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### A Sense of Place: An Affordance Perspective on Social Media Attachment and Social Media Addiction

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# A Sense of Place: An Affordance Perspective on Social Media Attachment and Social Media Addiction

Completed Research Paper

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## Abstract

*This study examines the relationship between social media attachment and addiction, viewing social media as built environments that users infrastructure or furnish to their preferences and interests (Reimers et al. 2022). Guided by the interactional theory of place attachment and the affordance lens, the study identifies the properties of social media's built environments that encourage infrastructuring. We tested a structural model using survey data from 324 students from a large university in the United States. The findings show that attachment to social media is a significant predictor of addiction, highlighting how positive experiences can result in unintended negative consequences. This is consistent with prior research suggesting that social media platforms are predominantly used for hedonic benefits and can be attributed to the psychological need for comfort, familiarity, and enjoyment. The implications of these findings are discussed, emphasizing the importance of considering place attachment in the study of social media addiction.*

**Keywords:** Social media, attachment, addiction, affordances

## Introduction

*"The burgeoning popularity of social apps as catalysts for interpersonal connection is both a blessing and a curse."*  
- Kwon et al. (2016)

Social media platforms have become an essential part of people's daily lives. Nevertheless, the same platforms have been linked to higher rates of depression, poor sleep, increased loneliness, and low life satisfaction (Cramer S 2018; Ponnusamy et al. 2020). While the use of social media is desired and encouraged, the challenge is that unregulated use can lead to negative consequences for the user, particularly among younger populations (Kwon et al. 2016). This dialectic view of social media highlights that social media has the potential to influence users both in a beneficial and negative way. For example, on the one hand, attachment to social media may help alleviate the emerging loneliness pandemic. However, excessive attachment to the platforms may lead to social media addiction, which may arise when users are unable to regulate their social media usage to the point that it interferes with their daily lives (Kwon et al. 2016; Tarafdar et al. 2020; Turel 2021; Turel and Serenko 2012). For instance, Turel (2021) demonstrated that pursuing hedonic rewards, such as likes, on social media can lead to engagement in technology-mediated dangerous behaviors like posting while driving.

Social media addiction is defined as a maladaptive psychological pattern of seeking out and using social media to the point where these behaviors become disruptive to daily life (Turel and Serenko 2012). Social media addiction may result in a number of behavioral addiction symptoms such as salience, withdrawal, relapse, increasing tolerance, conflict, and mood modifications (Turel and Serenko 2012). Over 210 million people worldwide suffer from internet and social media addiction (Longstreet and Brooks 2017). According to a 2019 global survey, although social media boosts users' access to information, communication ease,

and freedom of expression, respondents also felt that social media had harmed their personal privacy, increased their political polarization, and everyday distractions (Dixon 2019). Additional evidence suggests that individuals perceive themselves as increasingly dependent on smartphones and excessively monitoring information, which may come at the expense of their own productivity (Iyer and Zhong 2022). Ricci (2018) also reported that approximately 5-10% of Americans satisfy the diagnostic criteria for social media addiction.

An increasing body of research has highlighted several factors that contribute to social media addiction. One stream of research focuses on individual differences including needs and motivations, personality traits, cognitive appraisals, lack of control or self-regulation, habitual behaviors, and attachment styles (Ahmed and Vaghefi 2021; Blackwell et al. 2017; Cao et al. 2020). Another stream focuses on IT artifact-related characteristics such as likes, notifications, playing games in the app, updating status, and others. (Rothen et al. 2018). A third stream of research is based on models from the study of alcohol and substance addiction to understanding social media addiction, e.g., from neurological, positive reinforcement and reward seeking perspectives (Kwon, 2016; Turel, 2015). In our study, we focus on an environmental psychology perspective centered on the interactional theory of place attachment (ITPA) (Milligan 1998). We posit that viewing social media as built environments may reveal fundamental differences that are not currently captured in the literature. This perspective holds particular relevance due to the nature of social media, which resembles a virtual space or environment rather than a physical substance. Given the prevalence of phrases like "digital decluttering," often drawing parallels with decluttering one's home, it becomes essential to acknowledge that digital spaces are, to some extent perceived as alternatives to physical locales. We note however that, while the current study focuses on social media, these affordances could apply to widespread use of other technological devices including smartphones, laptops, tablets, and others. The objective of this study is to expand on existing models to gain a comprehensive understanding of social media addiction by accounting for the distinct characteristics of social media platforms as virtual spaces. Our study suggests that viewing social media as a place that users endow with meanings can offer a novel perspective for understanding social media and its impact on users. We further suggest that the process of bringing new practices into one's own world, known as infrastructuring, Reimers et al. (2022), is a distinctive feature that sets social media apart from other digital platforms and provides a unique perspective on social media as a place to which users become attached. Through infrastructuring activities, over time, the platform becomes a place where users experience a sense of comfort, enjoyment, and belonging. This approach can help us understand users' experiences when interacting with these platforms, such as what they encounter, how they perceive it, and what motivates them to spend more time on them.

Some scholars have noted that the notion of place has not received enough attention in the Information Systems (IS) literature (Goel et al. 2011). Although some studies, e.g., Venkatesh et al. (2019), have examined attachment in the context of parent-child relationships (human-human) and its impact on children's internet addiction, further research is warranted to investigate attachment to social media platforms (human-IT). Technology mediated human-human attachment has played an instrumental role in explaining the role of technology as a facilitator of human-human interactions across time and space (Cao et al. 2020; Stănculescu and Griffiths 2021; Venkatesh et al. 2019). This form of attachment sheds light into how individuals address the need to build and sustain interpersonal relationships, which may manifest in persistent use of technologies (Lou et al. 2005). This requires a unique set of affordances. For example, while human-human attachment explains the actualization of messaging, posting, liking, and friending affordances, human-IT attachment may uncover further affordances (Karahanna et al. 2018). Human-IT attachment pertains to the emotional relationship individuals form with the technology itself. It encompasses the psychological and behavioral factors that lead individuals to become attached, dependent, or emotionally connected to specific IT tools or platforms. This attachment could arise from the use of a unique set of affordances not yet explored in current IS research. For example, cerebral affordances (Borghini et al. 2021), which are related to the mental stimulation such as educational infographics have the potential to explain why individuals spend more time on social media platforms. Similarly, symbolic affordances (Borghini et al. 2021), unpack the interactions with discursive elements in cultural symbols, such as memes and value-representing content that users find fulfilling and that enable longer scroll times. Moreover, sensory affordances (Borghini et al. 2021), which stimulate the five senses, attract users through sight, sound, and touch, initiating the first step to using the platforms. To gain an understanding of the user experience on social media and how it fosters attachment to these platforms, we consider it necessary to dissect the attachment affordances they provide.

