Differentiating Problematic from Habitual Instagram Use: A Uses and Grats 2.0 Perspective

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Abstract
The popularity of Instagram among young adults has raised concerns about the excessive use of Instagram. Is it the kind of problematic media use that takes over one’s life or just habitual ritualized use characterized by mindless scrolling? How can we differentiate between the two based on the use of Instagram features and perceived gratifications from the technology itself? Drawing on the theoretical framework of Uses and Gratifications (U&G) and U&G 2.0, we conducted a survey study (N = 482) to answer these questions. Our findings show that habitual Instagram use is positively related to the use of lurking- and connection-related features and the gratification of play. By contrast, problematic Instagram use is positively correlated with the use of broadcasting-related features and the gratification of novelty. Theoretical implications for differentiating problematic from habitual Instagram use and practical implications for designing ethical interfaces, which consider the digital well-being of users, are discussed.

Keywords
Instagram, problematic use, habitual use, uses and gratifications, affordance-based gratifications

Introduction
Instagram is a popular photo-sharing platform with more than 1 billion active monthly users (Statista, 2022). This platform is highly favored by young adults, ages from 18 to 29 (Auxier & Anderson, 2021). It has been reported that Instagram users spend an average of 53 min every day on the platform (Jacob, 2022), and this trend is predicted to grow.

With the popularity of Instagram, there is a widespread concern about the potential harm of repeated use (Rozgonjuk et al., 2020). Some argue that this is a type of problematic media use, driven by gratification seeking (Kircaburun & Griffiths, 2018a, 2018b; Martinez-Pecino & Garcia-Gavilán, 2019), while others argue that these are non-pathological media habits arising from deficient self-observation and self-regulation (LaRose et al., 2010). This difference in outlook has not been resolved, leading some to conflate media habits with problematic media use (Sofiah et al., 2011).

Confusing or equalizing habitual with problematic media use can have negative effects on both theory and practice. Theoretically, misunderstanding the nature of a media behavior can threaten measurement validity and therefore internal validity of the study (Seo & Ray, 2019). The invalid conclusion could further undermine the theorization of the process of media addiction, thus negatively influencing knowledge generation. Practically, the absence of differentiation between habitual and problematic media use may lead to wrong assessment and inappropriate treatment of at-risk young people. Given that problematic media use can result in detrimental outcomes on users’ health and well-being (Wiederhold, 2019), it is important to differentiate it from habitual use which is considered less severe but a potential predictor of problematic use (Brand et al., 2016; LaRose et al., 2003; Song et al., 2004), although media habituation is not without negative consequences (Vishwanath, 2015). Furthermore, habitual and problematic media use may exhibit different use patterns. Differentiating them based on the use of Instagram features and the perceived gratifications of use can provide effective solutions to redesign the interfaces for problematic and habitual users. Considering the...
importance of disambiguating habitual from problematic media use for both theory and practice, this study seeks to examine predictors of these two use patterns. We focus on Instagram because it has been found to be more addictive than other social media platforms, such as Facebook and Snapchat (Rozgonjuk, Sindermann, et al., 2021).

Admittedly, it is not easy to draw a clear distinction between problematic and habitual media use as they resemble each other in many ways: formed through repeated media exposure (Kardefelt-Winther et al., 2017; Marlatt et al., cited in LaRose et al., 2003; Newport, 2019; Song et al., 2004), driven by similar social and psychological needs such as escapism, passing time, and mood management (Griffiths, 2005; Oulasvirta et al., 2012; Yee, 2007), and indicated by feelings of loss of control over one’s behavior (Chen & Kim, 2013; LaRose et al., 2003). However, they are distinct, addressing different stages or states of media use. Considering that both problematic and habitual Instagram use are developed from media use, the mass communication theory of uses and gratifications (U&G; Katz et al., 1973) and its extension U&G 2.0 (Sundar & Limperos, 2013) are particularly appropriate for making this distinction. Therefore, this study examines how key U&G concepts, such as media behaviors and gratifications, may help differentiate problematic from habitual Instagram use.

The present study contributes to the literature in the following ways. First, by taking all Instagram features into account and grouping them based on shared affordances, i.e., action possibilities, we are able to determine which actions are more addictive, thus providing behavioral discriminators of problematic and habitual use. It thus broadens previous studies on problematic Instagram use, which have selectively focused on certain features, such as liking and commenting, Instagram TV (IGTV) watching, photo, and video posting (Kircaburun & Griffiths, 2018b; Martinez-Pecino & García-Gavilán, 2019).

Second, this study explores the role of affordance-based gratifications in differentiating habitual from problematic Instagram use. By examining the pleasure of engaging with technological affordances, we extend prior studies on habitual and problematic media use, which are mostly focused on the predictive role of need-based gratifications (Huang, 2014; Sofiah et al., 2011; Zhitomirsky-Geffet & Blau, 2016). We argue that beyond satisfying users’ social and psychological needs, gratifications obtained from the technology itself could drive habitual and problematic Instagram use. Given that many current technological products are designed to be attractive to form habitual use and even addictive use (Alter, 2017; Eyal, 2014), focusing on affordance-based gratifications could help us understand how habitual and problematic Instagram use are developed, providing yet another dimension to disentangle the two concepts.

