“Wow another fake game from YouTube ad”: Unpacking Fake Games Through a Mixed-Methods Investigation

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Mobile games have become highly popular and profitable. While much work has been done to understand deceptive patterns of games and some unethical practices they apply, little is known about fake games, an emergent phenomenon in mobile gaming. To answer this question, we conducted two studies: a walkthrough method to characterize fake games, and a thematic analysis of user reviews to gain understanding from the user perspective. We found five types of misalignments that render a game fake and identified four primary facets of player experience with fake games. These misalignments act as realization points in the users' decision-making to define games as being fake. We discuss the fakeness of fake games, how the formation of an ecosystem helps with the circulation of fakeness, as well as challenges to governing fake games. Lastly, we propose implications for research and design on how to mitigate and identify fake games.

CCS Concepts: • **Human-centered computing → Human computer interaction (HCI) → Empirical studies in HCI**

Additional Key Words and Phrases: Fake games; mobile games; mobile game industry; deceptive patterns; player experience; free-to-play; game walkthrough; user reviews

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1 INTRODUCTION

In recent years, the mobile gaming industry has experienced a significant surge in popularity and revenue. In 2023, the mobile games market is projected to generate a revenue of US $89.25bn worldwide [122], surpassing console and computer games [82]. Particularly, free-to-play (F2P) mobile games have become a dominant category that seek to monetize through optional functions or features [37, 66] like in-game purchases and loot boxes [5, 20]. However, many titles in F2P mobile games have also been widely reported to be associated with the application and proliferation of deceptive design to promote and monetize their games [13, 38] and, recently, fake games [68].

Given the newness of the fake game phenomenon, there is a lack of academic discussion on what is or constitutes fake game. Thus, in this study, we start with a working definition of fake games as unfinished and undeveloped games that rely on advertising and social media platforms to evolve

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and become profitable. Later in the paper, we will be able to revisit the definition. Fake games employ deceptive strategies in both game design and in promotion and marketing strategies for player acquisition and retention. For example, in September 2020, the UK Advertising Standards Authority (ASA) ruled that Playrix, a mobile developer, had used misleading advertising for their games Homescapes and Gardenscapes, as the advertising did not represent actual game content [105]. The report also noted that promised features and main narrations in the advertising, such as "How to loot?" or "Pulling the pin," do not exist in the game. In the US, the Federal Trade Commission (FTC) reported that Tapjoy, Inc., a California-based mobile advertising company, settled allegations of not providing promised in-game rewards after users completed offers. The FTC mandated Tapjoy to prevent misleading users and to monitor its advertisers, with each violation potentially incurring a civil penalty exceeding $40,000 [110].

The phenomenon of fake games resonates with the existing scholarship on deceptive game design practices in HCI. Deceptive patterns have long been associated with shopping websites [69], social media platforms [76], social media games [34], privacy consent mechanisms [35], and with video games [26, 117]. In video game studies, deceptive game design has been studied in different domains and in different aspects, such as virtual currencies and gambling mechanisms like loot boxes in video games [13], time-limited events, offers, and promotions, which associated with fear of missing out [36], impulsive spending [47], and pay-to-win mechanisms [28]. These techniques are described as predatory, problematic, or unlawful monetization [6, 69].

However, there are also noticeable differences between fake games and deceptive game design practices. For example, while deceptive patterns exist mostly within the game environment [54, 117], fake games involve not only the game but also the marketing and promotion strategies outside of the game. In addition, while deceptive game designs have been observed in a wide range of games [26, 52, 54], fake games are often associated with F2P mobile games, to our best knowledge. To date, there appears to be only one study that points to the phenomenon of 'Fake-Vertising' in mobile gaming [68], which links the fakeness of games to false advertising, discussed from a media and communication perspective. To our best knowledge, this study is among the first to focus on fake games from the HCI perspective. Thus, the goal of our research is to explore fake games to understand the characteristics of fake games and how fake games impact players. Specifically, we ask two research questions:

RQ1: What are the characteristics of fake games?

RQ2: How do players experience fake games?

In order to answer both RQs, a three-step methodology has been adopted to collect and analyze fake games. We systematically collected titles of games perceived as fake by users, employed a walkthrough method [60] to answer RQ1, and analyzed user reviews from the App Store and Google Play to answer RQ2. We found that fake games are characterized by a misalignment between the games' envisioned experiences for users and how the games are actually played. We discovered that misalignment happens across different dimensions, from gameplay to rules and narrations. Our analysis of user reviews also revealed users experience fake games as a dynamic journey rather than a static phase. Players start engaged, but as they invest more time, they recognize the game's deceitful aspects. This realization often results in a profound change in their interaction with and perception of the game, impacting their trust and the effort they have invested.

Our contributions to HCI and game studies are multi-fold: First, our study is among the first to investigate and characterize fake games as a new emergent industry practice within mobile gaming. Second, we provide a comprehensive empirical account of how users experience fake games. Third, we provide conceptual insights into the realness and fakeness of games by analyzing fake games.

2 BACKGROUND

Fake games are often found in the booming mobile game industry, where mobile game advertisements are now commonly drawing players in with bold CGI animations or depictions of an innovative game mechanic or gameplay, only to provide an experience (or even genre of game) completely different from what was advertised [41]. This strategy has been employed not only as a development strategy but also as a business tactic. Despite criticism from players and media reports for misleading advertising [27], some games continue to gain in revenue surpassing 100 million downloads on mobile app stores like Google Play. Notable examples include Gardenscapes and Homescapes, which are heavily criticized for their mismatch between ads and gameplay [105].

Figure 1. A comparison between advertised game for Gardenscapes (right) and the actual gameplay, demonstrating a 'match three' gameplay (left). Source: Advertising Standards Authority (ASA) [7, 105].

The widespread practice of misleading advertising in mobile games often results in a significant mismatch between the advertised content and the actual gameplay experience. For example, in Gardenscapes (Figure 1, right side), it advertises an interactive role-playing style of gameplay, but the actual gameplay is a puzzle game. Video ads that showcase gameplay different from the real game are considered fake [67]. These ads often exaggerate the game's graphics, making them appear more realistic than they actually are. Advertisers sometimes use catchy headlines and visually appealing footage to grab attention, while others resort to oversexualizing the content to prompt viewer action. Numerous mobile game ads employ sexualized imagery or bizarre scenarios. In some instances, companies even use footage from other, more sophisticated games, falsely presenting it as their own. Additionally, certain ads acknowledge their sleaziness, and some companies specifically target children with their advertising strategies [87].

The rationale behind mobile gaming companies using fake ads can be attributed to the effectiveness and profitability of such advertising strategies [72]. Surprisingly, the most effective ad creatives often yield unexpected results. These practices can be traced back to the hyper-casual segment of mobile gaming, where the predominant business model is akin to 'throwing at the wall to see if it sticks [89].' Furthermore, it has been revealed that, unlike traditional fake game practices targeting children and young players, these digital deceptive practices have expanded their target audience to include mid-aged players, who typically fall under the category of casual gamers [25].

3 RELATED WORK

In this section, we first discuss the notions of realness and fakeness in the game literature, and then review extant research on deceptive patterns studied in HCI and games to provide an overview of previous and existing industry practices, and, finally, review studies of mobile game advertising to provide a landscape of perspectives from a promotional standpoint.

3.1 The Realness and Fakeness of Games

Rather than narrowly defining fake games in relation to existing game definitions to identify their characteristics, Consalvo and Paul [17] suggest a framework for understanding 'not real' games. This understanding can be gleaned by observing when a game's 'gameness' is questioned, challenged, mocked, or even rejected. Consalvo and Paul [16, 17] propose that 'not real' games can be characterized by four elements: (1) the emergence of new gaming formats, such as Facebook games; (2) an obscure or unclear developer or company behind a title; (3) the presence of certain elements in the game or doubts regarding its design, perceived difficulty, or length, which suggest underdevelopment; (4) specific patterns in a game's business model, for example, free-to-play.

Extending the discussed four elements, Hjorth and Richardson's study [123] observed that casual mobile games are often dismissed as "not real" games by players, regarded merely as distractions to pass time. This reflects a gaming hierarchy where traditional, more skill-intensive console or PC games are seen as legitimate, while casual mobile gaming is undervalued despite its widespread popularity. In addition, Paavilainen et al. [84] reported that participants with a background in traditional video gaming often considered social games as overly simplistic and repetitive, akin to toys rather than "real games." These players drew a clear distinction between social games and traditional video games, which they felt were backed by more extensive development cycles and larger companies, offering a richer, more immersive experience. There are some similarities and overlaps between our understanding of fake games and 'not real' games. They both are characterized as being underdeveloped, associated with their business model, i.e., F2P, and emerging on mobile platforms. However, 'not real' games do not describe the negative aspects of fake games, nor the potential negatives on the players, which is fakeness.

Fakeness has been a part of the gaming community, and can be considered synonymous with inauthenticity [39]. An area that studies 'not real' games and closely examines fakeness is when a game is designed not to serve for gaming, but rather as a medium for fraudulent activity, like collecting users' data [88] or types of games like play-to-earn (P2E) [102]. In P2E games, often structured on the blockchain system, players can earn tokens or rewards for their gameplay, which can be converted into real money [19]. In this context, fakeness is more associated with scams, in the sense that players do not receive rewards after spending excessive time playing those games. This issue has also been brought to the attention of the US Federal Bureau of Investigation (FBI), which warns of the existence of fake gaming apps that have stolen millions of dollars in cryptocurrency [45]. Researchers have categorized these behaviors under several types of harm [97], such as 'backdoor,' where the game is used to gain a high level of or complete access to resources by bypassing normal security measures. In some cases, players not only suffer financial loss but also receive Trojan malware upon installing the fake games [48]. For example, more than 500,000 users were tricked into downloading what were purported to be a mix of luxury car and truck simulation games on Google Play, only to find out they were actually viruses [10].

Fakeness has also been associated with the phenomenon of 'squatters,' i.e., when a game imitates a popular title and tricks users into downloading the fake version instead of the authentic one. For example, a study demonstrated that Angry Birds had 616 fake game versions on Google Play, and Clash of Clans had 1113 [42].