Specifically, our study aims to address the following research questions: 1) *To what extent do place attachment affordances result in attachment to social media platforms?* and 2) *To what extent does social media attachment result in social media addiction?* By addressing these research questions, the study offers several contributions to the existing research. Firstly, the study adds to the literature on IT addiction, by offering a complementary perspective on the precursors of social media addiction, i.e., social media attachment. Secondly, the present study adds to the IT affordance literature (Haag et al. 2023; Karahanna et al. 2018) by contextualizing three attachment affordances: sensory, cerebral, and symbolic (Borghini et al. 2021). This contextualization expands our current understanding of social media affordances and builds on established knowledge. Thirdly, the findings contribute to the current conversation on the concept that beneficial experiences can be simultaneously disruptive, (Benlian 2022; Haag et al. 2023; Vaast and Pinsonneault 2021), highlighting the dialectical tension inherent in social media platforms. This finding presents an opportunity for further research to explore the tipping point at which a positive experience, such as attachment transforms into deviant behavior, i.e., addiction. Fourthly, the study highlights the role of infrastructuring (Reimers et al. 2022) as a unique feature that sets social media apart from other digital platforms, paving the way for an understanding of how users form an attachment to social media. Lastly, our study also makes a methodological contribution by developing measures and operationalizing the concepts of social media attachment affordances and social media attachment. The study also offers practical implications. The implication for users is raising awareness regarding their attachment to social media applications. This awareness can establish a basis for informed decision-making and proactive strategies for reducing the risk of slipping into addictive social media behaviors. Moreover, understanding how attachment influences user behavior can offer valuable insights for platform developers. This understanding can guide the creation of interfaces that enhance user experiences while mitigating the potential for addictive usage, particularly among young adults.

## **Theoretical Background**

Extant IS literature has identified various antecedents of social media addiction, which can be broadly categorized into three main groups: IT-artifact factors, user-related factors, and situational factors. The IT-artifact factors refer to features of the technology itself, such as the "likes" feature, which has been linked to the problematic use of social media. Additionally, salient features of hedonic platforms, such as profile creation and updating, check-in buttons, search toolbar, and follow buttons, have been found to contribute to the progressive compulsive use and eventual addiction to these platforms (Vaghefi et al. 2022). Research on user-related factors has focused on the characteristics that predispose or protect individuals from information system addictions. Studies have found that user cognitions and perceptions, as well as individual differences such as self-efficacy, personality, and personal innovativeness, have been associated with IT addiction (Kuem et al. 2021; Turel 2015; Turel et al. 2011). Emotions such as feelings of guilt and enjoyment have also been explored in relation to IT addiction (Turel 2015; Turel and Serenko 2012). Contextual factors, such as the accessibility of devices and the internet, have also been found to facilitate constant checking which leads to intended and unintended negative consequences (Gerlach and Cenfetelli 2020).

Thus far, research linking the IT-artifact factors of social media to user-related factors has studied the needs and motivations of users as a mechanism that leads to social media addictions. For example, (Vaghefi et al. 2022) found that a combination of salient individual needs, affordances, technology features, IS use behaviors, and control mechanism outcomes (successful or unsuccessful) influence an individual's trajectory toward hedonic IS use addiction. Another mechanism identified to link features of the IT artifact and user-related factors is positive reinforcement. For example, Kwon et al. (2016) found that individuals become more vulnerable to social app addiction under several conditions including positive reinforcement, sensitivity to social liquidity, and discounting the effects of current consumption on future harmful consequences. Similarly, (Turel 2015) reports that positive reinforcement facilitates the development of strong habits and reinforces it until it becomes a "bad" habit that facilitates the formation of maladaptive psychological dependence on the use of IT. Activities that involve users' appropriation of IT features to obtain a desired state are another mechanism noted in the research. For example, Rothen et al. (2018) found that certain activities on Facebook, including status updates, gaming, and notifications, were related to problematic use of the platform.

The link between user-related factors and situational factors has also been investigated with habit playing a salient role. According to (Turel and Serenko 2012) “if familiar environmental or situational cues are present, individuals may not engage in full cognitive deliberation and thoroughly consider their behavior” (p. 513), hence increase in habitual use of social networking sites was found to lead to addiction to the sites. Similarly, in another study, Turel (2015) found that even when users consider discontinuing IS use, habit can devalue this act. This is consistent with Bright and Logan (2018) who found that often consumers discount their experiences of social media fatigue to remain involved with social media because they believe that continued use provides outcomes that are more positive than discontinuance of use. In the current study, we propose that another potential mechanism connecting features of the built social media environment and the affordances from interactions with the platforms is attachment to the social media platforms.

### ***The Concept of Place and Place Attachment***

A review of the literature reveals that two main schools of thought exist in IS attachment literature. The first is Bowlby (1969's) interpersonal perspective of attachment which was conceived based on mother-infant relationships. A salient feature of Bowlby's perspective is it focuses on human-human or interpersonal attachment. Several IS scholars have adopted this perspective to study how interpersonal attachment influences the use of information systems. For example, in their recent work, Venkatesh et al. (2019) found that parent-child attachment moderates the relationship between parenting behaviors (control, monitoring, unstructured time, and rationalization) and children's internet addiction. Additionally, Kim and Koh (2018) found that avoidant attachment may lead to low self-esteem and anxiety, which in turn may lead to smartphone addiction. Overall, this conceptualization places an emphasis on the relationship that humans have with other humans and offers a unified understanding of attachment to others and how it influences IS-use behaviors.

The second area of attachment research is place attachment, which is concerned with a person's connection to "built" environments or spaces. This view is captured by the interactionist theory of place attachment (ITPA), (Milligan 1998). According to ITPA, place attachment is “the emotional link formed by an individual to a physical site (space) that has been given meaning through interactions” (Milligan 1998). While a space exists in the abstract, a place is a space that has been endowed with meaning, and values and steeped in sentiments (Goel et al. 2011; Milligan 1998). This conceptualization highlights how place attachment is socially constructed since people create the meanings associated with the "built environment" by interacting with its objects (Milligan 1998). While not widely adopted in the IS literature, we draw from ITPA as the theoretical framework for this study for two reasons. First, ITPA has the unique ability to provide a comprehensive perspective on the relationship between humans and IT, specifically in the context of social media as built environments. Second, ITPA allows us to explore unique social media affordances relevant to social media addiction that prior research has overlooked.