Together, this study examines how habitual and problematic Instagram use may differ across various behaviors and affordance-based gratifications. The goal of the present study is threefold: (1) to inform the conceptualization of habitual and problematic Instagram use, (2) to enhance user awareness and regulation of their Instagram use, and (3) to propose design ideas to combat problematic social media use and promote digital well-being.

The rest of the article is structured as follows. First, we introduce the concepts of habitual and problematic media use in general, and apply these concepts in the context of Instagram use. Next, we elaborate the difference between habitual and problematic Instagram use based on behaviors and affordance-based gratifications.

**Literature Review**

**Media Habits**

Media habits are a form of automatic behavior in media consumption that develop as people repeat media behaviors in stable environments (LaRose, 2010). Building upon Saling and Phillips’ (2007) work on automatic behaviors, LaRose (2010) summarized that media habits are characterized by the lack of awareness, attention, intentionality, and/or controllability. While these four dimensions can work independently or in different configurations to shape automatic behaviors, LaRose argued that two negative outcomes can be formed out of the four dimensions of automaticity: one is deficient self-observation, referring to the inability to observe one’s behavior, and the other is deficient self-reaction, which indicates the inability to control and regulate one’s media use. While the positive association between deficiency of self-regulation and habit strength was found in previous studies (LaRose et al., 2003), the measures for deficient self-regulation (LaRose et al., 2003, 2010) are quite similar to the measures for relapse, a behavioral addiction component that refers to one’s inability to limit media use (Griffiths, 2005). Therefore, focusing on the aspect of deficient self-regulation/reaction may equate media habits with problematic media use, which does not help disentangle the two.

To differentiate habitual use from problematic use, the present study focuses on the dimension of deficient self-observation to understand media habits, which emphasizes the inattentiveness and mindlessness aspects of one’s media use. It is important to note that the lack of attention and intention in media use does not necessarily lead to negative life consequences. Rather, habitual media use may be an adaptive way to manage and structure one’s daily life, as evident in earlier scholarly work in ritualized TV viewing (Rubin, 1984). Thus, we argue that habitual media use, characterized by deficient self-observation, constitutes a unique media use pattern that could be differentiated from problematic media use.

**Problematic Media Use**

Problematic media use is defined as a period of intensive involvement with media in the pursuit of gratifications,
which takes time and focus away from other aspects of life (Kardefelt-Winther et al., 2017). There are many theoretical models to understand problematic media use. Some argue that it is the problem of users. They have addictive personalities such as high sensation-seeking (R. Smith, 1986), suffer from previous psychopathology like depression (Caplan, 2005), have maladaptive cognitions such as believing “nobody likes me outside the online world” (Davis, 2001), or have deficient self-regulation (LaRose et al., 2003).

By contrast, another school of thought posits that technology is to blame. For example, Griffiths (1995) argued that there are reinforcing and inducing features in the technology to trigger excessive human–machine interaction, which in turn forms a technological addiction. Industry observers have also pointed out that technologies are designed to be addictive, as tech giants need user attention and engagement to generate revenue (Alter, 2017; Newport, 2019; Orlowski, 2020).

More recent research has argued that problematic and addictive behaviors may result from the interactions between the user and technology. On the one hand, psychological and neurobiological characteristics can determine the formation of problematic or even addictive behavior. On the other hand, media-specific aspects and other environmental factors are likely to accelerate or decrease the development of that particular behavior, as posited by the Interaction of Person-Affect-Cognition-Execution (I-PACE) model (Brand et al., 2016, 2019). While the process and mechanism of addiction need to be further investigated, problematic media use has been demonstrated to have harmful effects on people’s lives. It can interfere with one’s sleep, work, study, and relationships, and in extreme cases, it could cause psychological distress and lead to malfunctioning in daily life (Domahidi & Quandt, 2015).

As an unintended consequence of media use, problematic media use is not formed overnight. It is a process developed from daily media use. Drawing on the learning model, scholars have argued that addictions are habits to begin with (LaRose et al., 2003; Song et al., 2004). When the pleasurable experiences associated with a habit become a conditioned response to negative affect, it causes problematic use. Translated into the context of Instagram use, a user might consciously turn to Instagram for gratification at first. With repeated exposure, Instagram use becomes a primary response for coping with a bad day. Then, as the time spent on Instagram interrupts one’s daily life, there are more bad days, leading to even greater use of Instagram as a way of escaping from personal problems, thus forming problematic media use and addiction. Similarly, scholars have argued that the transition from gratification to compensation also helps differentiate different stages of addictive use, wherein the former represents more voluntary and habitual media use and the latter implies more problematic and even compulsive pattern of use (Brand et al., 2016). Given that habitual media use is found to be an important predictor of problematic media use (van Deursen et al., 2015), we propose the following hypothesis:

**H1.** Habitual Instagram use is positively related to problematic Instagram use.

**Theory of U&G**

While habitual media use may precede problematic media use, they are both formed from regular media use. In daily use of media, the theory of U&G argues that users are active, and they know how to use media to satisfy their needs by purposively selecting among various media choices (Katz et al., 1973; Rubin 2002). Given its emphasis on active audiences and their motivations, the theory of U&G is faulted for ignoring the critical role played by the technology (Ruggiero, 2000; Sundar & Limperos, 2013). With the emergence of interactive technologies that emphasize the interaction between users and technologies, Sundar and Limperos (2013) proposed a revised framework called U&G 2.0, arguing that affordances of media technology, namely action possibilities suggested by interface features, can give rise to new gratifications. Based on this premise, a new suite of affordance-based gratifications has been developed to understand how technologies satisfy users’ needs and become the primary source of gratifications. In sum, if the original U&G theory stresses active audiences, U&G 2.0 highlights the active role of technologies in shaping human–media interactions. Given that Instagram use includes both active users and agentic technology, both the original U&G paradigm and the newer U&G 2.0 formulation provide useful frameworks to explore the formative stage of habitual and problematic media use. In the following sections, we discuss how the use of Instagram features and the attainment of affordance-based gratifications work in tandem to collectively shape a person’s media experience on Instagram.

**Instagram Feature Use.** The use of technological features is an important dimension that may distinguish habitual from problematic Instagram use. There are many ways to discuss the use of Instagram features. One of them is the passive versus active use framework (Pagani et al., 2011). While the dichotomy is informative by suggesting that passive use is detrimental and active use is beneficial to one’s health and well-being (Escobar-Viera et al., 2018; Pagani et al., 2011; Verdun et al., 2015), it may not be specific enough to differentiate different motives for active Instagram use. For example, both giving likes to friends’ posts and posting selfies can be categorized as active use, but they may have different effects on the formation of habitual and problematic Instagram use as the former focuses on self-expression, while the latter stresses one’s connection with others.

Another competing solution is to discuss the use of each Instagram feature on different media use outcomes. However, given that there are more than 20 features on Instagram at the
time of the study, this approach may not be effective. To provide a theoretically meaningful and practically feasible typology of Instagram feature use, we draw on the notion of affordance by identifying what users can do with each of the Instagram feature. Based on the shared action possibilities, we classify all Instagram features into three categories, namely, broadcasting, lurking, and connection.

Specifically, broadcasting-related features allow users to become the source of information, which can be achieved via features, such as photo and video posting. Given that the feature of Stories affords opportunities for creation and self-expression, which allow users to assert their identity and express their opinion to followers, it falls into the category of broadcasting as well. Different from broadcasting, which is characterized by active Instagram use, lurking-related features facilitate passive use of Instagram. Some examples include browsing others’ posts, following celebrities, and watching IGTV. Third, there are several features allowing users to connect with each other and broaden one’s social network, which is labeled connection-related features. Liking, commenting, adding hashtags in one’s post, and forwarding posts are all examples pertaining to social connection.

This typology was used by C.-C. Yang (2016) to examine the effect of Instagram activities on loneliness. Yang found that connection and lurking can lower the level of loneliness, whereas broadcasting is associated with more loneliness. This pattern suggests that some Instagram activities, such as broadcasting, may be more prone to abuse than others. The problematic role of broadcasting is also suggested by other studies. For example, Tamir and Mitchell (2012) found that self-expression can activate the same reward mechanisms in the brain as food, money, and sex. Furthermore, a survey study on YouTube addiction also found that content creation, a form of broadcasting, is a stronger predictor of YouTube addiction compared to content viewing (Balakrishnan & Griffiths, 2017). Together, we argue that engaging with broadcasting-related features is likely to promote problematic Instagram use.

One characteristic of broadcasting is that it involves more active cognitive and affective engagement (Alhabash et al., 2019). By contrast, activities that develop into habits involve less cognition and decision-making (Alhabash et al., 2019; Oulasvirta et al., 2012). Considering this, lurking, an activity that allows passive consumption of others’ posts with little thinking, may be more prone to media habits. This argument is supported by Oulasvirta et al. (2012), whose mobile logging data showed that habitual smartphone checking is characterized by brief and repetitive inspection of dynamic content with almost no decision-making during use.

Similar to lurking, features that support social connection are also likely to facilitate habit formation because the brain circuits that govern habits are especially sensitive to social rewards (Graybiel, 2008). Therefore, features that can reward users with connectedness, such as liking, commenting, and sharing, are likely to contribute to habitual Instagram use. The social incentive for habitual media use is empirically supported by van Deursen et al. (2015), who found that social usage of smartphones is a significant predictor of habitual smartphone use but not of addiction.