A less explored and newly emergent type of fakeness association is when fake becomes a part of game promotion and uses fake creative in advertising, essentially depicting gameplay footage [68]. This trait of fakeness places closely to our working definition of fake games and in the next sections, we focus more on the deceptive patterns in advertising to better situate our research quest.

There has been a growing interest within HCI and game studies to understand the perception of authenticity in games. However, fake games have not received adequate attention. Therefore, our study aims to address this gap.

3.2 Games and Deceptive Patterns

The phenomenon of fake games, particularly its deceptive nature, echoes research on deceptive patterns (also known as dark patterns), an area of research in both HCI and game studies. Harry Brignull [11] first proposed the idea of ethically dubious design approaches, defining deceptive patterns as intentionally constructed user interfaces that mislead users into taking actions they might not have intended to. These designs are not accidental but are developed based on a thorough understanding of human psychology and are typically created without considering the best interests of the user [12, 34]. Brignull categorized deceptive patterns, which were later reorganized and expanded by Gray et al. [34]. Different classifications have been proposed to study deceptive patterns like misleading, seductive, trickery, or manipulative, each with nuances in their characteristics and effect on users [70].

Deceptive patterns have attracted much attention from the HCI community, and scholars have investigated deceptive patterns in different contexts like social media services [77], shopping websites and e-commerce [69], mobile applications [20], privacy settings [121], and internet of things (IoT) [59]. For example, Wu et al. [112] investigated deceptive patterns in livestream e-commerce, focusing on platforms Alibaba's Taobao and ByteDance's TikTok and they highlighted how platform designs enhance deceptive practices and explored viewers' perceptions and reactions to these strategies. In an empirically similar example, Gray et al. [33] explored how manipulative designs affect users' experiences and emotions which revealed users identify manipulation through aspects like distrust, privacy concerns, data tracking, security threats, explicit manipulation tactics, and freemium product models.

The interest and studies around deceptive patterns have also sparked interest in games. One of the earliest studies of deceptive patterns in games proposed by Zagal et al. [117] describes it as intentional patterns that cause negative player experiences contrary to players' best interests, and likely to occur without their informed consent. They illustrated three categories of depictive patterns: (1) Temporal, which deceive players regarding the amount of time required to play or progress in a game. (2) Monetary, involving patterns that trick players into spending more money than anticipated. And (3) Social capital-based, which risk players' social capital, loosely defined as the value of their social standing and relationships. Research has been conducted to focus on different aspects of games and closely examining them tied to deceptive patterns, like the in-game microtransaction system [36], free-to-play (F2P) games [6], or three-dimensional gameplay [54]. Research focusing on mobile games found a lack of communication within the industry, particularly in the hyper-casual game sector, where rapid development cycles and data-driven designs prevail [1]. There have also been studies focusing on free-to-play games to analyze in-game advertising and purchasing with a focus on children. These highlighted how deceptive patterns have been applied in the monetization strategies [26].

Fake games represent a distinct category within the discourse on deceptive patterns in gaming. Unlike traditional analyses, which concentrate on deceptive elements confined within gameplay, the concept of fake games expands this scope. It encompasses a broader range of deceptive practices that span across various platforms, including game marketplaces, advertising on social media, and the gaming environment itself. Our research offers insights into the multi-platform nature of deceptive patterns by delving into the study of fake games.

3.3 Games, Marketing, and Misalignments

In late 2022, approximately half a million mobile games were available on the Google Play Store [29]. Thus, it is reasonable to assume that marketing is a vital component for acquiring new players in the saturated mobile game market [68]. This tight competition and willingness to survive have demonstrated some unethical and, in some cases, non-complying practices of promoting the game in a deceptive manner.

Mobile marketing refers to all promotional activities targeting consumers via mobile channels [92]. The integration between mobile games and advertising falls into three categories: (1) in-game advertising, (2) external advertising of games, and (3) cross-promotions. The first type of integration is in-game advertising (IGA), defined as integrating products or brands within a digital game [104]. Advergames, unlike in-game advertising (IGA), are games created specifically to promote a brand, product, service, or idea, aiming to enhance brand image and drive website traffic [104]. These games, which are often casual and accessible, are designed to be engaging and providing quick rewards, and can be played in short bursts on devices like tablets and smartphones, making them ideal for filling brief downtimes throughout the day.

The second integration between mobile games and advertising occurs when game companies promote their games on other platforms like Instagram, Facebook, and TikTok [57]. Studies showed how three large mobile game companies, Rovio, Zynga, and King, grew their titles by having external advertising on social media [61]. This type of advertising involves integrating brands or products into games available on major social networks, like Facebook. Players are drawn to social network gaming for various reasons, including social interaction, relationship building, teamwork or competitive play, role-play identity, and escapism from reality [104, 115].

The third strategy is cross-promotion, aimed at retaining users within a company's game portfolio. This approach involves using established titles to advertise newer games, particularly if a recent release is experiencing high churn rates. By showcasing ads for the new game within existing successful ones, developers can encourage players to try out their latest offerings [96].

Determining whether an advertisement is misleading remains a contentious and challenging issue, with disagreements among advertisers, consumer advocates, and researchers regarding a universally accepted definition and identification method [58]. Researchers introduced and tested an empirically-based procedure for identifying misleading advertising, defining it as "if it creates, increases, or exploits a false belief about expected product performance" [91].

Within the intersection of advertising and HCI, there have also been studies on advertising legitimacy and social media advertising and their impact on users. Studies have delved into the risks of manipulative advertising in Extended Reality (XR), highlighting issues like misleading marketing and emotional manipulation tactics that target vulnerable users [75]. The quest for transparency in advertising algorithms revealed a preference for straightforward disclosures, noting that while clarity is desired, it can also lead to a critical view of algorithmic accuracy [23]. The development of tools like AdIntuition aims to unmask undisclosed advertisements on social media platforms, offering strategies for more honest content presentation [99]. Additionally, research into digital interfaces has identified 'attention capture damaging patterns' (ACDPs), pushing for a typology to guide technologists and policymakers in protecting users from psychological exploits [80]. Persuasive tactics in advertising emails have been found to frustrate users, triggering a call for more ethical advertising practices that respect user agency [95].

While marketing and promotion have been interests of study in HCI, focusing on social media, the effects of deceptive advertising and its impact on players in the context of gaming have not been

explored before. Our study contributes in this way by providing and opening up more discussion at the intersection of HCI, gaming, and advertising.

4 METHODS

Our methodology includes three key steps. First, we collected fake game titles in a systematic process (4.1). Second, to address RQ1 (4.2), 'What are the characteristics of fake games?' we utilized the walkthrough method of applications [64], which is suitable for delving into the game's structure and the ways it interacts with and influences the player's journey [64]. Third, to answer RQ2 (4.3), 'How do players experience fake games?' we collected and analyzed user reviews on the App Store and Google Play. Next, we detail these steps.

As the definition and initial understanding of a fake game are central to the study design, it is important to mention that the working definition we started with is tentative and composed of online articles, news media coverage of policy entities like the FTC and ASA, as discussed earlier, and the authors' interaction with the phenomenon. The definition will be developed as the research progresses, and we will revisit the fake game definition in the discussion section to reflect on how it has evolved.

4.1 Identifying and Collecting Fake Games

Given the underexplored state of fake games and the lack of existing documentation, we first needed to deal with the methodological challenge of developing a robust, systematic, replicable, and reproducible method to identify fake games. With the aim of minimizing bias in the selection of games to study and to avoid self-selection of game titles, we opted for a crowdsourcing approach to tap into the wisdom of the crowd. We examined various data collection methods common in the HCI field, including experiments, surveys, and interviews. However, each presented limitations: interviews could be challenging due to the unfamiliarity of the 'fake game' concept among participants; surveys were unsuitable given our limited knowledge of the phenomenon; and lab experiments lacked ecological validity. Therefore, we turned to mass data collection methods such as data scraping, log analysis, data capturing, and tracking, which offer comprehensive and scalable ways to gather large datasets from real-world interactions. We chose to focus on social media platforms due to their crucial role in the promotion and distribution of fake games. Twitter, in particular, was selected for its open data accessibility and the ability to track how these games are marketed and discussed. Other platforms like Facebook and YouTube were considered but posed challenges such as privacy settings, closed groups, and the difficulty of systematically categorizing user-generated content.

Specifically, we used Community Notes [15], a crowd report function on X (formerly Twitter), which allows users to identify information in Tweets they believe is misleading and write notes that provide informative context [111] (for more information see Appendix A). We considered Twitter's Community Notes the most suitable data source for this study for several reasons:

- First, the entire dataset is open-sourced and available with all the metadata, including removed Tweets, is on the official website with monthly updates. It was especially important for us to have access to the removed content as game companies remove their posts if they receive Community Notes fact-checks under their posts, which are still accessible through the Twitter database.
- Second, as of now, Twitter is one of the few social media platforms that allow crowdsourced content moderation and flagging adverting content posted by the companies' official account using their provided tool thus matches the scopes of this study in collecting mobiles games

titles for further analysis in a transparent matter. We valued a crowdsourced approach and given that the algorithms regarding how the posted flags are being displayed and how users find the additional explanations helpful made it a right fit for our research. Other platforms like Reddit have not further published how their algorithms regarding upvote/downvote, and their sorting tools like "Hot" work.

Table 1. List of identified mobile games from Twitter Community Notes that were flagged as fake by the community.

Games title	Downloads/ Reviews		Age restriction		Release date	Developer
	App Store (iOS)	Google Store (Android)	iOS	Android		
Block Blast [G7]	250k+	100m+ 200k+	+12	(E)Everyone	2022	Hungry Studio
City Of Crime Gang Wars [G3]	15k+	10m+ 250k+	17+	M (17+)	2022	FingerFun Limited.
Dragonscapes Adventure [G2]	55k+	10m+ 600k+	4+	E	2020	Century Games
Dungeon Hunter 6 [G6]	10k+	1m+ 30k+	12+	T	2023	GOAT Games
Evony: The King's Return [G15]	115k+	100m+ 650k+	12+	E (10+)	2016	Top Games
Fishdom [G11]	1m+	100m + 6m+	+4	E	2016	Playrix
Gold and Goblins: Idle Merge [G1]	25k+	10m+ 350k+	+4	E	2020	AppQuantum
Hero Wars [G10]	150k+	100m+ 1.6m+	+12	T	2017	NEXTERS
Hustle Castle [G8]	40k+	50m+ 1.4m+	+9	E (10+)	2017	MY.GAMES B.V.
Idle Lumber Empire [G5]	75 k+	50m+ 900k+	+12	E	2021	Game Veterans
Stormshot [G4]	20k+	10m+ 150k+	+12	T	2022	FunPlus International
Top War Battle [G13]	110k+	50m+ 700K+	+10	E (10+)	2020	River Game
Total Battle: War Strategy [G14]	15k+	10m+ 100k+	+9	E (10+)	2018	Scorewarrior
Township [G12]	1.3m+	100m+ 10m+	+4	E	2013	Playrix
War Robots Multiplayer Battles [G9]	500k+	100m+ 4.5m+	+12	E (10+)	2015	MY.GAMES B.V.

