On Social Media Design, (Online-)Time Well-spent and Addictive Behaviors in the Age of Surveillance Capitalism

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Abstract

Purpose of the Review Social media attracts billions of users worldwide, and research has investigated how screen time or time spent online is linked to well-being. Additionally, addictive-like behaviors towards the social media platforms are a focus of many studies. However, related research often neglects the simple fact that social media companies have willingly created immersive online environments with the aim to "persuade" users to spend as much time possible on their social media apps to watch ads and enlarge their digital footprints.

Recent Findings We think that it is of utmost importance to better understand how the many design elements on social media platforms—ranging from the like-button to endless scrolling—impact the psyche and behavior of users. Such knowledge will not only help to better understand how problematic social media use evolves but will also provide important knowledge on how more healthy social media platforms could look like in the future. In this context, the present article also critically reflects the time well-spent initiative by the industry.

Summary From our view, the many problems around social media will only be solved if the data business model is abandoned. As long as companies base their business model on the digital surveillance of people's lives, no changes towards healthier social media platforms can be expected.

Introduction

At the moment of writing, more than four billion people use social media [1]. The unbelievable success story of social media can be explained due to many factors. Uses and gratification theory among others proposes that humans spend time on social media due to social, hedonic, and utilitarian gratification [2], but clearly other motives have also been carved out [3–5]. Without doubt, the chance to build social capital via social media [6], and to communicate from one to many, makes social media a highly interesting tool for people both in their private and professional lives [7]. Beyond the many advantages arising from social media use, critical voices see that there are also detrimental aspects due to social media use [8]. Among others, social media use can result in addictive-like patterns.

Issues Around Labeling and Understanding the Nature of Excessive Social Media Use

It is relevant to reflect that scientists have not agreed so far on a common way to assess addictive tendencies towards social media nor on a unified term to label excessive social media use behavior. In the literature, terms such as problematic social media use, social media addiction or social networks use disorder (SNUD) can be found, complicating discussion and research in the field. The SNUD term aligns with the nomenclature of gaming disorder, which since 2019 has been an official diagnosis in the WHO's ICD-11 [9]. If an addiction framework is applied to study and characterize excessive social media use, scientists at the moment discuss if the diagnosis framework for gaming disorder can

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be simply transferred to social networks use disorder, by exchanging the term "Gaming" with "Social Media" [10]. The criteria to assess gaming disorder are as follows: loss of control over gaming, prioritizing gaming beyond what was important in life before, sticking with gaming although negative consequences are already visible, and functional impairment due to gaming (such as break up of romantic relationships or endangering job loss). The last criterion is perhaps of particular importance to ensure that practitioners and scientists alike are not pathologizing everyday life [11]. Although it is still too early to ultimately decide upon the actual nature of excessive social media use [12], the literature is relatively clear in showing robust associations between SNUD and depression/anxiety disorder tendencies [13], but the field still is hampered by too many cross-sectional studies, preventing the disentanglement of cause and effects.

Another important aspect we discuss in this work more in-depth touches upon the time spent online. Although the tech-industry aims to prolong users' online use, we mention that longer use does not necessarily or "per se" mean that someone is "addicted" towards the platform. This should not downplay the responsibility of the industry here, but rather explains what is meant when scientists speak of addictive behavior in the context of social media use. And although not every long-time user of social media is addicted (perhaps being part of one's job as an influencer), it is also clear that addictive-like social media use goes along with excessive time spent online. Similar discussions are led in the context of gaming and esports [14–16].

Further Negative Side Effects of the Data Business Model

Before we exclusively discuss the time spent online/addictive behavior topics in the context of the data business model behind social media platforms, further negative side effects of current operating social media platforms should at least briefly be mentioned. People are presented with misinformation campaigns and hate speech online, which can adversely impact societies and personal well-being; and due to the massive amounts of data arising while one uses social media—personal privacy is endangered [17]. These mentioned problems can all be traced back to the data business model behind most of the current operating social media platforms, which foresees that people receive a use-allowance of a social media service in exchange for the digital footprints provided while using a platform [18•]. The knowledge arising from the digital footprints of each user is exploited to understand who the users are and what their interests are. This kind of information is of high interest for the marketing industry [19], which pays a large amount of money to send personalized ads matching one's digital

footprints, likely resulting in higher click and buy rates (or greater probability that someone votes for a certain party in the political context [2021•]). The business model fostering a spy-mentality on the tech-industry's side has been also coined "surveillance capitalism" by Shoshana Zuboff [22••], who critically reflects on downsides of the current business culture of the tech-industry.

