









Older Adults' Engagement with Short Video Applications During the COVID-19 Pandemic: Perceived Affordances and Constraints

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Abstract. The spread and proliferation of short video applications (like TikTok) equip older adults more opportunities to obtain information and pleasure, especially in the COVID-19 pandemic. However, research on the use of TikTok among older adults is limited. In this exploratory study, we conducted interviews and on-site observations with 11 older adults aged 50 years or older who had experience using TikTok. This study explored the experience of TikTok's specific features for older adults from a need-affordance-features perspective, including the needs met and challenges encountered by older users. The findings show that older users' perceptions of the affordances provided by TikTok can be divided into two categories of egocentric affordance and allocentric affordance, totaling nine. We also identified three perceived constraints, including user interface design, privacy and security, and operability. The study extends the understanding of social media affordances from the perspective of older adults and also provides practical insights for the design and service improvement of short video applications.

Keywords: COVID-19 · Older Adults · Perceived Affordances · Perceived Constraints · Short Video Applications

1 Introduction

In recent years, short video applications have gained rapid tractions among public due to the proliferation of mobile devices and advancement of 5G technology. In their nascent stage, short videos applications took identity and emotion sharing as the underlying logic, with the characteristics of low content production thresholds and fast dissemination [1]. They conquered user-generated-content (UGC) users with their instrumentality, sociality, and fragmentation, erasing the lines between content providers and consumers. While there are multiple short video applications in the market, TikTok has emerged as the leading short video application globally. It is available in 155 countries, with over 800 million monthly active users worldwide and 2 billion downloads [2]. During the

COVID-19 pandemic, people spent increasingly more time on short video applications, looking for new means for entertainment and staying connected. This increase in demand further boosted the download volume of TikTok [3].

Previous studies or surveys have generally indicated that TikTok is a social media platform mainly targeted at young people [4]. However, this latest social media behemoth has now penetrated the older population, especially during the COVID-19 pandemic [5]. Compared to other groups, older adults are more susceptible to experiencing isolations and encountering difficulties in accessing information and maintaining social connections [6]. Short video applications offer a novel way to enhance the digital lives of older adults, particularly during the pandemic. However, older adults usually have low digital literacy [7] and may be faced with many challenges in the use of short videos. Existing literature has paid little attention to the use of TikTok among older adults, especially lacking an understanding of their overall perception of TikTok use. Previous research focusing on older adults has predominantly centered on their content generation and self-representation on TikTok [8, 9], but has not explored the interaction between older adults and the platform's technology especially in the pandemic.

To better understand older adults' utilizations of TikTok, this study conducted interviews and on-site observations of 11 older adults who had experiences in TikTok during the COVID-19 pandemic. This study adopted a Need-affordance-features (NAF) perspective [10] to investigate how older adults interact with various features of TikTok, particularly focusing on how well these features satisfy their needs and causing limitations. Unlike technological determinism, the idea of affordance acknowledges and prioritizes the role of humans in the use of technology [11]. The NAF perspective, based on self-determination theory and psychological ownership theory, is often used to understand the interaction between users and specific features of social media, which helps researchers to identify relevant needs and affordances, as well as motivations for use [12, 13].

We found that older adults' perceived affordance of TikTok were richer than anticipated, which meets different psychological needs of older adults. However, these affordances also presented some constraints for older adults. This study extends the disclosure on social media affordance [10], by adopting the perspective of older adults and with a focus on the unique context of the COVID-19 pandemic. This study also contributes practical insights for short video platforms to improve their services and designs. Finally, the findings from the context of COVID-19 pandemic can enhance the understanding and comprehensions of older adults' use of digital technologies in health crises and provide references to improve their digital literacy.