In sum, we predict that problematic and habitual Instagram use can be differentiated by differential use of Instagram features. While problematic Instagram use may be related to broadcasting, habitual media use is likely to be associated with lurking and connection. Therefore, we propose the following hypotheses:

- **H2.** Broadcasting is positively related to problematic Instagram use (H2a) but not to habitual Instagram use (H2b)
- **H3.** Lurking is positively related to habitual Instagram use (H3a) but not to problematic Instagram use (H3b).
- **H4.** Connection is positively related to habitual Instagram use (H4a) but not to problematic Instagram use (H4b).

**Affordance-Based Gratifications.** Apart from features on Instagram, gratifications obtained from the technology itself could be compelling reasons for habitual and problematic media use (Balakrishnan & Griffiths, 2017; S.-C. Yang & Tung, 2007). Originating from the Modality-Agency-Interactivity-Navigability (MAIN) model (Sundar, 2008), the framework of U&G 2.0 proposes four broader affordance-based gratifications that could be derived from the use of interactive media, namely modality-based gratifications, agency-based gratifications, interactivity-based gratifications, and navigability-based gratifications (Sundar & Limperos, 2013). We discuss each of the gratifications in relation to Instagram use below.

**Modality-based gratifications** arise from the use of features that provide information through multiple modalities, such as text, photo, and video. Given that visual appeal is known to be a distinct gratification of Instagram use (Alhabash & Ma, 2017; Hu et al., 2014), the presence of photos and videos may help users immerse in places that they cannot physically experience (i.e., being-there) and obtain unique and distinctive perceptual feelings that could not be found in other platforms (i.e., novelty).

**Agency-based gratifications** are associated with features that allow users to become the source of information. Updating one's social media profile (Jung & Sundar, 2018) and blogging social or political events (Stavrositu & Sundar, 2012) are found to elicit greater sense of agency. By sharing ideas, asserting identities, and communicating thoughts with one’s followers, Instagram users are likely to obtain a heightened sense of personal agency (i.e., agency enhancement) and a greater feeling of belonging with a community (i.e., community-building).

**Interactivity-based gratifications** constitute the third type of affordance-based gratifications, referring to features that
allow users to make real-time changes to the content. As a photo-based platform, Instagram provides a variety of filters to beautify one’s posts. Users are motivated to experiment with photographing by trying out a variety of visual effects (Al-Kandari et al., 2016). The contingent and responsive interactions with the platform (i.e., responsiveness) may make users feel active and in control (i.e., activity).

Navigibility-based gratifications reflect the enjoyment of moving through the Instagram interface. Different from a static webpage, Instagram creates a three-dimensional space for users to explore, which makes Instagram a fun place to visit (i.e., play). In addition, Instagram allows users to browse posts freely and surf for things that they find interesting (i.e., browsing). The gratification of browsing may become more salient when exploring recommended posts on Instagram.

Previous studies provide some clues about how affordance-based gratifications may be related to problematic social media use. For example, Xu et al. (2015) revealed that expected novelty outcomes, namely, the expectation of trying new interactive features and obtaining new information, were associated with addiction to Weibo, the Chinese microblogging site. Cao et al. (2020) found that personalization, a source of agency-based gratifications, is indirectly related to addiction to WeChat, the Chinese social media application, through emotional and functional attachment. Huang et al. (2014) found that perceived interaction from interpersonal communication, such as having back-and-forth interactions with friends and receiving feedback in a timely manner, could partly explain the relation between social gratifications and problematic social networking site (SNS) use. The addictiveness of interactivity is also confirmed by Wu and Sundar (2017), which found that addicts of instant messaging enjoyed the process of having messages exchanged with one another more than the content embedded in each message. Using the language of affordance-based gratifications, all these findings suggest that modality-based (e.g., novelty from new features), agency-based (e.g., agency enhancement from personalization), and interactivity-based gratifications (e.g., having responsive and contingent interaction with friends) are likely to trigger problematic social media use.

While a few studies have examined how affordance-based gratifications may be related to habitual use, van Deursen et al. (2015) found that “process gratifications” are stronger predictors of habitual smartphone use compared to smartphone addiction. This finding implies that the pleasures obtained through the process of Instagram use may be related to habitual Instagram use. Given that all affordance-based gratifications could be viewed as process gratifications, we predict that if young adults overly enjoy being presented with multiple modalities of interaction, having their voice heard, interacting with the platform, and having fun in exploring Instagram as an online space, they are more likely to develop habitual use of Instagram. Considering that affordance-based gratifications are promising in their ability to predict both habitual and problematic Instagram use, and little is known about how these gratifications could differentiate problematic from habitual Instagram use, we ask the following research question:

**RQ1.** How do affordance-based gratifications differ between problematic and habitual Instagram use?

**Method**

To test hypotheses and answer research questions, we used a survey with an online questionnaire administered through Qualtrics.

**Sample**

Considering that college students form a major portion of the user base of Instagram (A. Smith & Anderson, 2018), we conducted a survey with 539 college students recruited from five undergraduate classes at a large northeast university in the United States. Course credits were offered to enhance participation.

Of the 539 participants, 482 indicated they were Instagram users, and they checked Instagram 11–20 times on an average day ($M=3.55$, $SD=1.86$). Demographically, our participants were predominantly female (62.9%), White (84.9%), and had an average age of 19.47 ($SD=1.34$). Their median family income range was US$100,000 to US$150,000 a year.

