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Digital Nudges for Reducing Social Media Screen Time

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Abstract

This study explores whether user experience (UX) nudges can help young adults reduce their screen time on social media, specifically on TikTok, and whether they find these nudges useful. Many social platforms are designed to be addictive, and traditional digital self-control tools are often ignored. In this study, 11 participants aged 18-25 tested two UX nudges over one week: a short breathing exercise and a self-imposed timer, both shown before using the app. Data was collected through screen time measurements and pre- and post-intervention interviews.

The average screen time decreased by 193 minutes (35.8%), but the change was not statistically significant. However, most participants said the nudges made them more aware of their usage and helped them reflect before scrolling. The qualitative data was analyzed using inductive content analysis, showing themes like increased awareness, behavioral change, and irritation due to repetition. While some participants found the nudges helpful, others wanted more customization or found them annoying.

The study suggests that nudges can support more mindful use of social media, even if they do not always lead to major behavior changes. It highlights the importance of designing interventions that balance helpfulness with user comfort. Further research with a larger group and longer duration is needed to better understand the long-term impact.

Keywords: *UX nudges, screen time, TikTok, young adults, digital well-being, self-control tools, behavior change, user perception*

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1 Introduction

The rapid advancement of mobile technology has transformed social media into a dominant part of daily life, especially for young users. Platforms like TikTok, Instagram and YouTube shorts use sophisticated recommendation algorithms and engaging interfaces to maximize user retention. While these platforms promote creativity and connection, concerns have been raised about their role in excessive screen time, which has been linked to sleep disturbances, anxiety, depression, procrastination, and decreased productivity (Scott & Woods, 2018). On average, people worldwide spend 6 hours and 42 minutes per day online (Salim, 2019), and half of U.S. teenagers report feeling addicted to their phones (Hurley, 2022).

Social media platforms are intentionally designed to maximize engagement, often using dark patterns, manipulative design techniques that exploit cognitive biases to keep users scrolling (Mathur et al., 2021). This strategy, known as the "attention economy" (Davenport & Beck, 2001), monetizes user engagement through targeted advertising. Existing Digital Self-Control Tools (DSCTs), such as screen time reminders and app limits, offer limited effectiveness, as users frequently override or ignore them (Hiniker et al., 2016). Given these challenges, User Experience (UX) nudges offer an alternative approach, subtly guiding users toward healthier behaviors without restricting their freedom.

Unlike strict time limits, UX nudges are designed to influence behavior through subtle interventions, such as time-based reminders, friction-based interactions, and contextual pop-ups. While these techniques have been implemented in some platforms, their effectiveness within highly immersive environments like TikTok remains underexplored.

This study examines whether UX nudges can reduce excessive screen time on social media platforms like TikTok and how users perceive these interventions. By investigating their effectiveness, the research contributes to the broader discussion on ethical technology design and strategies for promoting digital well-being in an era of increasingly persuasive social media platforms.

1.1 Problem statement

Many young adults struggle to control the time they spend on social media, often using apps like TikTok longer than they intend. This is because these platforms are designed to keep users engaged, showing endless content based on their interests (Montag et al., 2021). As a result, people may lose track of time, which can affect their daily routines, productivity, and well-being. To help with this issue, some apps provide Digital Self-Control Tools (DSCTs), such as screen time reminders or daily limits. However, these tools are often ineffective because users ignore them, turn them off, or quickly dismiss them (Hiniker et al., 2016). This suggests that a different

approach is needed: one that encourages users to be more aware of their screen time without forcing restrictions.

One possible solution is UX nudges, which are small design changes that guide users toward healthier habits. Instead of blocking access, nudges help users make more mindful decisions about their app usage. Nudges have been used successfully in other areas, such as health and finance, but their impact on social media habits is not well understood (Sunstein & Thaler, 2008).

This study tests two types of nudges to see if they can help young adults (18–25) reduce their screen time on TikTok. The first is a short breathing exercise that appears when users open the app, giving them a moment to reflect before they start scrolling. The second is a self-imposed usage timer, allowing users to set a time limit before they begin using TikTok. By collecting screen time data and feedback from participants, this study will evaluate whether these nudges can support better self-regulation.

Another important factor is how users perceive these interventions. If they find nudges helpful, they might be more likely to use them. However, if they see them as annoying or unnecessary, they may ignore them. Understanding user reactions is key to designing effective solutions that promote healthier social media habits without disrupting the user experience.

This research aims to provide insights for designers, developers, and policymakers who want to create better digital tools that help people manage their screen time in a way that feels natural and supportive.

1.2 Purpose and research questions

The purpose of this study is to investigate whether UX interventions, known as nudges, can effectively reduce the time young users spend on social media and assess their perceived helpfulness.

To fulfill this purpose, the study aims to answer the following research questions:

1. **Do UX nudges effectively reduce time spent on scrolling?**
   This question seeks to determine whether UX nudges lead to measurable reductions in screen time among social media users.
2. **How do young users perceive these nudges in terms of helpfulness?**
   User perception is a key factor in the success of nudges. This question explores whether young users find these interventions beneficial or intrusive.

1.3 Scope and Limitations

This study focuses on assessing whether UX nudges can effectively reduce TikTok screen time among young adults aged 18–25. The research employs both quantitative

(screen time tracking) and qualitative (pre- and post-intervention interviews) methods to evaluate the impact of two specific nudges: a breathing exercise upon opening TikTok and a self-imposed screen timer. By examining participants' screen time data before and after using these interventions, the study aims to determine their effectiveness in promoting more mindful social media usage.

Despite its contributions, this study has several limitations. Firstly, the sample size is relatively small, consisting of only 11 participants, which limits the generalizability of the findings. Previous research has shown that small sample sizes often hinder the ability to make broader conclusions about larger populations (Glesne, 2011). Additionally, all participants were university students, which introduces a contextual constraint, as their screen time behaviors may not be representative of a broader demographic. This lack of diversity could impact on how the results are interpreted in a wider context, as university students' social media usage may differ from that of young adults in other settings.

Another significant limitation is the timing of the study, as data collection occurred during the university exam period. This external factor may have influenced participants' TikTok usage, potentially reducing their screen time independently of the nudges. Stress, workload, and time constraints associated with exams have been shown to impact screen time behaviors (Kuss & Griffiths, 2017). Consequently, it is difficult to isolate the specific effect of the interventions on screen time, as these factors may have naturally led to lower engagement with social media during this period.

Furthermore, while participants were assured of anonymity through a signed privacy agreement, the fact that they knew the researchers may have introduced social desirability bias. This is a common issue in behavioral research, where participants may alter their behavior to align with perceived expectations or avoid judgment (Van de Mortel, 2008). In this case, participants might have subconsciously reduced their TikTok usage in response to the study's objectives, potentially leading to an overestimation of the nudges' effectiveness.

