

Cyberaddiction to TikTok during the COVID-19 pandemic

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Cyberaddiction
to TikTok

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Abstract

Purpose – The purpose of this study is to shed light on the determinants of TikTok cyberaddiction during the COVID-19 pandemic, as well as the resulting attitudinal and intentional reactions of users.

Design/methodology/approach – An online survey of 305 young TikTok users was conducted to test the research hypotheses. Data was analyzed through a partial least squares approach.

Findings – The results highlight the mediating role of cyberaddiction to TikTok in the relationship between psychological disorders (anxiety and loneliness) and attitude toward TikTok. Indeed, it was found that anxiety and loneliness contribute to TikTok cyberaddiction. The latter would have a positive effect on attitude toward TikTok, which decreases in the presence of fear of missing out (FOMO). It was also proven that attitude toward TikTok has a positive impact on attitude toward the brands promoted on this platform, resulting in an increase in purchasing intentions.

Research limitations/implications – This study was conducted during the COVID-19 pandemic. It is therefore interesting to replicate it to see if the research model can be still validated in the absence of an emergency situation. Testing the model on a larger target, including older TikTok users, could also lead to interesting findings.

Practical implications – Knowledge of the psychological factors behind cyberaddiction should not be seen as an opportunity to take advantage from addicted shoppers' vulnerability. Managers should rather limit communication campaigns on TikTok during crisis periods, undertake retargeting actions by sparing vulnerable TikTok users and avoid stimulating anxiety and loneliness which can lead to cyberaddiction and compulsive purchases.

Originality/value – This study sheds light on the central role of cyberaddiction to TikTok in the relationship between psychological disorders and users' reactions, during a pandemic. It focused on the moderating role of FOMO on the relationship between determinants of cyberaddiction and attitude toward TikTok. Escape theory and attachment theory were used and adapted to the context of social media.

Keywords Cyberaddiction-TikTok-COVID-19-FOMO-attitude-intention, Attitude, Intention, COVID-19, TikTok, FOMO, Cyberaddiction

Paper type Research paper



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Adicción cibernética a TikTok durante la pandemia de COVID-19

Resumen

Objetivo – El propósito de este estudio es arrojar luz sobre los determinantes de la ciberadicción a TikTok durante la pandemia de Covid-19, así como las reacciones actitudinales e intencionales resultantes de los usuarios.

Diseño/metodología/enfoque – Se realizó una encuesta en línea a 305 jóvenes usuarios de TikTok para probar las hipótesis de investigación. Los datos fueron analizados a través de un enfoque PLS.

Resultados – Los resultados destacan el papel mediador de la ciberadicción a TikTok en la relación entre trastornos psicológicos (ansiedad y soledad) y la actitud hacia TikTok. De hecho, se encontró que la ansiedad y la soledad contribuyen a la ciberadicción a TikTok. Esta última tendría un efecto positivo en la actitud hacia TikTok, que disminuye en presencia del miedo a perderse algo (FOMO, por sus siglas en inglés). También se demostró que la actitud hacia TikTok tiene un impacto positivo en la actitud hacia las marcas promocionadas en esta plataforma, lo que resulta en un aumento en las intenciones de compra.

Originalidad – Este estudio arroja luz sobre el papel central de la ciberadicción a TikTok en la relación entre trastornos psicológicos y reacciones de los usuarios, durante una pandemia. Se centró en el papel moderador del FOMO en la relación entre determinantes de la ciberadicción y la actitud hacia TikTok. Se utilizaron y adaptaron la Teoría del Escape y la Teoría del Apego al contexto de las redes sociales.

Limitaciones/implicaciones de la investigación – Este estudio se llevó a cabo durante la pandemia de Covid-19. Por lo tanto, sería interesante replicarlo para ver si el modelo de investigación aún puede ser validado en ausencia de una situación de emergencia. Probar el modelo en un público objetivo más amplio, que incluya a usuarios mayores de TikTok, también podría conducir a hallazgos interesantes.

Implicaciones prácticas – El conocimiento de los factores psicológicos detrás de la ciberadicción no debe verse como una oportunidad para aprovechar la vulnerabilidad de los compradores adictos. Los gerentes deberían más bien limitar las campañas de comunicación en TikTok durante los periodos de crisis, emprender acciones de retargeting evitando a los usuarios vulnerables de TikTok y evitar estimular la ansiedad y la soledad que pueden llevar a la ciberadicción y a compras compulsivas.

Palabras clave Ciberadicción-TikTok-Covid-19-FOMO-actitud-intención

Tipo de artículo Trabajo de investigación

在 COVID-19 大流行期间对TIKTOK 的网络成瘾

摘要

目的 – 本研究旨在探索COVID-19大流行期间TikTok网络成瘾的决定因素, 以及用户的态度和意图反馈。

设计/方法/途径 – 为了验证研究假设, 本研究对305位年轻的TikTok用户进行了在线调查, 并使用PLS方法对数据进行了分析。

发现 – 研究结果凸显了在COVID-19大流行期间, TikTok网络成瘾与心理障碍(焦虑和孤独)之间的中介作用。实际上, 研究发现焦虑和孤独可能会促成TikTok网络成瘾的发展。而TikTok网络成瘾则可能在一定程度上改善对TikTok的态度, 减轻错失恐惧。研究还表明, 对TikTok的态度对该平台推广的品牌态度产生积极影响, 进而增加了购买意图。

独创性 – 这项研究详细探讨了COVID-19大流行期间TikTok网络成瘾的核心作用, 特别关注了心理障碍与用户反应之间的关系。重点分析了逃避理论和依恋理论在社交媒体环境下的应用, 并对错失恐惧在网络成瘾和对TikTok态度之间的调节作用进行了调查和分析。

研究限制/意义 – 这项研究是在COVID-19大流行期间进行的, 因此复制它以验证研究模型在紧急情况缺失的情况下是否仍然有效是很有趣的。将这个模型应用于更广泛的对象, 包括年长的TikTok用户, 可能会带来一些有趣的发现。

实践意义 – 了解网络成瘾背后的心理因素是非常重要的, 但不应被视为利用沉迷购物者的脆弱性的机会。在危机期间, 管理者应该限制在TikTok上的传播活动, 以避免刺激焦虑和孤独, 保护那些脆弱的TikTok用户, 防止他们沉迷于平台并进行强迫性购物。