The idea that non-geographic spaces can be represented as a place is supported by IS research. For example, Goel et al. (2011) expounded on the notion of virtual worlds and how they can be transformed from space to place through the awareness and interactions that individuals have with objects in virtual environments. The authors found that place attachment in the virtual world is driven by social awareness, location awareness, and task awareness. Other studies have used the place metaphor to study IT artifacts such as online retail stores, (Horakova et al. 2022), virtual communities, (Kim et al. 2022) smart-city technologies, (Wnuk and Oleksy 2021), instant messaging (Wu et al. 2017), and others. A few scholars have reconceptualized place attachment to emphasize the attachment figure to an IT. For example, Choi (2013) defined IS attachment as “the strength of the bond connecting the IS product or service with the user's self” (p. 2355). In his study, Choi found that visual aesthetics, personalization, and relative performance have positive impacts on the attachment to the browser, which then positively influences users' online community participation intentions. Similarly, in his seminal work, Li (2014) defined IT attachment as “a close tie or affective bond between IT and users. It provides the benefits such as a haven and secure base in IT use.” Overall, this conceptualization underscores the attachment figure from other humans to IT and presents a consistent view of attachment to places.

As illustrated by the above studies, integral to the concept of place attachment are interactions. According to Milligan, there are two interwoven interactions, which are related to an individual's past and potential

experiences with a site (Milligan 1998). The first one is interactional past which refers to prior experiences with a site otherwise known as memories. An interactional past is created through the cumulation of meaningful experiences on the site and can also be thought of as a history tied to a site. What is important to underline with interactional past is that “the degree of meaningfulness of these experiences translates into the degree of attachment to the site itself” (Milligan 1998, p. 2). This conceptualization gives ground to represent social media as a place, a springboard through which users create meaningful experiences through interactions. Social media “refers to online platforms where people form communities in which they create, exchange, comment, and cocreate content” (Karahanna et al. 2018, p. 738). Social media platforms are built environments that consist of both material and social objects (Blumer 1986; Leonardi 2011; Orlikowski 2007). Material objects are the set stages created by the architects (designers) of the built environment. Users can then appropriate the material objects e.g., posting, replying, like, and chat features to create meaningful experiences on their social media profiles (social objects). Through these interactions, users “furnish and decorate” or infrastructure (Reimers et al. 2022) their spaces with meaningful objects e.g., through what they post and whom they follow, both of which determine the contents of their feed.

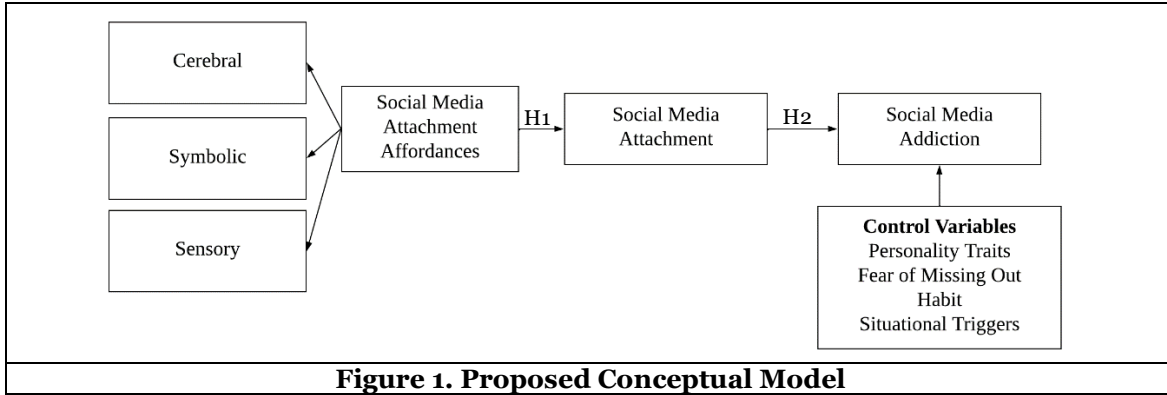
Interactional potential, the second component of ITPA is defined as “future experiences imagined or anticipated to be possible in a site” (Milligan 1998). Put differently, the interactional potential is the “range of experiences that are perceived as possible in a given place” (Milligan 1998, p. 16). It is at the heart of interactional potential that the affordances perspective to social media attachment comes to play. Scholars posit that place attachment depends on the specific physical characteristics of a setting but not always (Milligan 1998). While the features of the built environment are essential for interactions, they are only a part of the story. As Vaghefi et al. (2022) posit, “affordances are distinct from features and should not be confused with the latter because while an artifact’s technical and physical features are embedded in the technology by design, affordances only exist in relation to the individual actor/user” (p. 5). In accordance with this assertion and consistent with Borghini et al. (2021), we posit that in like manner, social media platforms offer potential affordances that users recognize, use, and can modify in certain situations in a process called infrastructuring (Reimers et al. 2022).

“Infrastructuring” is the continual “process of bringing new technologies and practices into one’s own world” (Reimers et al. 2022, p. 1568). According to Reimers et al. (2022), a world is both a personal place where the individual feels at home, but also one that is public in that it is exposed to and shaped in part by the opinions and validation of others. The concept of being-in-the-world as described by Reimers, and colleagues encapsulates “how extant technologies and practices can become a part of a holistic nexus of familiar entities that would provide the comfort, security, and purpose implied by infrastructure as a home” (p.1555). This notion is consistent with (DeSanctis and Poole 1994a)’s concept of adaptive structuration which suggests users are not passive recipients of technology, but actively adapt and structure it to meet their needs. This adaptation process helps individuals create a personalized and comfortable virtual space that feels like home and brings them enjoyment. Social media differs from other digital media in its affordance for infrastructuring. Infrastructuring is associated with social places and our attachment to them. Therefore, the infrastructuring afforded by social media raises the possibility that people may be differentially attached to social media. This is why we are studying social media addiction in terms of place attachment.

Given the above discussion, in this study, we define social media attachment as the emotional link formed by an individual to social media that has been given meaning through interactions with objects on the platform in the process of infrastructuring. This attachment is formed through a combination of selective following, user-generated content (infrastructuring), and the material properties of the social media environment, which provide sensory, cerebral, and symbolic affordances that shape users' perceptions of meaningfulness of the platform.

## **Research Model and Hypotheses**

In this section, we develop our research model, which is summarized in Figure 1. Below we develop each hypothesis that constitutes it.