Another key limitation concerns participant motivation. The individuals involved did not necessarily have a personal interest in reducing their TikTok screen time but participated primarily as a favor to the researchers. Research on motivation suggests that intrinsic motivation plays a significant role in the success of behavior-change interventions (Deci & Ryan, 2000). As such, participants who are genuinely interested in reducing their screen time may have responded differently to the nudges than those who were less motivated.

Finally, this research does not assess the long-term impact of UX nudges. Participants used the nudging app for only one week, which may not be sufficient to determine whether the interventions lead to sustained behavioral changes. Studies have shown that

many interventions, including nudges, may have short-term effects, but fail to induce long-lasting behavior changes (Ludwig et al., 2012). To understand whether these interventions can continue to influence behavior over time, future studies should explore their long-term efficacy.

By acknowledging these limitations, this study provides a foundation for further research. Future work should consider larger and more diverse samples, varying contextual conditions, and longer study durations.

1.4 Disposition

To help the reader follow the structure of this report, this section outlines how the rest of the thesis is organized.

The next chapter, **Chapter 2 – Theoretical Framework**, provides the background and concepts that support this study. It covers areas such as the attention economy, persuasive design, digital well-being, and UX nudges.

Chapter 3 – Method and Implementation explains how the study was carried out. It describes the research design, the use of the "One Sec" app as the intervention, and the steps taken to collect and analyze both qualitative and quantitative data. This chapter also includes a discussion on the study's reliability, validity, and ethical considerations.

In **Chapter 4 – Results**, the findings from the data are presented. This includes participants' screen time before and after the intervention, as well as insights from interviews about their experiences and perceptions of the nudges.

Chapter 5 – Discussion explores what these results mean. It compares the findings to previous research, discusses how they relate to the research questions, and considers the implications for design, theory, and future digital well-being tools.

Lastly, **Chapter 6 – Conclusions and Further Research** wraps up the study. It summarizes the key takeaways, reflects on the limitations, and offers suggestions for how future research could build on these findings.

2 Theoretical framework

2.1 Introduction

This chapter presents, compares, and evaluates the theoretical perspectives and prior research that inform this study. By examining concepts from behavioral economics, persuasive technology, and digital well-being, this framework provides a foundation for the research methodology. Specifically, these theories will guide the development of interview questions and the interpretation of empirical findings, ensuring that the study systematically explores the potential of UX nudges to reduce excessive social media usage.

2.2 The attention economy and persuasive design

The attention economy is based on the idea that human attention is a valuable and limited resource, particularly in an era where digital platforms compete to capture and retain it. Herbert Simon first introduced this concept, explaining that the abundance of information available means attention must be allocated efficiently (Simon, 1969). In this digital environment, attention has become a form of currency that determines the profitability of platforms. Social media companies use this model to increase engagement, often through advertising revenue. The longer users stay on a platform, the more advertisements they are exposed to, and the more data companies collect, which strengthens their business model.

The importance of attention for digital platforms cannot be overstated, as increased user engagement directly influences their financial success. Many users report that passive scrolling on social media feels meaningless, yet they struggle to disengage due to the habitual nature of their usage (Lukoff et al., 2018). This loss of autonomy is often a result of persuasive design techniques that encourage prolonged use. Social media platforms implement features such as intermittent variable rewards, which function similarly to slot machines, keeping users engaged through unpredictable gratification (Griffiths, 2018). These are rewards that appear at random, such as an entertaining video or a funny meme, and users never know when they will get the next one. This unpredictability makes users keep scrolling in hope to find something interesting, and it becomes a hard habit to break.

Social validation mechanisms like Facebook's 'like' button reinforce continued engagement, making it difficult for users to step away (Alter, 2017). The "like" button acts as a form of instant social approval. When users receive likes on their posts, they experience positive emotional feedback, which encourages them to post more often and check the app frequently. This creates a cycle where users begin to associate app usage with feelings of recognition and self-worth, making the platform more emotionally rewarding and harder to leave.

Persuasive design techniques are intentionally crafted to make digital experiences more engaging and difficult to leave. Aesthetically pleasing designs and visually appealing avatars tend to generate more positive user responses, leading to greater interaction with a platform (Tormala et al., 2006). Many of these techniques leverage psychological principles to keep users online. For example, small visual cues, such as red notification badges, autoplay features, and streak indicators on apps like Snapchat, create a sense of urgency and compulsion (Alter, 2017). The removal of natural stopping cues is another major persuasive design element. Before infinite scrolling, users had to make a conscious decision to load the next page, offering them an opportunity to stop. However, infinite scrolling eliminates this break, encouraging users to continue engaging with content indefinitely (Harris, 2019).

These persuasive strategies highlight ethical concerns regarding digital well-being, as they shape user behaviors in ways that prioritize engagement over personal autonomy. While these design choices enhance platform profitability, they also contribute to excessive screen time and diminished self-control, raising questions about the responsibility of tech companies in influencing user habits.

2.3 Digital well-being

Digital well-being refers to an individual's ability to maintain a healthy balance between the benefits and drawbacks of digital connectivity (Vanden Abeele, 2021). While smartphones and digital devices offer many advantages, excessive screen time has been linked to various negative consequences. Studies show that the average smartphone user interacts with their device thousands of times per day, with daily screen time often exceeding three hours, and in some cases, even five hours for heavy users (Deng et al., 2019).

Although mobile technology enhances communication and access to information, it also creates challenges for users. Research suggests that smartphone usage can interfere with social interactions (McDaniel & Drouin, 2019), reduce productivity at work and school (Duke & Montag, 2017), and contribute to procrastination (Schnauber-Stockmann et al., 2018, as cited in Vanden Abeele, 2021). Additionally, prolonged screen exposure has been linked to sleep disturbances, health issues (Lanaj et al., 2014), and increased stress and anxiety (Büchi et al., 2019). Many individuals, particularly younger users, recognize these negative effects; surveys indicate that a significant proportion of young adults, teenagers, and even parents believe they spend excessive time on their screens and struggle to reduce usage despite wanting to do so (Paul & Talbott, 2017, as cited in Vanden Abeele, 2021).

In response to these concerns, a new category of digital well-being tools has emerged, aiming to help users develop healthier technology habits. Digital well-being apps, such as Forest, use gamification techniques to encourage users to focus on tasks rather than getting distracted by their devices. These apps often implement features like timed lockouts, goal setting, and progress tracking to promote mindful usage. Additionally, many individuals turn to digital detox strategies, which involve intentionally limiting or eliminating screen time for a set period. Digital detox practices range from short breaks during the day to extended periods of disconnection, such as weekend retreats or social media fasts.

As the challenges of excessive screen time continue to grow, digital well-being remains an important area of study, highlighting the need for tools and strategies that support a healthier relationship with technology.

2.4 Digital self control tools and their limitations

Digital self-control tools (DSCTs) are designed to help users manage their screen time and reduce digital distractions. These tools, which include mobile applications and browser extensions, primarily rely on self-monitoring techniques to encourage mindful technology use (Monge Roffarello & De Russis, 2023).

