

How Social Media Platforms Manipulate Kidinfluencers? Analysing the Adoption of Deceptive Design Patterns by Big Techs

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ABSTRACT

The term *kidinfluencer* denotes children who produce entertaining content for social media platforms such as TikTok and Instagram. These young artists frequently publish videos or pictures that highlight their skills, pastimes or general activities in their daily routines, which draws a sizable audience. This can result in business collaborations with platform partners, providing children and caregivers with several options for income. Despite the success and fame of a few kidinfluencers, their use of social media has also sparked worries about their privacy, safety, and potential exploitation. This article explores this phenomenon from the perspective of risks brought by social media platforms, which treat children as relevant content creators but neglect their well-being and autonomy online. By mapping previous studies on the topic, we investigate the scenario of young influencers, using the notion of deceptive design patterns as a lens of analysis of platform manipulation of children's decisions and interests. To address the identified problems caused by these patterns, we present a set of prototypes as suggestions for changing platforms' features in order to safeguard children's rights and best interests online.

CCS CONCEPTS

• **Human-centered computing** → HCI design and evaluation methods; User studies.

KEYWORDS

kid influencers, social networks, child labor, artistic labor

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1 INTRODUCTION

The way people engage and consume media has changed dramatically as a result of the widespread use of social media platforms (e.g., TikTok, Instagram, Youtube), where digital influencers are playing an increasingly important role. The large impact caused by such content producers can be measured: the influencer marketing platform market was valued at USD 7.36 billion in 2021 and is expected to reach the value of USD 69.92 billion by 2029. [37]

When kids are involved in the social media market scenario not as consumers but as producers of content for software platforms, they benefit from increased creativity and social skills. Besides, by acting as *kidinfluencers* (also called “micro-celebrities”, i.e. someone who stands out with their content productions in digital environments and has high numbers of followers [20]), children can be a source of income for their families, offering a financial lifeline. However, the involvement of children as influencers has raised concerns and sparked ethical debates. In a recent study, Permanasari et al. (2021) reinforce that “*children should not work (as they are) physically and psychologically immature, still developing and need education, and (...) vulnerable to violence and exploitation*” [34].

In the cinema industry, children's work is allowed under certain limitations, related to restrictions on age, working hours and type of activity performed. But in the context of social media, there are concerns about the effect of excessive exposure on children's cognitive and emotional development [36]. One of the main arguments against the work of children as influencers is their lack of maturity and judgment when dealing with issues related to online privacy and exposure on the internet. Adolescent Internet users are potentially more at risk for identity theft, exposure to violence and pornography, and cyberbullying [47]. Furthermore, this process raises a concern about the responsibility of parents, whose duty is to safeguard their children and ensure their well-being.

The involvement of kidinfluencers in advertising activities has raised concerns due to the potential exploitation and manipulation through tricks used by platforms. These tricks, known as deceptive or manipulative design patterns, were originally identified by Harry Brignull in 2010. This researcher, who coined the term dark patterns, is an UX practitioner with a doctoral degree in cognitive science [16]. He defined deceptive patterns as ethically dubious design approaches, when interface characteristics and features of a given technology modify users' choice architecture to gain their attention, data, and money [8]. They potentially make users do things that they did not mean to, like buying or signing up for something [6].

This paper presents a descriptive case study of kidinfluencers' activities on three social media software platforms governed by Big Techs: YouTube, Instagram, Tiktok. Our contribution is threefold:

(i) portraying the scenario of kidinfluencers activities in terms of aspects such as actors, pains and expectations, and regulations; (ii) describing the adoption of deceptive patterns by Big Techs on their platforms, which can be harmful to kidinfluencers; (iii) presenting prototypes with interface enhancements that demonstrate potential solutions to address the problems identified.

The remainder of the paper is organized as follows. In Section 2, we present a conceptual background on social media software platforms and children's privacy and protection online. Section 3 describes the research methodology. Our results are detailed in Section 4, with an analysis of kidinfluencers' context as well as threats to their welfare and autonomy due to deceptive patterns. Section 5 presents prototypes to address the problems we observed. Finally, Section 6 presents final considerations.

2 BACKGROUND

2.1 Social Media Software Platforms

In the last decade, the IT companies have gradually shifted to complex **software ecosystems**, which can be described as a set of businesses functioning collectively as a unit and interacting with a shared market for software and services, together with the relationships among them [24]. These ecosystems are leveraged by platforms (e.g. iOS, Android, etc.) which are means to aggregate the company itself (e.g., Amazon, Google, Meta, etc.), partners (e.g., advertisers, complementors, resellers, etc.) and users. Hence, they gather actors co-creating value via SDKs (a collection of tools, libraries and documentation that enables developers to create software applications for a specific platform or framework) and APIs (a set of rules and protocols that allows different software applications to communicate and interact with each other) to nurture an open innovation business model.

Google's **YouTube** exploded as an ecosystem largely maintained by users, who act as content creators. Creating content became a practice among children as well. Children started to dominate the list of top YouTube channel earners and viewer numbers. According to the American Community Survey [43], in 2019, 95% of 3- to 18-year-olds in the United States had home internet access. From unboxing videos to family vlogs to nursery rhymes, content created by and for children has emerged as a multi-billion dollar business [11]. In this context, children can become stars through YouTube and other social media platforms.

