

Dark Patterns in Video Games: An Exploratory Study

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Abstract—Dark patterns are embedded in various online platforms to manipulate and trick users. Studies have primarily focused on non-video games-based platforms. We conducted a manual analysis of 500 video game reviews to identify the categories of dark patterns embedded in video games. We examine the ways in which different dark patterns affect the privacy of players and discuss gaps and challenges to be addressed by future research.

1. Background and Motivation

In 2010, UX designer Harry Brignull coined "Dark Pattern" (DP) to describe intentionally deceptive user interfaces online [1]. Studies by Gray et al. [2] and Luguri et al. [3] have highlighted the psychological impact of these tactics, revealing how users can feel manipulated and engage inadvertently. DPs encompass various forms, such as the *roach motel*: where users find it challenging to exit services easily [4]. They are also linked to privacy breaches involving deceptive data collection and consent forms [5], [6].

While DPs have been extensively studied in various online platforms like e-commerce websites [7], dating applications [8], and social media [9], there has been limited exploration of their presence in video games (VGs). VGs, unlike other platforms, offer immersive experiences and interactions. Even e-commerce platforms now tend to incorporate VG elements as a marketing strategy (i.e., brand awareness, boost sales, etc.) to further engage customers [10].

Initial research indicates the presence of DPs, intentionally incorporated into VGs by developers to influence players' choices [11]. Gray et al. [12] observed some instances of DPs in VGs, albeit in a broader context. Similarly, Zagal et al. [13] identified seven types of DPs in VGs, focusing on time, money, and social capital. Aagard et al. [14] conducted a qualitative study on DPs in mobile VGs but found limited participant knowledge, leading to discussions on only eight types of DP. Despite these efforts, there remains a lack of systematic investigation into DPs within the realm of VGs.

To address this gap, we conducted an exploratory study analyzing 500 online reviews of 34 popular VGs from the Google Play Store and Apple App Store. By categorizing DPs identified in the literature and observing 35 DPs in the sample reviews, we shed light on their presence in VGs. Additionally, we discuss privacy concerns associated with these DPs and propose avenues for further research in this domain.

2. Exploratory Analyses

We collected reviews from both stores, focusing on the most popular VGs in January 2023, selecting the top six VGs from each store's top free, grossing, and paid categories, resulting in 34 VGs. After identifying the trending VGs, we collected the most recent 15 reviews for each game, excluding duplicates resulting in a total corpus of 500 English reviews. We manually analyzed reviews against established categories of DPs [7], [12], [13], [15], [16], [17], [18], adapted based on the context of VGs, and labeled with applicable DP categories, considering that some reviews focused on specific aspects while others provided an overall perspective, resulting in some reviews being labeled with multiple DPs. In our findings, presented in Appendix A and B, we identified and summarized 35 types of DPs across the 34 trending VGs, observing instances where one DP reinforces another within VGs and categorizing privacy-breaching DPs into First and Second Derivative Privacy DPs. We noted that different VGs implement the same DPs in varied ways, posing challenges for both VG players and researchers, with disparities between platforms evident, possibly stemming from platform-specific restrictions or competitive strategies. Additionally, reviews suggested a self-fulfilling cycle of DPs, highlighting the normalization and entrenchment of these patterns within VG ecosystems.

3. Gaps and Future Research Directions

The analyses underscore the need to broaden the research on DPs in VGs across various gaming platforms, to capture a more comprehensive picture with the need for increased player awareness regarding DPs in VGs. Future research should explore methods of informing players about DP tactics and develop scalable detection mechanisms to identify DPs within VGs, complicated by the diverse development languages and platforms utilized, as well as the prevalence of third-party APIs potentially harboring DPs [19]. Regulatory intervention is deemed necessary to address the proliferation of DPs in VGs, as self-regulation by industry giants is deemed insufficient due to inherent conflicts of interest [17]. Bills proposed like the DETOUR Act aim to combat DPs, but their efficacy in addressing the multifaceted challenges posed by DPs in VGs remains uncertain. Beyond monetary concerns, our study advocates examining broader implications on privacy, mental health, and well-being, as seen in instances of addictive gameplay and privacy breaches within VGs.