Rules of Thumb such as "More Time on Social Media Results in Decreased Well-being" are Outdated

As mentioned already, we will now exclusively focus on the mental health sector in this work, which is also related to the well-being complex. Here, much work has been already conducted to better understand if more time spent on social media goes along with decreased well-being [23••]. This is in fact a highly relevant question, because (a) vulnerable groups such as adolescents spend increased amounts of time on social media platforms [24] and (b) the data business model led social media companies to design highly immersive platforms which aim to lure in users to heavily use the platforms [25••]. This in turn means not only more eyes on the presented ads on social media platforms, but also more digital footprints of the users, which helps the industry to characterize a person's interests on a fine, granular level [26]. Meta-analyses present data on how well person characteristics such as personality can be inferred from digital footprints [27, 28], a research area being also labeled digital phenotyping or mobile sensing [29].

Against the existing background of research-findings, it can firmly be said that equations such as "more time on social media = decreased well-being" are too simplistic to shed light on potential associations of social media use and life satisfaction or emotional happiness. Fittingly, a meta-analysis suggests, at best, only small inverse associations between social media use and well-being [30•]. Of course, an individual may still experience adversity in the context of their own social media use, which is not surprising as online dangers—such as being confronted with hate speech, cyberbullying and other harmful content—can await users on social media platforms. This said, simple rules of thumb, as the one presented, are not matching upon the reality of many users, and research shows that many factors play a role in understanding for whom social media use will result in delightful or dreadful experiences [31]. What are such factors? Among others, we need to consider age and gender of the users investigated [32]. For instance, in the cited work, younger age and being female were risk factors for excessive social media use. In addition, personality (high neuroticism, low conscientiousness) seems to be a relevant variable predicting which users develop—for instance—problematic social media use [33]. Aside from this, use-motives (see above) and how people use social media also need to be

considered. Additionally, it has been discussed if more passive vs. active use of social media results in worse well-being [34], but also this field shows heterogeneity in findings [35]. To sum up at this point, the study of the well-being complex in the realm of social media use is complicated. We end this section with the observation that greater addictive tendencies towards social media (beyond screen time) are associated with decreased well-being/increased depressive tendencies (to a greater extent than the time spent well-being associations [36, 37]), therefore further providing empirical ground to study the addiction complex.

Although much is known already, from our view one critical aspect is less targeted by scientists aiming to understand why persons ultimately spent too much time on social media or even show addictive usage patterns: the design of social media platforms.

Does the (Online) Time Well-spent Initiative of the Industry Really Aim to Counteract Addictive-like Behavior Towards Social Media?

Interestingly, the tech-industry itself saw the need to develop a time well-spent campaign touching upon social media use. One could argue that with such a campaign they at least indirectly admitted to downfalls of the data business model. For Mark Zuckerberg, time well-spent as the CEO of Meta (then Facebook) meant the following: "By focusing on bringing people closer together—whether it's with family and friends, or around important moments in the world—we can help make sure that Facebook is time well spent".[1] Against this background it is interesting that Meta released screen time tools enabling users to monitor and set time limits on their Instagram or Facebook use.[2] Furthermore, Apple finally started to provide users with a screentime tool[3] giving insights into how much time users spent in the previous week on their smartphones. CEO Tim Cook formulated alongside the campaign: "We don't want people using their phones all the time … This has never been an objective for us."[4]

As independent scientists, we would like to understand how many people actually use these tools and we want to know if these time-keeper tools are effective in reducing time spent either on social media or the smartphone in general. Do these tools really result in time well-spent, and how should this be best measured? As the tech-industry in large

parts still does not share relevant data on this or related topics, it is unclear if these new services really work in a positive way for users. Beyond this, one might also raise the question if time-control tools—as mentioned above—simply represent a marketing tool, so that the tech-industry can pretend that they are supporting their users to achieve more healthy behavioral usage patterns. It should not be forgotten that reducing online time cannot be in the interest of social media companies, when at the same time they earn their money via the attention economy and surveillance capitalism.

