacy and interface complexity. Platforms frequently obscure privacy settings and terms of service using technical jargon and misleading layouts. This disproportionately affects older users, who may struggle to navigate convoluted consent mechanisms. Additionally, the sunk cost fallacy plays a significant role, as older adults may feel compelled to continue using platforms after investing time and effort into learning their functionalities (Toffalini et al., 2024).

Both groups are targeted by dark patterns that exploit cognitive biases like FOMO and loss aversion, embedded in manipulative notifications, limited-time offers, and deceptive designs. Addressing these vulnerabilities requires targeted interventions, such as digital literacy programs for older adults and teenagers, alongside stricter regulations to curb manipulative practices aimed at these populations (Marwick & Lewis, 2017; Lorusso et al., 2024).

3.2 Impact on Content Creators

Content creators are integral to short video platforms, driving user engagement and shaping platform culture. However, dark patterns and algorithmic pressures compel creators to prioritize click-driven content over meaningful or high-quality material.

Algorithms that reward metrics like likes, shares, and watch time incentivize sensationalist, emotionally charged, or provocative content (Gray et al., 2018). Creators often feel pressured to adopt manipulative techniques such as clickbait titles, misleading thumbnails, and exaggerated claims to remain visible within the platform's recommendation system. Monge Roffarello and De Russis (2022) note that this trend marginalizes educational and thoughtful content, as it struggles to compete with attention-grabbing material optimized for algorithms.

This dynamic undermines the diversity and integrity of content ecosystems. Sensationalist trends often spread misinformation, erode user trust, and overshadow creators producing valuable but less clickable content (François & de Souza, 2020). Over time, creators face a dilemma between staying true to their creative goals and conforming to platform demands for visibility.

The competitive environment further exacerbates these challenges. Creators must constantly adapt to algorithm changes, which prioritize viral content and favor high-engagement metrics. Those who fail to align with these trends risk being marginalized, leading to a self-reinforcing cycle where high-quality content is devalued, and creativity is stifled (Marwick & Lewis, 2017). Addressing this issue requires platforms to reconsider their algorithmic priorities and create incentives for diverse, high-quality content that enriches the

digital ecosystem.

Dark patterns also entrench content creators within platform ecosystems, creating a lock-in effect that reduces their autonomy and flexibility. Platforms employ strategies such as audience-specific formats and opaque revenue policies, making it difficult for creators to migrate their followers to alternative platforms (Borhesius et al., 2018).

The reliance on a single platform forces creators to conform to its algorithmic demands, even when those demands conflict with their personal or professional goals. For example, creators who attempt to promote external sites or monetize content outside the platform may experience reduced visibility or reach. Lorusso et al. (2024) highlight how platforms use preferential treatment for creators who align with their profit-driven priorities, further consolidating control.

This market dependency not only stifles creative freedom but also limits opportunities for diversification and innovation. Addressing these challenges requires systemic reforms, such as developing standardized content portability protocols and implementing fairer platform policies that empower creators to retain their audiences and revenue streams across multiple ecosystems.

3.3 Impact on Advertisers and Industries

The attention-driven economy created by dark patterns has made advertising on short video platforms increasingly competitive and costly. Platforms use dark patterns like personalized recommendations and infinite scrolling to maximize user engagement, creating a premium demand for ad placements. As a result, advertising costs have risen significantly, disproportionately impacting small businesses with limited budgets (Marwick & Lewis, 2017).

Larger corporations often dominate ad placements, leaving small businesses with fewer opportunities to reach their target audiences. To compete, smaller advertisers are forced to adopt aggressive marketing tactics, such as emotionally charged content or clickbait-style ads, which can alienate consumers and damage brand integrity over time (Gray et al., 2018).

Dark patterns also erode consumer trust, ultimately harming advertisers and industries reliant on short video platforms. Tactics like disguised ads and coercive consent mechanisms create a perception of dishonesty, as users feel misled and manipulated. This mistrust reduces the effectiveness of advertising campaigns, as consumers become skeptical of promotional content (François & de Souza, 2020).

Regulatory scrutiny is growing, with laws like the GDPR and CPRA targeting manipulative practices in digital advertising (Nouwens et al., 2020). Businesses that rely on these strategies risk legal consequences, reputational damage, and diminishing returns, as consumers prioritize transparency and ethical practices.

3.4 Broader Societal Implications

Algorithms that exploit dark patterns play a significant role in reinforcing filter bubbles, where users are repeatedly exposed to content that aligns with their existing preferences. This repeated exposure isolates individuals from diverse perspectives, fostering an environment of ideological polarization and diminishing opportunities for critical discourse (Pariser, 2011; Gray et al., 2018). As users remain confined to their echo chambers, their viewpoints become increasingly rigid, creating barriers to understanding opposing perspectives and fueling societal divides. The lack of exposure to alternative ideas not only limits individual growth but also poses a broader threat to democratic processes, where the ability to engage in constructive debate is essential for informed decision-making and consensus-building.

Moreover, dark patterns amplify sensationalist and emotionally charged content to maximize user engagement, often prioritizing clicks and shares over accuracy and balance. This dynamic is especially harmful during critical events such as elections, where the rapid spread of misinformation can undermine public trust in democratic institutions (François & de Souza, 2020). Sensational content, bolstered by algorithms designed to prioritize engagement, diverts attention away from meaningful issues and fosters a culture of superficial interaction with complex topics. The erosion of informed civic participation weakens the foundations of democracy, as citizens are less equipped to make well-informed decisions, and opportunities for meaningful dialogue are replaced with divisive rhetoric.