- Third, researchers have made a case for the participation of non-experts, such as users of platforms, in the assessment of content that could be deceptive [4, 53, 86]. This approach resonates with Lévy's principles of collective intelligence, which emphasize the value of harnessing the knowledge and insights of a diverse group of individuals to solve problems and make decisions [63]. By leveraging the collective input of platform users, who can provide real-time feedback and flag deceptive content, we can enhance the accuracy and reliability of content assessment.

To systematically collect titles of mobile games flagged as fake, we downloaded the public database from Twitter's official website and analyzed the notes associated with flagged tweets following the PRISMA methodology. While PRISMA is widely used in literature reviews and meta-analyses, they have also been proven to be well-equipped methods in video games research for collecting and analyzing games [14, 108] or corpus of games [2] with specific inclusion criteria. As outlined by the PRISMA method [124], we followed four stages: identification, screening, eligibility, and inclusion, to identify a total of 15 fake games. For more PRISMA details, see Appendix B. Table 1 is the list of identified games, along with their information on the mobile game market.

4.2 Study 1: The Walkthrough Method Data Collection and Data Analysis

This study utilizes a method similar to the application walkthrough method [64], which has been employed by previous HCI studies to examine the identified games. The application walkthrough method has been applied within the gaming community to investigate manipulative mechanisms like loot boxes [71], problematic monetization strategies[6], and the dynamics of battle passes [49].

We chose this method because the steps in the proposed application walkthrough method, including Vision, Business Model, and Governance, reveal layers beneath the surface and "moves beyond identifying user deviations from the designer's original vision (e.g. choosing not to complete certain profile fields) to recognizing user-led activities, artefacts or services associated with the app" (p. 895) [64:895]. This method is well-suited for answering our research question regarding the characteristics of fake games, as they have not been categorized and studied before. They require meticulous and intense scrutiny through expert evaluation to better understand why they are labeled as misleading. Finally, this method allows for an in-depth interaction with the game elements and a detailed comparison between the actual gameplay after downloading and the way the games are presented by the company.

The walkthrough method involves "stepping through the app incorporates elements of ethnography through observation and generating field notes" (p. 887) [64:887]. Following this doctrine, we collected our data through session notes and organized it into a codebook with separate sections for observations on promotional materials and game interactions, which was crucial for analyzing content given the variability in gaming experiences. For each of the identified games, individual data collection sessions were conducted to collect any data regarding the environment of expected use, i.e., vision, operation model, and governance, which lasted at least 90 minutes for each game. This duration is considered sufficient to mimic the initial consumer experience, given the average daily engagement of approximately 8 minutes, or rather 48 hours per year [6, 119].

Each session's workflow consisted of the first author downloading the games on two separate devices, an iPhone 14 for the iOS version and a Pixel 5a for the Android version, to compare them closely with their advertising videos and their official materials, including their description, game thumbnail, screenshots, and official trailer on both Google Play and the App Store. We obtained advertising clips from community notes that shared a link to an online video. We also searched each game title in the open Meta Ad Library [73] for up to one year for comparison. The one-year period was set to ensure the advertising is still relevant and best represents the latest version of the game.

The Meta Ad Library was selected over several other options for several reasons: (1) The Meta Ad Library has advanced sorting and filtering features, and supports detailed searches for branded content on Facebook and Instagram; and filters by app and date are available for Facebook, Instagram, and Messenger [74]. (2) The TikTok Ad Library lacks U.S.-based ads; and (3) the Google Ad Library has limited search functions.

Each session also entailed creating or logging into a game account, thoroughly reviewing in-game content, and playing available modes. The gameplay was then compared against its advertising to identify discrepancies. The researcher revisited both the game and its ads to annotate any unrepresented features or misalignments. Lastly, a detailed comparison between these annotations and the game was made to document differences.

To analyze the walkthrough data, we adopted a form of content analysis tailored for video games [94], which mitigates these challenges and provides some guidelines on how to code data that has been utilized in game studies before [71]. The two authors held meetings to discuss the codes and often returned to the games to further refine and study the misalignments as needed. This iterative process lasted until we reached an agreement on the emergent codes to explain all the different misalignments between the real game interactions and the promotional materials.

4.3 Study 2: Game User Reviews Data Collection and Data Analysis

Since this walkthrough method does not engage with user content, authors of the walkthrough methodology suggests that "researchers can pair it with data collection techniques that query APIs or conduct close readings of user data samples" (p. 896) [64]. We recognize that the walkthrough method offers benefits for understanding user interactions at the interface level, but falls short of revealing users' *in-the-wild* experiences. Thus, we designed a second study to reveal how users experience these games through the analysis of user review data. User reviews provide multifaceted insights, including design enhancement suggestions, conjectures on developers' aims, and player experience [118]. Examining these reviews reveals a broad range of player interactions and reactions, which have been utilized in indie game creation [106], addressing privacy concerns in free-to-play games [93], and enhancing games with potential therapeutic functions [85].

For each identified mobile game, we downloaded all reviews on both Google Play and the App Store using a custom Python script scraper, totaling 2,479,292, (1,832,390 from Google Play and 646,902 from App Store) reviews across 15 games. We utilized an open-source scraper for each respective marketplace, Google Play [78] and the App Store [65]. As identified by another study [21], while it was possible to scrape all user reviews available on Google Play, permissions and rate limits only allowed us to scrape a limited number of reviews from the Apple App Store. Therefore, we analyzed fewer reviews from the App Store than from Google Play.

We applied several criteria to screen relevant reviews as follows: 1) Reviews containing 200 or more characters were included because longer reviews can provide deeper insights for analysis. This character length was determined after measuring the average length of reviews from our scraped data, ensuring the inclusion of as many comprehensive reviews as possible. 2) Reviews published between December 04, 2022, and December 04, 2023. As game developers make changes and rapidly push updates with new apps and updates to existing ones, we aimed to capture the most recent user reviews. 3) Reviews written in English. 4) Reviews containing substantive justifications for their ratings (e.g., how the user experienced the game) (see [21]). Thus, we excluded reviews containing vague language, unsubstantiated absolutes (like 'best,' 'worst,' 'never again,' etc.), and unsupported general and absolute statements (e.g., 'loved this game,' 'hated this game').

We sampled 200 reviews for each game, totaling 2,589 (Hustle Castle [G8] had a total of 181 after applying the criteria). To ensure the sample representativeness, we calculated the distribution of

each rating for each game and then randomly selected 200 reviews based on the distribution rate of the respective game.

For the user review analysis, we employed an inductive thematic analysis [9]. We began by first assigning initial codes to the reviews and iteratively developed themes as analysis progressed. The first author began by reading and becoming acquainted with the game reviews. This initial step involved breaking down the reviews to assign initial codes to the expressed ideas or concerns. During the coding process, all authors held weekly meetings to discuss the appropriateness of each code in capturing the user's experience with the played games in the review dataset. An experience could be a word, a sentence, or an entire review, depending on the level of detail the user provided or how they described a feeling or situation. Afterward, the authors engaged in several rounds of coding to identify patterns, such as higher-level themes, by grouping similar codes into themes and similar themes into overarching themes. For instance, a quote '...even if I would like the current game, the fact that the developers decided to lie about their game means they can't be trusted.' was placed under the theme of Trust and Transparency, which conceptually belonged to an overarching theme, Response Pattern. For another example, '...wasted 10 minutes of my life on this fake garbage.' was categorized under the theme of 'long progress span,' and 'Looked fun, but ended up as a frustrating game,' was categorized under 'short fun span.' These two themes were then grouped with other similar themes under the overarching theme of Unfolding Realization.

5 FINDINGS

In this section, we present the findings from our study, divided into two main parts: the characteristics of fake games and the player experiences with these games. Study 1 identifies and categorizes the specific attributes and deceptive strategies employed by fake games through five themes. Study 2 explores the dynamic user journey, highlighting how players experience and respond to fake games through four themes.

5.1 Study 1 Findings: Fake Games Characteristics

Our analysis indicated a pronounced misalignment between the game's projected vision — including its purpose, intended player base, and play scenarios as depicted in the provider's materials such as descriptions, screenshots, and advertising — and the player's experience during gameplay and categorized under five themes:

5.1.1 Gameplay Disguise. Gameplay disguise refers to the extent to which gameplay in the promotional material differs from the actual gameplay. Gameplay is "playing and trying to overcome challenges" which is an interaction between the rules [50]. In gameplay disguise, advertisements often showcase game mechanics and visuals that are not found in the actual game. Specifically, game companies promote aspects that diverge from the core gameplay, often highlighting mini-games or also known as puzzle games (Figure 2). Most of the games studied offered two or more game modes. Typically, one is a building strategy mode, while the other modes consist of side puzzle games. However, the majority of promotional materials only illustrated the puzzle elements. It is only upon downloading and interacting with the game that users realize the core gameplay is different. For clarity, 'core gameplay' refers to the primary mode that serves as the game's main environment, through which players must progress to access other modes. 'Puzzle games,' in this context, are defined as secondary modes or bonus levels that require minimal interaction or are gated, with interaction contingent upon progress in the core gameplay. The misrepresentation of gameplay occurred across different dimensions including nonexistent, exaggerated, and unfinished.