As long as application programming interfaces (APIs) are closed or restrictions to run one's studies on the platforms are too large, social media will remain a black box, although it is high time to understand how people behave in this online realm to better understand the social media-well-being and addiction complex [38•]. This naturally will not only mean understanding if the time-restriction tools help foster "time well-spent" (a blurry concept) on the platforms, but also to understand how each design element alone and in interaction with other design elements on the platforms impact upon time spent online and user well-being. Work by Montag and colleagues introduced several design elements—alongside—psychological/behavioral economic theories—which aim to prolong online use and engagement with the platforms [25••]. Among these design elements are the like-button, read-receipt functions, endless scrolling, but also number of followers collected on a platform could be named, the colors used on the platforms and personalization of content. Furthermore, push notifications and time restrictions of content are used to elicit *fear of missing out* bringing people to the platforms [39, 40]. We also mention an important new article [41••], which presents design elements of social media and other platforms in a systematic taxonomy and also making the relevant point that it is of importance to identify if "they have a role in the development of behavioural problems" or if this is not the case (p. 145). This said, each design element has been extensively tested (with high degrees of probability) by the industry via so called AB-testing to assess its effects on the users. For instance, there is the personalized newsfeed at Facebook, which was not always part of one's personal content history. When the company decided to present each user with the best personal "New York Times of You" [42] (p. 261), the company clearly must have been keen to know (and very likely tested) how people behave when confronted with a personalized vs. non-personalized newsfeeds. Logically, personalization should trigger more interest in users (with less chance of users becoming bored); hence, such a feature should keep users on the platform for more time. Outgoing from such insights, the tech-industry then could move further and test how humans behave when the platform has no natural end anymore. In such a design setting, the users
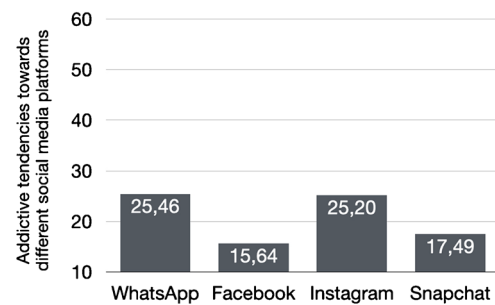
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[1] https://www.theverge.com/2018/1/17/16903844/time-well-spent-facebook-tristan-harris-mark-zuckerberg.

[2] https://www.cnbc.com/2018/08/01/facebook-and-instagram-time-well-spent-features.html.

[3] https://www.apple.com/newsroom/2018/06/ios-12-introduces-new-features-to-reduce-interruptions-and-manage-screen-time/

[4] https://mashable.com/article/apple-tim-cook-time-100.

Fig. 1 Left side depicts AB-testing done by the tech-industry to come up with the most immersive social media platforms; right side depicts study findings [43] showing that social media platforms go along with different addictive potential (likely also due to different in-built design elements); pictures adapted from Montag [2], no copyright needed

would be able to scroll on forever and will always find new content. In this case, the industry could test what happens when users are confronted with endless scrolling vs. a platform with an endpoint. The simple experimental plan is also depicted in Fig. 1 (left side), where not only an AB-testing plan, but rather ABCD-testing-plan is presented with the design elements mentioned in the sentences above. In the present 2 × 2 design, it is very likely that variant A—hence a platform which features endless scrolling and personalization—will result in the most online time.