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Appendix A - Identified DPs Groupings

TABLE 1. GRANULAR GROUPING OF DPs BASED ON THEIR CATEGORIES

| DP Categories | DP Types |
|---------------|-----------------------------|
| Monetary | Currency Confusion |
| | Hidden Cost |
| | Loot Boxes |
| | Monetized Rivalries |
| | Pay-to-skip |
| | Pre-delivered Content |
| | Pressured Selling |
| | Price Comparison Prevention |
| | Pseudo Currency |
| | Waste Aversion |
| Temporal | Countdown Timers |
| | Deceptive Countdown Timers |
| | Grinding |
| | Play-by-Appointment |
| Psychology | Bad Defaults |
| | Bait-&-Switch |
| | Confirmshaming |
| | Disguised Ads |
| | Fake Notification |
| | False Hierarchy |
| | Infinite Scroll |
| | Toying-with-emotions |
| | Trick Questions |
| | Visual Interference |
| Privacy | Deceiving Privacy |
| | Forced Action |
| Coerce | Forced Registration |
| | Obstruction |
| Social | Friend Spam |
| | Shadow User Profile |
| Miscellaneous | Gamification |
| | Misdirection |
| | Nagging |

TABLE 2. GROUPING OF DP TYPES BASED ON PRIVACY DERIVATIVE

| Privacy DPs Derivative | DP Types |
|------------------------|-----------------------------|
| First | Forced Action |
| | Forced Registration |
| | Friend Spam |
| | Hidden Information |
| | Pressured Selling |
| | Price Comparison Prevention |
| | Shadow User Profile |
| Second | Trick Questions |
| | Hidden Cost |
| | Pre-delivered Content |

Appendix B - DPs, Definitions, and Examples

TABLE 3. DPs ALONG WITH THEIR DEFINITIONS AND ILLUSTRATIVE EXAMPLES IDENTIFIED FROM REVIEWS IN TRENDING 34 VGS

| Types of DPs | Definitions | Illustrative Examples from Reviews |
|-----------------------------------|--|---|
| <i>Bad Defaults</i> | When VGs are intentionally left with bad defaults to leverage the required player's effort in changing them | To fix crashing of VG on devices, player has to navigate through files and remove XBL file |
| <i>Bait-&-Switch</i> | Fools player into making player think that player is going to do one thing but player ends up doing something different | Players were shown 'X' button to close the Ads, however, when players press button, players are directed to/ended up in App store |
| <i>Confirmshaming</i> | VG elements which made players guilty about opting (or not) for something | Prompt players with Ads stating buy it to support community |
| <i>Countdown Timers</i> | Dynamic timers indicating the deadline of level or task in VG, which steer player in making extra effort and spending additional time in VG to finish task | The purchases of vehicles and challenges were showcased as a requirement for the fifth set of buildings which was coming soon, however, when the player completed the requirements by playing VG continuously, VG still kept on showing coming soon |
| <i>Currency Confusion</i> | Force players to convert real money to in-game currency to make in-app purchase | Player has to get 1000 in-game coins in exchange for real money \$2.27. After that, a player was able to buy extra moves |
| <i>Deceiving Privacy</i> | Collect data of which player is not aware of or has refused to provide | Captured a screen recording without player being informed |
| <i>Deceptive Countdown Timers</i> | Mislead players in believing that they have failed to finish the level in a given time, when in reality they have not | Player complained about having clocks and timers reset, right after timers start (even when the time was not over), to zero and they have to start the level from the scratch |
| <i>Disguised Ads</i> | Ads are disguised with VG's elements, e.g., buttons | Pressing every other button by players, plays an Ad in Parking Jam 3D VG |
| <i>Fake Notification</i> | Sends fake notifications to player to keep player checking the notifications or VG | Player got a notification to put the character to sleep whereas, player has already put the character to sleep five hours ago and was not even playing the VG at that moment |
| <i>False Hierarchy</i> | Situations where options are set in hierarchy (to give visual importance to some options) whereas they should be provided to player in parallel | Player expressed concern when player struggled to navigate icons because of the order in which they were presented in the toolbar |
| <i>Forced Action</i> | Players are forced to perform certain actions | Player has shared experiences where a player was forced to watch an Ad after every few seconds |
| <i>Forced Registration</i> | Withholding VG functionalities until player register to the VG account, however functionalities would work w/o registration | Players were forced to have Minecraft accounts to play multiplayer with random people |
| <i>Friend Spam</i> | VG spams player's social network or other accounts on social media | Players has been spammed with strangers' friend requests. In some cases, a VG has accepted friend requests without the player consents |
| <i>Gamification</i> | Make player to complete certain actions to gain something | To advance game accessories and items, players have to watch Ads |
| <i>Grinding</i> | Practice which forces player into spending time needlessly to extend the duration of VG | From reviews it is observed that players are provided with either over simplistic or impossible or dull or repetitive levels to extend VG's duration |
| <i>Hidden Cost</i> | Additional costs charged to players, which players find out in later processes or stages or levels | A player explicitly bought the English monopoly board but later found that the player was charged \$5.70 which included the cost of all the monopoly boards available in different languages |
| <i>Hidden Information</i> | Information or options relevant to player are made readily available to player | Player has to go back to the list of cities, scroll down the correct cities and only then player was able to navigate achievements |
| <i>Infinite Scroll</i> | It makes the player addicted to the content of the VG | Player became addicted to the VG such that the player suffered from the mental breakdown and panic attacks when the player was not able to play the VG game |
| <i>Loot Boxes</i> | Practice where players have exchange real money to get random in-game items | Players must have to acquire loot boxes to unlock items |
| <i>Misdirection</i> | Make players focus on one thing to distract players from certain information which benefits developers | Players have to build a tower (another game) in Parking Jam (main game) which is not even related to the main game. Thus, to engage players unnecessarily with the aim to extend gameplay time |
| <i>Monetized Rivalries</i> | Exploit player competitive behavior and encourage player to spend money, to achieve in-game status, which player otherwise would not has | Player got competitive against player's friends, such that player has started to spend \$25.39 daily on a VG |
| <i>Nagging</i> | Consistently ask players for the same action | Player has been bombarded with pop-ups related to buying spins, when a player run out of spins |
| <i>Obstruction</i> | It makes it impossible for a player to get out of the process in VG, because either it takes too much effort or is complicated | Whenever a player run spins, a player has to go through the process of pressing the 'X' button in the corner of the pop-ups, prompted one after another many times |