2 Related work

2.1 Affordance Theory And Need-Affordance-Features Perspective

The concept of affordance, originated from Gibson [14] in ecological psychology, refers to the interaction between an actor with the environment. Norman [11] applied this concept to the field of design and offered a different insight. He argued that affordance depends on the individual's subjective perception and understanding of external features. Hutchby [15] was the first to apply affordance to technologies, understanding it as

an IT artifact. According to him, affordance can explain how technology enables or constrains specific human action, yet technology does not necessarily lead to human action. With the prevalence and development of social media platforms, affordance theory has been applied broadly in related domains. In recent years, some scholars developed and employed different typologies to conceptualize affordances within social media contexts. Treem and Leonardi [16] proposed four dimensions of social media affordances (i.e., visibility, associating, editability, and persistence). Majchrzak and Faraj [17] put forward four categories of affordances for knowledge sharing: meta voicing, trigger attending, network-informed associating and generative role-taking. In addition, other scholars successively proposed functional media affordance [18], communication affordance [19], and social business technology affordance [20]. Karahanan et al. [10] proposed the Needs-Affordances-Features (NAF) perspective for social media, which identified the most integrated social media affordance through a comprehensive literature review and analysis of social media applications. This provides a systematic framework for understanding the affordances of social media and the users' psychological needs.

While many theories of technology use emphasize situational motivation, the NAF theory focuses on general life needs that go beyond specific contexts [10]. The field of psychology believes that every person has innate psychological needs and is driven to engage in activities that satisfy their needs [21, 22]. Therefore, the NAF perspective suggests that users' intrinsic psychological needs serve as a motivating factor for their utilization of social media, and that the affordances offered by social media can satisfy these needs [10]. Nowadays, the NAF perspective has been applied widely in social media studies to identify relevant needs, affordance, and motivations for use based on specific features of social media, providing insights into the design of social media features. For example, Wei [12] drew on the NAF perspective to investigate the impact of three psychological needs (i.e., need for competence, autonomy and relatedness) on both work-related and social-related social media use. Abhari's study applied the NAF perspective to figure out psychological motivation of the use of Business Intelligence tools [13].

2.2 Social Media Use

Social media is defined as a new type of online media that provides users with a great venue for engagement. Participation, openness, dialogue, community and connectivity are its main features [23]. In the last decade, social media research has been booming. Previous studies on social media use have primarily investigated usage motivation [24–26], usage intensity [27, 28], usage behavior [29, 30], problematic use (e.g., addiction) [31–33] etc. The main theories used in this field are Technological Acceptance Model (TAM), affordance theory, the Uses and Gratification theory (UGT), Theory of Planned Behavior (TPB), Unified Theory of Acceptance and Use of Technology (UTAUT), and Diffusion of Innovation Theory (DIT). In particular, social media research around affordance theory has become increasingly numerous. Although most of the current literature focuses on ubiquitous platforms like Facebook, Twitter and enterprise social media, the exploration of affordances present in short video platforms is relatively limited [34]. Considering the increasing popularity of short video platforms, it is particularly important to investigate its affordances and need met.

Empirical studies on social media use have been conducted on a wide variety of populations, such as adolescents, corporate employees, and nurses. The aging trend of society has brought more attention to older adults. Extant literature has focused more on the accessibility [35, 36], acceptance [37, 38], adoption [31, 39], and age-appropriate design [40, 41] of technologies. This was based on the hypothesis that older adults do not use new technologies and that there is a digital divide with younger people. In fact, an increasing number of studies have yielded results that are completely opposite to this hypothesis [42]. Recently, researchers have focused on the experience and impact of social media use among older adults. For example, Kusumota et al. [43] found that the use of social media had positive results (63.6%) in minimizing loneliness and/or social isolation in older adults compared to various other technologies. Milovich et al. [44] investigated whether interventions using free social networking platforms could improve the cognitive speed of older adults. Han et al. [45] explored the factors of social media use among older adults and the role of social media in promoting their health. Some studies adopted affordance theory to understand older adults' social media use, including their need satisfaction [46], motivations [47], and effects on intergenerational segregation [48], more often in the context of Facebook, ignoring the specific features of short video applications.