One of the main concerns regarding child use of YouTube is the potential exposure to inappropriate content. The Federal Trade Commission (FTC) penalized YouTube \$170 million in 2019 for breaking the Children's Online Privacy Protection Act (COPPA) for gathering personal data from kids without getting permission from their parents. FTC determined that YouTube did not offer means to get parental consent for collecting personal information, while being aware that many of the channels on its platform were targeted at children under the age of 13 [13]. In response to the FTC's findings, YouTube updated its features and regulations to better safeguard kids using its service. For instance, in 2020 YouTube introduced "supervised experiences", a tool that enables parents to restrict their child's use of the platform to a list of reliable channels and videos [46]. After this upgrade on the platform, YouTube allows parents to create individual profiles for the children; control and

approve what their children could watch; and limit the usage time, among other features to protect the child.

Children are also frequently exploring **Instagram** features to communicate with friends, exchange images and videos, and interact with their favorite influencers. As noted by Alhabash et al. [4], Instagram has become a powerful marketing tool, with brands using influencers to promote their products to a young and impressionable audience. In this context, kid influencers have emerged as a fruitful segment, with children as young as three years old promoting products and receiving payment for their endorsements. Hence, we notice an increasing number of children and teenagers using Instagram as a way to earn money. However, there are serious health hazards for kids on this platform, particularly anxiety, depression, body image concerns [12], online grooming and harassment.

Finally, we must highlight the key role of **TikTok**, from the Chinese IT company ByteDance. With a large selection of tools and filters for sharing short mobile videos, this social media platform reached the top-3 favorite platforms for children in 2021 [39]. In 2020, TikTok disclosed that more than one-third of its daily 49 million users were under the age of 14 in the United States. The proportion of users younger than 14 was as high as 43% in Britain and 45% in France. With a total number of downloads that reached two billion globally [11, 40], TikTok also became a source of controversy, with concerns about children's privacy and safety. The company faced numerous accusations of non-compliance with its own rules and guidelines. In 2021, the Irish Data Protection Commission investigated how TikTok handled children's data and transferred such information to China, where its parent company is located. ByteDance answered the authorities by claiming to use "approved methods" [23]. In another accusation, the UK Data Commissioner's Office alleged Tiktok had violated UK and European Union data protection laws by processing children's data without adequate security measures, transparency or consent of guardians [38].

2.2 Deceptive Design Patterns Affecting Children's Well-being

According to the TIC Kids Online 2022 survey, which examined how children aged 9 to 17 utilize digital technologies, 86% of approximately 24 million Brazilian kids and teenagers in that age range who are Internet users reported having profiles on social media platforms (which represents around 21 million). Participation in social media occurs at high rates across all age groups, nearly reaching the entirety of Internet users aged 15 to 17 (96%) [27].

Despite being frequent users, children are often unaware of (cyber) risks for lack of perception about theft, stalking, and harassment [42]. For instance, one of the key issues in protecting children's rights online is the collection and use of their personal data. Children under the age of 16 must obtain parental permission before having their data processed by online platforms, in accordance with the GDPR [31] and its Brazilian version, the LGPD [1]. However, while using social media platforms, children may easily disclose personal data (e.g. name, address, phone number), causing online behaviours to be shared without their knowledge or consent, despite the UN's premise of children's right to privacy [5].

Children's well-being in a digital world involves protecting them against threats including cyberbullying, exposure to potentially

harmful substances, and privacy invasions. Additionally, it involves providing children with access to secure digital environments that meet their developmental and educational requirements. However, the new forms of profit related to this scenario, largely formed by children working as influencers and engaging in sponsorship to promote products and brands, lead platforms to neglect the protection of children who produce online content [14].

Platforms adopt **deceptive design patterns** by structuring their features to modify the set of choices of users and manipulate the flow of information. According to Radesky [35], most applications used by children have functionalities guided by manipulative design, with features that adopt manufactured time pressure, navigation restrictions and even “baits” to encourage longer gameplay or more purchases. Even the inclusion of a strategy known as “cuteness” can constitute a manipulative pattern, which has been identified, for example, in domestic robots [22].

Hence, deceptive patterns go against those users’ best interests, harming them and/or creating negative experiences [25]. An example is a pattern like *confirmshaming* (i.e. when the user is emotionally manipulated into doing something that they would not otherwise do [6]), which can be implemented through a character of an app saying “*don’t just stand there, buy something!*” [35], and affects users’ autonomy. Mathur et al. argue that **autonomy** is the normative value according to which users have the right to act on their own reasons when making decisions, without being overly influenced or compelled by outside forces [25]. The concept of autonomy is directly related to children’s developing capacity for self-determination and decision-making.

This scenario raises concerns about children’s privacy and safety, as well as their rights to access and participate in online spaces without fear of harm. Therefore, it motivates our study on the risks that a kidinfluencer faces on platforms heavily formed by manipulative design patterns.