关键词 网络成瘾-TikTok-COVID-19-FOMO-态度-意图

文章类型 研究型论文

1. Introduction

Because it was uncertain and exceptional in nature, the COVID-19 pandemic has generated a range of psychological ailments such as stress, anxiety, depression or panic (Nawaz, 2023). Emotional overload during the pandemic has led individuals to adapt themselves to the virtual world, particularly to social networks (Alfina *et al.*, 2023). The latter allow for filling the gap of limited social interactions and lessening the sense of isolation that was created due to the pandemic (Cauberghe *et al.*, 2021). Largely characterized by an exceptional surge in logging times during the pandemic (Zhang, 2022), these networks are now an auspicious environment for the development of addictive tendencies (Nikolinakou *et al.*, 2024). In this regard, some studies noted that because of the omnipresence of social networks in people's lives in times of crises, they were able to speed up a problematic use of these interfaces and the adoption of more addictive behaviors (Brailovskaia *et al.*, 2021). Such behaviors are particularly noticeable in young populations, making them vulnerable to some addictive tendencies. Being potentially such, the social network TikTok, whose use has increased dramatically during the pandemic (Su *et al.*, 2020), seems to be very popular for this age group, with more than one billion users (Montag *et al.*, 2021) who can create music-filled videos or imitate the content of other videos. In this vein, Ceci (2023) pointed out that TikTok recorded more than 272 million downloads in the third quarter of 2023. However, the problems associated with this usage seem alarming, especially when the browsing habit turns into a need in itself, or even an anxiety-driven addiction (Brailovskaia *et al.*, 2021). Accordingly, some studies have highlighted the idea that psychological disorders, often observed during a pandemic, lead to an addictive use of social networks (Shukur *et al.*, 2023). Bearing on this proposal, it seems quite relevant to focus on the central role of cyberaddiction to TikTok in the relationship between psychological disorders (anxiety and loneliness) and attitudinal and intentional reactions, during a pandemic. It is also interesting to highlight the moderating role of fear of missing out (FOMO) in the relationship between cyberaddiction and attitude toward TikTok. Indeed, if the COVID-19 pandemic is potentially able of triggering coping mechanisms spreading over emerging social networks such as TikTok, addiction itself has not been sufficiently excavated, despite its managerial interest. In this regard, some studies clearly highlight the emotional disorders associated with this crisis and the crucial role played by these emotions in the development of affects and cognitions when using social networks (Nawaz, 2023). However, to our knowledge, very little research has focused on exploring in depth addictive behaviors to social networks and their central role in affecting users' reactions. Even more, we know very little about the moderating role of FOMO. This latter concept has received little interest from researchers in marketing, although this emotion is associated with more attachment to social networks (Alfina *et al.*, 2023). Accordingly, our research attempts to shed light on these behaviors while exploring the specific factors at the origin of its triggering as suggested by previous research (Zhang, 2022). This study will therefore attempt to answer the following research question: To what extent do emerging addictive psychological disorders during a pandemic affect consumers' addiction to the TikTok social network, and what impact does this addiction have on their attitude and intention to purchase the brands promoted on this network?

2. Theoretical background

The aim of this study is to examine the determinants of cyberaddiction to the TikTok network during a pandemic as well as the resulting attitudinal and intentional reactions of users. To this end, two theories are used to consider TikTok users' reactions. First, escape theory (Heatherton and Baumeister, 1991) assumes that certain self-regulatory processes,

aimed to cope with the negative emotions felt by an individual, lead to extreme behaviors. These behaviors, aimed at coping with unhappy states of mind, can become addictive in some cases. Adapted to this study's context, escape theory allows us to expect that the psychological disorders experienced during the pandemic led users to develop an addiction to TikTok. Thus, individuals seek to regulate the psychological disorders they suffer from through the adoption of excessive behavior, in this case, the excessive use of TikTok.

Second, attachment theory (Bowlby, 1958), initially developed to describe children's biological attachment to their mother, proposes the idea of an instinctive and essential attachment to survive. By analogy, actions of TikTok users are designed in response to the attachment to this network. Such attachment is supposed to ensure their psychological comfort and well-being. Attitude toward TikTok can therefore be approached as a lever of favorable beliefs and strong emotional attachment to this network. Internet users would seek to regulate their psychological discomfort by adopting external figures as an escape.

2.1 Social network addiction

The concept of internet addiction disorder took different names ranging from cyberaddiction, pathological, excessive or compulsive use, to a problematic use (Su *et al.*, 2020). Internet-based addictive disorders seem to have originated with the appearance of social networks (Courbet *et al.*, 2020). This has led authors to coin the phenomenon as social network addiction (Shukur *et al.*, 2023). According to Bányai *et al.* (2017), this disorder describes an excessive concern, driven by an uncontrollable, sometimes pathological, urge to log in to social networks. The criteria behind this behavior are similar to those of addiction to substances or gambling, in particular mood disorders or conflicts (Nawaz, 2023). The COVID-19 pandemic presented itself as a setting conducive to the development of emotional disorders (Zhang, 2022). In this regard, it has been admitted that the negative emotions and psychological fluctuations experienced by individuals in these moments represent triggers for its addiction (Khrouf and Maghraoui, 2021). Specifically, the TikTok network seems to be the most addictive social media during the COVID-19 pandemic (Qin *et al.*, 2022).

2.2 Determinants of cyberaddiction to TikTok during the COVID-19 pandemic

Individual vulnerabilities and psychological disorders appear to be key predictors of addictive behaviors (Cauberghe *et al.*, 2021). However, the magnitude of the phenomenon during a pandemic incites us to explore its determinants in the context of emerging applications like TikTok.