Despite their growing popularity, DSCTs face several limitations. Many existing tools focus on blocking access to distracting apps or websites entirely rather than addressing the underlying design elements that drive compulsive usage (Lukoff et al., 2021). For example, apps like Forest encourage users to stay focused by rewarding them for avoiding distractions (Seekrtech, 2023), they do not directly mitigate the persuasive techniques embedded within platforms such as social media and video streaming services. Research suggests that these platforms employ internal attention-capture mechanisms such as infinite scrolling, autoplay features, and algorithm-driven

content recommendations that make it difficult for users to disengage (Lukoff et al., 2021).

Another challenge is that DSCT interventions often require users to set their restrictions, which may not always be effective. Studies show that self-imposed limitations can be difficult to maintain, particularly when users are highly engaged with digital content (Lyngs et al., 2019). Without deeper systemic changes in platform design, DSCTs may offer only a temporary solution rather than a long-term strategy for digital well-being. As digital habits continue to evolve, researchers emphasize the need for tools that limit access and promote healthier interactions with technology.

2.5 User experience nudges

Nudges are subtle interventions designed to guide individuals toward making better decisions by leveraging their cognitive biases (Congiu & Moscati, 2022). These interventions do not impose restrictions but instead create an environment where individuals are gently steered toward choices that align with their long-term well-being. In the digital realm, nudges have been increasingly used to help users manage their technology consumption, particularly in the context of social media and smartphone usage.

Hagman et al. (2015) describe "pro-self" nudges as those that assist individuals in avoiding irrational behaviors that could harm their well-being. Digital nudging has been explored as a mean to mitigate excessive social media use and promote healthier digital habits. For example, interventions such as reminders, grayscale mode, and usage limits have been implemented to reduce screen time and encourage more mindful engagement with digital content.

Despite their potential benefits, the adoption of digital nudges is hindered by usability concerns and ethical dilemmas (Purohit & Holzer, 2021). One major challenge is balancing effectiveness with user experience. If a nudge is too forceful, it can create friction and diminish usability, making individuals more likely to ignore or disable the intervention (Purohit et al., 2023).

Moreover, while digital nudges can be used to promote self-regulation, they can also be exploited as manipulative design tactics, often referred to as dark patterns. Some social media platforms leverage these tactics to increase user engagement and extend screen time rather than to encourage healthy digital behaviors (Mildner & Savino, 2021). However, when applied ethically, digital nudges have the potential to support digital well-being by helping users regain control over their technology use and reduce overconsumption (Purohit et al., 2023).

As research in this area progresses, it is essential to consider the ethical implications and user experience of digital nudges. Striking the right balance between

encouragement and autonomy is crucial to ensuring that these interventions serve their intended purpose and which is helping individuals cultivate healthier digital habits.

2.6 Relevance to this study

The ideas discussed in this chapter are directly related to the goals of this study, which aims to explore how UX nudges can help reduce excessive social media usage. The theories of the attention economy, persuasive design, and digital well-being give important insights into how platforms are designed to keep users engaged, often at the cost of their well-being. The attention economy explains how platforms turn user attention into profit by encouraging constant engagement. Persuasive design strategies, such as infinite scrolling and variable rewards, make it harder for users to stop using these platforms, even if they want to.

The concept of digital well-being highlights the negative effects of too much screen time, such as health problems, stress, and reduced social interaction. As users become more aware of these issues, the need for tools that help them manage their technology use is growing. Although Digital Self-Control Tools (DSCTs) have been created to help users limit screen time, these tools often fall short because they focus on blocking access to distracting apps rather than addressing the underlying design features that keep users engaged.

UX nudges, on the other hand, offer a different approach. Rather than restricting access, nudges aim to gently guide users toward healthier behavior without limiting their freedom. However, for nudges to be effective, they must be used thoughtfully to ensure they do not interfere with the user experience or manipulate users in a way that feels forceful. This study will explore how UX nudges can help users reduce excessive social media usage by encouraging more mindful engagement while considering ethical concerns.

This study will use the theories discussed to investigate how UX nudges can be designed to encourage healthier social media habits. By combining insights from behavioral economics, persuasive design, and digital well-being, the study aims to contribute to a better understanding of how design can help users manage their technology use more effectively and improve their overall well-being.

3 Method and implementation

This study used a mixed-method experimental approach to understand how UX nudges affect TikTok usage. A qualitative method was chosen to capture participants' thoughts, experiences, and behavior changes, which would be difficult to measure through numbers alone (Creswell & Poth, 2018). By collecting detailed reflections before and after the intervention, we aimed to gain a deeper understanding of the effectiveness of UX nudges in shaping digital habits. Quantitative data in the form of screen time metrics was also collected to objectively assess changes in TikTok usage.

The research was conducted as a case study, where participants used the "One Sec" app to delay access to TikTok. Case studies are useful for examining real-life behaviors in context, allowing for a detailed analysis of how external interventions impact user habits (Yin, 2018). Using a qualitative approach enabled participants to describe their experiences in their own words, providing insights beyond just tracking screen time.

Before starting the full study, we conducted a pilot test with two users. The purpose of the pilot was to make sure that everything worked smoothly, including the technical setup of the One Sec app and the clarity of the interview questions. The pilot helped us identify and fix small issues in the process, such as app settings that were not correctly applied or unclear instructions. Doing a pilot test also allowed us to practice the interview structure and improve the flow of the study (Van Teijlingen & Hundley, 2001).

Data was collected through semi-structured interviews and screen time tracking before and after the experiment. The pre-experiment interviews helped establish participants' usual TikTok habits, reasons for usage, and previous attempts to control screen time. The post-experiment interviews focused on their experience with the nudges, any behavior changes they noticed, and whether they found the intervention helpful or disruptive. These interviews allowed flexibility while ensuring consistency across participants (Bryman, 2016). In parallel, screen time data was recorded over a three-week pre-intervention period and one week post-intervention.

To ensure the study's validity, interview questions were carefully designed to align with research goals and encourage meaningful responses. Reliability was maintained by following a structured interview format while allowing open-ended answers. Participants' self-reported TikTok usage data was also collected to add further context to the findings (Flick, 2018).

Ethical considerations were addressed throughout the study. Participants provided informed consent, and their responses were anonymized for privacy. Potential biases, such as self-reporting inaccuracies, were minimized by comparing interview responses with actual screen time data where possible.

3.1 Data collection

To collect data, we conducted semi-structured interviews before and after participants used the "One Sec" app. This method provided both structure and flexibility, allowing participants to share their experiences while ensuring consistency in the topics covered (Bryman, 2016).

The pre-experiment interviews focused on understanding participants' TikTok habits, their motivations for using the app, and their previous attempts to reduce screen time. We asked them to estimate their daily TikTok usage and then verify it by checking their phone settings. To collect accurate data, we requested screenshots of their TikTok screen time for the past three weeks. This helped us compare their perceived and actual usage, reducing the risk of self-reporting bias (Creswell & Poth, 2018).