3 RESEARCH METHOD

This paper reports a descriptive case study of the risks faced by kidinfluencers while acting on YouTube, Tiktok and Instagram platforms. The study was comprised of four phases, namely: data collection through literature review; data analysis by extracting information from the articles selected; data synthesis with the use of techniques; and prototyping for illustrating alternative interfaces that do not put children at risk. Such four phases were performed during ten months by two researchers with a background in Computer Science (one professor with a PhD and one undergraduate student), one of which more focused on reviewing the results of activities performed, for double-check and enriched interpretation. This research was triggered by a request from the Public Ministry of Labor from São Paulo/Brazil for a critical analysis of how Big Techs were dealing with children performing artistic activities on their platforms in terms of protection, security and privacy online.

In the first phase, **data collection**, we searched for relevant papers using three academic engines (Google Scholar, IEEEExplore and ACM Digital Library) with the string ((*child* OR *kid* OR *kids* OR *children*) AND (*influencer* OR *artistic labour* OR *artistic labor*)) OR (*kidinfluencer*) AND (*social media* OR *social network* OR *platform* OR *TikTok* OR *Instagram* OR *Youtube*). We analysed all resulting

titles and abstracts in terms of their contribution to understanding the use of social media platforms by children who produce content, as a form of (artistic) child labor. We must note that the large number of entries on Google Scholar led us to examine only the first 100 articles listed. In addition, we conducted a backwards search to verify whether an article had references to previous works that were also relevant for the topic. We enhanced this dataset by examining grey literature, as it became a relevant source of up-to-date information for researchers from varied scientific areas [21]. Hence, we used Google News to search articles on the topic, adopting the same set of keywords. In total, we selected 23 papers, including journalistic and scientific articles. The final data analysis spreadsheet is available in <https://tinyurl.com/yc79vyvu>.

During the second phase, **data analysis**, we structured the selected articles in a break-down sheet with the columns: author, title, keywords, and publication date. From the articles, we extracted data that were relevant to explain the context of kidinfluencers acting in platforms: (1) people/actors, (2) activities; (3) pains/concerns; (4) desires/expectations; (5) platform rules and country regulations; and (6) platform features and technologies.

We performed **data synthesis** in two ways. Firstly, we considered techniques such as the Onion Diagram and User Journey map to represent contextual information (stakeholders of the problem and a child’s feelings, respectively). An onion diagram shows dependencies among actors in a specific context or organization, and a journey map is a visualization of the process performed by a person to accomplish a specific goal [15]. More details are given in Section 4.1 about the application of these techniques.

Secondly, we considered a categorization of manipulative design patterns available at the website “Deceptive Design” [6] to assess to what extent social media platforms act against a child’s best interests. Each pattern was analyzed in each platform, and we mapped tricks used by tech companies to make kids do something they did not mean to, or did not have the ability to distinguish or properly understand. The synthesis of items 1-5 is described in Section 4.1, while item 6 is discussed in Section 4.2.

Finally, a **prototyping** phase was conducted in light of the interpreted evidence. We aimed at creating interface prototypes for the YouTube platform to illustrate ways to address the issues identified in terms of kidinfluencers’ individual welfare and autonomy. We propose four screens, presented in Section 5.

4 KIDINFLUENCERS WORK IN SOCIAL MEDIA SOFTWARE PLATFORMS

4.1 Overall Scenario

The context of child influencers includes diverse **actors**, as we represent in the onion diagram in Figure 1. We organized these actors by degree of proximity to the problem being investigated. The children themselves, who create and consume content, are the center of the scenario, and close to them are their families and caregivers, and the platform companies, which moderates the content produced. At an outer level, we observed advertisers, associations and agencies that seek to protect children’s rights, governments and legislators, content consumers and academic researchers.

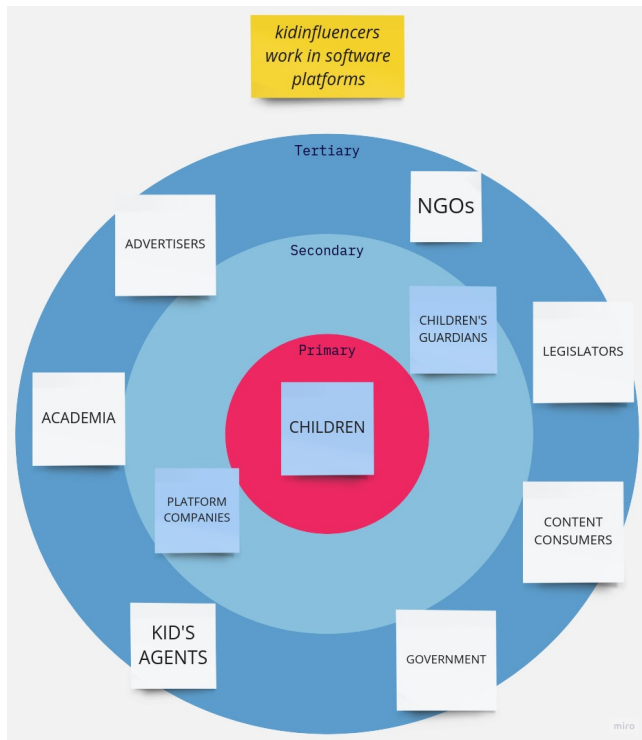


Figure 1: Actors represented in an onion diagram.