2.2.1 COVID-19 anxiety. COVID-19 anxiety is one of the most commonly experienced distresses during the pandemic (Brailovskaia *et al.*, 2021). It represents a pathological manifestation of fear experienced in uncertain, unexpected or unknown situations (Zhang, 2022). This fear is often associated with an excessive tendency to use social networks (Courbet *et al.*, 2020). Then, people experiencing anxiety are often phobic subjects who privilege the virtual world and seek comfort in interactions on social networks (Shukur *et al.*, 2023). Accordingly, a direct association between anxiety and social network addiction was highlighted during the general lockdown imposed by many governments during the 2020 pandemic crisis (Brailovskaia *et al.*, 2021). Confronted with the unique and unprecedented nature of the pandemic, users have shown an excessive attachment to the specific functionalities of TikTok which, in their eyes, allow them to relieve fear and fill an interpersonal void (Zhang, 2022). This amounts to a frantic search for an escape space from anxiety (Shi *et al.*, 2017). Then, watching funny videos or participating in creating them on TikTok could likely alleviate this distress by creating a dopamine-filled sensation and more

positive emotions (Strick, 2021). Against these proposals, the following hypothesis is then formulated:

H1. COVID-19 anxiety increases cyberaddiction toward the TikTok social network.

2.2.2 Loneliness. Loneliness represents a subjective experience, created from people's estimation of the gap between the desired level of social relationships and the one actually achieved (Peplau and Perlman, 1982). It seems that this emotion gained momentum during the pandemic because of the introduced health restrictions (Cauberghe *et al.*, 2021). Because of the difficulty to socialize in real life during lockdowns, internet and social networks offered interesting social interaction alternatives to users while being physically distant (Cerdá-Mansilla *et al.*, 2021a; 2021b). Indeed, the feeling of loneliness undermines the well-being of individuals, leading them to exchange with others in the virtual world in order to fill some of the experienced relational void (Shi *et al.*, 2017). Cyberaddiction may therefore be an adaptive strategy arising from the difficulty of interacting with others, particularly during pandemic periods. In this line of thought, more recent research has suggested that loneliness was able to speed up addiction to the TikTok social network as an escape from everyday life stress and a shortcut to society (Zhang, 2022). These proposals allow us then to formulate the following hypothesis:

H2. Loneliness experienced during the COVID-19 pandemic increases cyberaddiction to the TikTok social network.

2.3 Cyberaddiction and attitudinal reactions

2.3.1 Cyberaddiction and attitude toward the TikTok social network. Attitude describes people's beliefs and emotional attachment to a technology whose use becomes a daily routine (Ellisson *et al.*, 2007). It seems to be an important outcome of cyberaddiction (Roth *et al.*, 2022). Indeed, social theory considers that individuals develop beliefs that systematically gear their actions toward sources of reward (Lewinsohn and Graf, 1973). Using social networks, taking advantage of the interaction and sharing features they present, are probably major sources of reward, especially for addicted individuals (Shukur *et al.*, 2023). In this regard, attachment theory assumes that when individuals are attached to an object with which they feel secure, they have positive attitude toward themselves and toward the object of attachment (Bowlby, 1958). Translated to the context of cyberaddiction to TikTok, users should develop positive attitude toward TikTok when they are addicted to it (Tang *et al.*, 2021). They consider this social media as a refuge able to meet their security need, particularly in a context of pandemic, increasing thus individual vulnerabilities (Shukur *et al.*, 2023). By analogy with the reinforcement mechanisms defined in Bandura's learning theory (Bandura, 1977), it seems that addiction as a response to an emotional deficit leads to an anticipation of affect supported by a favorable attitude to the network. These latter assumptions allow us to propose the following hypothesis:

H3. Cyberaddiction to the TikTok social network increases the positive attitude toward it.

2.3.2 Cyberaddiction as a mediator between COVID-19 anxiety and attitude. Little research has explored the mediator role of cyberaddiction, especially in social networks. Nevertheless, Sanz-Blas *et al.* (2019) proved that addiction mediates the impact of Instagram overuse on emotional fatigue and instastress. According to them, cyberaddiction allows internet users to benefit from connecting with others, helping people or finding information. Cyberaddiction can thus be considered a tool appeasing psychological tensions for some

internet users, especially in crisis periods. For TikTok-addicted users, the social network is this appeasing tool (Strick, 2021). Consequently, they naturally develop a positive attitude toward it. COVID-19 anxiety felt led internet users to use several strategies to reduce this state of mind. They tend to develop a cyberaddiction to social networks like TikTok which could fuel them with positive emotions and attitude (Strick, 2021; Zhang, 2022). The hedonic character of addiction makes users appreciate this source of pleasure and avoid focusing on its dark side. Cyberaddiction could therefore play a mediating role between COVID-19 anxiety and attitude toward the network. This observation allows us to formulate the following hypothesis:

H4. Cyberaddiction to the TikTok social network mediates the link between COVID-19 anxiety and attitude toward TikTok.

2.3.3 Cyberaddiction as a mediator between loneliness and attitude. For many individuals, the continuous exposure to videos on TikTok, because of cyberaddiction, is a source of positive effect and a means to recover from loneliness (Hunt *et al.*, 2018). Thus, cyberaddiction is experienced as an escape from reality. In this regard, Shi *et al.* (2017) pointed out that family dysfunctioning is an important source of emotional loneliness. When internet users feel alone, they tend to look for virtual interaction and become vulnerable to cyberaddiction. Internet seems to provide feelings of autonomy and competence, increasing users' self-esteem, especially for young users who are vulnerable. In a short time, they can become addicted to the medium and need to maintain these pleasant states, especially in pandemic periods that have the particularity of generating states of vulnerability (Hunt *et al.*, 2018). In other words, cyberaddiction caused by loneliness could generate a feeling of pleasure and improve the internet user's attitudinal states (Shi *et al.*, 2017). This experience is so strong that it promotes acceptance and tolerance to the use of these networks and leads to a loss of interest in other activities (Tang *et al.*, 2021). Bearing on these proposals, the following hypothesis is formulated:

H5. Cyberaddiction to the TikTok social network mediates the link between loneliness and attitude toward TikTok.