**Figure 1. Proposed Conceptual Model**

**Social Media Affordances that Motivate Place Attachment**

Central to Milligan (1998)’s ITPA are interactions with the built environment implying that these environments have properties that encourage or influence the activities that can take place within them. Using the affordances lens, we posit that social media have embedded social and material affordances of interactions. The concept of affordances was coined by Gibson (2014) to describe that environments offer animals action possibilities that the animals can choose to use to perform certain actions. This concept has since been widely accepted in other disciplines (Borghini et al. 2021; Karahanna et al. 2018; Vaghefi et al. 2022). Specific to IS research affordances are understood to describe how the appropriation of the embedded features of a technology only exist in relation to the individual user (Vaghefi et al. 2022). Specific to our current study are social media affordances, which are defined as “action possibilities permitted by social media features” (Karahanna et al. 2018). Central to Karahanna and colleagues’ logic of the needs-affordances-features model is the presence of psychological needs that individuals perceive that features of social media can potentially fulfill. One of these fundamental psychological needs is the need for having a place, or sense of place (Pierce et al. 2001). According to Pierce, individuals naturally have the desire to “possess” a certain territory or space to have a “home” in which to dwell” (p. 300). Expounding on this notion, Karahanna et al. (2018) posit that this need not be a physical place but can also be reflected through “cyber” spaces e.g., virtual worlds and social media.

The interactionist theory of place attachment asserts that through their interactions, social media users create interactional pasts, i.e., “memories” by curating their feed and following certain accounts that infrastructure their spaces. Similarly, further interactions with current and “new ties activate the enactment of new emotional repertoires,” which become interactional potential (Borghini et al. 2021). Environmental psychologists, (e.g., Raymond et al. 2017) argue that affordance theory can help explain how people develop a sense of place through their interactions with the environment, and that affect plays a significant role in this process. Consistent with (Reimers et al. 2022) and the affordances perspective, in this study we conceptualize the social aspect of place attachment as the process of infrastructuring one’s world which involves the individuals’ as well as a public’s discursive and material interactions. Reimers et al. (2022) argue that the process of infrastructuring is such that an individual’s view of the world, and the infrastructure within it, is both private and public; it serves as a personal haven where we feel comfortable, yet it is also exposed to the opinions and input of others.

Social media is an excellent example of this discursive co-infrastructuring process since it allows users to create an online “home” by following users whose posts resonate with their own. This is a very selective process because, similar to how people don’t just bring anything to decorate their homes, but rather choose objects that suit their taste and aesthetic, individuals’ social media accounts are curated by carefully selecting whom to follow and what to post (which together make up the content of one’s feed). Consistent with Reimers et al. (2022)’s assertion that a person’s infrastructure is also a public world of discursive and material interactions, we posit that socially, an individual’s social media world is a function of their own infrastructuring activities through selectively following certain accounts as well as their own user-generated content. These activities collectively form symbolic and cerebral affordances (Borghini et al. 2021) through which users interact to form their social media world. The interactions afforded by these affordances lead

to the formation of emotional bonds that users learn to associate with the social media environment. Reimers et al. (2022) argue that by simply going about their daily lives in an attentive and responsive manner, people engage in exploratory infrastructuring where they discover and map the limits of the objects in their built environments. Hence, materially, we posit that some properties of the social media environment constrain or influence the activities that are perceived to happen within it (i.e., sensory affordances). We believe that a closer examination of sensory, cerebral, and symbolic affordances, and their relation to social media attachment may advance our knowledge of how addictive social media use develops. Below, we go over each of the three affordances in more detail and we propose a conceptual model.

### **Sensory Affordances**

Sensory affordances<sup>1</sup> are “elements that immediately produce a perception of this particular place as a source of comfort and enjoyment, rife with potential for diversion and fulfilling desires” (Borghini et al. 2021, p. 898). Social media sensory affordances are the design features of social media that help users sense something. Many acknowledge that “one of the first ways that humans relate to place is through their senses” (Cross 2015). This includes constructed “cyber” spaces such as virtual worlds (Goel et al. 2011) and in our case, social media. In their exposition of how people get attached to retail spaces Borghini et al. (2021) argue that sensory<sup>2</sup> experiences such as sight, smell, hearing, and touch are what give consumers an immediate sense of comfort, ease, and enjoyment, and make them anticipate opportunities for fulfilling desires. According to Goel et al. (2011), “sensory perceptions provide informational inputs about the space around us and enable us to become aware” (p. 752). Consistent with (Goel et al. 2011), sensory inputs of sight and hearing and properties that enable such perceptions are embedded in the design characteristics of the environment. We conceptualize these material affordances as sensory affordances of social media environments manifested in the design elements of social media platforms.

Prior research suggests that certain elements of an IT produce sensory experiences that can determine whether and how long a user stays and interacts with a site (Cyr et al. 2006; Rosen and Purinton 2004). For example, Cyr et al. (2006) found that the design aesthetics including the visual appeals and graphics of commercial websites were linked to the overall enjoyment for users when interacting with them. Rosen and Purinton (2004) similarly found that designing commercial sites to include the sensory shopping experience contributes to making sales and increasing the amount of time consumers spend on the sites. Furthermore, Davis (2001) posits that certain stimuli (e.g., the sound of the computer connecting to an online service or the tactile sensation of typing on a keyboard) associated with a certain behavior have the power to elicit problematic internet use. In like manner, social media applications have features like deliberately chosen logos and aesthetically pleasing designs that when combined with users’ desire to satisfy particular needs such as scrolling for a pleasurable experience, enable the actualization of the users’ needs (Matthews et al. 2020). Therefore, we posit that sensory affordances lead users to develop attachment to social media.

### **Cerebral Affordances**

Cerebral affordances are “the learning opportunities afforded by a new space—to discover new consumption trends, cultivate personal interests, and be inspired” (Borghini et al. 2021, p. 899). In social media, we conceive of cerebral affordances as the mentally stimulating learning or educational opportunities offered by social media. In the formation of attachment to retail stores, Borghini et al. (2021) assert that, although sensory stimulation may entice customers into a store, mental stimulation that increases neural activity ensures a longer visit, resulting in a more significant attachment. This can be true for social media. For example, on Instagram, users frequently share educational content aimed to inspire, motivate, and encourage others. Several eminent scholars (such as Adam Grant) frequently publish short, simple, and condensed infographics presenting recent research findings in a manner that is understandable to the general public. Similarly, the Instagram live Q&A feature also allows users to ask questions about specific topics in real-time. Additionally, Facebook offers an array of features that promote mental stimulation such

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<sup>1</sup> In their paper, this is referred to as “sensual affordances.” Borghini et al. (2021)



as games, polls, and others, all of which encourage mental stimulation that may lead to longer time visits and stronger attachment.