| | | |
|------------------------------------|---|---|
| <i>Pay-to-skip</i> | Solutions to challenges are provided by spending money | player encountered levels which were impossible and was asked to buy moves which solved those levels |
| <i>Play-by-Appointment</i> | Force player to play at specified times only | Player was not allowed to compete in weekly challenges because player was assigned to collect 13 skins which player already completed before the assignment |
| <i>Pre-delivered Content</i> | When player pays an additional fee only then certain functionalities of VG are available, though those functionalities were included in the price of purchased VG | Player paid \$25.39 for the VIP level after registering an account, whereas, with \$12.69 spent on a guest account, player was already on the VIP level |
| <i>Pre-selection</i> | Situation where developers have either set an option as default or made choices wishing the player to choose. These options or choices are against the interest of players and lead to various consequences | Player expressed that player was not given a choice of what a player wished to play and was pushed to play a certain mode, otherwise a player would lose points and get penalized |
| <i>Pressured Selling</i> | High-pressure tactics to steer player into buying expensive VG items | When a player has to sell team players, the player has been low balled whereas, at the same time, when a player has to buy team players it is 3-5 times high value |
| <i>Price Comparison Prevention</i> | Based on each player's level of interaction, developers give different prices or offers to each player in VG | One player was asked to pay the money to unlock one of the hero, while in the same VG, another player was offered to unlock the same hero in exchange for diamonds and gold boxes earned from completing the task list |
| <i>Pseudo Currency</i> | When a player is unaware of how much a player has spent because player forgot its real currency | Player kept on paying for 50 lives in each level to win the levels without realizing that the player ends up paying \$25.39 |
| <i>Shadow User Profile</i> | Utilizing bandwagon effect to influence players decisions and choices | Players got more involved in VG because players were shown the activity of their friends players, e.g., last online when they went offline, their achievements, etc. |
| <i>Toying-with-emotions</i> | Situation where VGs influence players' emotions to manipulate a player about critical information or choices | A player expressed that player started playing Pou back in 2013 and Pou has now grown up. However, the player is so emotionally attached that though VG has already finished, a player still has VG remain installed on a device and occasionally checks Pou |
| <i>Trick Questions</i> | Trick players when have shallow attention with the wording or VG's elements | Making normal difficulty mode less visible to trick and made players play modes which require money to unlock packs |
| <i>Visual Interference</i> | When VGs use a visual style for options such that player gets influenced into opting for certain options over others or placement of options making it difficult for player to interact with VG | Player highlighted that a button to look back at the previous move and the button to confirm the current move both are placed in the same place, thus making it difficult to play because the back button was pressed accidentally every time instead of the current one. Thus, this leads to a waste of time as player has to set the move again and again |
| <i>Waste Aversion</i> | Situations when VGs forces to upgrade in-game items or a small amount of purchased in-game items are left and can not be used for next level | Player paid for 5 (as a default) moves to finish the hard level but only one move was required and end up paying for extra 4 unused moves |