Table 2. Identified characteristics of fake games through the walkthrough method.

characteristics	Gameplay Disguise	Narrative Pretense	Popular Externalization	Ruleset Distortion	Incentive Illusion
Summary	Hidden core gameplay behind puzzle games that may or may not exist.	Attempting to draw ambiguous and sometimes bizarre storytelling and level of interactivity to the game.	Projecting external recognizable elements from ell-known media to enhance a game's appeal.	Implication of rules and logics of the game that do not follow the needed and projected skillset.	Making progression and receiving reward look streamlined and without hindrance.
Games	[G1, G2, G3, G4, G5, G7, G8, G9, G10, G11, G12, G13, G14, G15]	[G1, G2, G3, G4, G5, G6, G7, G8, G10, G11, G12, G13, G14]	[G3, G4, G5, G6, G7, G8, G9, G10, G11, G12, G13, G15]	[G1, G2, G3, G4, G5, G6, G7, G10, G11, G12, G13, G14, G15]	[G1, G2, G3, G4, G5, G6, G7, G8, G10, G11, G12, G13, G14, G15]

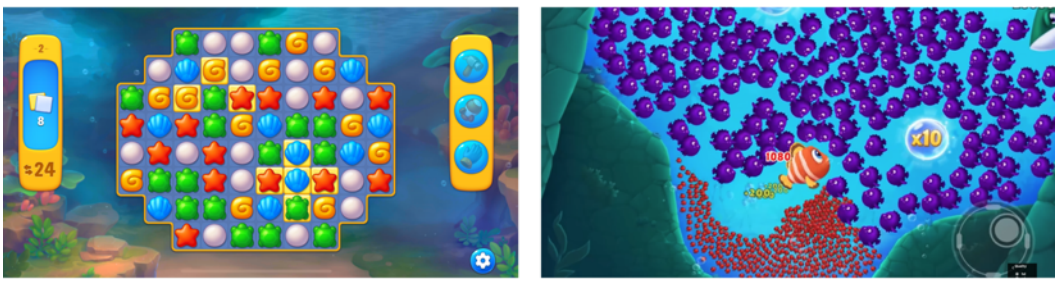

Figure 2. A gameplay disguise with nonexistent gameplay equivalent in Fishdom [G11]. On the right is the advertising clip where players control a fish and gain power by eating the fish around it, suggesting a puzzle game. On the left is the core gameplay, a 'match three' game.

Nonexistent gameplay. Nonexistent gameplay is defined as a situation where the promoted interactions in the game and the defined rules do not exist in the game, neither as a feature, game mode, nor gameplay. For example, the promotional materials for Idle Lumber Empire [G5], including the trailer on Google Play and App Store, present gameplay where players are involved in managing traffic and distributing lumber to grow their companies. This content suggests player interaction with tasks such as operating a lift truck to move logs to a lumber factory. However, such gameplay does not exist in the game, and the interactive elements are absent from the actual game mechanics. While the title suggests it is an idle game, a genre known for progressing with minimal player action [2], the promotions depict neither an idle game nor the actual gameplay present in the game. This practice has been observed in other games as well. For example, with Hero Wars [G10], the advertising demonstrates a 'Plants vs. Zombies' gameplay in one of their advertisements, which does not exist in the actual strategy battle game.

Exaggerated gameplay. Exaggerated gameplay involves presenting game elements in a way that exaggerates their presence and mechanism. Advertisements depict highly dynamic and

interactive gameplay when, in reality, the game offers a much more static experience with limited interaction. For instance, Evony [G15] is primarily known as a building strategy game, despite its 'Pull the Pin' style advertising [68] suggesting puzzle games in promotions where players can pass obstacles by adding elements like water into lava, solidifying a walkway to pass a challenge. However, such a mechanic occurs in a static and non-equivalent way. Despite spending much time advancing through the game, the game engine and simulation process remain the same, indicating that the promotional gameplay advertised has applied a high-end and professional game and physics simulation, only having an abstracted version in the game, which does not follow the same physics behavior.

Unfinished gameplay. The 'unfinished gameplay' category is characterized by player experiences of anticipated content that appears to be in development but not currently accessible within the game. In Top War [G13], for instance, there is an in-game advertisement library that includes the introduction of new gameplays, yet these features seem to remain unimplemented over time (Figure 3). Additionally, our observations of Stormshot [G4] revealed glitches within the puzzle games on both iOS and Android platforms. This could indicate that the game may have been released without comprehensive testing, resulting in a gameplay experience that feels incomplete or underdeveloped.

Figure 3. This screenshot from Top War demonstrates a section in the game where they suggest players can try out various new gameplay modes. However, clicking on them only displays recorded clips that do not exist in the game, suggesting an advertising library within the game.

5.1.2. Narrative Pretense. Narrative pretense explains misalignment between the promoted narrative and the actual game narrative. Narrative is the story that the game tells and can be a plot, the characters, the world, and the events that unfold within the game setting [46]. Narrative provides context to the gameplay; it gives meaning to the players' actions and helps to create an emotional connection with the game. Narrative pretense also happens in both emergent and embedded narratives. In the games studied, the advertised stories or narratives are often either absent or significantly different from what is presented. The studied games commonly exhibited

false narratives across two primary dimensions, including emergent narratives and embedded narratives.

Figure 4. A narrative pretense in Dragonscapes. On the left: the advertising suggests emergent and dynamic storytelling that exists in the game. On the right: The game environment lacks an equivalent plot and storytelling.

Emergent narratives. Emergent narratives offer dynamic, player-driven storytelling with minimal authorial control, evolving in real-time [60]. The concept of emergent narratives, as introduced by Ruth Aylett [5], emphasizes a character-based rather than a plot-driven approach to interactive storytelling. In the advertising videos examined, this approach was misrepresented, showcasing scenarios where a main character encounters challenges, suggesting player-driven decision-making. For example, Dragonscapes [G2] features a woman with a child facing a house flood, where players seemingly choose between a blanket or a fan to solve the problem. However, no such scenario exists in the actual game, disconnecting the advertisement's narrative from the game's reality. These fictitious scenarios are thus misleading, falsely implying story elements that are not present.

Embedded narratives. Embedded narratives, conversely, are pre-written and woven into the game's fabric, providing a static background story that does not change with player interaction [109]. Embedded narratives, as opposed to emergent, offer a structured storyline where player interactions do not alter the plot's progression. Choices within the game may appear to provide divergent paths, yet they invariably lead to predefined conclusions, lacking genuine narrative branching. This is evidenced in games we studied, where despite the presence of linear and simplified plots, misrepresentation arises when the narratives embedded in the game bear no relation to the narratives advertised. For instance, Evony [G15] extensively markets a partnership with the film *Napoleon* [125], using its official trailers for promotional purposes on app marketplaces and featuring Napoleon in the game's thumbnail. Nonetheless, the game itself is disconnected from the Napoleon narrative, even within the constrained dialogue between in-game characters.

5.1.3. Popular Externalization. Popular externalization describes the practice of game advertisers utilizing culturally resonant content — whether it is the latest social media trend or iconic assets from other media properties — to create promotional materials that resonate with audiences. This practice emphasizes the amalgamation of familiar elements to craft compelling cues that attract attention and generate interest in the games, rather than reflecting the game's authenticity or originality. What renders this practice deceptive in the fake games studied is the lack of any

equivalent content within the game that matches what is projected in the externalized stream. This can be analyzed in two scenarios:

Figure 5. Two examples of popular extensions of fake games. On the left: Shaquille O'Neal, an American former basketball player and well-known celebrity advertising Top War [G13]; on the right: City of Crime Gang's [G3] official poster on app marketplaces, which uses copyright assets from GTA: Vice City.

Trending and social media deceptive imagery. This scenario explains a situation where in the advertisements, games are often depicted as being played by well-known celebrities or skilled gamers, leveraging the games' supposed popularity and trending status on social media platforms like TikTok and Instagram. To suggest that a game is part of a current trend, advertisers sometimes utilize popular social media phenomena. For instance, our analysis of a Top War [G13] advertisement revealed the use of the phrase 'Swipe to Play,' capitalizing on a viral challenge to appeal to its target audience. The omnipresence of social media, as evidenced by research [3], indicates how it pervades various aspects of life. The deceptive aspect of this imagery is highlighted when public figures, such as Shaquille O'Neal[2] was captured promoting gameplay experiences that are not found within the actual game.

Familiar and copyrighted assets. This scenario depicts instances where advertisements utilize well-known game assets, such as the Super Mario soundtrack or Grand Theft Auto (GTA) typeface, leading to misappropriation concerns in game advertising and intellectual property rights. For example, City of Crime Gang War [G3] employs advertising and in-game elements that echo the iconic Grand Theft Auto series, calling into question the legality of such copyrighted content use. This approach breaches the original creators' rights and deceives consumers, contravening Google's policies [30] against such practices.

5.1.4 Ruleset Distortion. This characteristic describes the discrepancy between the expected and actual difficulty, as well as the specific repertoire of skills and methods (i.e., rules [50]) required for overcoming challenges in game levels. Advertisements often misrepresent a game's difficulty, portraying it as either more challenging or easier than the actual gameplay. In the mobile games studied, promotional materials showcased complex puzzles and strategic gameplay, suggesting a multi-layered ruleset that implies a significant level of challenge. However, our gameplay analysis revealed that these complexities were notably absent, and the games featured a much simpler set of mechanics, often not following any structured rules which are twofold:

[2] Shaquille O'Neal is a retired American professional basketball player, sports analyst, and media personality.