Neurocognition research has noted some of the mechanisms underlying information-seeking behaviors. For example, Kobayashi and Hsu (2019, p. 13061) found that “while it is optimal to acquire information based solely on its instrumental benefit, humans also often acquire useless information because of psychological motives, such as curiosity and pleasure of anticipation”. These behaviors are especially relevant in the context of hedonic platforms like social media where information-consumption behaviors are driven by uses and gratification need of passing time and the intrinsic rewards of pleasure (Kobayashi and Hsu 2019). Similarly, marketing scholars found that consumers discount their experiences of social media fatigue to remain involved with social media because they believe that continued use provides outcomes that are more positive than discontinuance of use (Bright and Logan 2018). Therefore, we posit that the rewarding nature of social information and curiosity, i.e., the motive to collect information for its own sake (Kobayashi and Hsu 2019) will put users in a state of enjoyment when interacting with social media. Consistent with this research, Cross (2015) adds that “restorative places that offer the opportunity for relaxation, fascination, exploration, being away from worries, self-reflection, or desirable physiological experiences” are more likely to foster the formation of place attachment. Therefore, in a similar way, we hypothesize that the memories associated with social media enjoyment and exploration of mentally stimulating features and content on the platforms will encourage the formation of social media attachment.

### **Symbolic Affordances**

Lastly, symbolic affordances include an important cultural and social element (Borghini et al. 2021) that goes beyond the material aspect of the social media-built environment. According to Low (1992), place attachment is the symbolic bond created when individuals assign a specific site with culturally prominent emotional or affective meanings. Symbolic interactionism, argues that every object and action has a symbolic meaning, and this meaning is socially constructed through interactions with symbols such as language, gestures, and other forms of communication (Blumer 1986). The extant literature on symbolic expressions has pointed to properties of the IT-artifact that convey impressions that users, designers, and researchers may interpret as values and intents. This view of symbolic expressions or “the communicative possibilities of a technical object for a specified user group” represents a relational concept relative to a specific user group (Markus and Silver 2008, p. 623). This relational emphasis on symbolic expressions underscores their importance in shaping human-human interactions via a technology medium, a concept similar to the interpersonal perspective of attachment. The current study's focus on the IT as an attachment figure necessitates viewing symbolic expressions as a departure from the present conceptualization, which highlights users' interactions with symbolic objects that they introduce to their social media environments to furnish or infrastructure them in a way that ultimately leads to attachment to the platforms. The extant research on symbolic expressions informs certain aspects of our current conceptualization of symbolic affordances by highlighting the importance of symbols e.g., symbols, hashtags, mentions, share symbols, etc., in conveying meanings and values (Chen et al. 2020; DeSanctis and Poole 1994b; Grgecic et al. 2015; Markus and Silver 2008). Our view of the symbolic meanings of social media is an extension of Chen et al. (2020)'s symbolic interactionism view, which examines how individuals interpret technology as an object represented by both intrinsic and symbolic meanings. In this study, we focus on the symbolic meanings that users bring to the social media environment through the process of infrastructuring. We interpret symbols as stimuli that users bring to their social media environment through what they post, whom they follow, and what their followers post. These symbolic objects afford users the potential to contribute and consume social media content. Thus, our perspective on symbolic interactions is framed through the affordance lens. Formally, we define symbolic affordances as the interactive potential derived from social, abstract, and culturally significant objects (e.g., photos, videos, text) that users and their followers bring to their social media environments in the process of infrastructuring.

Blumer (1986) contends that three types of objects are a product of symbolic interaction: physical objects, abstract objects, and social objects. Physical objects are tangible things such as trees and chairs, social objects include categories of humans, (e.g., mother and friend), institutions (e.g., school or government), and abstract objects such as guiding ideals (e.g., principles, morals, and beliefs). In social media, while physical objects may be hard to conceptualize, social objects can be viewed as objects that exist in a social space, e.g., friends, followers, groups, organizations, and events. Social media platforms offer many social

objects such as groups, pages, and events that users can join and participate in. Like inviting friends to one's home, we imagine that the process of selecting those who can be part of one's social media space is highly selective. Abstract objects, on the other hand, are intangible things that exist in a conceptual space such as concepts, ideas, beliefs, values, and principles. Extant research shows that values represent the standards of judgment applied when using technology, including language style and subject matter (Chen et al. 2020). Social media platforms offer many abstract objects such as trending topics, memes, and others that reflect shared cultural meanings and interpretations. Generally, in social media people follow objects (people, places, etc.) that resonate with them, who have a similar culture and history, and who share their values and principles. It is also thought that the symbolically constructed meaning on social media influences the usage patterns that are observed. Overall, in this study, we propose that users are initially drawn to social media platforms by sensory affordances in the form of design elements of the social media platforms, but it is the cerebral and symbolic affordances within those platforms that lead to meaningful interactions and a sense of attachment to social media. Therefore, we hypothesize that:

**Hypothesis 1:** (a) Sensory affordances, (b) cerebral affordances, and (c) symbolic affordances are positively related to social media attachment.

### **The Relationship Between Social Media Attachment and Social Media Addiction**

Several studies have investigated the relationship between attachment styles and social media addiction (Jenkins-Guarnieri et al. 2012; Kim and Koh 2018; Lee 2013), the emphasis on which humans are the attachment figure. Another set of studies has examined attachment to IT as the attachment figure (Goel et al. 2011; Kim et al. 2013; Wnuk and Oleksy 2021; Wu et al. 2017). The current work argues that affordances in the environment, e.g., the availability of symbolically meaningful and mentally stimulating objects enable users to perceive action potential to interact with the environment more and have longer visits to the site. The interactionist perspective posits that interactional pasts and users' history with a site induce a feeling of warmth and enjoyment that users have previously derived from the environment. This in turn causes the user to anticipate experiencing the same if not more enjoyment from the same context (Goel et al. 2011). IS research on flow theory (Csikszentmihalyi 1988) shows that users experience optimal enjoyment when interacting with an IT (Santhanam et al. 2016). Similarly, others show that social media consumption is driven by the intrinsic motivation of gaining a pleasurable experience through consuming social media content (Kuss and Griffiths 2011). Based on this assertion and the hedonic and recreational nature of social media platforms (Vaghefi et al. 2022), we posit that it is possible that the close tie and affective bond between users and social media platforms, which provides the benefits such as haven and secure base with its use may lead to maladaptive psychological dependence on social media platforms. Therefore, we hypothesize that:

**Hypothesis 2:** Social media attachment is positively related to social media addiction.

## **Research Method**

The proposed research model was tested using a survey research method on a group of emerging adults, a population that has been shown to be frequent users of social networking sites (Pew Research 2021). The sample consisted of 324 students from a large university in the United States. Following Compeau et al. (2012), the researchers considered students as representative of the demographic that uses social media frequently. Participants received extra credit for taking part in the study. The dataset was filtered to remove incomplete responses and surveys completed in less than five minutes (out of an average 10-minute survey). The resulting dataset was comprised of 302 participants. The average age of the participants was in the range of 18 to 24 years, with approximately 51% being male. All the participants were enrolled in a freshman introductory MIS course.