During the intervention, participants installed the "One Sec" app, which introduced a delay and reflection prompt each time they attempted to open TikTok. This nudge was

designed to create a moment of awareness, encouraging users to reconsider their automatic app usage (Sunstein & Thaler, 2008). The intervention lasted for a set period, during which participants used TikTok with the nudges in place.

After the experiment, participants took part in post-experiment interviews to discuss their experiences with the nudges. We asked whether the intervention influenced their behavior, made them more aware of their screen time, or led them to switch to other apps instead. We also inquired whether they found the nudges helpful or frustrating and whether they thought the effects would last over time. To complement their responses, we again requested screenshots of their updated TikTok screen time, allowing us to track any changes in usage patterns.

All interviews were conducted in person, recorded with participant consent, and later transcribed for analysis. Recording ensured accuracy and prevented data loss (Flick, 2018). The collected data included interview transcripts, self-reported estimates, and actual screen time records, providing both qualitative and quantitative insights.

The study included participants (4 males, 7 females) aged 18 to 25, selected through purposive sampling. This approach allowed us to focus on a group that actively uses TikTok, making the findings more relevant (Yin, 2018). Although the sample size was small, it enabled a detailed exploration of individual experiences and behavioral changes.

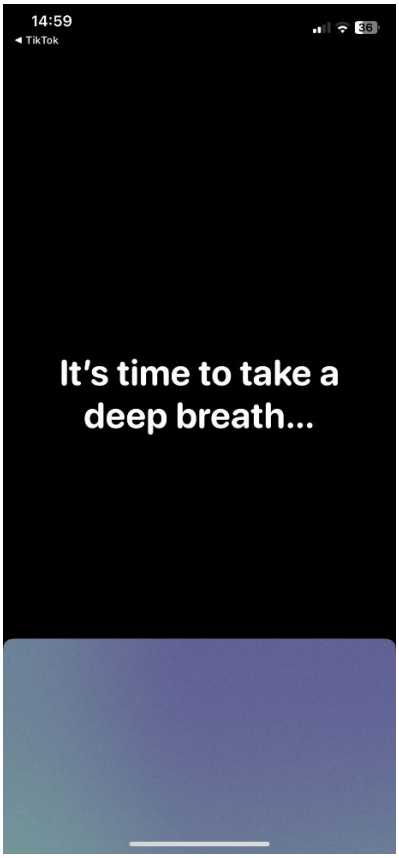

Figure 1: Screenshot of the 'One Sec' nudge delaying access to TikTok.

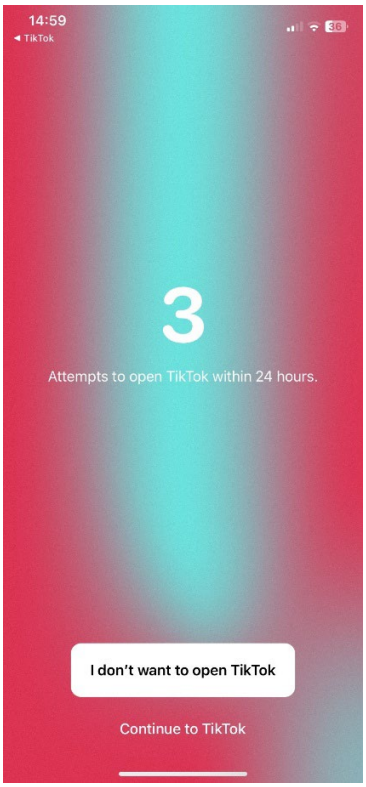

Figure 2: Screenshot of the 'One Sec' showing the number of attempts made within a 24-hour period.

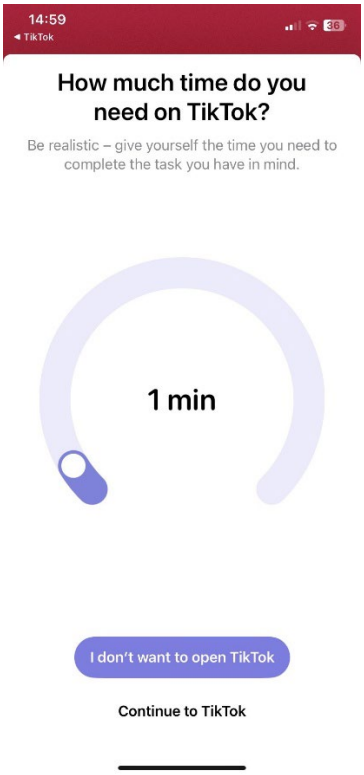

Figure 3: Screenshot of the 'One Sec' prompting the user to set a realistic time limit before accessing TikTok.

3.2 Data analysis

3.2.1 Qualitative analysis

The pre-experiment and post-experiment interviews in this study were analyzed using inductive content analysis. This method was chosen because the topic is not yet widely explored. When there is not enough existing knowledge about a subject, or when that knowledge is scattered, an inductive approach is considered suitable (Lauri & Kyngäs, 2005, as cited in Elo & Kyngäs, 2008).

Inductive content analysis is a way to understand written or spoken messages by identifying patterns and themes directly from the data, rather than relying on pre-established categories (Cole, 1988, as cited in Elo & Kyngäs, 2008). The process involves moving from specific statements or observations made by participants to more general conclusions or themes (Chinn & Kramer, 1999, as cited in Elo & Kyngäs, 2008).

Both inductive and deductive content analysis follow a similar structure that includes three main stages: preparation, organizing, and reporting (Elo & Kyngäs, 2008).

3.2.2 Preparation Phase

The preparation phase was crucial in ensuring the quality and depth of the inductive content analysis. This phase involved organizing the raw data and familiarizing ourselves with the content in order to conduct meaningful coding.

The pre-experiment interviews were collected using a structured set of questions, combining both scaled and open-ended formats. Each interview was transcribed into written form. The transcripts were read carefully several times to understand the participants' relationship with TikTok. During this stage, attention was given to identifying meaningful expressions or ideas that indicated patterns of behavior, emotions, or attitudes. The unit of analysis was typically a sentence or short paragraph that revealed a specific motivation (e.g., boredom), an action (e.g., deleting the app), or an emotional reaction (e.g., "go crazy" without access).

The data was then exported into a separate document where each response was segmented into smaller, analyzable text units. This allowed for focused analysis without losing context. All segments were marked by participant number (e.g., P1, P2) to preserve anonymity and enable cross-participant comparison later.

The post-experiment interviews were conducted after each participant used the One Sec app for a period of one week. These interviews included questions aimed at understanding their experience with the intervention, changes in behavior, and perceived usefulness of the app. Transcription followed the same method as for the pre-interviews, and the responses were read several times to grasp participant impressions and reactions.

In this phase, we aimed to capture both direct feedback (e.g., "it made me more aware") and indirect signs of impact (e.g., emotional responses, frustration, or substitution behavior). Sentences and paragraphs that reflected experience with nudges, behavioral change, or evaluation of the intervention were selected as units of analysis.

By the end of the preparation phase, both pre- and post-intervention data had been fully organized into analyzable text units, ready for open coding in the next phase.