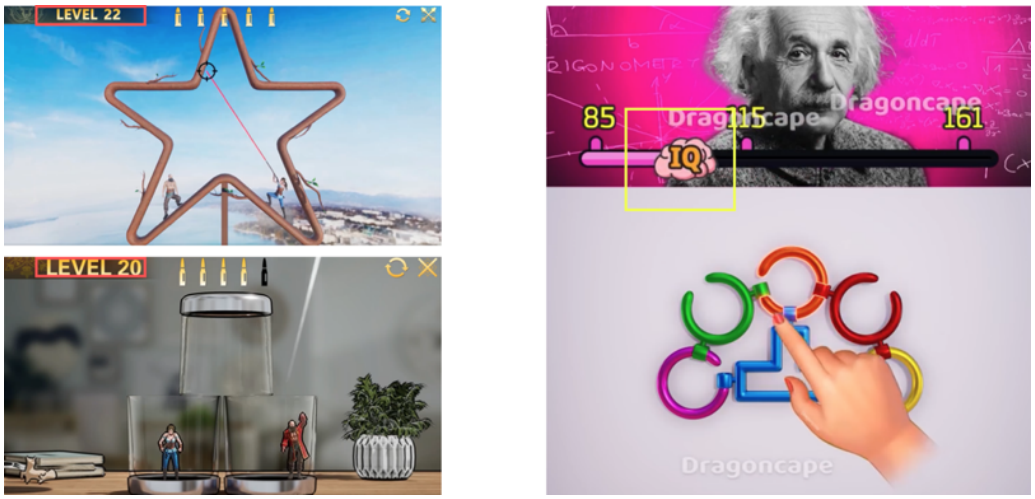

Figure 6. Two examples of rule distortion. On the left: Stormshot [G4] advertising demonstrates a change of rules and challenges from level 20 to 22, which does not occur in the game. On the right: Dragonscapes [G2] suggests a high IQ is needed to solve puzzles, which again, does not occur.

Manipulative needed skillset and intelligence. Manipulative needed skillset and intelligence explains situation where advertising materials for certain mobile games misleadingly suggest that a high intellectual skill set is required to overcome the designed rules. These promotions often target individuals seeking mentally stimulating challenges by explicitly stating that the games are designed for players with a 'High IQ' in case of Dragonscapes [G2]. The advertisements employ tactics such as showing a fictitious IQ score that decreases with each in-game failure, which serves as a psychological lure for potential players to download and test their abilities against the game. This misrepresentation plays into the competitive nature of players who are driven by the satisfaction of overcoming difficult challenges. Our analysis of games indicates that these claims are not substantiated by the actual game content, which does not align with the high-skill requirement presented in the advertisements.

Misleading difficulty curve. The misleading difficulty curve describes a situation where advertisements falsely suggest an increasing level of difficulty and more complex rules with each subsequent level. However, our analysis reveals that the rules and difficulty remain largely unchanged, contradicting the advanced challenge depicted in promotional materials. Advertisements allure players with the promise of new environments, characters, and escalating difficulty levels after each completed puzzle. Yet, the actual game progression is marked by repetitive assets and mechanics, with no real escalation in challenge or gameplay variety. This leads to a disparity between the expectations set by the advertising and the actual in-game experience, which may impact player retention and satisfaction, as the advertised complexity and depth are not delivered.

5.1.5 Incentive Illusion. The last characteristic, incentive illusion, resonates with the operation model and governance [64] of the studied games. It describes how advertisements often boast easy rewards and quick advancement to lure players, which typically misrepresents the truth. Promotional materials oversimplify the progression system and the rewards players receive after each level, suggesting an unambiguous path through the game. However, our analysis demonstrated

that progress and rewards are restricted in two ways: through time gating and problematic scaling issues.

Time-gating. In the gaming industry, time-gating is a method of restricting content progression by imposing a waiting period before players can access new mini-games or advance in the core game [101]. Our analysis of the advertised materials revealed that they prominently feature puzzles or mini-games, diverting from the central gameplay mechanics, which are typically rooted in building strategy or simulation. To participate in these mini-games, players are compelled to engage with the main game's building components, which are subject to time-gating. Consequently, players are often forced to resort to in-game purchases as a means to bypass these artificially imposed delays and continue with the puzzle gameplay that is advertised.

Scaling problem. In video games, proper scaling is critical for maintaining challenge and engagement; it involves adjusting elements such as difficulty, rewards, or enemy strength in line with the player's level or progression. In our analysis of games Hero Wars [G10] and Hustle Castle [G8], we identified a significant discrepancy in scaling, particularly within the puzzle segments. The in-game currency required to access subsequent levels failed to scale appropriately, creating an insurmountable barrier to progression without resorting to microtransactions. This issue starkly contrasts with the advertising portrayals, which suggest seamless advancement to higher levels, thereby misleading players regarding the actual game experience.

5.2 Study 2 Findings: Fake Games Player Experience

Our study reveals the user experience of fake games as a dynamic journey rather than a static phase. It charts a narrative arc from initial engagement through a pivotal moment of realization. This experience is characterized by four primary themes: Unfolding Realization, Invisible Risk, Emotive Contours, and Response Patterns.

5.2.1 Unfolding Realization. Unfolding Realization reflects the process through which players recognize signs that a game may not align with their initial perceptions of authenticity. The players' realization is mostly enabled and influenced by the game design that incorporates the mechanics of predatory monetization [98]. This finding details the transition from initial engagement to a state of critical reflection, where players' initial enthusiasm is tempered by their ongoing experiences with the game.

Unveiling Incompleteness. Unveiling Incompleteness refers to the player's recognition that a game might be fraudulent, often indicated by its lack of completion. Players discern this when they encounter a game that is riddled with bugs and glitches and shows signs of underdevelopment—conditions that starkly contrast with the polished, fully-realized experience promised by advertising. For example, a user mentioned:

> Buggy and unnecessarily sadistic...the game is based around chests with character cards to speed up production but it keeps holding the player back by crippling lower generators. There are also instances where delivery of orders are crippled because resources have ran out and the forklifts are already holding something. Do not pay for this, it's unfinished.

This user's interaction with Idle Lumber Empire [G5], an idle game advertised as an interactive strategic game, expresses dissatisfaction with game mechanics that fall short of those expectations. The user points out specific issues such as 'crippling lower generators' and resource shortages that detract from the completeness of the gameplay experience. The mention of 'unfinished' indicates the user's disappointment and suggests that these issues lead to doubts about the game's integrity, potentially prompting the realization that the game might not be as legitimate as presented.

Temporal Dissatisfaction. Temporal Dissatisfaction arises when there is a notable disparity between the player's expected and actual experiences of a game's progression and pacing. For example, a game might end too quickly or drag on for too long, contributing to a player's critical evaluation of the game and dissatisfaction:

> False advertising: The actual game [is] something completely different than the ads show. It's a base-building sim[ulation] with some army control. The actual game is not bad, but it deliberately gives you a feeling of fast progression in the beginning, so you get hooked, then the amount of resources needed to progress increases exponentially. Weeks of grinding and/or in game purchases is needed to improve and have a chance vs other players and even later PVE [player-vs-environment].

The user describes a quick initial progression gives way to a slow, resource-intensive grind, diverging sharply from advertised expectations and necessitating either extensive grinding or in-game purchases. This disparity between expectation and reality of the temporal output can be considered a breaking point to the fake game realization.

Felt Manipulation. Felt manipulation captures the sensation of being deceived or misled by the game's design, which marks a turning point in the player's engagement. Such experiences evoke a profound sense of betrayal, as players confront the reality of the game's intentions, leading to the realization point of calling the game fake. For example, this user describes their interaction with Block Blast [G7]:

> I'm deleting because of the ad, not the ads in the game, but the ad for the game. My gripe is with the ad for this game. It shows a different game- Tetris with a lot of lines. I downloaded it because I want to play that game. So I got suckered. Bait and switch. It's ok, I tell myself, because it's still a decent game. And then I see the ads and the game I wanted to play and I remember that I was suckered.

This user's experience illustrates felt manipulation through deceptive advertising that breeds betrayal and a constant reminder of being tricked. The stark 'bait and switch' between the promised and actual game experience prompts a profound loss of trust, leading to a decision to disengage.

5.2.2 Risks. Risks highlight the potential dangers and negative consequences that lurk beneath the surface of fake games, often unrecognized until directly encountered by the player.

Privacy and Security. Privacy and security concerns in fake games encompass anxieties about unauthorized data access and the potential for malware infection. Players could be concerned from the first step into the game, where it exhibits a very predatory privacy policy towards collecting various players' data. The fear of unauthorized data access or the potential for malware infection becomes a significant deterrent, influencing realization moments in players' decision-making. For example, one user mentioned:

> You guys are literally asking us to accept all the terms and conditions. In that there is one tick box which is "I hereby also agree to the transfer of my personal data to third parties". You idiots. You are openly stealing our data and transferring to third parties. Even if I untick that box. There's no choice for me. I have to Accept all and continue. How come this game is approved and allowed to play.

This player's outrage at being compelled to agree to the transfer of personal data to third parties during game registration captures the broader issue of opaque and coercive data practices in fake games that undermine user privacy. Highlighting the ineffectiveness of opting out and the lack of

regulatory oversight, this account calls for urgent reforms in digital gaming to protect player autonomy and enforce ethical standards.

Financial Risk. Financial risk involves the potential for monetary loss and exploitation within the gaming environment, ranging from not receiving items in-game after purchases to the game making unauthorized purchases and charging players' cards without their consent. For example:

> I've been playing Evony for about 10 months. I thought it was a puzzle game. It's not. The puzzles are not the game. It's an addictive game that encourages absolutely reckless spending of real money to be at all competitive. If you find a loophole to try and reduce spending even slightly, Top Games will ruthlessly steal everything. They are pretty arbitrary about it also. The company is out of China so there isn't much you can do about it once they've taken your stuff. Customer service is a joke. If they respond at all, it takes weeks to get anything resolved.

This player's experience with Evony [G15] exposes the game's encouragement of reckless spending and the developer's punitive response to any spending reduction, highlighting the financial exploitation prevalent in the fake games' environment. The difficulty in addressing grievances, especially given the company's international location, underscores the need for increased accountability and ethical standards to protect players' investments and rights against such manipulative practices.

Content Risk. Content Risk in fake games refers to the potential harm that exists for users, especially vulnerable groups like children. This includes exposure to inappropriate content, e.g. graphics, sounds, and effect, and interactions that can occur due to the lack of moderation. The heightened concern from parents and guardians about these risks underscores the need for improved content standards and protective measures for younger users within such games. For example:

> I am so tired of this and other games objectifying women as sex objects. Kids play this game. My 12 year old doesn't need to see half naked women or grow up thinking that women are just there as a sex object for his amusement… Woman are more than an object to turn on kids. Like seriously, how many younger children play this and you have soft porn on here?

This review from a player about Total Battle War [G14] raise alarms over toxic in-game chat and the sexualization of women, stressing the dangers such content poses to children and the perpetuation of harmful gender stereotypes in fake games. The demand for a safe and respectful gaming space for youth calls for developers to critically assess and improve content standards to protect young audiences and foster a healthier gaming culture.