In Figure 2, we present a complementary view of actors, highlighting aspects such as **activities or responsibilities** (e.g. how platforms facilitate or control those users).

Children who create content for social media platforms are partially protected by **laws, guidelines, and policies** focused on the child's experience on the Internet. The Children's Online Privacy Protection Act (COPPA), a federal law of the United States, establishes guidelines for collection and use of personal information from children under the age of 13. An example is mandating that tech companies get permission from parents before data collection that can nurture their online services. This regulation limits platforms, websites and applications from collecting children's personal data, which could be available to third parties like advertisers. In 2015, the FTC issued an Enforcement Policy Statement on Deceptively Formatted Advertisements, including advertorials, online advertising or sponsored content [9].

Child labor exploitation and privacy were two main concerns that we identified with respect to regulation of kidinfluencers activities. In order to protect child influencers, some countries have put specific legislation and rules into place, including defining working hours limitations and minimum age requirements. Some examples:

- USA: some States explicitly regulate child performers. California's *Online Eraser* law allows children to request the removal of their content by operators of online services such as Meta or Google, but it's unclear how that might apply to content posted by their own parents. A recent bill aims to expand the labor law to include children appearing in

monetized videos posted on platforms. If approved, this legislation would require children to present a work permit, meet schooling requirements and have regulated working hours and conditions [30];

- France: a law came into force in 2021 that regulates the activity of YouTubers under the age of 16. It posits those influencers in the same level of children and teenagers who work on TV, cinema or as advertising models. Their earnings must be deposited into a bank account that they can only access at age 18 and parents must seek permission from the administrative authority to record videos of children under the age of 16 for monetary gain. Besides, there is a limit of weekly hours for the activity, reducing the risks to education. Finally, children can request deletion of their personal data without parental permission [32];
- Brazil: current legislation prohibits advertising aimed at children, considering children's protection against commercial exploitation as a social value that needs to be satisfied by companies. In addition, there is a need for authorization of child labor when its purpose is the child's participation in artistic representations. However, this obligation does not extend to kidinfluencers (i.e., there is no legal imposition of judicial authorization for the performance of these activities by these children) [2].

Additionally, to ensure the safety of kidinfluencers on their platforms, social media platforms like YouTube and TikTok also have their own rules for child content creators. For instance, YouTube has a specific policy for child creators that entails parental approval and limits the kinds of content that can be produced and distributed. For child producers, TikTok has policies that ban live streaming and direct texting. Recently, those Big Techs have revised their terms of use and general rules. After a US\$170 million fine for illegal background tracking of children in 2020, Google implemented COPPA-compliant measures on Youtube (e.g. disabling ads and personalized comments on videos that could attract children). Then, in August 2021, Google announced new policy changes to raise children's privacy, protection and well-being online (e.g., removal of "overly commercial" content from YouTube Kids such as the famous "unboxing videos" that encourage viewers to buy a product; definition of default upload setting to "high privacy" for users aged 13-17; and reminders indicating who can see their videos as well as others to "take a break" for 13-17 year-olds) [33].

The exposure of children on the Internet as influencers raises many **pains and concerns**. The cognitive abilities, emotion regulation, and moral development are still immature for children under 12 [7]. These abilities could help them understanding the persuasive intent of advertising and strategies used to persuade them, control the emotions that advertisements may arouse, and evaluate the fairness and appropriateness of advertising (e.g., use of stereotypes). A strongly developed advertising literacy is essential for a critical reflection on advertising, avoiding subconscious persuasion [19]. Another issue is the negative impact on children's mental health. The excessive use of social media can lead to problems such as anxiety, depression, sleep disorders, and self-esteem issues [45]. Figure 3 shows a user journey that describes the main activities and feelings of a child acting as a digital influencer, based on [18, 19, 28, 30, 41].

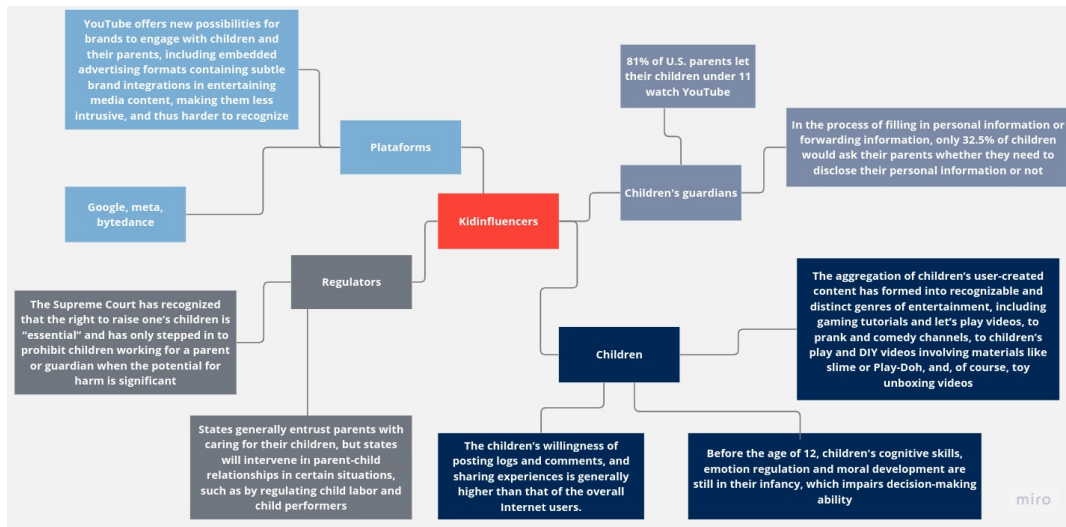


Figure 2: Mindmap of actors and activities.