All interviews: pre- and post-intervention, were transcribed and carefully read multiple times to develop familiarity with the content and identify meaningful statements. Each participant had responded to a structured set of open-ended and scaled questions.

For the pre-intervention interviews, the unit of analysis was usually a full sentence or short paragraph describing TikTok usage patterns, motivations, or emotional responses.

For the post-intervention interviews, the unit of analysis included reflections on the use of the One Sec app, changes in habits, emotional reactions to nudges, and perceived impact.

These textual units were highlighted and extracted into a separate document to support the coding and categorization process.

3.2.3 Organizing Phase

The next step was to begin open coding. During this part, notes and short labels were written next to sections of the text to highlight important points. These labels helped identify common ideas or patterns. After that, the codes were grouped into categories based on similarities (Elo & Kyngäs, 2008). These categories were developed directly from the interview data (Elo & Kyngäs, 2008).

Creating these categories also involved interpretation, meaning we had to decide which ideas fit together based on their meaning (Dey, 1993, as cited in Elo & Kyngäs, 2008). This step helped organize the data into a clearer structure without losing the participants' original thoughts.

3.2.4 Reporting Phase

In the reporting phase the categories were summarized and explained, and relevant quotes from participants were selected to show their thoughts in their own words. This made it easier to understand how the participants experienced their TikTok use before and after the intervention with the One Sec app.

3.2.5 Quantitative Analysis

To evaluate the impact of the nudging intervention on TikTok usage, a quantitative analysis was conducted using screen time data collected from 11 participants. Screen time was measured over a three-week period prior to the intervention and again for one

week after the nudges were implemented. The purpose of this analysis was to determine whether the nudges had a measurable effect on reducing TikTok usage.

A paired samples t-test was selected to compare the average screen time before and after the intervention. This statistical method is commonly used in behavioral research to assess whether differences in paired observations (such as pre- and post-intervention measures) are statistically significant (Kim, 2015). The null hypothesis (H_0) stated that there would be no difference in screen time, while the alternative hypothesis (H_1) posited that the nudges would lead to a reduction.

In addition to the t-test, Cohen's d was computed to estimate the effect size of the intervention. This measure complements the t-test by providing an indication of how substantial the change was, regardless of sample size (Cohen, 1988). According to Cohen, a d value of 0.2 represents a small effect, 0.5 a medium effect, and 0.8 a large effect.

These two statistical methods were used in combination to assess both the significance and magnitude of the behavioral change observed after the intervention.

3.3 Validity and reliability

Validity refers to how well a method measures what it is intended to measure. In this study, several steps were taken to support validity.

First, the interview questions were designed to align with the research questions and were based on established theories of digital well-being, persuasive design, and behavioral nudging.

Second, the study collected real screen time data directly from participants' devices. This approach reduced the risk of relying solely on self-reported information, which can often be inaccurate. By comparing participants' interview responses with their actual screen time, the study aimed to provide a clearer picture of how the nudges influenced behavior.

Third, the selection of participants also supported validity. Since the study focused on TikTok usage among young adults, participants were chosen based on their age (18–25) and active use of the app. This ensured that the data collected was relevant to the research aim.

Reliability refers to how consistent and repeatable the results of a study are. In simple terms, if someone else were to repeat this study using the same methods, they should obtain similar results.

To improve reliability, all interviews followed a structured guide, ensuring that the same types of questions were asked to each participant. The interviews were also transcribed, which helped preserve the accuracy of what was said.

The nudge used in the study was identical for every participant, ensuring that everyone experienced the intervention in a consistent way. Furthermore, the data was analyzed using standardized methods for both quantitative and qualitative data.

While some subjectivity is unavoidable in qualitative research, these steps were taken to reduce bias and support a consistent and well-documented analysis process.

3.4 Considerations

In this study, several important considerations were taken into account to ensure the research was conducted in a responsible way. These include ethical, societal, and scientific considerations. Since the topic involves technology and human behavior, it was especially important to think carefully about the impact of our methods on participants and the broader implications of our findings.

Ethical considerations were a top priority throughout the study. All participants were informed about the purpose of the research, how their data would be used, and their right to withdraw at any time. They signed a privacy agreement to confirm their consent. Although screen time data was collected, no sensitive personal information was stored or analyzed. Respecting the privacy and autonomy of participants was key to maintaining trust and protecting their rights, as suggested by the principles of research ethics (BPS, 2014).

It was also important to consider the possible influence of the researchers' presence. Since the participants personally knew the researchers, there was a risk of social desirability bias, where participants might feel pressure to behave in ways that seem more "acceptable" (Van de Mortel, 2008). We tried to minimize this by creating a non-judgmental and open environment during interviews, and by emphasizing that there were no "right" or "wrong" behaviors.

From a societal perspective, this research addresses the growing concern about excessive screen time, especially among young adults. Social media overuse is linked to mental health challenges like anxiety, sleep problems, and procrastination (Keles et al., 2020). By testing small and non-invasive interventions like UX nudges, this study contributes to the ongoing conversation around digital well-being and how to encourage healthier habits online. While this research alone cannot solve the problem, it supports efforts to make digital spaces more balanced and humane.

We also reflected on the scientific limitations of our methods. As mentioned earlier, the small sample size and short duration of the study mean that the results should be seen as exploratory rather than conclusive. However, the combination of qualitative and quantitative data provides a richer understanding of how nudges were perceived and whether they had any short-term impact. This mixed-method approach is often

recommended when exploring new or complex behavioral topics (Creswell & Plano Clark, 2017).

Although environmental or sustainability concerns were not directly part of the research topic, we were aware of the broader discussion around the role of technology in society. Helping users develop more mindful digital habits can indirectly reduce the environmental impact of always-on, high-engagement app design, by encouraging less frequent use and more conscious interaction with digital platforms.

We aimed to conduct research that is both respectful toward individuals and valuable for the wider community.

4 Results

4.1 Presentation of Collected Data

This section presents the data gathered before and after the experiment. The information includes participants' demographics, their self-reported behaviors and attitudes before using the app, their measured screen time, and their feedback after the intervention. The data is organized to give a clear overview of the participants' experiences without adding personal opinions or analysis.