5.2.3 Emotive Contours. Emotive Contours refers to the broad spectrum of emotional responses elicited by players' experiences with fake games, ranging from initial intrigue and excitement to profound disappointment, frustration, betrayal, and anger. This theme examines the affective impact of these games, highlighting the emotional journey that players experience by playing fake games.

Disappointment and Frustration. Disappointment and frustration arise from the gap between players' expectations and the reality of the gaming experience, particularly when the game in question fails to deliver on its promises or exhibits significant flaws. Players describe moments of reflection where the excitement and anticipation for the game collapse into disillusionment, marking a significant emotional shift in their gaming journey. The user reviews in this category encompass both players who download and play the games, and users who engaged with the advertising solely. For example:

> Bait and switch Fake ads. Game is trash. You will get board and frustrated with the terrible random candy crush style games and some of the games you cannot beat and have to play the same game like 8 times to hope for a random setup for a win of that one mini game. Trashy and lazy game developers. It's like they never played it as a regular customer.

This player expresses deep frustration with false advertising and poor gameplay in a game, citing 'bait and switch' tactics that lead from initial interest to disappointment with its 'trashy' mechanics and repetitive, difficult mini-games. This feedback underscores the gap between marketing and player experience, emphasizing the need for game developers to align their ads with reality and prioritize engaging, well-tested gameplay.

Betrayal and Anger. Betrayal and anger are intense emotional responses to perceived deceit or manipulation by game developers, which is the response to their review or the game itself. These feelings go beyond simple dissatisfaction, touching on fundamental issues of trust and ethical conduct within the gaming industry. Anger, in this context, is not just a reaction to specific incidents but a broader expression of resistance against deceptive practices in the industry. For example:

> Same stupidity you get from every other ad game. They advertise their alleged game or say it's just like the ad and when you download the game it is nothing like the ad. Sure you might have some mini game lodged in there after many hours of playing but nothing like the ads. Worst part is that after you leave them a one star review they have the same generic response that says oh sorry and you should have played longer to get the mini game. Save you time and don't download this game! Trust me

In this review, the developer's dismissive response to critical feedback further erodes trust, underlining the necessity for genuine transparency and respect for players to ensure their satisfaction and maintain industry integrity which led to the players' anger.

Fun and Appealing. Fun and appealing addresses the positive emotional reactions some players have towards fake games. It considers how certain individuals find enjoyment in these games, regardless of their incomplete or deceptive elements. Here is an example:

> Honestly, the ads are 90% fake but its an awesome game, have had it for years, boy I wished they make anniversary gifts. Other than that, graphics are awesome and the frame rate doesn't drive you insane.

The user's review acknowledges the inaccuracy of the game's advertisements in War Robots [G9] but still praises the actual gameplay, citing high-quality graphics and consistent frame rate as reasons for their long-term engagement. This review demonstrates that players can find genuine enjoyment in fake games based on their gameplay experience, independent of promotional misrepresentations.

5.2.4 Response Patterns. Response Patterns encompass the variety of actions and reactions demonstrated by players as they confront and cope with the realities of fake games. This theme examines the proactive and reactive measures taken by players as they navigate the aftermath of their experiences.

Disengagement. In player responses to fake games, disengagement signifies the act of withdrawing participation and interest from a game following negative experiences. Players recount the process of uninstalling the game, often projecting their intentions in reviews with statements like 'I am going to uninstall it right now' or 'this is an uninstall for me.' Additionally, ceasing to

engage with the game's community serves as a form of closure, allowing them to move on from the negative experience.

> I downloaded Fishdom based on the advert I saw. I have candy crush already and am enjoying it. I don't need an imitation of candy crush in the name of Fishdom. Telling me the advert is part of the game is rubbish and misleading. I will I can give 0 as review because that is exactly what the game vs advert deserves. Uninstalling this immediately.

Disappointed by misleading advertising that promised one game and delivered a mere imitation, a player promptly uninstalls Fishdom [G11], reflecting a broader trend of disengagement to guard against further disillusionment in fake games. This decisive action underscores the importance of trust in advertising and the need for authenticity to maintain player satisfaction and integrity within the industry.

Negative Word-of-Mouth. Negative word-of-mouth refers to the sharing of unfavorable experiences and opinions about a game with others. This communicative act serves as a warning to potential players and a mechanism for community support, allowing individuals to validate their experiences and caution the wider community about the pitfalls of engaging with fake games.

> You know what's funny? Twitter calls you out in your fake ad's for your god awful game and I quote "This is a fake mobile game ad, it's deliberately deceives consumers in order to trick them into downloading the game and to create a viral effect over people complaining in the comment section" at least they help advise consumers not to download cash traps like these, I'd rather not play it, why would I focus on playing a game where the main content shown in the ads are hidden you only want money.

The user review points to negative word-of-mouth by citing observations made on Twitter about the game's misleading advertisements. By referencing these external comments, the user contributes to a collective discourse that cautions potential players against engaging with the game. This sharing of information underscores the community's role in disseminating experiences with fake games and supports the network of players in making informed decisions.

Ethics Advocate. Ethics advocate reflects the actions taken by players who, in response to encountering fake games, call for improving ethical standards within the gaming industry. For example:

> The ad for this game Is misleading. When will you guys realise that honesty Is the best policy. I played for several weeks trying to get to the so-called great puzzles. After weeks of building and generally boring content, I did find one ok puzzle. I can't wait until google implements the new false advertising rule. This will force development teams to be honest and fair in your advertising.

The user review criticizes the game's advertising as misleading and expresses a preference for honest marketing practices. The player's disappointment after an extended period of play, which led only to a single satisfactory puzzle, exemplifies concerns over truthful advertising in gaming. The user's anticipation of regulatory action against false advertising reflects a wider call for ethical standards in game development and marketing.

6 DISCUSSION

Our findings from Study 1 depicted the characteristics of fake games, while Study 2 demonstrated how players experience them. The findings from Study 1 informed Study 2 in a sense that they contextualized misalignment as a turning point in the player experience that leads to calling out

games as being fake. This set of findings allows us to reflect upon the fakeness of fake games, how to govern fake games, and lastly, to discuss implications for research and design.

6.1 Understanding the Fakeness of Fake Games

In our more complete definition of fake games, we can define them as games promoted with content that fails to accurately represent their actual gameplay, or those in a developmental flux—remaining underdeveloped and unfinished while marketed as complete products—are conventionally classified as 'fake games.' By emphasizing the perception of fakeness, we can address a definitional paradox where a game, which literally exists and is real, is categorized as 'fake' due to its deceptive nature. This more comprehensive definition allows us to understand that the deceptive nature and misleading presentations are what render these games 'fake' in the eyes of users as per our findings, despite their actual existence. In the following sections, we will discuss the fakeness of these fake games.

Fake games exploit social media and advertising ecosystems. The practice of fake games is rooted in deceptive advertising [120] and the specific methods used to promote these games on social media. Our findings advance prior research [16, 17] which highlighted this phenomenon, using other terminology like 'not real' in the context of social games on Facebook. Our analysis of game walkthroughs and user reviews indicates a complex interplay among social media, advertising, and the games examined, pointing to the presence of an ecosystem of platforms [44]. Fakeness transpires and circulates within this ecosystem goes from one platform to another, resembling the effect of platformization. Platformization can be described as the process through which social media networks expand their influence across the wider internet, ensuring that external web content is compatible and integrated with their platforms [40]. Our research revealed how social media platforms facilitate player engagement and transitioning of fakeness within games, serving as a medium for popular externalization. This underscores the significant influence of social media and the seamless transition between platforms, evidenced by the simplicity with which games can be installed with a single click from an advertisement. Our user reviews of fake games frequently hinted at platformization, describing how users were effortlessly redirected from one social media platform, such as TikTok, to Google Play. The entanglement of platforms in fake games complicates user realization, indicating a need for clearer disclaimers during platform navigation.

The classification of fake game is a variable state. Prior research has identified fraudulent behaviors, such as misleading advertising, theft of intellectual property, and imitation [39, 42, 68]. These behaviors contribute to a perception of inauthenticity, thereby classifying such games as fake and raising concerns over their legitimacy. In our research, we observed 'fake game' as a variable state rather than an attribute inherent to any specific genre or medium. In some reviews users who have invested months and even years in the game mentioned that it was not always deceptive; it only became so after several updates that changed its marketing strategies. Thus, being a 'fake game' is not permanent; a game previously categorized as such can redeem itself and be recognized as legitimate by amending its practices to better align with consumer expectations. For another instance, 'No Man's Sky' underwent a transformation from being widely criticized for false advertising [79] to being recognized and praised as a quality survival game after Sony's committed development efforts [81]. This shift underscores the fluid nature of what constitutes a fake game. This transformation exemplifies our observation of fake games as a state rather than a fixed classification.

The fakeness of fake games is not only temporally variable, but also layered. The case of Playrix [7, 105] and the ruling against their deceptive practice for not including advertised content in their games popularized the practice of incorporating mini-games or puzzle games as a defensive strategy

to avoid accusations of misleading gameplay [55]. Our close examination of fake games revealed an unclear vision [64], i.e., their purpose, target user base, and usage scenarios, characterized by a core gameplay integrated with a series of puzzle games. The duality of mini games versus core gameplay adds complexity to the evaluation of a game's authenticity. As identified in our findings, players were confused and frustrated by their inability to find the games advertised, as they were presented with a different and generic core gameplay that did not resemble the advertised games. The dual or multi game modes strategy, while mitigating immediate legal repercussions, ultimately disorients players and undermines the integrity of the gaming experience. We demonstrated user disengagement from the games studied and a decline in their trust, as evidenced by their response patterns. This implies that a game's long-term success hinges on aligning its marketing narrative with the existing in-game content, thus fostering a sustainable and trust-based relationship with its user community.

6.2 Experiencing Fakeness

Our research revealed how fake games negatively impacted player experiences in various ways. First, comprehending the concept of fake games requires acknowledging the nuanced process of their identification and the consequent impact on players' long-term engagement. The realization of a game's inauthenticity is not straightforward; players may invest time and develop an emotional connection, only to later recognize the game's deceptive nature. Second, the possibility of such games being discontinued introduces a layer of unpredictability, complicating the players' investment. Consequently, when a game that has been accepted as genuine for an extended period introduces deceitful tactics, it can leave a loyal player base feeling misled by the developers, who have shifted away from previously established expectations.