The colors in the map represent mood variation, with red indicating when the child is sadder and experiencing more suffering, and blue when feeling happiness and excitement. Being closer to the boundary between the two indicates more neutral feelings. We perceive the great variation of feelings, from great happiness to disappointment and sadness.

In terms of **expectations**, kidinfluencers usually aim to obtain what many influential vloggers often receive: (i) free products from brands in return for a mention in a video on their social media accounts on TikTok or Instagram, for instance; (ii) payment to create a sponsored post or video and distribute it to their followers [44]. Regarding child influencers, this desire to receive free gifts is even stronger due to their lack of maturity, making them willing to have an extensive work schedule. Within this context, parents and guardians may see their children as a way to earn extra money by creating content for the internet, even if this may affect the physical and mental well-being of the children.

4.2 Manipulation via Deceptive Patterns

We used an initial taxonomy of deceptive design patterns [6] as a lens of analysis of the problems observed in kidinfluencers' context. Our goal was assessing which of these patterns are used by YouTube, TikTok and Instagram, i.e. how these social media platforms affect the decision-making of children who are content producers. In particular, some of these patterns affect children in general, also involving those who consume content from platforms.

We identified six out of the twelve deceptive design patterns presented by Brignull [6]. In Table 1, we list a set of the deceptive design patterns identified, together with our analysis of their use in the social media platforms studied: *Trick Questions*, *Privacy Zuckering*, *Misdirection*, *Confirmshaming*, *Disguised Ads* and *Forced Continuity*. They were identified and are discussed next.

The **Trick Question** pattern asks users a question that seems straightforward, but is designed to steer them towards a particular option. We found it in the three platforms, on registration features.

For example: a user is asked by the platform to select between “yes” and “no” options, but the question’s wording is unclear, making it difficult to determine which choice best covers the desired result. On TikTok, there is an advertisement stating, “Invite your friends and earn up to R\$3,365.00”. However, achieving that amount by inviting new contacts proves to be an unreliable and non-trivial process. The conditions are written in tiny letters and placed on a page that is difficult to access. Children may find this especially difficult since they do not have the knowledge or experience to detect and avoid such manipulative techniques.

To capture viewers’ curiosity and persuade them to click on the video, content providers on YouTube, for instance, may utilize Trick Questions in the titles or thumbnails of their videos. Users may as a result be duped into viewing content that is not what was advertised or pertinent to their interests. Similar tactics can be used by kidinfluencers on Instagram and TikTok to entice followers to interact with their posts or take part in challenges without fully comprehending the potential repercussions. Concerns regarding transparency, permission, and user manipulation are brought up by the use of trick questions. These platforms can influence people’s behavior or expose them to misleading content by preying on their curiosity or need for engagement.

Privacy Zuckering is a manipulative pattern that tricks users into sharing more personal data than they intended to [26]. The data collected by the application may be used for targeted advertising, data mining, or other purposes that the user did not intend or expect. An example of this pattern is when a website or app requires users to agree to lengthy and complex terms of service agreements, without clear information about how their personal data will be used or shared. We mapped this pattern in the three platforms evaluated. Children who use YouTube may be exposed to targeted advertising and, once they interact with some content or post something, the platform obtains personal information about them without their knowledge. Similar criticism has been leveled

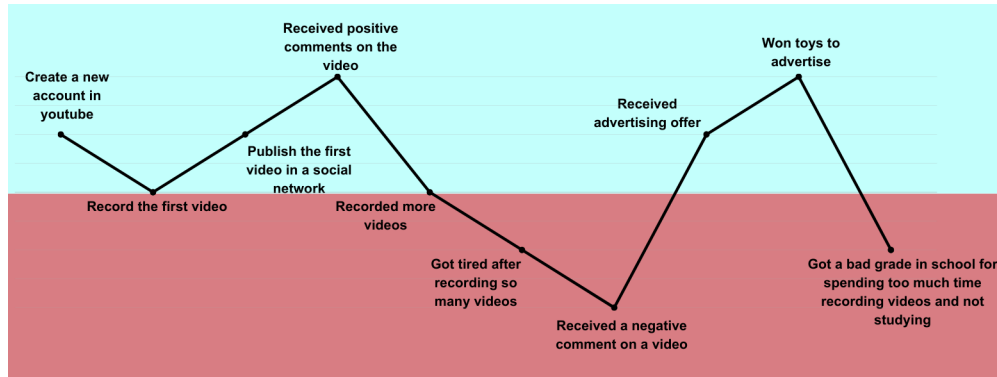


Figure 3: A kidinfluencer user journey.