2.3.4 Fear of missing out as a moderator between cyberaddiction and attitude. With the rapid spread of the COVID-19 pandemic and the ever-accelerating use of social media, a truly new syndrome seems to be emerging; FOMO, also called fomophobia or FOMO. Przybylski *et al.* (2013) defined the concept as "a generalized anxiety that arises when individuals fail to get what they want to know in their absence, it is manifested primarily by the desire to continue to know what others are doing." High levels of social media frequency can exacerbate the feeling of FOMO (Alfina *et al.*, 2023). Specifically studying the TikTok social network, Alfina *et al.* (2023) concluded that FOMO is a factor increasing the addictive behavior of internet users. The Interaction of Person-Affect-Cognition-Execution model (I-PACE) presents FOMO as a cognitive bias intervening in situations perceived as stressful and generating problematic internet use (Brand *et al.*, 2019). It can lead to compulsive behavior, and people may fail in resisting the urge to check their social media. Therefore, the fear of having missed something on the network is problematic for addicted persons as they start questioning their ability to control and self-regulation. Thus, the perceived lack of efficiency could decrease the favorable attitude toward TikTok as a space of addiction. TikTok is thus conceived by addicted people as a necessary malaise that they must continually control. This self-regulation could satisfy the need of personal freedom that governs attitude to end cognitive failure and psychological frustration. It is therefore

expected that FOMO negatively moderates the effect of TikTok cyberaddiction on attitude toward the platform:

- H6.* FOMO decreases the effect of cyberaddiction to the TikTok social network on attitude toward the platform during the COVID-19 pandemic.

2.4 Extension of TikTok attitude to the brand

Brand attitude denotes a relatively enduring internal evaluation that assesses the degree to which consumers adhere to the brand (Spears and Singh, 2004). In a social network context, evaluation of content of a given network directly impacts the attitude toward the brand present on that network (Lin *et al.*, 2019). Indeed, considering the importance of experience sharing and its effects on brand adherence, it seems that internet users tend to appreciate brands whose image is reinforced by social networks (Xu *et al.*, 2021). It is thus quite expected that a positive attitude toward TikTok is likely to propel an attitudinal response of the same magnitude toward the brand (Lin *et al.*, 2019). Moreover, Dwinanda *et al.* (2022) noticed that TikTok has a spray of features conducive to the development of greater interactivity between retailers and their followers, thereby improving attitude toward the brand. Bearing on these proposals, we propose the following hypothesis:

- H7.* Positive attitude toward TikTok produces a positive attitude toward the brands promoted on this social network.

2.5 From attitude to purchase intention on TikTok

Purchase intention refers to “the subjective probability of making an effort to acquire a brand” (Spears and Singh, 2004). In this regard, the four-stage model of loyalty (Oliver, 1997) puts forward the following causal chain; from cognition to affect, from affect to intention and from intention to behavior. This allows for the assumption that purchase intention is explained by the internet user’s attitude and increases the likelihood of a real behavior toward a given brand. In this regard, Maghraoui *et al.* (2022) proved that consumers’ attitude toward the brand present on social networks positively influences their purchase intention. In particular, on TikTok purchase intention seems to be strongly conditioned by the nature (favorable/unfavorable) of the internet user’s attitude toward the brand (Dwinanda *et al.*, 2022). Hence, we can assume that liking a brand on TikTok is likely to increase the possibility of joining it through a purchase behavior in the future. These assumptions allow us to formulate the following hypothesis:

- H8.* Positive attitude toward the brand on TikTok increases the intention to purchase it in the future.

Bearing on the above proposals, we propose to test the following research model (Figure 1).

3. Research methodology

3.1 Data collection

An online survey was conducted to better approach the behavior of TikTok users. The questionnaire was presented as an academic study seeking to understand the behavior of TikTok users, especially during the COVID-19 pandemic. The survey was administered to young TikTok Tunisian users, with an age range between 18 and 29. Indeed, this

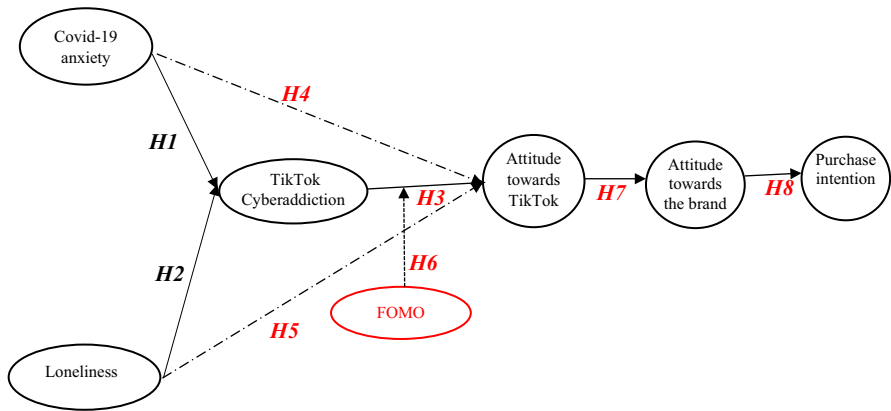
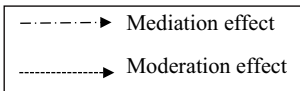


Figure 1.
Conceptual model



population belongs to Generation Z, which is born between 1995 and 2009 and represents currently the youngest and the largest population group (Wang *et al.*, 2023). Indeed, Generation Z is digital native (Wang and Guo, 2023) and has grown simultaneously with the development of social media and is particularly familiar with online purchases (Belanche *et al.*, 2019). It is also the population that has the highest social media usage rate (Xu *et al.*, 2021). It has the particularity of being perpetually seeking to keep social ties, especially during the successive imposed lockdowns (Liu *et al.*, 2021). In Tunisia, recent statistics show that most TikTok users practically belong to this age category (Novatis, 2023), which makes the target representative of the population of TikTok users. In addition, the literature suggests that cyberaddiction is more likely to affect young people, because of their vulnerability (Montag *et al.*, 2021; Shukur *et al.*, 2023). A link of the questionnaire was shared by the authors on social networks, particularly on TikTok as an immersive platform considered an addiction space (Montag *et al.*, 2021). The survey took place between December 2021 and January 2022. After removing incomplete questionnaires, a convenience sample of 305 young TikTok users was obtained. Respondents have various demographic characteristics (Table 1).