**Procedure**

After approval by the University’s Institutional Review Board, we recruited instructors of five undergraduate classes in communications to distribute the online questionnaire to their students. We told instructors that students would receive a completion code after the study, which could be used to exchange extra credit from that course.

In the survey questionnaire, we first asked participants’ consent to participate in the study, after which they were directed to questions about demographics. We then measured frequency of Instagram use, Instagram use motives, frequency of Instagram feature use, and affordance-based gratifications. Finally, we assessed their tendency for problematic and habitual Instagram use with well-established scales, as described in the next section.

**Measures**

**Problematic Instagram use** was measured by the Bergen Facebook Addiction Scale (Andreassen et al., 2012). The only change we made was replacing “Facebook” with “Instagram” in each statement. Rated on a 5-point Likert-type scale ($1=very rarely$ and $5=always$), participants were asked how often they experienced the following six symptoms in the last year, namely salience (three items; spent a lot of time thinking about Instagram), tolerance
(three items; spent more time on Instagram than initially intended), mood modification (three items; used Instagram to forget about personal problems), relapse (three items; tried to cut down on the use of Instagram without success), withdrawal (three items; became irritable if prohibited from using Instagram), and conflict (three items; ignored partner, family members, or friends because of Instagram). These symptoms reflect the core addiction elements identified by Griffiths (2005). An index of problematic Instagram use was created by averaging the 18 items ($M=2.23$, $SD=0.78$, Cronbach’s alpha = .94).

Measures for habitual Instagram use were adopted from LaRose et al. (2003), which included the following three items: (1) Using Instagram is a habit that I have gotten into; (2) Using Instagram is part of my usual routine; and (3) I use Instagram without really thinking about it. We created an index of habitual Instagram use by averaging the three items ($M=5.54$, $SD=1.37$, Cronbach’s alpha = .93).

**Instagram Feature Use.** Based on the available features on Instagram at the time of this study, we asked participants how often (1 = never and 5 = always) they engaged in the following 22 activities on Instagram during the past year: (1) view other’s photos; (2) view others’ recorded video; (3) watch others’ live stream; (4) follow celebrities; (5) follow other Instagram users; (6) watch IGTV; (7) explore recommended posts; (8) post my selfie; (9) post other photos; (10) post videos; (11) post my own live stream; (12) update my profile picture; (13) host my own IGTV; (14) record my own story; (15) share my Instagram post to my other social media; (16) like others’ posts; (17) comment on others’ posts; (18) get likes from others; (19) get comments from others; (20) add hashtags when describing my posts; (21) forward posts to others; and (22) add contacts to Instagram. Based on the typology of feature use, activities (1)–(7) were categorized as lurking, (8)–(15) as broadcasting, and (16)–(22) as connection.

**Affordance-based gratifications** were measured with 18 items from Sundar and Limperos’s (2013) list, which was validated by Rathnayake and Winter (2018). Rated on a 7-point Likert-type scale (1 = strongly disagree to 7 = strongly agree), the 18 items captured eight affordance-based gratifications, namely being-there ($M=4.32$, $SD=1.45$, Spearman–Brown’s coefficient = .91), novelty ($M=3.94$, $SD=1.98$, Spearman–Brown’s coefficient = .46), agency enhancement ($M=4.44$, $SD=1.31$, Spearman–Brown’s coefficient = .77), community-building ($M=4.12$, $SD=1.31$, Spearman–Brown’s coefficient = .66), activity ($M=4.11$, $SD=1.24$, Spearman–Brown’s coefficient = .57), responsiveness ($M=4.21$, $SD=1.15$, Spearman–Brown’s coefficient = .68), play ($M=4.95$, $SD=1.09$, Spearman–Brown’s coefficient = .51), and browsing ($M=5.40$, $SD=1.02$, Spearman–Brown’s coefficient = .78). We reported the Spearman–Brown coefficient rather than Cronbach’s alpha because the Spearman–Brown coefficient is argued to be the most appropriate reliability statistic for a two-item scale (Eisinga et al., 2013). A full list of measurement items for affordance-based gratifications can be found in the appendix.

**Control variables** included demographics, Instagram checking frequency, and motives for Instagram use. Given that previous studies have shown that younger and female users are more likely to use Instagram (Auxier & Anderson, 2021; Rozgonjuk et al., 2020) and develop problematic use tendency (Wiederhold, 2019), we added age and gender as covariates. In addition, we controlled for income because family income may influence one’s use of Instagram, as richer people may have larger social networks, which may increase their use of features pertaining to social connection. Moreover, given that racial identity may influence one’s user experience with Instagram (a recent report from Pew Internet Research [Auxier & Anderson, 2021] shows that a smaller proportion of White Americans [35%] use Instagram compared to Hispanic [52%] and Black Americans [49%]), we added race as a control variable.