| | Description | Instagram | Youtube | Tiktok |
|-------------------|--|-----------|---------|--------|
| Trick questions | When glanced upon quickly the question appears to ask one thing, but when read carefully it asks something else entirely | X | X | X |
| Privacy zuckering | The user is tricked into publicly sharing more information about them than they really intended to | X | X | X |
| Misdirection | The design purposefully directs the user’s attention to one thing in order to distract them from another | X | X | |
| Confirmshaming | The act of guilting the user into opting into something | X | X | X |
| Disguised ads | Adverts that are disguised as other kinds of content or navigation, in order to make the user click on them. | X | X | X |
| Forced continuity | When the user’s free trial period of a service comes to an end and the credit card is charged without warning. | | X | |

Table 1: Use of deceptive design patterns by platforms

towards TikTok for its data harvesting methods, which include obtaining users’ biometric information. For example, in 2020, the app was found to be accessing users’ clipboard data without their explicit consent. TikTok addressed the issue and claimed it was a bug [10]. In 2019, YouTube was fined \$170 million for collecting personal data from children. The FTC has been investigating YouTube for its handling of data from users under the age of 13. Young children are protected by a federal law that requires parental consent before companies can collect and share their personal information [17]. Concerns have been expressed regarding the platform’s capacity to safeguard users’ privacy, particularly young children who are more susceptible to internet dangers. Instagram has also been charged for violating users’ privacy, with reference to its methods of data acquisition. The platform has been criticized for gathering user information without their knowledge or agreement and utilizing it to target advertisements.

Misdirection occurs when the user’s attention is deliberately focused on one thing, to divert their attention from another one. For example, using small or low-contrast text, creating a cluttered interface, or placing important information (e.g. privacy settings) in unexpected locations. In Instagram, the privacy settings are hidden and not easily accessible. Sections such as *personal data*, *password and security*, and *information and permissions* do not provide ways for kidinfluencers or their caregivers to manage personal data. These features are hidden in other sections.

Another deceptive design pattern available in the three studied platforms is **Confirmshaming**, which is the act of embarrassing or blaming the user for choosing something [25]. An example: when a platform uses a design element like a large "No" button or adopts unattractive design for the option of declining a service or subscription. By feeling as though they are making a mistake by turning down the offer, the user may be more inclined to accept it. Users may suffer as a result of confirmshaming’s pressure to make decisions they may not want to make. Companies may increase consumer trust and deliver a pleasant user experience by being open and moral in their design methods. An example that we found on all three platforms is persuasive advertisements that attempt to influence the user. When the user tries to close them, they may receive a message suggesting they are making a mistake, such as "Are you sure you want to miss out on this unmissable opportunity?". A child may end up clicking in the advertiser due to such pressure or embarrassment, which is something they are not yet emotionally prepared to manage, or asking their parents for paying for a service they may no longer need or desire as a result of feeling guilty and second-guessing their decision to quit or unsubscribe.

Disguised ads are adverts that are disguised as other kinds of content or navigation, in order to get users to click on them [6], and can also be categorized as a deceptive design pattern. In the context of children social network users, this deceptive design patterns appear in Tiktok and Instagram Stories between the videos and on

Youtube, where the user may have to wait for the advertisement to end to be able to see the videos.

Finally, **Forced continuity** is a deceptive design pattern that occurs when the user is tricked into signing up for a subscription or membership by making the process of unsubscribing or canceling difficult or confusing [6]. For example, a Big Tech might offer a free trial period for a platform product or service, requiring users to enter their credit card information to sign up. Once the trial period is over, the service will automatically start charging the user's credit card on a regular basis unless the user cancels the subscription. This deceptive design patterns occurs specifically on YouTube paid membership (Youtube Premium), which enables child influencers to obtain a secondary revenue stream (e.g. followers can provide them with donations) in addition to what they already earn through ads. YouTube offers a 30-90 days period of free trial, requiring credit card information, but cancelling the membership is not straightforward.

YouTube has a version called YouTube Kids, specifically designed for children under the age of 13. The app was launched in 2015 as a response to concerns about inappropriate content being accessible to children on the main YouTube platform. YouTube Kids features a simplified interface that is easy for children to navigate, with large icons and voice search capabilities. The content on YouTube Kids is curated by a team of human reviewers, as well as by machine learning algorithms that filter out inappropriate content. The app also allows parents to set up profiles for their children, which can limit the types of videos that they can access and screen time. Although YouTube Kids is a good alternative for the safety of children on YouTube, it was still possible to find manipulation patterns in it, such as Trick Question and Misdirection.

5 ALTERNATIVE DESIGNS

In this section, we propose early prototypes that illustrate initial ideas for how some deceptive patterns could be avoided in social media platforms. Our examples are based on the YouTube app. We focus on mobile applications since a higher percentage of children have access to smartphones than to regular computer usage [29].

Figures 4, 5, and 6 illustrate the following problem in YouTube Kids: the platform lacks a mechanism to verify whether the individual creating an account as a parent is truly an adult. This problem falls under the category of deceptive design patterns, specifically the **Trick question** pattern, as it involves a question where there is no mechanism to verify if the user is providing truthful information. Despite the question being straightforward, there should be some method of age verification, as it is an app designed for children. In order to address this issue, a proposed solution includes an additional screen where age confirmation is required by submitting a photo of an identification document, as depicted in Figure 7. However, to avoid risks in terms of privacy, the uploaded image must be deleted after being processed by the algorithm.