Scientific Roadmap for the Next Future

When thinking about the future of more healthy social media platforms, it will be of interest to not only understand what combination of design elements creates the greatest online times and perhaps also most addictive tendencies [41••], but also to obtain insight into the effect sizes. How drastic are the effects of each design element or a combination of design elements on online time/engagement with the platforms and does this affect user well-being? The tech-industry behind social media platforms likely can answer such questions, but without sharing such data, independent scientists must painstakingly find workarounds to investigate the platforms. This investigation has been done in several ways in the past. Before the Cambridge Analytica data scandal [44], when APIs at Meta were still open [26], scientists could study digital footprints of users and bring this data layer together with self-report information of the study participants. With the help of such study designs, it was revealed that receiving likes probably resulted in greater happiness, and this is in part mediated by self-esteem [45]. More happiness due to platform visits likely enhances the aim of the industry so that users spend more time on these platforms—perhaps also with the consequence, for some users, that addictive-like behavioral patterns might be created. But we also want to stress that being happy on a platform taken alone is something positive, and again we do not want to pathologize everyday life. Nevertheless, such positive experiences can shape habit formation, leading participants to revisit platforms over and over again [46]. Indeed, it has been observed that receiving likes not only triggers the reward circuitry of the brain [47], but also might result in addictive-like behavioral action patterns towards the platform [48]. In the aftermath of the Cambridge Analytica data scandal, the APIs were closed, therefore often leaving scientists with the only option to study social media effects via questionnaires or supplement such self-report research with smartphone log data [49]. Mobile sensing—as interesting as it is—only allows "objectively" recording which apps people use for how long on smartphones, but does not provide insights into what people actually do on the phones—in terms of in the apps (due to the sandboxing principle). These restrictions hamper the field of social media research touching upon user well-being and the addiction complex. Self-report in the near future will also necessarily play an important part in social media research, because at least at the moment it is hard to infer the criteria to diagnose addictive-like tendencies towards a platform via digital footprints only (but textmining might come close in the future; [50]); see also recent reflections on the potential of digital phenotyping/mobile sensing in research on internet use disorder [51].

In sum, as long as APIs are closed, scientists will further study social media effects by asking participants about their online use and perhaps by imitating platforms using experimental setups. This way, we know for instance that the endowment effect might be a good explanation for why people have problems in quitting social media [52, 53], and that nudging mechanisms are a likely explanation for the power of read-receipt functions (working for some via social pressure; [54]) or that colors are of relevance to hold a grip on user attention [55]. Compared to the many questionnaire studies being conducted on addiction symptoms in the field of social media and well-being, the power of design elements driving social media use is still understudied. This area of research needs to be enhanced, and it can be expected that users with different personalities react differently to design elements [56]. Such insights clearly will complicate answers to relevant research questions. Moreover, it is unlikely that "one size fits all" design solutions will help to enhance well-being of all social media users.

Conclusions

From our view, the industry uses narratives such as time well-spent alongside the time-keeping features to distract society from their own responsibility with the platforms they created [57]. By providing users with online time tools, it is not unlikely that the companies behind social media want to blind society from their responsibilities to re-design their platforms towards more healthy online environments. Abstaining from a focus on online time as fundamental to social media companies' business model will require new forms of paying for the online services [58]. Of course, a social media company cannot operate for free, but needs resources to pay programmers, content moderators, server farms, and so forth. When discussing alternative payment models it has been put forward if social media is a public good [2], which would mean that platforms should not be in the hands of private companies anymore. Then, social media services could be paid for instance by tax revenue. Also, subscription models are imaginable, but not for the social media platforms we see now. Instead, we would pay for radical, new social media platforms with different designs respecting privacy and human rights of the users. These future platforms would take the slogan "time well-spent" and surrounding mental health issues seriously. It is time to re-start social media [18•].

Declarations

Conflicts of Interest Dr. Montag reports no conflict of interest. However, for reasons of transparency, Dr. Montag mentions that he has received (to Ulm University and earlier University of Bonn) grants from agencies such as the German Research Foundation (DFG). Dr. Montag has performed grant reviews for several agencies; has edited journal sections and articles; has given academic lectures in clinical or scientific venues or companies; and has generated books or book chapters for publishers of mental health texts. For some of these activities, he received royalties, but never from gaming or social media companies. Dr. Montag mentions that he was part of a discussion circle (Digitalität und Verantwortung: https://about.fb.com/de/news/h/gespraechskreis-digitalitaet-und-verantwortung/) debating ethical questions linked to social media, digitalization, and society/democracy at Facebook. In this context, he received no salary for his activities. Finally, he mentions that he currently functions as independent scientist on the scientific advisory board of the Nymphenburg group (Munich, Germany). This activity is financially compensated. Moreover, he is on the scientific advisory board of Applied Cognition (Redwood, CA, USA), an activity which is also compensated. Dr. Elhai notes that he receives royalties for several books published on posttraumatic stress disorder (PTSD); is a paid, full-time faculty member at University of Toledo; occasionally serves as a paid, expert witness on PTSD legal cases; and receives grant research funding from the U.S. National Institutes of Health.

Human and Animal Rights and Informed Consent Does not apply.

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