3.2 Measurement instruments

The measures used in this study were validated in previous studies. Adaptations to the context of the TikTok platform were made. Then, two academic experts translated the measurement scales into French, which is the language spoken by respondents. A back-translation procedure was followed to ensure the conformity of items translated to the original ones (Frikha, 2019). The questionnaire includes items from Lee *et al.*'s (2020) COVID-19 anxiety scale, Russell's (1996) loneliness scale and Przybylski *et al.*'s (2013) FOMO scale. Similarly, Andreassen *et al.*'s (2014) scale to measure addiction toward TikTok, Ellisson *et al.*'s (2007) scale to measure attitude toward social networks, Chattopadhyay and Basu's (1990) brand attitude scale as well as Moon and Kim's (2001) scale to measure the purchase

Variable	%	Cyberaddiction to TikTok	
<i>Gender</i>			
Male	50.8	301	
Female	49.2		
<i>Age</i>			
18–22	27.2		
23–26	46.2		
27–29	26.6		
<i>Profession</i>			
Students/pupils	48.2		
Employed	47.2		
Unemployed	4.6		

Table 1.
Demographics of the participants

intention of the brand present on TikTok were chosen. To operationalize the studied constructs, five-points-Likert scales were used (Frikha, 2019).

3.3 Data analysis

To confirm the dimensionality of the used scales and to purify them, exploratory factor analyses were performed. The results showed the unidimensionality of the scales. The reliability analyses also proved that the scales had good internal consistency (Table 2). Partial least squares approach (PLS) was chosen for the data analysis (SmartPLS3 software) because it is particularly well suited for expansive and exploratory theoretical models (Xu *et al.*, 2021). This study adapts escape theory and attachment theory (Bowly, 1958) to the context of an emerging social media during the COVID-19 pandemic. Some concepts, like FOMO or COVID-19 anxiety, included in the research model have been little studied in the past and allowed us to adapt existing theories to the context. Furthermore, the PLS method is particularly adapted to complex models with a large number of constructs and items (Hair *et al.*, 2014), which is the case in this study.

4. Results

4.1 Common method bias

To avoid common variance bias that may appear when self-reported data is used, common method bias was assessed using Harman's one-factor test (Podsakoff *et al.*, 2003). To this end, an exploratory factor analysis was performed on all the variables of the study. The results indicate that the one extracted factor accounts for 41.33% of the variance among variables, which is less than the cutoff point of 50%. Then, common method bias is not a serious concern in this study.

Constructs	KMO	Cronbach's alpha
COVID-19 anxiety (ANX)	0.81	0.91
Loneliness (LON)	0.90	0.95
Attitude toward TikTok (ATT)	0.76	0.93
Cyberaddiction to TikTok (CYB)	0.83	0.92
FOMO	0.78	0.91
Attitude toward the brand (AB)	0.76	0.95
Purchase intention (PI)	0.70	0.91

Table 2.
Results of exploratory factor analyses

4.2 Measurement model

Measurement model was estimated in order to check the reliability and validity of the used measurement scales. Reliability was established (Table 3) as all CR values are above 0.7 as recommended by Hair *et al.* (2014). Similarly, the obtained Dijkstra–Henseler’s ρA are all above the threshold of 0.7 (Hair *et al.*, 2014). Moreover, indicator reliability is satisfactory since outer loadings are above the cutoff point of 0.6 (Qin *et al.*, 2022). Convergent validity was checked through AVEs, which are all above 0.5 (Hair *et al.*, 2014).

Likewise, all constructs have good discriminant validity as they meet the Fornell and Larcker (1981) criterion that the square root of AVEs be higher than correlation between the latent variables (Table 4).

The HTMT matrix (Table 5) confirmed this finding and proves that discriminant validity is strong since all values are lower than the threshold of 0.85 (Qin *et al.*, 2022).

4.3 Structural model

Before proceeding to testing hypotheses, the predictive quality of the structural model was assessed using the R^2 and Q^2 coefficients (Table 6). The obtained R^2 coefficients are above the average of 0.33 (Xu *et al.*, 2021). Similarly, the Stone-Geisser Q^2 coefficients are all higher than 0. These results therefore attest to the good predictive quality of the structural model.

To validate the hypotheses, a 5,000-iteration bootstrap was performed as recommended by Hair *et al.* (2014). The results (Table 7) proved first that COVID-19 anxiety promotes TikTok cyberaddiction. This finding allows us to support the first hypothesis ($H1$). Then, we found that loneliness felt by users also enhances TikTok cyberaddiction. Thus, the second hypothesis ($H2$) is supported. Moreover, it was proven that TikTok cyberaddiction favors the development of a positive attitude toward it. The third hypothesis ($H3$) is therefore supported.

To test hypotheses $H4$ and $H5$, the mediating effects have been estimated following the procedure of Hair *et al.* (2014). The results (Table 8) showed that COVID-19 anxiety has a significant effect on attitude toward TikTok. When the mediator is introduced, the effect of COVID-19 anxiety on attitude toward TikTok was still significant but decreased significantly (β changes from 0.94 to 0.29). The calculated variance accounted (VAF) indicated that mediation is partial ($20\% < \text{VAF} < 80\%$). Testing the mediation of cyberaddiction in the relationship between loneliness and attitude toward TikTok showed that loneliness has a significant effect on attitude toward TikTok. By introducing the mediator, the impact of loneliness on attitude toward TikTok became insignificant. The calculated VAF proved that this mediation is full ($\text{VAF} > 80\%$). Thus, hypotheses $H4$ and $H5$ are supported.

Furthermore, the moderating effect of FOMO on the relationship between cyberaddiction and attitude toward TikTok was studied following the approach of Chin *et al.* (2003). In particular, we found that the interaction between the moderator (FOMO) and the independent variable (cyberaddiction) affected negatively the dependent variable (attitude toward TikTok). This finding means that FOMO slows down the impact of cyberaddiction on attitude toward TikTok. The sixth hypothesis ($H6$) is thus supported.

The results also proved that positive attitudes toward TikTok lead to positive attitudes toward the brand. The seventh hypothesis ($H7$) is therefore supported. Finally, findings confirm that attitude toward the brand promoted on TikTok has a positive influence on purchase intentions. Consequently, the eighth hypothesis ($H8$) is supported. The results of the structural model are summarized in Figure 2 below.