### **Constructs and Measures**

After much review of the current research on place attachment, we found that existing measures did not adequately capture the proposed constructs, particularly in the context of social media as a place. Following MacKenzie et al. (2011), who emphasize the importance of considering the context of the study in selecting the appropriate measurement techniques, we developed measures to operationalize the proposed

constructs to augment existing scales. A careful review of how the construct has been used in prior research (Borghini et al. 2021; Choi 2013; Cross 2015; Li 2014; Low 1992; Milligan 1998; Raymond et al. 2010), showed that a key dimension of place attachment is the emotional connection to physical spaces. Therefore, in this study we conceptualized social media attachment as a unidimensional construct capturing a person's emotional connection to their social media world that is constructed through their own infrastructuring activities and interactions with meaningful objects (physical, symbolic, or abstract) on the platforms. We conceptualized social media attachment affordances as a multidimensional construct reflected by sensory, cerebral, and symbolic affordances. To overcome the limitation of current measures, which do not fully capture the constructs, we generated a list of representative items that were partly adapted from prior research and others self-developed. Self-developed items were created based on an iterative deductive process from the theoretical definitions and prior research. To capture **social media attachment**, we partly adapted items from (Raymond et al. 2010) and created new items based on (Borghini et al. 2021). To measure **sensory affordances** we partly adapted aesthetic design items from (Cyr et al. 2006) and created new items based on (Borghini et al. 2021; Matthews et al. 2020). To measure **cerebral affordances**, we partly adapted items from Cao et al. (2020)'s measure of informational support and created new items based on (Borghini et al. 2021). To measure **symbolic affordances**, we developed items based on (Borghini et al. 2021). **Social media addiction** was measured using 9-items adapted from (Turel and Serenko 2012). All responses were measured at a seven-point Likert scale unless otherwise specified. Lastly, we evaluated the impact of social desirability using a 13-item scale adapted from (Turel, 2011). The correlations between the social desirability scale and all constructs were weak, ranging between -.25 and .23, indicating that social desirability bias did not pose a significant concern for this study.

### **Content Validity and Common Methods Bias**

To assess the content validity of the constructs, we followed (MacKenzie et al. 2011) who recommended that to ensure content validity, researchers should assess whether: 1) the individual item is representative of an aspect of the content domain and 2) the items as a set are collectively representative of the entire content domain of the construct. We constructed a matrix in which definitions of the related constructs were provided as columns and the list of items capturing these constructs was listed as rows. Four Ph.D. students were asked to rate the extent to which each item captured each of the constructs. We used a five-point Likert-scale ranging from 1 (not at all) to 5 (extremely well). According to MacKenzie et al. (2011), we also added a construct that is theoretically related to social media attachment to evaluate its nomological validity, i.e., social media identity (Carter et al. 2020). Based on the feedback received from raters, social media attachment, and social media identity were able to differentiate well between some items, while overlapping in others. As a result, these items were revised and subsequently evaluated by a different set of three Ph.D. students. In the second round of ratings, the items were found to exhibit sufficient discrimination. A potential threat to the validity of survey research is common method bias, which we assessed by using a marker variable, fashion consciousness following (Venkatesh et al. 2019). The correlations between the theoretically unrelated marker variable and our constructs range between 0.016 and 0.255. This procedure led us to believe that there is no concern of common methods bias in this study.

### **Analysis**

To test the research model, we employed a two-step procedure using partial least squares (PLS) structural equation modeling on SmartPLS 4.0. We chose PLS because it has been suggested to be appropriate for examining relationships that are exploratory and developmental in nature (Fornell and Larcker 1981). The first step was aimed to assess the measurement model, including convergent and discriminant validity. In the second step, we assessed the path model and tested our hypotheses. We specified the second-order construct, social media attachment affordances, as a reflective higher-order construct of sensory, cerebral, and symbolic affordances. We used the repeated indicator approach, i.e., all indicators of the reflectively measured lower-order components were simultaneously assigned to the reflective measurement model of the higher-order construct.

### **Measurement Model**

To assess the internal validity of the measurement model, we conducted a confirmatory factor analysis. Following the scale purification step from (MacKenzie et al. 2011), we assessed the cross-loadings via CFA

which showed that some items did not sufficiently represent the proposed construct (Anderson and Gerbing 1988). These items were dropped, and further iterations of CFA factor loadings yielded sufficient factor loadings. The remaining items exhibited factor loadings of above 0.7 for all constructs except for addiction, which was also nearly 0.7. A summary of the factor loadings and cross-loadings is shown in Table 2. The results of the average variance extracted (AVE), were above the suggested level of 0.5 (Fornell and Larcker 1981), for all constructs which shows that convergent validity was met. Discriminant validity was assessed using the Fornell and Larcker (1981) criterion, which recommends that the square root of the AVEs be greater than the inter-factor correlations. As shown in Table 1, this condition was also met. Similarly, the constructs' composite reliabilities (CRs), were above the recommended range of .70 (Peterson 1994) showing that there was internal consistency within the measures.

	Addiction	Attachment	Cerebral	Sensory	Symbolic	AVE	Alpha	CR
Addiction	<b>0.747</b>					0.558	0.902	0.922
Attachment	0.473	<b>0.823</b>				0.678	0.881	0.885
Cerebral	0.187	0.500	<b>0.859</b>			0.738	0.824	0.834
Sensory	0.308	0.489	0.521	<b>0.868</b>		0.753	0.836	0.850
Symbolic	0.178	0.459	0.660	0.556	<b>0.823</b>	0.678	0.840	0.853

**Table 1. Measurement Model Internal Consistency, Convergent, and Discriminant Validity**

Note: AVE (Average variance Extracted), CR (Composite Reliability, rho a), Alpha (Cronbach's Alpha). Bolded are the square roots of AVEs.