Furthermore, we controlled for the frequency of checking Instagram in the study because checking behavior is an indicator of habitual smartphone use and is characterized by repeated and temporary use of the medium, which is similar to the lurking behavior in the current study (Oulasvirta et al., 2012). Given that checking behaviors may be a third variable that influences both the independent variable and the dependent variable in the study, we controlled for it in the analysis.

In addition, given that motivations are drivers of media use, gratifications, and unintended consequences of media use, according to the theory of U&G (Katz et al., 1973), we incorporated five motives for Instagram use as covariates. Based on Lee et al. (2015), the five motives of Instagram use were social interaction, archiving, self-expression, escapism, and peeking. Correspondingly, we asked participants how often (1 = never and 5 = always) they used Instagram (1) to get updates on close friends and family, (2) to connect with people who share similar interests, (3) to depict my life through photos/videos, (4) to remember special events, (5) to express myself, (6) to become popular, (7) to kill time, (8) forget about troubles, (9) to peek into other people’s lives, and (10) to browse daily lives of celebrities. We created five indexes for each major motive by averaging the items belonging to their corresponding categories ($M_{social\ interaction}=3.47$, $SD_{social\ interaction}=0.87$; $M_{archiving}=3.56$, $SD_{archiving}=0.95$; $M_{self-expression}=2.92$, $SD_{self-expression}=0.92$; $M_{escapism}=3.21$, $SD_{escapism}=0.87$; and $M_{peeking}=3.31$, $SD_{peeking}=0.91$).

**Analysis**

We present details of data cleaning and preparation, measurement validity, and data analysis plan in the following sections.
Data Cleaning and Preparation. We first checked central tendency and dispersion for each measurement item by looking at mean/median/mode, standard deviation, range, and the maximum and minimum values. Following this, we replaced missing values with series mean. Considering that all aggregated scales fell into the recommended range for the mean of skewness and kurtosis (+/-2 for skewness and +/-7 for kurtosis; Hair et al., 2010), we concluded that the normality assumption for parametric statistics analysis was not violated. We also examined zero-order correlations between key study variables to check the issue of multicollinearity. As shown in Table 1, all correlations were below the recommended threshold of .7 (Tabachnick et al., 2001), thereby ruling out any concerns of multicollinearity.

Measurement Validity. To demonstrate discriminant validity of the constructs, we established a measurement model in which each item was loaded onto its purported latent variable and the first item in each latent variable was used as a marker indicator. The overidentified model was then analyzed with a maximum likelihood minimization function. Given that the proposed model did not have a good fit based on Kline’s (2015) criteria, we removed six items that had low factor loadings (below .3), which negatively influenced the global fit. The items were watching IGTV, watching live stream, hosting IGTV, adding hashtags in the posts, sharing posts to other social media, and adding contacts to Instagram. After trimming the items, coupled with correlating error terms suggested by modification indices, the revised measurement model fit the data well: χ²(df=1,330) = 3,009.48, p < .001, chi-square fit statistics/degree of freedom (CMIN/DF) = 2.26, comparative fit index (CFI) = .90, root mean square error of approximation (RMSEA) = .05, 90% confidence interval (CI)=[.049, .054], C_fix > .05, standardized root mean square residual (SRMR) = .09. Given that all items belonged to their purported constructs and there was no cross-loading items in the measurement model, we can reasonably infer discriminant validity.

We re-computed the scales for lurking, broadcasting, and connection based on the revised measurement model. A summary of descriptive statistics for each key study variable can be found in Table 2.

Analysis Plan. Given that the purpose of the study is to differentiate habitual from problematic Instagram use by examining the predictor role of Instagram feature use and affordance-based gratifications, we conducted two hierarchical regression analyses. Following the theory of U&G, which argues that social and psychological needs drive the use of media, which in turn generates gratifications and other unintended consequences of media use (Katz et al., 1973), we entered control variables, including demographics, frequency of Instagram checking, and motives for Instagram use first, followed by Instagram feature use (the second block) and perceived affordance-based gratifications (the third block). Moreover, when predicting problematic Instagram use, we entered habitual Instagram use into the last block of the model.

We chose hierarchical regression because it is useful for evaluating the contributions of variables of interests after controlling for previously entered predictors (Lewis, 2007). In other words, hierarchical regression can help determine whether newly added variables show a significant improvement in the explained variance on the dependent variable. This approach is better than entering all predictors at the same time because the order of entry of variables is based on theory, and therefore ideal for hypotheses testing and knowledge generation.

To further differentiate habitual from problematic use pattern, we used median split (median = 2.11 for problematic Instagram use and median = 6.00 for habitual Instagram use)
to delineate two groups of users—Problematic Users, characterized by high levels of problematic use but low levels of habitual use, and Habitual Users, characterized by high levels of habitual use and low levels of problematic use. We used a series of independent sample $t$-tests to determine how these two groups differ in Instagram feature use and perceived affordance-based gratifications.