Constructs	Outer loadings
<i>COVID-19 anxiety (ANX)</i>	
Adapted from Lee <i>et al.</i> (2020) CR = 0.92; ρ_A = 0.96; AVE = 0.72	
I felt dizzy, lightheaded or faint, when I read or listened to news about the coronavirus	0.697
I had trouble falling or staying asleep because I was thinking about the coronavirus	0.923
I felt paralyzed or frozen when I thought about or was exposed to information about the coronavirus	0.738
I lost interest in eating when I thought about or was exposed to information about the coronavirus	0.955
I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus	0.914
<i>Loneliness (Lon)</i>	
Adapted from Russell (1996) CR = 0.96; ρ_A = 0.97; AVE = 0.66	
I feel like no one really understands me	0.641
I wait for people to call or write to me	0.842
There is no one I can turn to	0.643
I am no longer close to anyone	0.877
My interests and ideas are not shared by those around me	0.842
I feel left out	0.848
I feel completely alone	0.825
I am unable to reach out and communicate with those around me	0.746
My social relationships are superficial	0.812
I feel hungry for company	0.909
No one knows me really well	0.762
I feel isolated from others	0.893
I am unhappy to be so withdrawn	0.852
It's hard for me to make friends	0.890
People are around me but not with me	0.776
<i>Attitude toward TikTok (ATT)</i>	
Adapted from Ellisson <i>et al.</i> (2007) CR = 0.93; ρ_A = 0.93; AVE = 0.83	
TikTok is part of my everyday activity	0.928
I am proud to tell people I'm on TikTok	0.902
TikTok has become part of my daily routine	0.955
I feel out of touch when I haven't logged onto TikTok for a while	0.867
<i>Cyberaddiction to TikTok (CYB)</i>	
Adapted from Andreassen <i>et al.</i> (2014) CR = 0.92; ρ_A = 0.92; AVE = 0.72	
I spent a lot of time thinking about TikTok or planned use of social media	0.761
I felt an urge to use TikTok more and more	0.868
I used TikTok to forget about personal problems	0.853
I tried to cut down on the use of TikTok without success	0.812
I become restless or troubled if you have been prohibited from using TikTok	0.902
I used TikTok so much that it has had a negative impact on your job/studies	0.904
<i>FOMO</i>	
Adapted from Przybylski <i>et al.</i> (2013) CR = 0.92; ρ_A = 0.95; AVE = 0.55	
I fear others have more rewarding experiences than me	0.711
I fear my friends have more rewarding experiences than me	0.781
I get worried when I find out my friends are having fun without me	0.806
I get anxious when I don't know what my friends are up to	0.717
It is important that I understand my friends "in jokes"	0.792
Sometimes, I wonder if I spend too much time keeping up with what is going on	0.732

Table 3.
(continued) Measurement model

Constructs	Outer loadings
It bothers me when I miss an opportunity to meet up with friends	0.787
When I have a good time, it is important for me to share the details online	0.859
When I miss out on a planned get-together it bothers me	0.656
When I go on vacation, I continue to keep tabs on what my friends are doing	0.683
<i>Attitude toward the brand (AB)</i>	
Adapted from Chattopadhyay and Basu (1990) CR = 0.96; $\rho A = 0.96$; AVE = 0.92	
Brands promoted on TikTok are good	0.964
I like brands promoted on TikTok	0.950
Brands promoted on TikTok are nice	0.973
<i>Purchase intention (PI)</i>	
Adapted from Moon and Kim (2001) CR = 0.91; $\rho A = 0.93$; AVE = 0.79	
I will probably buy a product on TikTok soon	0.828
I intend to use the TikTok to buy a product soon	0.941
It is likely that I will shop on TikTok soon	0.874
TikTok will probably be the medium I use to do my shopping in the future	0.926

Table 3.

Constructs	ANX	LON	ATT	CYB	FOMO	AB	BI
Covid-19 anxiety (ANX)	<i>0.85</i>	0.58	0.34	0 / 65	0.55	0.40	0.38
Loneliness (LON)		<i>0.81</i>	0.56	0.71	0.36	0.38	0.38
Attitude toward TikTok (ATT)			<i>0.91</i>	0.80	0.55	0.63	0.69
Cyberaddiction to TikTok (CYB)				<i>0.85</i>	0.54	0.54	0.46
FOMO					<i>0.73</i>	0.48	0.36
Attitude toward the brand (AB)						<i>0.96</i>	0.76
Purchase intention (PI)							<i>0.89</i>

Note: The values in italic are the square roots of AVE

Table 4.
Discriminant validity
(Fornell–Larcker
criterion)

Constructs	ANX	LON	ATT	CYB	FOMO	AB	PI
Anxiety toward COVID-19 (ANX)		0.588	0.372	0.687	0.535	0.425	0.233
Loneliness (LON)			0.582	0.726	0.323	0.385	0.418
Attitude toward TikTok (ATT)				0.844	0.521	0.670	0.744
Cyberaddiction (CYB)					0.469	0.573	0.494
FOMO						0.385	0.366
Attitude toward the brand (AB)							0.815
Purchase intention (PI)							

Table 5.
HTMT matrix

Constructs	R^2	Q^2
AB	0.40	0.36
PI	0.59	0.51
ATT	0.70	0.53
CYB	0.59	0.45

Table 6.
Predictive quality of
the structural model

5. Discussion

This study shed light on the influence of psychological disorders on TikTok cyberaddiction and its consequences on users' attitudinal and intentional reactions during the COVID-19 pandemic. Indeed, in line with previous research (Zhang, 2022), our results showed that COVID-19 anxiety as well as loneliness heightened addictive behavior to TikTok during the pandemic. Indeed, the intensive use of social media is to cope with depressive moods and promote anxiogenic thoughts of escape (Shukur et al., 2023). Moreover, restrictions and preventive measures during the pandemic accelerated the sense of isolation in many individuals. As far as TikTok is concerned, its use to escape anxiety and isolation seems to lead to problematic use and even addiction (Nikolinakou et al., 2024).