4.1.1 Participant Demographics

The study involved 11 participants from a variety of cultural backgrounds, providing diverse perspectives. The group included 7 women and 4 men. Participants were from the following countries:

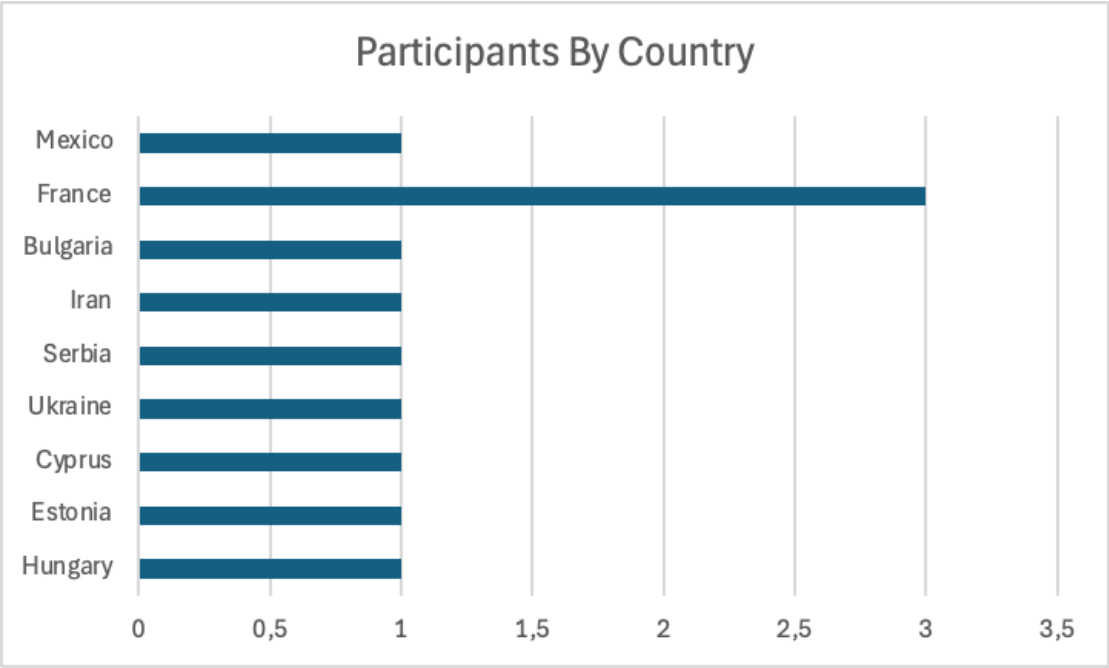

Figure 4: *participants divided by country that took part in the study*

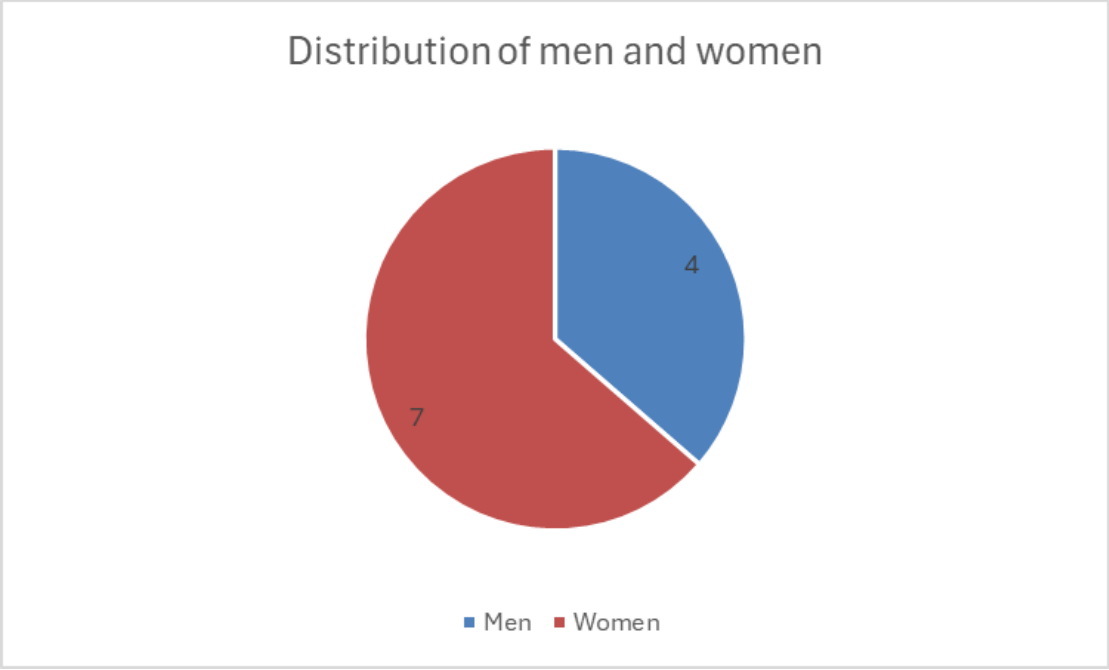

Figure 5: *distribution of men and women that took part in the study*

4.1.2 Pre-Experiment Self-Reported Behaviors

Before using the intervention app, participants were interviewed about their typical TikTok use and related behaviors. The table below shows the emotional reasons behind their usage, how automatic their use felt, their ability to control it, whether they

multitasked, their attitude toward nudging, and how addicted they felt. All ratings are on a 1–10 scale, where 10 indicates a strong presence of the described trait.

Participant	Emotional Triggers	Perceived Automaticity	Perceived Self-Regulation	Multitasking	OneSec Attitude	Perceived Addiction
1	Boredom	10	5	Yes	Positive	8
2	Procrastination	7	4	Yes	Positive	7
3	Night use	10	10	Yes	Skeptical	7
4	Breaks, social	8	8	Yes	Positive	4
5	Leisure, skincare	7	7	Yes	Positive	4
6	Dissociation	5	6	Yes	Skeptical	9
7	Boredom, food	6	6	Yes	Positive	4
8	Escape	9	7	Yes	Negative	7
9	Entertainment	7	7	Sometimes	Skeptical	4
10	Educational, food	10	5	Yes	Negative	7
11	Inspiration	1	9	No	Negative	1

4.1.3 Screen Time Data (Pre- and Post-Intervention)

Participants' screen time on TikTok was recorded before and after the experiment.