3 Method

Semi-structured interviews were conducted to understand the experiences of a small group ($N = 11$) of older adults who were engaging with TikTok during COVID-19 pandemic. Purposive and snowball sampling methods were employed to recruit participants. The eligibility criteria are as follows: (1) aged 50 or older, based on Zulman et al.'s [49] definition; (2) had used TikTok at least once during the COVID-19 pandemic.

3.1 Participants

A county in eastern China was the initial recruitment site, where the researchers identified several participants and used a snowball sampling technique to find additional participants. According to eligibility criteria, a total of 11 older adults were recruited to participate in the interview. The participants were individually contacted by the investigators and they provided informed consent prior to their participation in this study. The demographic details are shown in Table 1. The sample included 7 females and 4 males, ranging in age from 50 to 78 with 55 being the average. In terms of educational background, four participants have completed primary education, six have completed secondary education, while only one has completed higher education. It is worth noting that the majority of participants in the study chose to continue working even after reaching retirement age.

3.2 Data Collection

Data collection was conducted in November and December 2022. Each interview was conducted face-to-face in participant's home, lasting approximately 60 min. Each participant was provided with a 100 CNY honorarium for their participation. We have

Table 1. Demographic details of the participants.

Participants ID	Gender	Age	Educational Background	Household members	TikTok Usage (approximate time)	Working status
1	Male	50	Secondary	Partner, children	5 years	still working
2	Female	62	Secondary	Children	10 months	retired at home
3	Female	56	Primary	Living alone	5 years	still working
4	Female	53	Primary	Partner	2 years	still working
5	Male	54	Tertiary	Partner	3 years	still working
6	Female	50	Primary	Partner, children	4 years	still working
7	Male	50	Secondary	Living alone	4 years	still working
8	Female	52	Secondary	Children	2 years	retired at home
9	Male	51	Secondary	Partner	5 years	still working
10	Female	51	Secondary	Partner	1 year	still working
11	Female	78	Primary	Children	5 years	retired at home

designed an interview protocol that aims to gain insights into participants' understanding and utilization of specific features on TikTok, as well as their experiences with these features, both positive and negative. The protocol also delves into the challenges that users encounter when using TikTok in their daily lives. Through this protocol, we hope to gather comprehensive and valuable data that can shed light on how people interact with the platform and the impact it has on their lives. The interviews were audio-recorded with the consent of the participants. The participants were informed that the content of their narratives would be used strictly for research purposes. To maintain the anonymity of the data, participants were asked to avoid mentioning their names in the interviews. We also encouraged participants to use TikTok after the formal interview. We conducted on-site observations and interacted with participants as necessary. The field notes obtained from observation are used as supplementary material for later coding analysis to provide additional details that participants may have overlooked during the interview process.

3.3 Data Analysis

All interviews were voice recorded and transcribed for data analysis. Then the interview transcripts were analyzed using an open coding method [50]. We conducted a bottom-up thematic analysis with the interview data to identify key themes related to our research questions. To enhance the reliability of the coding scheme, process, and outcomes [51], two native Mandarin-speaking researchers were involved in the coding work. We first coded a transcribed interview independently. Then we compared their coding results to identify differences in their codes through a face-to-face meeting. After two rounds of discussion, we resolved such discrepancies and reached a consensus on our codes (an acceptable inter-coder reliability score of $K = 0.92$). Throughout the coding process, we compared new codes with existing ones, and adjusted the coding scheme as necessary by reorganizing or combining codes to ensure accuracy [52]. This iterative process improved the coding scheme over time, helping us identify important themes in the data. Further, all the codes were translated into affordances and constraints related to the use of TikTok in older adults' daily life.

4 Results

This study identified 9 major affordances and constraints related to use TikTok as summarized in Fig. 1. Referring to the social media affordance framework proposed by Karahanna et al. [10], perceived affordances were categorized into Egocentric and Allocentric affordances. Here, we define each affordance and illustrate how different features shape the affordances of TikTok. Table 2 shows the mapping between perceived affordances and the specific features of TikTok.