Player experiences with fake games are diverse. We refrain from making an absolute statement that fake games are always negative to all players. In fact, fakeness and a game being labeled as fake have been part of the video game history. From the early development of physical copies of Pokémon games, where fake games would be associated with copies not produced by Nintendo, term 'fake' usually carries negative connotations among players and is synonymous with inauthenticity [39]. Some players are even attracted to fake games. For instance, there is a niche gaming community, a subculture originating in Japan, known as 'Kusoge'—which translates to crappy games—that embraces these titles, challenging themselves to play and overcome the bugs and unplayability [22]. In our study, the variability in responses to fake games, ranging from enjoyment to frustration as was discovered in our user reviews, underscores the individualized experiences of players. Not all players view fake games negatively; some find value or entertainment in them despite their deceptive nature. Thus, player experiences with fake games are not homogeneous, but complex and multifaceted.

Fake games are deliberately targeted at certain types of players. Previous studies [32, 62] show that games are tailored to engage and retain specific user groups. For example, in an interview, the design team of Lily's Garden, a mobile game known for its bizarre advertising [56], deliberately targeted their game at women over 30, who make up the largest audience for these types of mobile games [25]. In a similar vein, our findings indicate that fake games often promote themselves as non-competitive and more suitable for casual players. The concern with fake mobile games arises from their strategic targeting of casual players, a demographic that was not previously exposed to gaming-related content such as game news, game reviews, and game streaming. Nor were they familiar with the fake games prior to the advertising. Consequently, these players may experience a longer period of realization regarding the game's authenticity, unlike more knowledgeable, hardcore gamers who are more readily capable to assess the authenticity of their chosen games. The

targeting strategies of fake mobile games can initially attract casual players, but these tactics may delay the players' recognition of the games' actual features and gameplay as stated by our user reviews.

6.3 How to Govern Fakeness.

The need for stricter regulation of fake games is highlighted by their evasion of FTC policies [110], further complicated by the games being offered for free. The free-to-play (F2P) model poses a regulatory challenge because traditional consumer protection laws are harder to enforce without a direct purchase. Our findings emphasize concerns raised by players seeking legal action as they believe they were deceived into playing the game. Prior research on the free-to-play business model [37, 38, 83] has indicated potential harm and risks. Our user reviews revealed that risks in free-to-play games are not only present but also vary in type and impact. These range from financial risks, such as not receiving in-game items or having them removed to exposure to content that may be inappropriate for vulnerable demographics like children.

Regulating free-to-play games requires a multi-faceted and collaborative approach. Given the complexities we mentioned, it is evident that the FTC alone may face challenges in effectively regulating free-to-play games, especially due to their global presence and the absence of direct purchases. Therefore, it is crucial for the FTC to collaborate with other entities and adopt a multi-faceted approach. The FTC can partner with international regulatory bodies to create unified standards and share best practices for monitoring and regulating deceptive game practices globally. For instance, the Netherlands banned loot boxes within the country for violating regulations on gambling, and their regulator has pushed towards harmonizing the regulation across the EU [103]. This kind of international cooperation can help address the global nature of the gaming industry. Additionally, the FTC can work with consumer protection organizations to launch public awareness campaigns that educate consumers about the risks of fake games and how to identify deceptive practices.

In another example, the UK's Gambling Commission has conducted public awareness campaigns to educate the public about the risks of online gambling and how to spot potential frauds [107]. Such campaigns can help raise awareness and empower consumers to make informed decisions. Furthermore, the FTC can collaborate with technology companies to develop enhanced enforcement mechanisms. This could include increased fines and penalties for developers found guilty of deceptive practices, serving as a deterrent. The FTC's significant fines against Facebook for privacy violations [51] demonstrate the impact of such measures. The FTC should also advocate for updates to the legal framework to cover digital goods and services, ensuring that consumer protection laws apply even in the absence of direct purchases. By working with lawmakers and industry stakeholders, the FTC can help ensure that regulations keep pace with the evolving digital landscape. For instance, the Consumer Review Fairness Act protects consumers' rights to post honest reviews online [24], even for free services. By adopting these measures and fostering international cooperation, the FTC can more effectively address the challenges posed by fake games.

Game marketplaces require focused regulatory action for accurate promotion. Game distribution marketplaces should be the focus of regulatory action to ensure that promotional materials accurately represent the actual gaming experience. Google Play has policy guidelines for developers that prohibit deceptive design, stating, 'Apps that are deceptive, malicious, or intended to abuse or misuse any network, device, or personal data are strictly prohibited' [31]. Similarly, the App Store warns, 'If your app engages in misleading marketing practices, scams, or fraud in relation to the entitlement, your app will be removed from the App Store and you may be removed from the Apple Developer Program [45]. Prior research on privacy concerns and game regulation [93] highlighted

the shortcomings of marketplaces in scrutinizing the games they host. Despite a lack of moderation and verification—a concern echoed by users—our study has uncovered that deceptive design occurs across various dimensions of games, from gameplay to narrative, including rules and incentives. This demonstrates that existing governance mechanisms, particularly those found in policy guidelines, may not effectively address fake games due to their ambiguous definitions.

6.4 Community vs. Fake Games

Platforms should work together across multiple channels and engage communities to develop tools through third parties and extensions. For example, the App Store and Google Play can provide tools similar to Community Notes, allowing users to contribute additional information about games. For example, App Store and Google Play can provide tools similar to Community Notes, allowing users to contribute additional information about games. This crowdsourced tool can serve as a nudge, helping potential players make more informed decisions by highlighting discrepancies between promotional materials and actual gameplay. Furthermore, third-party browser extensions could be developed to flag potential deceptive practices based on user reviews and ratings, offering another layer of protection.

Another approach could involve the integration of independent verification services. These services could review and certify games based on their accuracy in promotional materials and overall fairness, providing a seal of approval that users can trust. Another practical solution could be the integration of AI-driven real-time monitoring systems tailored for mobile users. These systems can be implemented as mobile apps that continuously scan and analyze both promotional materials and in-game content. For instance, an AI-powered app could compare game advertisements with actual gameplay footage to detect discrepancies. When a significant mismatch is found, the app could notify users directly on their mobile devices, flagging the game for further review. Over time, the AI can learn from new data and improve its ability to identify deceptive practices, becoming more accurate and efficient. This dynamic and responsive approach helps ensure that any new deceptive strategies are quickly recognized and addressed, providing mobile users with timely and actionable information. By implementing these measures, we can create a robust framework for effectively governing the fakeness in the gaming industry.

Community activism challenges fake game practices. Other forms of active communities are combating the practices of fake games by raising awareness, using platforms like Twitter—where we collected our data—and Reddit, where multiple subreddits are dedicated to this cause like r/shittymobilegameads. Community-driven activities include filing petitions, one of which had garnered over 13,000 signatures at the time of this research [43], calling for change and advocating for more user-centric practices in the industry. Prior research demonstrates the power of community-driven initiatives in gaming [90]. For example, Blizzard in 2021 introduced the idea of the World of Warcraft Community Council [8] after backlash and criticism toward their lawsuit[18]. The Community Council serves as a medium to transmit players' feedback on various aspects of the game, incorporating a wide range of opinions, playstyles, and interests to the developers. Similar approaches can be adopted within the mobile industry to advocate for better and more ethical practices. Adopting similar community council models in the mobile gaming industry could significantly enhance player involvement in the development process, ensuring that feedback from a broad user base is considered in game design and policy decisions. This inclusive approach not only bolsters the quality and authenticity of mobile games but also reinforces trust between developers and the gaming community, potentially leading to a self-regulating ecosystem where ethical practices are the norm and player satisfaction is prioritized.

6.5 Implications for Research

The notion that 'any publicity is good publicity' takes on a complex meaning in the context of fake games. The paradoxical possibility that negative attention could increase user engagement with fake games warrants in-depth research into the dynamics between publicity and users' behavior within the gaming market. Understanding how exposure, whether positive or negative, affects the proliferation of fake games is essential, especially if it inadvertently magnifies the issues it aims to mitigate.

First, further research is needed to explore how negative exposure affects player decisions and the thresholds at which players tolerate deceptive practices. This research could also examine the lifecycle of fake games, tracing the patterns of player engagement and identifying when players typically disengage. Such insights could prove invaluable in developing timely and targeted interventions to counteract the spread of fake games.

Second, in addition to individual player responses, comparative analyses across different gaming platforms could shed light on structural susceptibilities and the effectiveness of regulatory measures. Longitudinal studies could then track the evolution of fake games, assessing the impact of industry practice advances, marketing strategies, and community awareness on their prevalence and influence.

Lastly, synthesizing the discourse surrounding fake games through a meta-analysis could lead to a comprehensive framework for understanding and combating deceptive online practices. This could inform theoretical models for studying online deception and its societal implications, ultimately guiding industry practices and policy-making towards fostering a transparent and ethical gaming environment.

6.6 Implication for Design

The issue of fakeness in the gaming industry affects player trust across both mobile and AAA games. This was highlighted by the 2013 legal case involving Sega and Gearbox [100], which centered on false advertising related to 'Aliens'. The persistence of fakeness, particularly as it emerges in free-to-play business models, underscores the importance of accurate representation in game advertising. It is essential for the integrity of game design that promotional material aligns closely with the actual gameplay to set correct expectations. Responsive game design that incorporates player feedback is important to address any discrepancies. As it was informed by our analysis of user reviews, clear and honest monetization strategies are also key in maintaining player trust. Implementing these practices can improve the gaming experience and support the credibility and longevity of game titles in a competitive market.

The emergence of fake games, which our research suggests are challenging for players to identify, has proved not only prevalent in gaming but also easily adapted to other platforms, such as console games [116]. In light of this, the implications for game design are clear: There is a need for robust design frameworks that enhance transparency and reduce the perception of fakeness, ensuring that even in environments where users themselves are creators, there are safeguards that uphold the integrity of the gaming experience. These frameworks should be informed by the understanding that the practices behind fake games can erode user trust and that design interventions are necessary to protect and inform the gaming community.