Although YouTube Kids is a good alternative for the safety of children on YouTube, it does not address the problem of child influencers, as it does not allow publishing videos. Thus kidinfluencers continue to use the main YouTube platform. In the YouTube platform, one problem observed is not having an extra check when publishing a video, making it possible for children to post videos

without parental consent, often resulting in the sharing of children's information without parental authorization. The US congress recognized that parents should be in control of their children's data online with the Childhood Online Privacy Protection Act (COPPA), which gives parents authority over the information websites collect from their children [30]. This problem can be categorized as the deceptive design patterns **Privacy Zuckering**. As a possible solution, when publishing a video, we suggest an extra screen with digital recognition, as shown in Figure 8. This feature would require explicit permission from caregivers, who could allow or prevent the upload of this data from a child to the platform. In case they consider this is a sensitive data to be offered to Big Techs, an alternative option could be to use an extra password.

Our final example addresses advertisement. According to studies conducted by the NGO Alana Institute [3], the advertising content developed in the digital environment is not easy to identify, leading to error even in adults, constituting veiled advertising, which enhances the illegality and harmfulness of marketing communication directed to the children's audience. Unmarked advertising involving the participation of children is an example of **Disguised ads** and should be treated with even greater severity than unmarked advertising created by adults, as it involves child labor. Hence, platforms should have some tool to report advertising made by children that is unmarked, as shown in Figure 9.

6 CONCLUSION

Our main **contribution** was to (i) identify and exemplify the use of deceptive design patterns by large platforms and (ii) propose alternative designs that contribute for individual welfare and autonomy of kidinfluencers. As we discussed in this article, the use of technology plays a critical role in shaping the dynamics of child influencer marketing, from the platform design to the algorithmic recommendations and the data collection practices. Therefore, there is a need for a comprehensive approach that considers ethical, legal, and social implications of child influencer marketing and foster children's rights by design.

Threats to validity include the possibility that relevant articles may have been missed in our search procedure, despite our best attempts to gather evidence in a structured manner (e.g., search string, extraction spreadsheet, etc.). However, by conducting a reverse search, we were able to reduce this threat. Relying on evidence from journalistic articles posed another risk because they can be prone to personal opinions. We addressed this problem by taking into account platform's documentation and by performing tests where we manually went through the platforms and mapped the problems according to the deceptive design patterns.

In **future work**, we plan to expand our investigation by looking at articles in the fields of Law and Social sciences, as well as presenting our results directly to platforms through partnerships with NGOs such as Alana Institute, which maintain a close relationship with Big Techs to promote the protection of children online. Additionally, a more thorough study of the platforms (including an inspection analysis and a user study with children and guardians) will allow us to refine, evolve and create prototypes free from deceptive patterns. Such prototypes should also be validated with children and guardians.

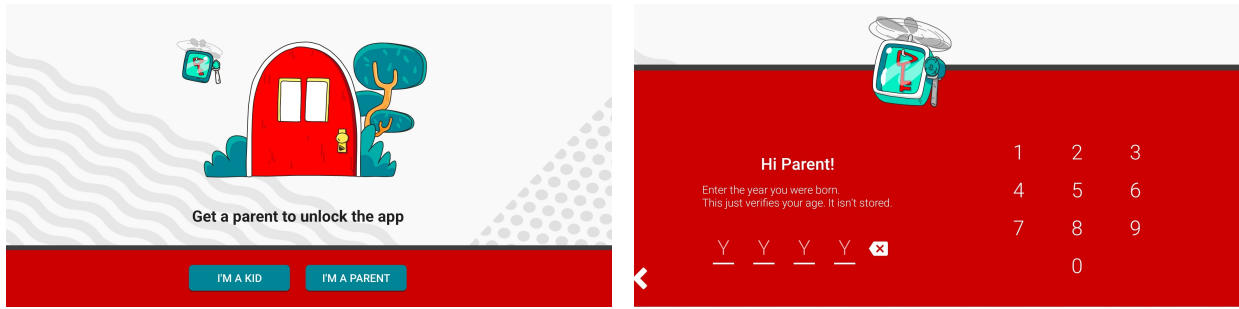


Figure 4: Initial flow to enter the account.

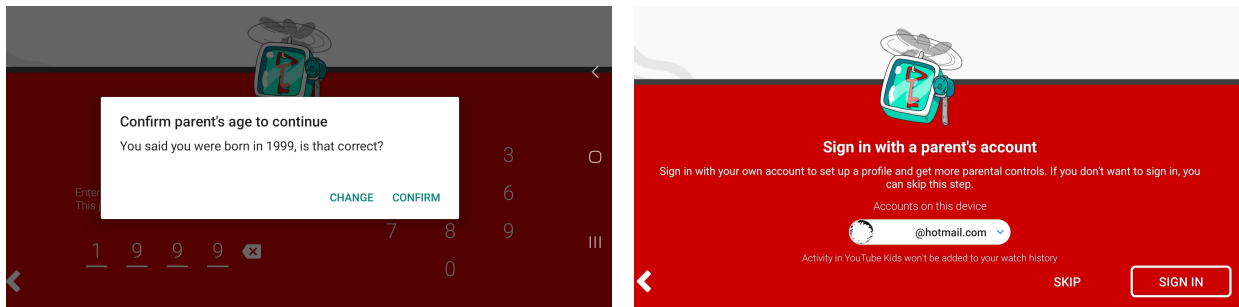


Figure 5: Weak confirmation.