Items	Addiction	Attachment	Cerebral	Sensory	Symbolic
SMA1: I sometimes neglect important things because of my interest in social media.	<b>0.773</b>	0.356	0.191	0.229	0.127
SMA2: My social life has sometimes suffered because of me interacting with social media.	<b>0.753</b>	0.268	0.118	0.213	0.14
SMA3: Using social media sometimes interfered with other activities.	<b>0.736</b>	0.326	0.128	0.197	0.073
SMA4: When I am not using social media, I often feel agitated.	<b>0.758</b>	0.371	0.179	0.257	0.191
SMA5: I have made unsuccessful attempts to reduce the time I interact with social media.	<b>0.73</b>	0.3	0.071	0.149	0.106
SMA6: I am sometimes late for engagements because of my use of social media.	<b>0.744</b>	0.252	0.063	0.215	0.084
SMA7: Arguments have sometimes arisen because of the time I spend on social media.	<b>0.755</b>	0.298	0.171	0.272	0.19
SMA8: I think that I am addicted to social media.	<b>0.783</b>	0.533	0.136	0.303	0.159
SMA9: I often fail to get enough rest because of my use of social media.	<b>0.685</b>	0.325	0.172	0.184	0.097
Att1: I am very attached to my social media.	0.449	<b>0.794</b>	0.335	0.37	0.292
Att2: My social media is strongly associated with emotional and affective meanings to me.	0.495	<b>0.863</b>	0.406	0.403	0.422
Att3: I often associate memories and experiences with social media.	0.34	<b>0.848</b>	0.388	0.41	0.333
Att4: Social media is a place where I feel connected.	0.298	<b>0.804</b>	0.519	0.466	0.458
Att5: I have a lot of memories associated with social media.	0.369	<b>0.806</b>	0.391	0.355	0.363
CA1: In social media, I get intellectually stimulated.	0.204	0.376	<b>0.846</b>	0.464	0.607
CA2: In social media, I generally feel mentally engaged.	0.126	0.416	<b>0.872</b>	0.453	0.564
CA3: Social media allows me to think of new ideas and perspectives.	0.156	0.483	<b>0.859</b>	0.429	0.539
SA1: Sensory cues on social media help me feel a sense of anticipation or excitement.	0.275	0.478	0.477	<b>0.912</b>	0.517
SA2: Sensory cues on social media (e.g., visuals, sounds) evoke positive feelings in me.	0.267	0.406	0.469	<b>0.826</b>	0.478
SA3: Sensory cues on social media help me recall past experiences and memories.	0.261	0.381	0.404	<b>0.863</b>	0.449
SYMB1: My social media affords me to interact with content that is representative of my principles.	0.101	0.315	0.473	0.414	<b>0.727</b>

SYMB2: Social media content is culturally meaningful to me.	0.196	0.415	0.542	0.488	<b>0.812</b>
SYMB3: Social media content reminds me of cultural symbols that are important to me.	0.162	0.35	0.549	0.462	<b>0.855</b>
SYMB4: Social media content (e.g., photos, videos, posts) allows me to connect with my values.	0.12	0.417	0.601	0.464	<b>0.891</b>

**Table 2. Item Loadings and Cross Loadings from CFA**

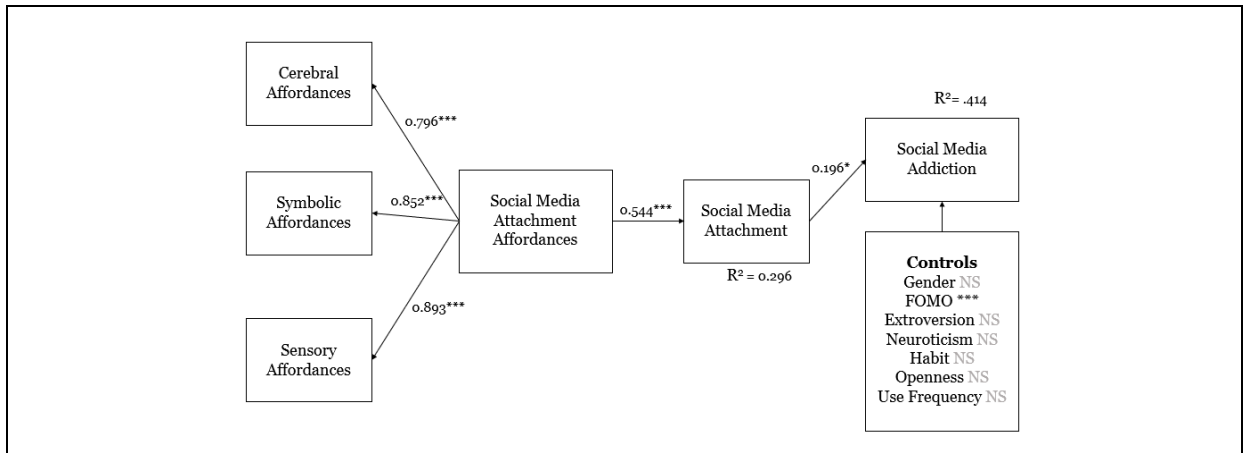
**Structural Model**

To test the hypothesized relationships, we specified the structural model in SmartPLS 4.0. We included several control variables including age, gender, social media use frequency, and use habit. Because prior research has shown that personality types and fear of missing out (FOMO) are positively associated with social media addiction (Blackwell et al. 2017), to ensure that our construct of social media attachment explains variance above and beyond these constructs, we control for them.

The results of the structural model show the strength of the relationships between latent constructs. As shown in Table 3 and Figure 2, the model explains 41.4 percent of the variance in social media addiction. Similarly, the second-order social media attachment affordances construct, explained 29.6 percent of the variance in social media attachment, showing that sensory, cerebral, and symbolic affordances were each found to significantly influence individuals’ attachment to their social media. Of the control variables, only fear of missing out (FOMO) or “the pervasive apprehension that others might be having rewarding experiences from which one is absent or the desire to continually stay connected to what others are doing” emerged as a significant predictor of social media addiction. (Przybylski et al. 2013, p. 1841). This is consistent with current research which posits that FOMO is associated with problematic social media use (Kuss and Griffiths 2011). These results show support for both our hypotheses.

Path	Coefficients	T statistics	P values
<b>Hypothesis 1:</b> Attachment Affordances -> Attachment	0.544	11.77	<b>0.000***</b>
<b>Hypothesis 2:</b> Attachment -> Addiction	0.188	2.890	<b>0.004**</b>
Controls			
Extraversion -> Addiction	-0.089	0.835	0.404
FOMO -> Addiction	0.288	5.299	<b>0.000***</b>
Gender -> Addiction	-0.008	0.182	0.856
Habit -> Addiction	0.106	1.833	0.067
Neuroticism -> Addiction	0.100	1.710	0.087
Openness -> Addiction	0.133	0.699	0.485
Use Frequency -> Addiction	0.077	1.560	0.119

**Table 3. Results of the Structural Model**



**Figure 2. Results of Structural Model**

NS, not significant. \*p<0.05; \*\*p<0.01; \*\*\*p<0.001.

## **Discussion**

The objective of the study was to examine a novel antecedent of social media addiction, i.e., social media attachment. In this study, we view social media as built environments or spaces that users shape according to their preferences and interests, which causes them to develop an attachment and eventually an addiction to these platforms. Our approach was guided by the interactional theory of place attachment, and the affordances lens, which helped us identify the properties of social media's built environments that encourage infrastructuring (Reimers et al. 2022). Our findings demonstrate that attachment to social media is a significant predictor of addiction to social media. This finding demonstrates that sometimes positive experiences such as attachment can result in unintended negative consequences, i.e., addiction in this case. This finding is consistent with prior research which suggests that social media platforms are predominantly used for their hedonic benefits (Turel 2015; Turel 2021; Vaghefi et al. 2022), which can be attributed to the fact that pleasure is a gratifying experience. These studies have frequently examined the motivational uses of social media platforms from a psychological needs perspective. However, the need for a place where one can seek comfort, familiarity, and enjoyment is a psychological need that has received little attention in research. Additionally, our study contextualizes and operationalizes three social media attachment affordances (sensory, cerebral, and symbolic), which are positively related to social media attachment. The implications of these findings are discussed below.