7 LIMITATIONS AND FUTURE WORK

Our qualitative research was an attempt to uncover an emergent industry practice and enhance understanding of the concept of fake games. We do not claim that the game titles studied are the

only fake games, nor do we suggest that these games are perpetually entitled to being considered fake. As we discovered and discussed, the state of being a fake game is not indefinite or static, and it should not be considered a genre. Therefore, more games across different platforms, like console games or user-generated games, can be analyzed in the future to see how the identified themes support or refute this notion across the gaming industry.

The selection of Twitter Community Notes as the main pipeline to identify fake game titles is fitting for our study due to its transparency, replicability, and reproducibility, though it may introduce biases since certain game titles promoted outside Twitter might not be included in our dataset. Looking forward, we plan to explore additional data collection methods to broaden our understanding and categorization of fake games.

Due to the novelty of this topic, even combining two methodologies—a game walkthrough and user review analysis—cannot unveil all the facets of fake games. Interviews or surveys with people who have played fake games and invested time or money into them can yield nuanced results and provide a deeper understanding of this phenomenon. Future research can recruit players who have experience engaging with fake games and interview them.

Moreover, due to the nature of live game systems, i.e., constant updates and hotfixes from game companies, the 90 minutes of gameplay in Study 1 may not be sufficient to clearly compare the correspondence between a game's promotional material and its gameplay. This directly influences the extent to which the research games identified may not meet the study's criteria for 'fake' games in the short term.

Lastly, in reflecting on the implications of the terms 'fake' and 'fakeness,' we acknowledge that these terminologies carry negative connotations, similar to the concept of 'dark' in studies of deceptive patterns. We view our terminologies as resonating with the concepts of emic and etic, meaning we used these terms because they reflect insider language practices within the industry and are understood in a practical context.

8 CONCLUSION

Our study has explored 'fake games,' a newly recognized phenomenon within the gaming industry, particularly prevalent in the mobile game sector. Fake games are described as being in a fluid state; they are underdeveloped and unfinished yet promoted as complete products. This is facilitated by deceptive patterns designed to trick users into downloading them, which increases their likelihood of being perceived as fake. We identified a misalignment between the games' promotion on platforms such as social media and marketplaces, and the actual gaming experience, which is a characteristic of fake games that occurs across various dimensions of gaming. It calls for more focused attention on the ethical dimensions of game design and the need for standards that protect consumer interests and promote transparency in the gaming industry.

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A. APPENDIX: TWITTER COMMUNITY NOTES FUNCTION

Community fact-checking steps are involve selecting the "Write a Community Note" option from the post's menu, contributors can answer multiple-choice questions and add context to explain why a post may or may not be misleading. If a note is rated as helpful by the community, it will be displayed on the post to offer additional context, enhancing the overall understanding of the content (See Figure 7). Conversely, notes arguing that a post is not misleading will be used for further evaluation by raters but will not be displayed unless deemed helpful. Upon submission, these notes are accessible on the Community Notes site for rating by other contributors. Their visibility on posts is contingent on achieving a 'Helpful' status, thereby contributing to the contributor's Writing Impact.

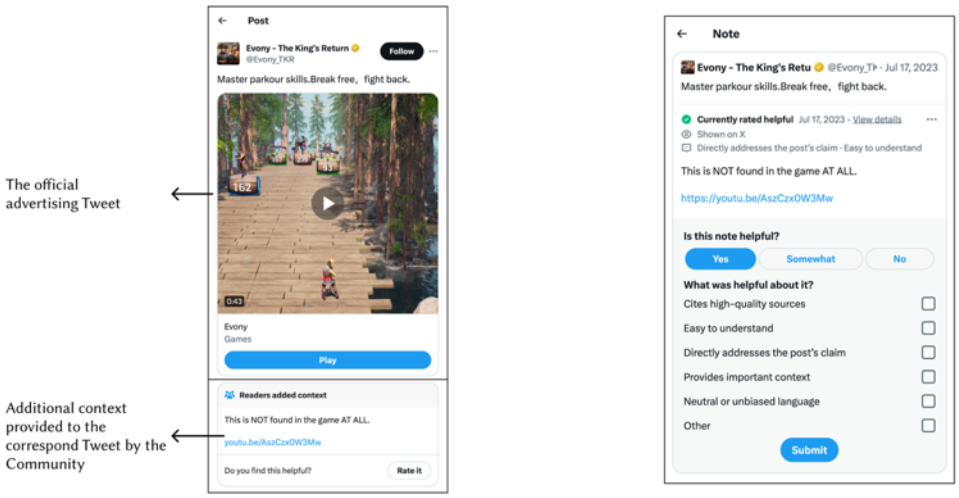

Figure 7. Left: An example of flagged advertising was originally posted by the official accounts of the mobile game 'Evony: The King's Return' [G15]. The Community Note provided additional information on the misalignment along with a link to YouTube to demonstrate the actual gameplay footage. Upon further interaction with the Community Note, users can see the status and more details about the note, which at the time of the study was labeled as 'helpful'

B. APPENDIX: PRISMA METHOD FOR IDENFITYING FAKE GAMES TITLE

We first defined the inclusion criteria for our protocol and then applied them by following the PRISMA method in four stages, which included (1) identification, which aided in searching for community notes related to fake games in databases using keywords derived from the working definition of fake games, (2) screening to remove duplicates and select only notes related to games, (3) eligibility – being classified as misleading or misinformation, having a reliable source, and being in the English language to exclude entries that do not match our inclusion criteria, and (4) inclusion, which involved data extraction and analysis of entries that met our criteria. The following are the criteria applied during the screening and eligibility protocol:

Misinformation Classification Criteria: We included only those notes that were marked by users as containing misleading content. To determine if a note addressed misinformation, users had to respond to the prompt 'Given current evidence, I believe this tweet is:' during the note-creation phase. We specifically selected notes tagged as 'misinformed or potentially misleading' and

'believable by many' based on their 'classification' labels to focus our study on data identified as potentially unreliable.

Source Reliability Filter: The dataset was narrowed to notes citing 'trustworthy sources' due to the high frequency of account and tweet deletions post-flagging or following the exposure of false advertising. Therefore, we emphasized the importance of community notes containing external links, enabling us to more effectively investigate and catalog games reported as fraudulent by users.

English Language Selection: Our analysis was confined to notes written in English. The decision to exclude non-English notes was driven by the scope of our research, which did not extend to the translation and interpretation of marketing strategies and audience targeting in languages other than English.

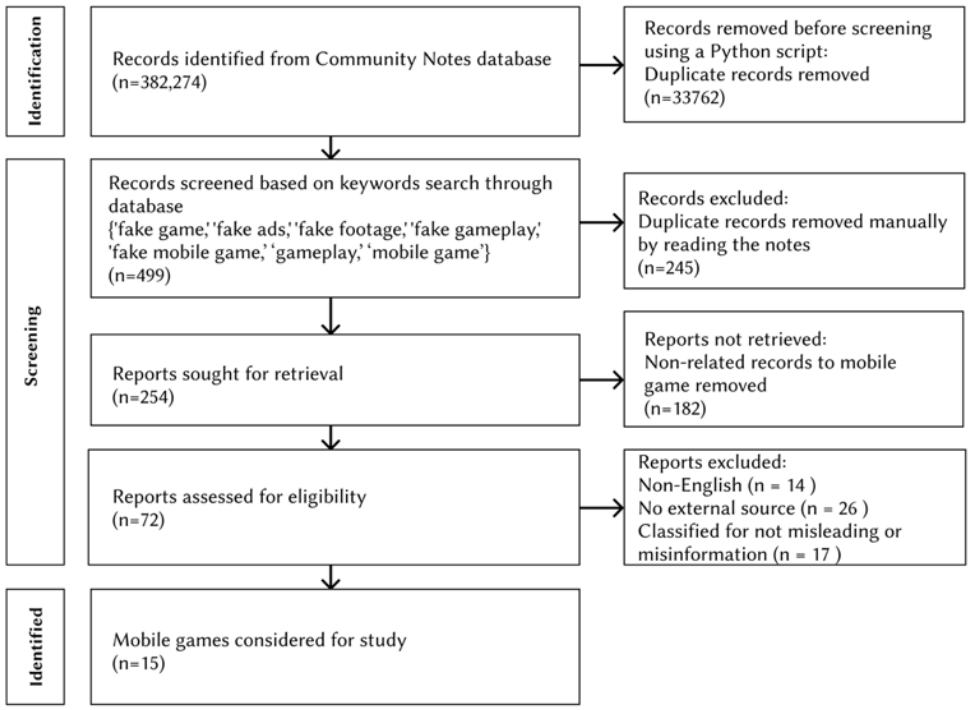

Figure 8. An overview of the Community Notes review process in a PRISMA flow diagram

The first author downloaded the open-source notes data on December 07, 2023, from the provided official website [114], which contained data contributions up to December 04, 2023. The data structure includes all metadata related to the notes and associated Tweets, encompassing classification categories, their scores, and identifiers. More information on the full description of the data structure with details can be found here [113] and also the open-source code on how the classification algorithm work [111]. All data similar to the original data structure, were stored in a local CSV database.

Following PRISMA protocol (Figure 8) for identified relevant notes, we rigorously search through the database using several keywords extracted from the working definition of the 'fake game.' These keywords are as follows: {'fake game,' 'fake ads,' 'fake footage,' 'fake gameplay,' 'fake mobile game,' 'gameplay,' 'mobile game.'}. This selection was validated by cross-referencing against known instances of fake games and ensuring that the chosen keywords captured the majority of cases

within the database. The sufficiency of these keywords was further reinforced by an iterative process where initial search results were evaluated for relevance and coverage, with adjustments made to the keyword list as necessary to encapsulate the full spectrum of fake game characteristics. During the screening process, duplicates were removed, and we made sure that the notes are discussing game-related topics. During the eligibility step, we carefully read and checked the notes against our criteria to ensure they met the inclusion criteria. The authors manually read and checked all the remaining notes, comparing them against the definition of a fake game. The final number of notes identified was 15. The notes were transformed into a list of game titles by reviewing the provided YouTube links, collecting the titles of the games, and subsequently searching for them in two of the largest mobile game markets: the App Store and Google Play.

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