4.1 Perceived Egocentric Affordance

Self-presentation. Self-presentation affordance refers to how users utilize social media to express their values, preferences, expertise, and other aspects of their personality through sharing information about themselves [10]. On TikTok, users have the opportunity to showcase themselves to others through the “creating a profile” or “uploading videos” functions. Self-presentation help users fulfill their autonomy need and expressing self-identify need [10], enabling them to freely choose what to share and how to present themselves. All interviewees have set their avatars with their own photos or things they like. For example, *“My TikTok avatar is an orchid, because I really like plants, especially orchid”* (P4). More than half of the interviewees' posted video content is related to selfies, group shots, hobbies, work and family life (P1, P3, P6, P7). By uploading videos, users can satisfy their needs of having a place and maintaining continuity of self-identity [10]. As P6 reported, *“TikTok gives me a special place to post videos related to myself... I post videos every day, some of my current life and some of my youthful photos”* (P6).

Content Sharing. Content sharing allows users to distribute content to others that may not necessarily be related to themselves [10]. In addition to uploading self-related content, many interviewees also upload content related to their observations, funny videos,

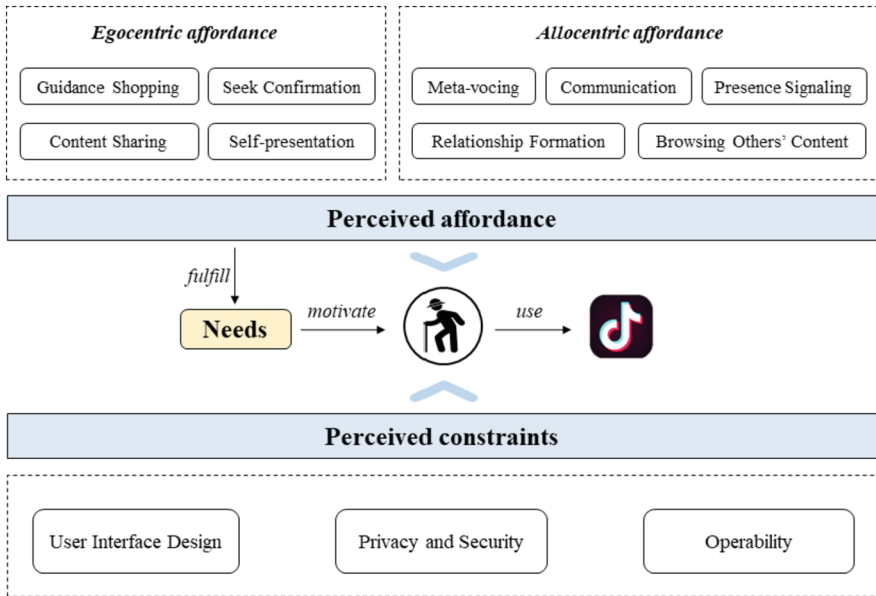


Fig. 1. Perceived affordances and constraints when older adults engage with TikTok

Table 2. Mapping of TikTok features to perceived affordances

	Perceived affordances	Features
Egocentric affordance	Self-presentation	creating a profile, uploading videos
	Content sharing	uploading videos
	Seek confirmation	searching
	Guidance shopping	watching videos, live streaming
Alloentric affordance	Presence signaling	online reminder, watching videos
	Relationship formation	following
	Browsing others' content	watching videos, following
	Meta-voicing	liking, commenting, favoring, forwarding
	Communication	direct messaging

and so on. For instance, “I will share some beautiful sceneries when I see it, which will make people feel enjoyable” (P1, P6). Some interviewees also use the forwarding and sharing function, forwarding to their personal homepage, sharing with specific individuals, and even across platforms such as WeChat. Content sharing is motivated by many reasons, such as spreading positive energy (P6, P7), alerting their children about scams (P4, P8), educating their family on COVID-19 preventions (P1, P3), and amplifying the reach of missing persons’ announcements (P7). This affordance helps users fulfill the need for autonomy and expressing self-identify [10].