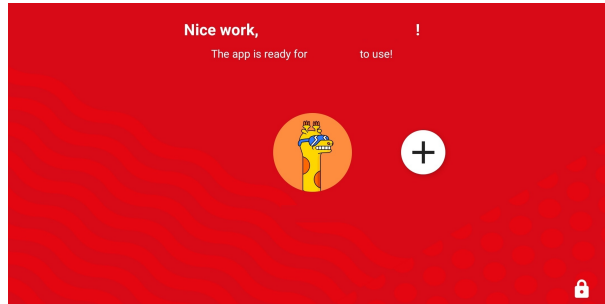


Figure 6: Account access.

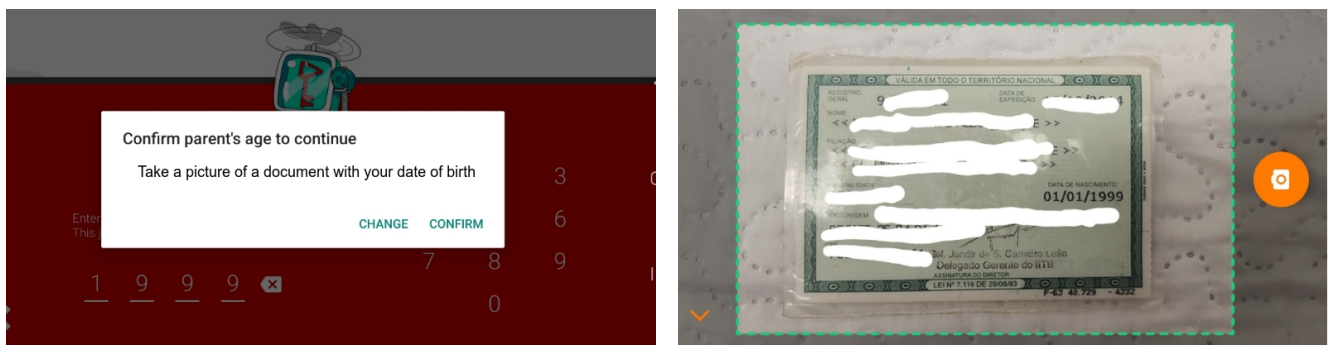


Figure 7: Proposed prototype for sending the document that proves user's age.

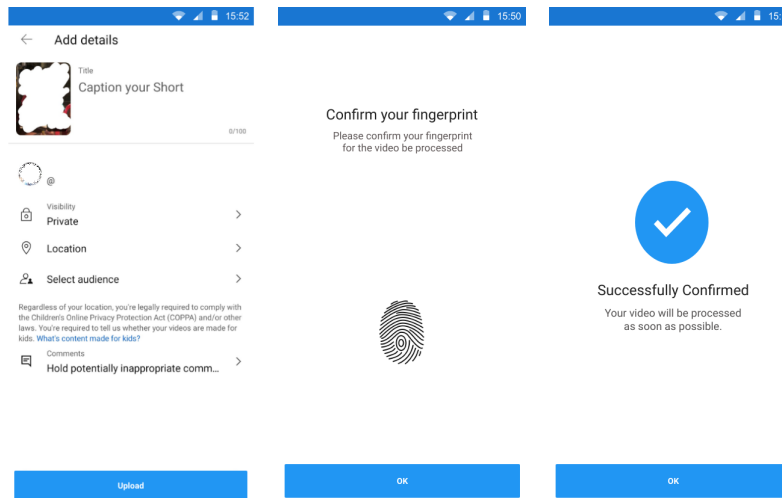


Figure 8: Proposed prototype with fingerprint confirmation to post a video.

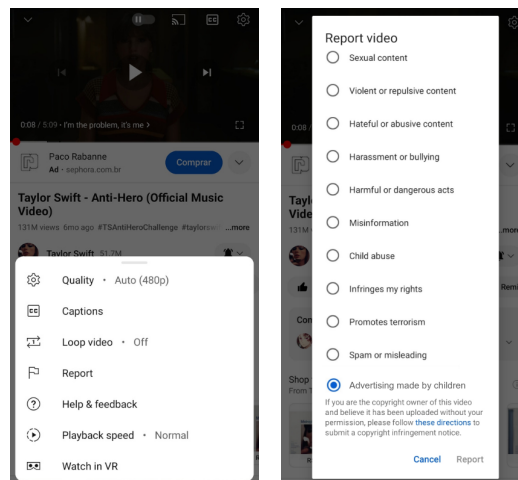


Figure 9: Proposed prototype to report a advertising made by children.

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