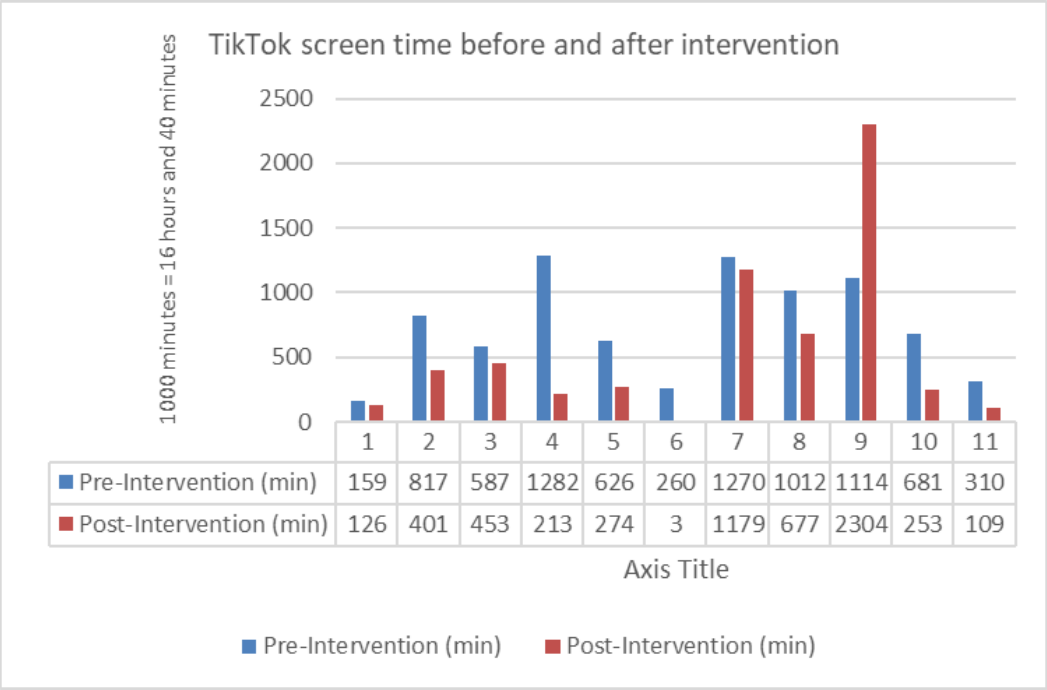

Figure 6: *screen time before and after intervention for each participant*

- Average Reduction in Screen Time: -193.27 minutes
- Average Percentage Reduction: -35.83%

A statistical paired t-test was conducted to examine whether the difference in screen time before and after the intervention was significant.

- P-value: 0.2594

Cohen's d was calculated to measure the effect size of the intervention, indicating the practical significance of the difference in screen time before and after the nudge.

- Cohen's d = 0.3512

4.1.4 Post Experiment Interview Summary

After the intervention, participants were interviewed again. Their responses were grouped into major themes, each containing subthemes and quotes that reflect their experience.

Theme	Subtheme	# of Participants	Illustrative Quotes

1. Experience with Nudges	Positive impact on usage	8	"It helped me realize I have some kind of addiction." "It helped reduce my screen time."
	Mixed or frustrating experience	7	"Overall it helped me but it was very frustrating." "Really boring and annoying."
	Novelty and curiosity	4	"It was something I've wanted to try but never have."
2. Perceived Effectiveness	Increased awareness	9	"Now every time I connect, it's intentional." "I became more aware of my priorities."
	Behavioral change	8	"I closed the app before the next intervention." "I used the app less without thinking."
	Substitution effect	6	"I switched to Instagram, but mostly to text." "I spent more time on YouTube Shorts."
3. Disruption and Irritation	Repetitive and interruptive nudges	7	"Doing the same thing after switching apps was annoying." "It interrupted my mood."

	Desire for control/customization	5	"The breathing exercise was too long." "Should let you set your own nudge style."
4. Sustainability	Temporary behavior change	6	"It helped during the week, but I'm not sure long term."
	Potential long-term impact with continued use	5	"If I kept using it, I'd reduce my screen time a lot."
5. Suggestions for Improvement	App integration & memory	4	"Shouldn't reset the timer when switching apps."
	Stronger limits or delayed overrides	5	"Remove the 'extend time' option or delay it."
6. Openness to Similar Tools	Generally hesitant or resistant	6	"No, I don't want this on other apps." "It's too annoying."
	Some openness with customization	3	"Only if I could choose the nudge or make it shorter."

Scales:

- Automaticity: How automatic their use felt (1 = Not automatic, 10 = Very automatic)
- Self-Regulation: Perceived control over use (1 = Low, 10 = High)
- Perceived Addiction: Self-reported feeling of being addicted (1 = Not addicted, 10 = Very addicted)

4.2 Data Analysis

This section presents the analysis of the collected data following the procedures outlined in the method chapter. Both the pre- and post-intervention interview transcripts were analyzed using inductive content analysis, which is well-suited when existing knowledge on a topic is limited or fragmented (Lauri & Kyngäs, 2005, as cited in Elo & Kyngäs, 2008). The analysis followed the steps of open coding, category creation, and abstraction (Elo & Kyngäs, 2008). Categories were developed directly from the data without applying preconceived frameworks (Elo & Kyngäs, 2008). By identifying patterns across participant responses, the analysis helps address the study's research questions and reveals how the nudge-based UX intervention affected screen time and user experience.

4.2.1 Effectiveness of UX Nudges in Reducing Screen Time

To answer the first research question: Do UX nudges effectively reduce time spent on scrolling? Both quantitative and qualitative data were considered.

Quantitative results showed that 10 out of 11 participants reduced their screen time during the intervention week, with an average reduction of about 193 minutes, or 35.8%. However, a t-test revealed a p-value of 0.2594, indicating that the reduction was not statistically significant. This may be due to the small sample size or high variation among participants. Despite this, the effect size, measured by Cohen's d, was 0.35, suggesting a small to moderate practical impact of the intervention on screen time reduction.

Qualitative data provided additional insights. Many participants reported that the nudges made them more aware of their usage patterns. For instance, comments such as "It helped reduce my screen time" and "I used the app less without thinking" were common. These statements suggest that for many users, the nudges contributed to a more conscious interaction with TikTok, even if the changes were not always dramatic or lasting.

However, some participants also described a substitution effect, noting they switched to other platforms like Instagram or YouTube Shorts. This finding implies that while TikTok use decreased, overall screen time may not have declined proportionally.

4.2.2 Perceptions of UX Nudges by Young Users

The second research question asked: How do young users perceive these nudges in terms of helpfulness?

Participants' perceptions were varied, but certain patterns appeared. Most participants appreciated the concept, with 9 out of 11 saying the nudges increased their awareness of how and why they were using TikTok. Quotes like "Now every time I connect, it's intentional" suggest a shift toward more mindful use.

Eight participants experienced positive behavioral change, while others found the nudges annoying or repetitive, especially when they triggered after switching apps. Seven participants mentioned frustration or irritation, using words like “boring”, “too long”, or “interruptive”.

Importantly, the feedback revealed a desire for customization. Several participants pointed out that personalization could make the intervention more tolerable or effective. One participant said, “Only if I could choose the nudge or make it shorter”, highlighting the role of control in shaping their experience.

Participants also differed in their views about the sustainability of these nudges. Some described the impact as temporary, while others believed the effects could become long-term with continued use. This suggests that one-off interventions may have limited impact without ongoing reinforcement.

5 Discussion

This chapter discusses the results of the study and compares them with earlier research on digital self-control, persuasive technology, and behavioral nudging. It also looks at what these findings mean in practice and theory and points out some of the study’s limitations.

5.1 Result discussion

Do UX Nudges Reduce Scrolling Time?

The results showed that TikTok usage dropped by an average of 193 minutes over the intervention period, which is a 35.83% decrease. However, this change was not statistically significant ($p = 0.2594$), likely because the number of participants was small. Even so, many users reported that they were using TikTok more intentionally, e.g. closing the app sooner or scrolling less mindlessly. These changes suggest that the nudges may have had some impact, which supports what Purohit et al. (2023) found: nudges can raise awareness and sometimes lead to behavior change, even if the effect is small. This is further supported by the effect size, with Cohen’s $d = 0.35$ indicating a small to moderate practical impact of the intervention.-value

How Do Users Feel About UX Nudges?