Seeking Confirmation. Seeking confirmation refers to the action of using TikTok platforms to seek additional information, opinions, or perspectives on a topic one has heard about in the real world. This can be especially useful when trying to understand a breaking news or a trending topic, due to the timeliness and richness of sources on social media [53]. Some interviewees who are proficient and frequent users emphasized that when they heard a news or topic in real life, they will search for relevant content on TikTok in order to gain a deeper understanding and validate (P1, P5, P7, P9). For example, “*It helps me know about the news, and for me it can even replace the search engine Baidu*” (P1). “*When I hear about an event in my life, I search for the topic to find a variety of statements and learn about different people’s viewpoints on the matter*” (P7).

Guidance Shopping. Guidance shopping affordance enables users to freely choose “interested product” they would like to buy. A percentage of interviewees reported having shopped on TikTok after being attracted to product descriptions while swiping through videos and watching live streaming of merchandise. One reported, “*I once bought something on TikTok, a beard trimmer. I saw it recommended during a livestream while browsing videos... I noticed people in the livestream using it very conveniently, which is suitable for someone like me with thick, coarse, and dense beard*” (P7). In addition, guidance shopping affordance help users solve problems by providing personalized services [54], e.g., “*When couldn’t go out during the COVID-19 pandemic, I bought very much on it. I think it’s just like Taobao. I asked for information about the products during the live streaming, such as the size of the clothes to see if they fit me. The people on the live streaming did answer my questions, which felt good*” (P1).

4.2 Perceived Allocentric Affordance

Presence Signaling. Presence signaling affordance allows users to show whether they are online and available, or to check if other users are currently available [10]. Many participants mentioned their desire to see which of their friends are currently online and available for interaction. As one stated, “*I want to know if friends are online, especially family members who are not around, so that I can know if they are free right now*” (P8). Based on our data, we found that participants were able to determine if their friends were online by observing whether there was a green dot on their friends’ avatars or if they had posted a video. One participant stated that “*Sometimes I stay up late and then when I see my friend still online, which is a green dot on his avatar, I would send a message asking him why he is still up so late*” (P6). And another commented “*Sometimes when I brush the videos of people I followed, I suddenly see a video my friend just posted, I instantly know that he is also on TikTok*” (P5).

Relationship Formation. Relationship formation refers to the affordance to enable users to build a relationship with someone in social media [10]. During the pandemic, many participants turned to TikTok to connect with others while in isolations. All respondents mentioned that they use the “following” feature to build social connections, which includes following people they don’t know and people they do know, resulting in friends and follow-only relationships. For example, “*Besides my family and friends, I also follow some of my peers at work, mainly because I want to know what they are doing and*

learn from them" (P1). Besides, TikTok provides users with the ability to freely choose whom to follow through its relationship formation affordance. As a participant said, *"I only follow people I know well, while sometimes unknown people follow me"* (P5), while another one said, *"I also follow people I don't know if I think they are interesting or I am lonely in physical isolations"* (P4). The latter way helped to form a new relationship with people all over the country, and this was particularly important during the pandemic as traditional forms of socializations were limited.

Browsing Others' Content. Browsing videos is the most commonly used feature of TikTok. The participants reported that they frequently browse videos on TikTok, as they can freely explore content that they are interested in. For example, one participant with a chronic disease of hyperglycemia stated, *"My blood sugar is high, so I have to exercise every day. When I can't go out during the COVID-19 pandemic, I want to learn how to exercise at home by watching videos on TikTok"* (P11). The participants also browse through other users' content by "following" users who share content they are interested in and visiting their profiles. One said, *"I like to watch videos about family routines and children's education-related content because I am not well-educated and can't understand anything else. For instance, I have watched the videos of '吉家女' from beginning to end, and sometimes I would click into her avatar to see if she had posted any updates"* (P6). In addition, some interviewees expressed that they become interested in other people's content when they receive notifications about videos posted by those they follow. As described in P10, *"I only watch the videos of people I follow. When I open TikTok and see a red number on 'Follow' or 'Friends', I will click on it and watch it"*. Browsing other people's content helped participants know what others were doing, increased their sense of connection with others, and helped them learn more about themselves, e.g., *"Sometimes when I see how difficult some people's lives are, I realize that my own problems are nothing in comparison"* (P4).