## **Theoretical Implications**

Given growing concerns about the impact of excessive social media use on individuals' wellbeing, extending the concept of spaces from e-retail stores and virtual worlds to social media is particularly relevant and timely. Since research on IT addiction is still relatively new in the IS field, current studies aim to explore the nature of this phenomenon, including its antecedents, mechanisms, and outcomes. Our research contributes to this literature by offering a complementary perspective on the precursors of social media addiction. Firstly, by contextualizing the three attachment affordances: sensory, cerebral, and symbolic affordances, our study adds to the comprehensive model of social media affordances proposed by (Karahanna et al. 2018). Karahanna and colleagues suggest social media affordances encompass self-presentation, content sharing, interactivity, presence signaling, relationship formation, group management, browsing content, meta voicing, communication, collaboration, competition, and sourcing. The current study introduces attachment affordances, i.e., sensory, cerebral, and symbolic affordances, thereby enriching our current understanding and extending the boundaries of existing knowledge. Second, we contribute to the discourse on the psychological wellbeing associated with the use of technology, an issue that is of growing concern to IS scholars, especially regarding addiction (Ahmed and Vaghefi 2021; Kwon et al. 2016; Turel 2015; Turel 2021; Turel and Serenko 2012; Turel et al. 2011; Vaghefi et al. 2022; Venkatesh et al. 2019) and users' overall wellbeing (Krasnova et al. 2015). Building on prior research, this study expands our understanding of social media affordances and provides a structured basis for future research and interventions in preventing social media attachment from progressing to addiction. Thirdly, the study contributes to the current conversation on the dialectical tension inherent in social media platforms, presenting an opportunity for further research to explore the tipping point at which a positive experience transforms into an addiction. Fourthly, we highlight infrastructuring as a unique activity that sets social media apart from other platforms, paving the way for understanding users' attachment to social media. Lastly, we operationalize the concept of social media attachment affordances, making a methodological contribution to the literature. By systematically analyzing the proposed variables, our study enriches the discourse surrounding social media attachment and addiction within the context of our model.

## **Practical Implications**

Our study also has implications for practice, i.e., designers and users. We believe that by recognizing the early signs of attachment, users and developers can intervene with targeted interventions to prevent the development of problematic behaviors. For users, the implications involve the impact on their psychological wellbeing, particularly for young adults, who may not have the experience to recognize, accept, and manage the adverse effects of addiction to these platforms (Krasnova et al. 2015). There is evidence to suggest that younger age groups, such as teenagers and college students, are more vulnerable to developing an addiction to social media. For example, a 2022 report from Pew Research revealed that approximately 67% of teens

say they use TikTok, with 16% of all teens saying they use it almost constantly. Similarly, Krasnova et al. (2015) found that social information consumption on social media platforms is associated with envy which in turn leads to reduced cognitive and affective wellbeing among college-age users. One important implication of this study is that it highlights the importance of users recognizing their attachment to social media. This is especially relevant as research shows that the Covid-19 pandemic shifted previously moderate users towards usage levels resembling addiction (Longstreet and Brooks 2023). We believe that this is a crucial step for users to adopt proactive measures to promote healthy social media practices, such as taking breaks and limiting social media access during specific hours, among others. The value of the current study is to bring awareness to users of their attachment to social media applications. This awareness could serve as a foundation for conscious decision-making and proactive measures to reduce the likelihood of sliding into addictive patterns of social media use. This is particularly significant given current research's focus highlighting the post-Covid repercussions of social media use.

Understanding how attachment forms can also guide platform developers in creating interfaces that promote positive user experiences while minimizing the potential for addictive use, especially for young adults. Prior research has demonstrated that social media platforms are designed to be engaging and addictive, with features such as notifications and infinite scrolling to encourage extended usage. This has resulted in discussions about the ethical obligations of technology companies and the need for policies to safeguard users, especially younger populations, from adverse effects. Our study adds to these findings by revealing that in addition to the sensory stimulating material properties of the platforms, even the positive aspects such as mentally stimulating features that encourage learning, and content that is symbolically meaningful to users, encourage attachment, which is a positive phenomenon, however, it can lead to addiction. Thus, our findings highlight the need for design practices that encourage engagement while taking necessary precautions to avoid fostering excessive attachment to the platforms. Moreover, by recognizing attachment as an antecedent of addiction, designers could add personalized technology use interventions. Such interventions could involve the development of technology that tracks an individual's social media use patterns and provides targeted feedback or support to help them reduce their usage.

## **Limitations and Future Research Directions**

The theorized relationships were based on the underlying premise of infrastructuring. While this study did not operationalize infrastructuring, future research could consider the extent to which individual differences in infrastructuring investments are implicated in the relationships posited and tested in this study. Additionally, our study demonstrates that a need for a sense of place encourages the development of social media attachment, a positive experience, where users find enjoyment and comfort, yet even with such a positive experience, there seems to be a tipping point at which attachment turns to addiction. In the current study, the mechanism behind this relationship was not tested. Future research could explore the threshold or tipping point at which attachment, (positive) transforms into addiction, (a negative) behavior. Moreover, while the present study focused on social media platforms, it is important to recognize that the use of and attachment and addiction to these platforms crosscuts and/or is embedded within use of and attachment and addiction to smartphones. This broader concept of smartphone attachment encompasses a range of other digital content such as news, entertainment, and communication applications. Our study was unable to differentiate users' relationships with social media from their relationships with smartphones. Therefore, future research could examine how place attachment translates to widespread use of smartphones, gaming devices, laptops, and other IT artifacts. Lastly, the current model was tested using a student sample, however, we recognize that the attachment and addiction phenomena extend beyond this population. This sample was chosen as an initial step to establish the feasibility and validity of our model. Therefore, future research could expand the model to encompass a range of diverse populations to increase the generalizability of the findings to a wider population.

## **Conclusion**

In conclusion, our study was motivated by the need to identify predictors of social media addiction by studying social media practices, thus opening the black box of social media activities that encourage longer scrolls that lead to attachment and addiction. Our study findings reveal that interactions between users and the social media's-built environment encourage infrastructuring, or furnishing of the platforms in a way

that makes users feel at home in the platform. This leads to attachment to the platform and eventually social media addiction. These findings provide us with the means, and the handle to target mitigation recommendations for reducing social media addiction.

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