Furthermore, it was shown that TikTok cyberaddiction favors the development of a positive attitude toward it. This finding seems to be in perfect agreement with those of previous studies that indicated that users who are addicted to a given social network are the most likely to perceive it as a source of a useful and pleasant experience (Tang et al., 2021). Thus, the experience taking place when TikTok users develop addiction to the platform makes them appreciate it and generates positive attitudes toward it (Qin et al., 2022). The resulting effects of this connection activate adhesion and become the reason of connection. With regard to social networks, this cycle can be described as a dopamine loop. Accordingly, it has been proposed that addiction to TikTok leads to judge its use as pleasant and enjoyable (Roth et al., 2022). This trend may therefore be the source of a greater appreciation and more positive attitudes toward this network (Hunt et al., 2018). However, the findings indicated that FOMO slows down the impact of cyberaddiction on attitude toward TikTok. Remarkably, TikTok content was the most downloaded in 2020, the year of the pandemic (Iqbal, 2021), which could reveal a fomophobia of not being on the network. For Przybylski et al. (2013), this

Hypotheses	Path coefficients β	Mean	SD	t-value	Results
H1: ANX → CYB	0.36	0.36	0.03	15.54**	Supported
H2: LON → CYB	0.50	0.50	0.03	6.52**	Supported
H3: CYB → ATT	0.73	0.72	0.02	46.52**	Supported
H6: FOMO * CYB → ATT	-0.15	-0.15	0.01	8.22**	Supported
H7: ATT → AB	0.63	0.63	0.03	19.32**	Supported
H8: AB → PI	0.77	0.77	0.02	11.49**	Supported

Note: **Significant at 1%

Table 7.
Testing direct effects

Mediation relationships	Total effect		Direct effect		Indirect effect		VAF (%)	Mediation	Results
	β	t-value	β	t-value	β	t-value			
H4: COVID-19 anxiety → Cyberaddiction → Attitude toward Tiktok	0.94**	42.19	0.29**	8.36	0.65**	16.42	69.14	Partial mediation	Supported
H5: Loneliness → Cyberaddiction → Attitude toward Tiktok	0.65**	23.77	0.07 ^{ns}	0.867	0.58**	17.95	89.23	Full mediation	Supported

Notes: **Significant at 1%; ns = not significant

Table 8.
Testing mediation effects

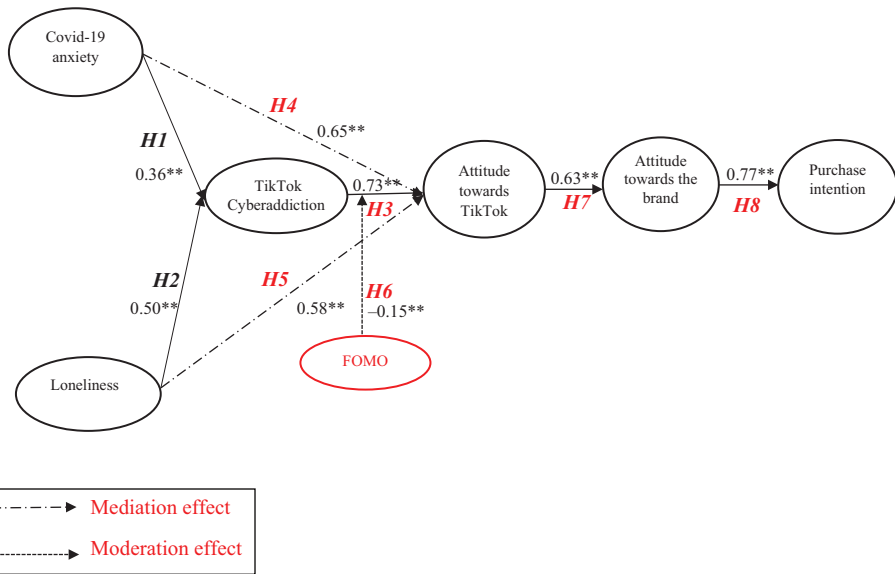


Figure 2.
Path coefficients

Note: ** $p < 0.001$

excessive fear questions the individual's abilities, self-efficacy and self-esteem. To maintain their own coherence, the user seeks to develop a feeling of artificial self-efficacy. As for gourmand users, lack of situation control leads the fomofobic to dispel the appetitive effect of social networks and eliminate their aggression in order to maintain their cognitive coherence and self-esteem. Rather than a source of entertainment, TikTok is conceived by addicted people as a necessary evil that they must continually control.

Moreover, the results proved the mediating effects of cyberaddiction on the relationships between psychological disorders (anxiety and loneliness) and attitude toward TikTok. Thus, lonely or anxious users try to satisfy their social needs by interacting with other users on social networks, watching a video, playing games, etc. On TikTok, satisfaction of such needs increases cyberaddiction through tolerance and favorable attitude to the network as well as makes users lose interest in other activities that were previously important for them. The platform seems to take them to a virtual and pleasant world (Tang *et al.*, 2021). This mediating relationship describes an info-communication phenomenon highlighting a concern with using TikTok as a dominant tool in their daily lives (Courbet *et al.*, 2020) to escape individual vulnerabilities such as anxiety and loneliness (Cerdá-Mansilla *et al.*, 2021a). This mediation gives a glimpse of how much this concern produces a specific emotional sphere that would be able to guide attitude of Internet users on social networks (Tang *et al.*, 2021).

Furthermore, it seems that a positive attitude toward TikTok is more likely to develop a similar attitude toward the brand promoted on this network. This is in line with the results of Lin *et al.* (2019) who proposed that a transfer of effects occurs, generally, from the source of the communication channel to the brand. This transfer is an extrapolation of the attitude toward TikTok to the brand advertised on this network. Indeed, the very regular TikTok content, mostly generated by users or influencers in the form of short videos, helps brands to

be known and to promote their accounts. In case the target appreciates the login activity on this network and judges it as appropriate to their needs, they are more likely to accept the brands present as well as their messages.

Finally, attitude toward the brand promoted on TikTok turns out to be a critical factor of future purchase intentions of the same brand, whether from the platform or outside. This is consistent with previous research indicating that consumers who initially developed a positive attitude toward the brand continue to desire it in the future (Lin *et al.*, 2019). At this level, it seems that an anticipation mechanism plays a central role in action planning (Ajzen, 1991).