The impact of dark patterns extends beyond ideological and civic harm, significantly affecting public health. Features such as infinite scrolling, autoplay, and persistent notifications are designed to prolong screen time, leading to sedentary behavior, disrupted sleep patterns, and mental health issues such as anxiety and depression (Marwick & Lewis, 2017; Lorusso et al., 2024). Younger users are particularly vulnerable, as they are more susceptible to the addictive nature of these design elements, which exploit developmental vulnerabilities and reinforce unhealthy digital habits. The cumulative effects of these behaviors, including physical health issues and reduced psychological well-being, underscore the urgent need for interventions that promote healthier digital habits and advocate for ethical platform design. Addressing these challenges requires a collaborative effort among policymakers, designers, and educators to create online spaces that prioritize user well-being over profit-driven engagement.

4. Governance Recommendations of Dark Patterns on Short Video Platforms

4.1 For Governments

Governments must establish clear and enforceable regulatory frameworks to explicitly define and prohibit dark patterns. Practices such as hidden costs, non-neutral choices, and coercive consent flows should be legally recognized and penalized (Gray et al., 2018). For instance, legislation like the European Union's Digital Services Act (DSA) and General Data Protection Regulation (GDPR) demonstrates the effectiveness of centralized oversight in protecting user autonomy and enhancing transparency (Nouwens et al., 2020).

One key intervention is the implementation of cooling-off periods for critical decisions, such as subscriptions or data-sharing agreements. Cooling-off periods provide users with the opportunity to reconsider choices without pressure, reducing impulsive behaviors influenced by manipulative tactics (François & de Souza, 2020).

Additionally, dedicated oversight bodies should be established to monitor compliance, investigate user complaints, and enforce penalties. These bodies can collaborate with advocacy groups, researchers, and industry stakeholders to quickly identify emerging dark patterns and ensure platforms adapt to ethical standards. Governments must also mandate algorithmic transparency, requiring platforms to disclose how recommendations are generated and to provide clear, accessible privacy settings. Harmonizing standards internationally can further promote fair competition while protecting global users.

By implementing these measures, governments can create a regulatory environment that curbs dark patterns, fosters trust, and prioritizes user well-being over platform profits.

4.2 For Platforms

Platforms must take responsibility for minimizing the harms caused by dark patterns by adopting ethical design practices and enhancing user control. A core principle is ensuring neutral choice presentation, where users are provided with clear and fair options without manipulative nudges. For example, privacy settings should avoid deceptive defaults, and options like opting out of data collection must be simple and accessible (Toffalini et al., 2024).

Regular internal audits of algorithms and design practices are essential for identifying features that exploit cognitive biases, such as infinite scrolling or excessive notifications. Platforms should establish independent ethics committees or collaborate with third-party auditors to ensure accountability and align their practices with both user interests and regulatory standards (Nouwens et al., 2020).

To empower users, platforms should provide easy-to-use tools to disable manipulative features, such as autoplay, infinite scrolling, and frequent notifications. Offering customization options allows users to regain control over their digital experience and reduces reliance on addictive design elements (Lorusso et al., 2024).

Transparency in algorithmic recommendations is another critical step. Platforms should explain how content is selected and allow users to adjust or opt out of recommendation systems. This reduces the risk of reinforcing filter bubbles and fosters a more diverse, user-friendly content ecosystem. By prioritizing ethical design, transparency, and user empowerment, platforms can enhance trust, regulatory compliance, and long-term user

satisfaction.

4.3 For Users

Users play a vital role in combating dark patterns by becoming more aware of manipulative designs and advocating for change. Enhancing digital literacy is a key step, empowering individuals to identify and navigate dark patterns such as coercive notifications, hidden costs, and infinite scrolling. Educational programs, workshops, and online resources can equip users with the knowledge to make informed decisions and resist exploitative tactics (Gray et al., 2018; Nouwens et al., 2020).

Special focus should be placed on vulnerable populations, including teenagers and older adults, who are more susceptible to manipulative designs. Targeted resources, such as guides on managing privacy settings, avoiding impulsive decisions, and recognizing misleading content, can mitigate risks for these groups. Parental controls and simplified interfaces can further support safe and balanced digital habits among vulnerable users (Lorusso et al., 2024).

Users can also take collective action by reporting unethical practices to regulatory bodies, participating in advocacy campaigns, and supporting initiatives aimed at improving digital transparency. Platforms often rely on user feedback to identify and address problematic features, making user participation a critical element in driving accountability.

By fostering digital literacy, protecting vulnerable groups, and engaging in collective advocacy, users can actively contribute to reducing the prevalence of dark patterns. These efforts help create a more transparent and user-friendly digital ecosystem that prioritizes individual autonomy and fairness.

5. Conclusions

This study examines the prevalence of dark patterns on short video platforms, such as Infinite Scrolling, Manipulative Notifications, and Disguised Ads, which exploit psychological biases to drive engagement. These practices harm user autonomy, creators' independence, and advertisers' fairness while amplifying societal issues like privacy erosion and content manipulation. To address these challenges, governments should implement clear regulations, platforms must adopt ethical design principles, and users need to enhance digital literacy. By fostering transparency, accountability, and user empowerment, we can mitigate the negative impacts of dark patterns and create a healthier, more equitable digital ecosystem.

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