Meta-voicing. Meta-voicing affordance enables individuals have an opportunity to engage in online conversation by reacting to content shared by others [15]. According to interviewees, they provided feedback by liking, commenting, forwarding or favoriting others' posts. Some interviewees reported that they express their approval and enjoyment of certain themed videos, such as acts of kindness, talent show, and humor actions, by "liking" and "forwarding" videos (P2, P5, P6, P7, P8, P9). Some interviewees mentioned that they would "favorite" or "forward" some videos about knowledge and life experience sharing, e.g., *"I previously favorited a video that talks about how to use empty bottles. I thought the content it presented was very useful"* (P8). Also, interviews can observe how others react to their own posts and experience peer acceptance, e.g. *"I posted some videos of me singing and received some 'liking' from others...and someone complimented me in the comments...I feel that means I am not bad at singing ha-ha"* (P7). This may enhance the feeling of connection with "peers" [10]. Unlike the act of presenting oneself and sharing content, in meta-voice, the user contributes additional knowledge to pre-existing online content rather than solely expressing their own viewpoint [17].

Communication. Communication affordance refers to the possibility for individuals to communicate directly on TikTok. Interviewees can exchange personal messages or

instant messages with others on TikTok, which help them build relationships with others. One mentioned, *“I met an old hometown friend on TikTok, and then chatted with him through ‘direct messaging’. We didn’t have any other ways to contact each other before, and it feels good to be able to connect now”* (P6). Further, communication affordance can satisfy someone’s need of expressing themselves, e.g., *“I chat every day on TikTok, ... I often forward some videos to my family and then attach my opinions”* (P7).

4.3 Perceived Constraints

While the older adults in our case all reported positive comments on the use of TikTok, they also mentioned some problems and challenges they encountered in engaging with TikTok. Three perceived constraints emerged from the analysis.

User Interface Design. As older adults grow older, their actions and cognition begin to slow down, so they may encounter some problems when interacting with the interface of short video platforms. Based on our interviews and on-site observation, we found that many participants were vulnerable to mis-touch when interacting with the interface. Some interviewees mentioned that they often accidentally click on links within the videos while watching, and are involuntarily redirected to other pages such as live streaming rooms, external platforms, or the page of topics, and find it difficult to return back. As one interviewee put it: *“...My fingers are not very flexible... I can easily click on the live streaming or the ad link. The ad link would jump to another platform and at first, I didn’t know what was happening...”* (P11). In addition, some respondents indicated that there are too many pages that can be switched currently, but they do not understand the functions of each page, which can lead to confusions (P4, P8, P11), e.g., *“There are too many pages for me...and I can only brush the video simply, as well as like, comment, favorite and forward...and sometimes can’t remember”* (P8). It’s worth noting that although TikTok offers an option to turn on an “elderly mode” in the settings, which includes larger fonts and simplified functions, interviewees were unaware of its existence and none of them had enabled it.

Privacy and Security. Privacy and security is another recurrent theme of older adults’ concerns in the interviews. In our study, some of the interviewees expressed concern that the commenting and online status features on TikTok could potentially compromise their personal privacy and even lead them to avoid using these features. For example, P4 said, *“I generally don’t comment, as it leaves my trace behind. If strangers see it, they can view my homepage by clicking my avatar or id”*, while P7 stated, *“I don’t like the online status notification. I feel like it exposes my personal information”* (P7). In addition, some interviewees stopped using certain functions that require authorized information due to concerns about security risks, such as *“I haven’t bought anything on it. When you’re ready to purchase, a window pops up asking you to agree to authorize personal information. I think it’s unreliable”* (P2).