6. Conclusion

It is clear that today TikTok is an essential virtual space of entertainment for young people. Considered the leading platform for snack video content, TikTok is also the object of covetousness by brands that do not hesitate to exploit it in parallel with other networks such as Facebook, YouTube or Instagram. Nevertheless, TikTok represents an environment conducive to the development of cyberaddiction, especially since its users are often young, highly credulous and vulnerable (Qin *et al.*, 2022). In particular, during the COVID-19 pandemic, internet users were more likely to develop psychological disorders that have promoted cyberaddiction (Shukur *et al.*, 2023). In this regard, this study specifically showed that COVID-19-induced anxiety and loneliness increased cyberaddiction, which in turn affected positively attitude toward TikTok. This effect however decreases when TikTok users feel fophobia. Moreover, TikTok cyberaddiction appears to play a mediating role in the relationship between psychological disorders (COVID-19 anxiety and loneliness) and attitude toward TikTok. It has also been proven that this attitude enhances, through a transfer of effects, attitude toward the brand promoted in the platform, stimulating purchase intentions.

From a theoretical perspective, this study has several implications (Table 9). First, it allowed us to consider TikTok an addiction medium affecting internet users' attitude and behavioral intentions. Internet in general and social networks in particular are well known for their addictive power. Nevertheless, TikTok users seem to be even more prone to cyberaddiction, probably because of their young age, making them particularly vulnerable (Montag *et al.*, 2021). Thus, this study has the merit of giving insights into this understudied phenomenon, despite its great importance (Qin *et al.*, 2022). Indeed, although it is not yet recognized by the World Health Organization, TikTok cyberaddiction has several negative effects on mental health (Montag *et al.*, 2021). Second, this research highlights two important determinants of cyberaddiction: COVID-19-induced anxiety and loneliness. Although

Results	Managerial and theoretical implications
COVID-19 anxiety and loneliness are important determinants of cyberaddiction	-Advertising campaigns broadcast on TikTok should be comforting and relaxing rather than stressful
Cyberaddiction to TikTok leads to a more favorable attitude toward it, toward the brand and increases favorable intention to buy those same brands	-Managers should limit commercial solicitations on TikTok in times of crisis, especially among younger consumers, who are particularly vulnerable
FOMO slows down the effects of cyberaddiction on attitude toward TikTok	-This study is one of the few that highlights the influence of FOMO on cyberaddiction to social networks
Cyberaddiction plays a mediating role between its psychological determinants and attitude toward TikTok	-Escape theory and attachment theory were adapted in this study to understand the pivotal role of cyberaddiction on the relationship between psychological disorders and users' reactions

Table 9.
Main managerial and theoretical implications

characterizing the COVID-19 pandemic, anxiety and loneliness may appear in other crisis situations and even in the absence of a specific context. These psychological disorders seem to play a crucial role in developing an excessive attachment to TikTok that can convert into addiction. Third, this study proved the moderating role of FOMO in the relationship between TikTok cyberaddiction and attitude toward it. FOMO is considered a concept still very little known by marketing researchers (Wigman *et al.*, 2017), yet it is particularly helpful to understand cyberaddiction (Liu *et al.*, 2021). Fourth, the mediating role of TikTok cyberaddiction between its psychological determinants (COVID-19 anxiety and loneliness) and attitude toward the platform was revealed for the first time, to the best of our knowledge. It allows for a better understanding of how attitudinal and intentional reactions to TikTok are formed, especially in a crisis context. Fifth, two theories were applied to better approach TikTok cyberaddiction: escape theory (Heatherton and Baumeister, 1991) and attachment theory (Bowly, 1958). Both were developed in psychology in order to understand individuals' behaviors and were adapted in this study to the specificities of cyberaddiction.

From a managerial perspective, some recommendations could interest professionals. Then, our study's results revealed that, during the COVID-19 pandemic, intention to purchase as well as positive attitudinal reactions stem from TikTok cyberaddiction generated by feelings of anxiety and loneliness. Nonetheless, managers should not in any case take advantage of critical periods like the COVID-19 pandemic to sell their products. Even if this study's results are specific to the COVID-19 pandemic, they could be extended to other similar contexts, especially stressful ones. As a first step, it is recommended for firms to limit communication campaigns on TikTok during crisis periods. Thus, during health or economic crises, firms should take socially responsible actions and try to contribute to society's well-being, especially with young vulnerable consumers like TikTok users. The large amount of information received makes them feel anxious and experience discomfort (Sanz-Blas *et al.*, 2019). Avoiding setting-up major advertising campaigns during crises should limit the devastating effects of enhanced cyberaddiction on attitudes and the unnecessary purchases that could lead to regret or guilt (Nawaz, 2023). Second, in order to control ravaging TikTok cyberaddiction and its dark side, managers are recommended to undertake retargeting actions by sparing vulnerable TikTok users. Firms could exploit users' data collected for advertising through machine learning techniques (Liu *et al.*, 2021) in order to detect individuals addicted to TikTok and unstream harmful content specifically for them (Roth *et al.*, 2022). Third, as socially responsible actors, firms should avoid putting in place means to fuel cyberaddiction or to stimulate psychological disorders like anxiety and loneliness. Advertising campaigns broadcast on TikTok should therefore be comforting and relaxing rather than stressful. Brands should therefore rely more on the fun content but also on its authenticity and reliability.

This study is not without limitations that open up some venues for future research. First, it would be interesting to see whether the obtained results are specific to the COVID-19 pandemic or not. To this end, researchers should replicate this study over a longer period of time and compare the obtained results with those of another health crisis or even in the absence of an emergency situation. Second, it is also interesting to check whether purchase intention is converted into an actual purchase, as proposed by the theory of planned behavior (Ajzen, 1991), by integrating this variable in the research model. Third, buying products in response to cyberaddiction could arise feelings of regret (Wang *et al.*, 2023). It is therefore recommended for scholars to shed light on them by taking into account this concept as a consequence of an actual purchase. Fourth, the survey was limited to a young target audience for reasons already discussed. However, it would be interesting to take into consideration older TikTok users. Fifth, it would also be appropriate to study the effect of other determinants of cyberaddiction, such as problematic smartphone use (Nawaz, 2023) or

narcissism (Wang *et al.*, 2023). Adding other factors explaining cyberaddiction in the model would probably lead to a better comprehension of TikTok users' behaviors.

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