**Results**

H1 proposed that habitual Instagram use would be positively related to problematic Instagram use. As shown in Table 3, regression results support this hypothesis ($\beta = .18$, $p < .001$). However, these two types of use are from being identical, with habitual use explaining only about 2% of the variance in problematic use. Differences between these two types of use are borne out by differential prediction of different Instagram feature use and perceived affordance-based gratifications, as can be observed by comparing the two columns of Table 3.

Regarding the predictive role of Instagram behaviors, our regression results show that broadcasting is positively related to problematic Instagram use ($\beta = .19$, $p < .001$) but negatively related to habitual Instagram use ($\beta = -.11$, $p < .01$). Thus, H2a was supported but H2b was rejected. Furthermore, lurking ($\beta = .26$, $p < .001$) and connection ($\beta = .18$, $p < .001$) are positively related to habitual Instagram use, but they are not related to problematic Instagram use. Therefore, H3a–b and H4a–b were all supported.

RQ1 asked about the role of affordance-based gratifications in differentiating habitual from problematic Instagram use. Results show that problematic Instagram use is positively predicted by the gratification of novelty ($\beta = .15$, $p < .001$), but negatively associated with the gratification of browsing ($\beta = -.26$, $p < .001$). Interestingly, the gratification of play is positively related to both habitual ($\beta = .14$, $p < .05$) and problematic Instagram use ($\beta = .12$, $p < .05$), although the relationship is relatively stronger for habitual Instagram use.

**Table 2. Descriptive Statistics for Key Study Variables.**

| Variable           | Mean | SD  | Cronbach’s alpha | Spearman–Brown’s coefficient | Minimum value | Maximum value | Median | Median absolute deviation |
|--------------------|------|-----|-----------------|------------------------------|---------------|--------------|--------|--------------------------|
| Broadcasting       | 2.40 | 0.68| .77             | n/a                          | 1             | 5            | 2.43   | .43                      |
| Lurking            | 3.85 | 0.68| .73             | n/a                          | 1.60          | 5            | 4.00   | .40                      |
| Connection         | 3.68 | 0.74| .81             | n/a                          | 1             | 5            | 3.80   | .40                      |
| Being-there        | 4.32 | 1.45| .91             | .46                          | 1             | 7            | 4.50   | .75                      |
| Novelty            | 3.94 | 1.20| n/a             | .66                          | 1             | 7            | 4.00   | 1.00                     |
| Agency enhancement | 4.44 | 1.31| n/a             | .77                          | 1             | 7            | 4.50   | .50                      |
| Community-building | 4.12 | 1.31| n/a             | .66                          | 1             | 7            | 4.00   | 1.00                     |
| Activity           | 4.11 | 1.24| n/a             | .57                          | 1             | 7            | 4.00   | 1.00                     |
| Responsiveness     | 4.21 | 1.15| n/a             | .68                          | 1             | 7            | 4.00   | .50                      |
| Browsing           | 5.40 | 1.02| n/a             | .51                          | 1             | 7            | 5.67   | .67                      |
| Play               | 4.95 | 1.09| n/a             | .78                          | 1             | 7            | 5.00   | 1.00                     |
| Habitual use       | 5.54 | 1.37| .93             | n/a                          | 1             | 7            | 6.00   | 1.00                     |
| Problematic use    | 2.23 | 0.78| .94             | n/a                          | 1             | 4.61         | 2.11   | .56                      |

*Spearman–Brown’s coefficient is argued to be the most appropriate reliability statistic for a two-item scale (Eisinga et al., 2013).*

**Table 3. Hierarchical Regression Predicting Problematic and Habitual Instagram Use.**

| Block 1: Control variables | Habitual Instagram use $\beta$ | Problematic Instagram use $\beta$ |
|----------------------------|-------------------------------|-----------------------------------|
| Gender (female = 1)        | .07#                          | .05                               |
| Age                        | -.00                          | -.01                              |
| Family income              | .05                           | .11**                             |
| Race (White = 1)           | .10**                         | -.03                              |
| Instagram checking frequency | .12***                       | .04                               |
| Social interaction         | -.04                          | .05                               |
| Archiving                  | .11*                          | -.15**                            |
| Self-expression            | .02                           | .23***                            |
| Escapism                   | .06                           | .12*                              |
| Peeking                    | .04                           | .11*                              |
| $R^2$                      | .36***                        | .35***                            |

| Block 2: Activities        | Habitual Instagram use $\beta$ | Problematic Instagram use $\beta$ |
|----------------------------|-------------------------------|-----------------------------------|
| Broadcasting               | -.11*                         | .19***                            |
| Lurking                    | .26***                        | -.04                              |
| Connection                 | .18***                        | -.08                              |
| $R^2$                      | .10***                        | .02***                            |

| Block 3: Affordance-based gratifications | Habitual Instagram use $\beta$ | Problematic Instagram use $\beta$ |
|-----------------------------------------|-------------------------------|-----------------------------------|
| Being-there                             | .04                           | .08                               |
| Novelty                                 | -.03                          | .15**                             |
| Agency enhancement                      | .03                           | -.07                              |
| Community-building                      | -.03                          | .02                               |
| Activity                                | .06                           | .07                               |
| Responsiveness                          | -.04                          | .03                               |
| Browsing                                | .06                           | -.26***                            |
| Play                                    | .14*                          | .12*                              |
| $R^2$                                   | .03**                         | .07**                             |

| Block 4: Habitual Instagram use | Habitual Instagram $\beta$ | Problematic Instagram use $\beta$ |
|--------------------------------|---------------------------|-----------------------------------|
|                              | $\Delta R^2$ | $\Delta R^2$ | $R^2$ | Adjusted $R^2$ | $F$ |
|------------------------------|---------------|---------------|-------|----------------|-----|
|                             |               |               |       |                |     |

N = 482. Entries are standardized regression coefficients.