Operability. Previous studies suggest that the ease of use and perceived usefulness of the technology significantly influence elderly’s continued adoption of technology [55, 56]. In this interview, older adults are still faced with some technological challenges.

Some interviewees mentioned that the process of cross-platform forwarding is complicated (P2, P10, P11), e.g., *"...I saw a video about how to wear a mask correctly during the COVID-19 pandemic, and I wanted to forward it to my family group on WeChat. However, it cannot be forwarded with one click, and I don't know how to operate it"* (P2). It was also suggested that the steps for making videos were also complicated and difficult to learn, e.g., *"I have no problem watching videos, but when it comes to uploading videos, especially those with music and subtitles, I feel it's very difficult. There are too many steps involved and I also need to type..."* (P3). In addition, some interviewees reported problems and bad experiences about purchasing goods on TikTok. An interviewee said: *"Sometimes I also watch product live streaming and then want to buy things...I need to provide my address, but I don't know how to type and can't fill it out..."* (P11).

5 Discussion and Conclusions

This paper investigates the perceived affordances and constraints of older adults' use of TikTok during the COVID-19 pandemic. The study found that elderly individuals could effectively utilize the various functional features of TikTok to satisfy their psychological requirements. We have sorted out a list of perceived affordances of older adults' engagement with TikTok, including self-expression, content sharing, seeking confirmation, shopping, presence signaling, relationship formation, browsing others' content, meta-voicing, and communication. Despite older adults being more proficient in using TikTok than anticipated, they still face some challenges, primarily related to user interface design, privacy and security, and operability.

The study's findings indicate that certain affordances were emphasized during the COVID-19 pandemic, including guidance shopping, relationship formation, browsing other users' content, and content sharing. Due to mobility restrictions during the lockdown, older adults, who were more susceptible to the virus, were encouraged to stay at home. As a result, they turned to TikTok more frequently as a means of coping with the pandemic's effects, utilizing different perceived affordances. For example, browsing others' content enabled them to follow exercise videos and workout at home when they were unable to engage in outdoor activities like walking or square dancing. Browsing others' content also provided an access to a wide range of information, including pandemic-related content. Moreover, the guidance shopping affordance has allowed some older adults to meet their daily shopping needs without leaving home. Furthermore, relationship formation and content sharing affordances enabled older adults to socialize with others through the internet, which helped them combat loneliness and social isolation during the pandemic.

This study helps to improve the age-appropriate design of TikTok. In spite of its simple and easy gesture interactions, older adults who lack finger dexterity may still encounter difficulties while using short video applications. While TikTok has developed an elder mode for the elderly population with larger fonts, icons, and simplified functional modules, older users still reported difficulty perceiving the presence of this version and finding a way to activate it. This finding highlights the importance of ensuring that age-appropriate versions are easily accessible and enabled by older people. This has broader implications for short-video apps like TikTok and other social media platforms.

This study also contributes to breaking stereotypes about older adults and their technological competence. Digital technology developers are often misled by such stereotypes [57]. However, the findings indicate that older adults perceive a richer affordance of TikTok than what researchers predicted. Although older adults face barriers to using TikTok due to cognitive decline and slower mobility, they still perceive diverse social media affordances. Additionally, previous studies have shown that older adults lack knowledge of potential online risks [58]. In contrast, this study found that older adults have a certain level of privacy and security awareness when using TikTok. They are aware that online status and comments could compromise their privacy and are concerned about the security risks of providing information required for authorization and purchases.

This study was limited by its small sample size, which constrains its generalizability. However, the study provided valuable data that enhances our understanding of older adults' engagement with TikTok. The findings shed light on the design of short video technology to better meet the needs of older adults. Moreover, this study was conducted during the COVID-19 pandemic, which can raise awareness and understanding of older adults' use of digital technologies during health crises and also provide insights into how to improve older adults' digital literacy.

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