Feedback about the nudges was mixed. Eight out of eleven participants said the nudges helped them use the app more consciously. One participant noted, *"Now every time I connect, it’s intentional."* On the other hand, a few users found the nudges repetitive or annoying. This reflects a trade-off between usability and effectiveness, as noted by Purohit and Holzer (2021). In short, nudges can work, but they need to be well-designed and user-friendly to be accepted.

5.1.1 Comparison with Previous Studies

The results of this study are in line with earlier research. For example, Lukoff et al. (2018) and Lyngs et al. (2019) found that many people use social media out of habit, which was echoed by participants in this study. Some users also reported switching to other apps like Instagram when nudged on TikTok. This "substitution effect" supports what Monge Roffarello and De Russis (2023) found: targeting just one app may not reduce total screen time. Also, some participants were annoyed by the nudges being too repetitive, which matches concerns raised in earlier research about digital well-being tools (Griffiths, 2018; Harris, 2019).

5.1.2 Implications for Theory and Practice

This study adds to the growing research on digital well-being by showing that simple nudges can help users become more aware of their habits and interrupt automatic behavior. The findings support the idea of user-centered and autonomy-respecting tools, as discussed by Vanden Abeele (2021). The study also shows that nudges should be personalized to match users' needs. Several participants were frustrated with nudges that felt too generic or repetitive.

5.2 Method discussion

The study used a mixed-methods approach, combining interviews with screen time tracking. This was done to understand both the behavioral impact of the nudges and how users felt about them.

5.2.1 Strengths of the Chosen Methods

Using both interviews and screen time data gave a more complete picture. The interviews helped explain how participants experienced the nudges, while the screen time data provided a concrete measure of behavior change.

A pilot test was done before the main study, which helped smooth out technical issues and improve the study setup. Also, the structured interviews helped keep responses consistent while still allowing for personal opinions.

5.2.2 Weaknesses and Limitations of the Methods

One major limitation is the small sample size (n = 11), which makes it hard to apply the findings to a larger group. The short time frame of the intervention (one week) may also have been too brief to see long-term effects.

Also, since the interviews relied on self-reported data, some participants may have said what they thought the researcher wanted to hear. This is a common challenge in qualitative research.

5.2.3 Achieving the Research Goals

Despite the limitations, the study met its main goal: it gave useful insights into how nudges affect screen time and user behavior. The combination of qualitative and quantitative methods worked well for answering the research questions. However, due to the small group and short timeline, the findings should be seen as preliminary. Future studies with more participants and a longer duration would help confirm these results and offer a stronger conclusion.

6 Conclusions and further research

This chapter presents the main conclusions from the study and suggestions for future research. First, it summarizes how the findings relate to the original research questions and the study's purpose. Then, it discusses possible directions for future work based on the study's limitations and insights.

6.1 Conclusions

The original problem was that many young users struggle to control their screen time, and that existing tools like screen time limits are often ignored. This research tried to find a softer, more mindful approach.

The findings showed that most participants reduced their screen time, even if the change was not always big. Many said that the nudges made them more aware of their behavior, which suggests that nudges can support self-regulation. This connects directly to the original goal of the study: helping users become more mindful, without using strict limits.

The study also showed that user perception is important. While many participants found the nudges helpful, some found them annoying or wanted more control over how the nudges worked. This means that for nudges to be effective, they must be designed in a way that respects the user experience.

In conclusion, this study supports the idea that UX nudges can be a useful tool to help young people manage their social media use. It also highlights the importance of thoughtful, user-centered design when building tools that aim to support healthier digital habits.

6.2 Further research

There are several ways this study could be expanded in the future to get an even better understanding of how UX nudges affect social media use.

The study involved a small group of university students. In future research, it would be helpful to include more participants from different backgrounds, trying to keep a balanced mix of genders. This would provide a more complete picture of how people with different habits and lifestyles respond to nudges, making the results more broadly applicable.

Secondly, this study only ran for a short period. Extending the study over several weeks or even months could help show whether the nudges have a lasting impact or if the effects fade over time.

It could also be valuable to test different types of nudges. For example, reminders that appear after a certain amount of scrolling, personalized feedback, or even playful elements like gamification could be compared to see what works best. In addition, looking at personal factors might help explain why some people respond better to nudges than others.

Finally, using more detailed tracking tools, such as app usage logs or even biometric data, could give deeper insight into how people interact with nudges and how their habits change.

Exploring these areas in future studies could help develop smarter, more personalized tools that support healthier digital habits in a way that feels natural and respectful to users.

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8 Appendixes

Appendix 1: Pre-Experiment Interview Questionnaire

Section 1: Demographic Questions

What is your age?

What is your gender identity?

What is your highest level of education?

What is your current occupation?

Section 2: TikTok and Phone Usage

How much time do you spend on social media daily on average?

How much time do you think you spend on TikTok daily? (Open-ended response)

Please take a moment to check your actual TikTok usage in your phone settings. How much is it? (Open-ended response)

Can you please send me the screenshots of the past three weeks of TikTok usage time?

What is your main reason for using TikTok?

Have you ever tried to limit your TikTok usage?

If yes, what strategies have you tried? (Open-ended response)

Section 3: Tech-Savviness and Time Management

How tech-savvy do you consider yourself? (Scale from 1 to 10, where 1 = not tech-savvy at all and 10 = very tech-savvy)

On a scale from 1 to 10, how much do you feel in control of your smartphone usage?

On a scale from 1 to 10, how often do you believe you open TikTok automatically without thinking?

Do you multitask while using TikTok (e.g., watching while eating, studying, working)?

Section 4: Before Installing One Sec

On a scale from 1 to 10, how addicted do you think you are to TikTok?

How would you feel if something stopped you from accessing TikTok? (Open-ended response)

If One Sec prevented you from accessing TikTok immediately, do you think you would reduce your usage? Why? (Open-ended response)

Appendix 2: Post-Experiment Interview Guide

Section 1: General Experience

Can you describe your overall experience with the study?

How did you feel about using TikTok with the introduced nudges?

Section 2: Perception of Nudges

Did any of the nudges feel helpful? If so, in what way?

Were there any nudges that felt annoying or disruptive? Why?

Section 3: Impact on Behavior

Did you feel the nudges influenced your screen time? If yes, how?

Did the nudges make you more aware of your TikTok usage habits?

Did you find yourself changing your behavior because of the nudges (e.g., stopping scrolling earlier, being more mindful of time spent on the app)?

Did you switch to another app instead of TikTok, such as Instagram or YouTube Shorts?

Section 4: Sustainability of Effects

Do you think the nudges would continue to impact your TikTok use if they were a permanent feature?

Have you changed the way you think about your social media use after this experiment?

Section 5: Suggestions for Improvement

How could the nudges be improved to be more effective or user-friendly?

Would you be open to using similar nudges in other apps? Why or why not?

Closing

Is there anything else you'd like to share about your experience with the study?