***$p < .001$, **$p < .01$, *$p < .05$, #$p < .10$
Results of independent sample *t*-tests largely confirm the differences between problematic and habitual users on dependent variables of interest. As shown in Table 4, habitual users engage more with lurking-related features (\(M=3.98, SD=0.65\)) than problematic users (\(M=3.64, SD=0.65\); \(t(169)=-3.71, p<0.001, d=-0.57\)). Similarly, habitual users (\(M=3.84, SD=0.60\)) use features pertaining to social connection more frequently than problematic users (\(M=3.48, SD=0.68\); \(t(169)=-3.63, p<0.001, d=-0.56\)). By contrast, problematic users (\(M=2.33, SD=0.61\); \(t(169)=2.08, p<0.05, d=0.32\)) prefer the features that afford broadcasting more than habitual users (\(M=2.54, SD=0.68\)).

Regarding affordance-based gratifications, those who are habituated perceive greater navigability-based gratifications than those who are problematic, especially in the aspects of browsing (\(M=5.62, SD=0.96\) vs \(M=4.79, SD=1.07\); \(t(169)=-5.30, p<0.001, d=-0.82\)) and play (\(M=4.99, SD=0.95\) vs \(M=4.58, SD=0.95\); \(t(169)=-2.76, p<0.01, d=-0.43\)). By contrast, problematic users (\(M=4.15, SD=0.92\)) enjoy the novelty of the interface more than habitual users (\(M=3.62, SD=1.15\); \(t(168.51)=3.35, p<0.001, d=0.50\)).

Again, these data patterns are largely consistent with the regression results described earlier.

**Discussion**

Our study reveals that habitual use and problematic use of Instagram are characterized by different user behaviors and affordance-based gratifications. Those who are habituated engage heavily with features that support lurking and social connection. As a result, they obtain a variety of navigability-based gratifications, such as browsing and play. By contrast, users who develop problematic use tendency engage more with broadcasting-related features. Compared to their habitual use counterparts, they enjoy more of the novel features on Instagram but less from browsing a variety of information on Instagram. By focusing on the role of technologies, that is, the use of Instagram features and the attainment of affordance-based gratifications, the present study contributes to prior knowledge in differentiating between habitual and problematic media use (LaRose et al., 2003; Park et al., 2021; Seo & Ray, 2019; van Deursen et al., 2015).

While habitual and problematic media use are fundamentally distinct concepts, we also find that they are positively related. The present study supports the process perspective of media use, viewing problematic Instagram use as an outcome of repeated and ritualized use of Instagram in daily life. This view is supported by previous studies arguing that problematic media use is a habit to start with, such that, when gratifying media experiences from ritualized use becomes a primary means to relieve dysphoric moods, it is likely to become problematic (Brand et al., 2016, 2019; LaRose et al., 2003). Scholars have further elaborated that all addictions are habits, but not all habits are pathological addictions (Graybiel, 2008; Marlatt, cited in LaRose et al., 2003). All this suggests that habitual use is a precursor to problematic use instead of the other way around. We expect future studies to confirm the causal relationship between these two types of media use with longitudinal data.

Given that the study is based on retrospective survey data, an important question is the extent to which the self-reported habitual and problematic Instagram use relates to its corresponding tracked behavior. Since self-reported measures are proxies of actual behaviors and are found to be moderately related to behavioral logging data (Parry et al., 2021), we do not expect a significant difference between the observed use patterns in the current study and actual behaviors through mobile logging data. However, it is well-known that people are likely to lie about their actual social media use time, especially if they have developed a problematic use pattern.
This social desirability tendency may cause a greater discrepancy between self-reported measures and tracked data. Future studies can assess the difference by comparing objectively measured and subjectively reported habitual and problematic Instagram use.

Likewise, it would be meaningful to examine how habitual and problematic Instagram use differ as a function of Instagram feature use by using tracked behaviors on Instagram, rather than self-reported measures. While it is unclear how the results might differ, the positive relationship between lurking and habitual Instagram use is confirmed by at least one study, in which behavioral tracking data suggest that habitual smartphone checking is characterized by brief and repeated use sessions without effortful decision-making (Oulasvirta et al., 2012), which resembles the activity of lurking. This correspondence increases the external validity of the findings. While the pattern of habitual Instagram use is partly confirmed, studies have also shown that self-reported measures and actual behavioral data of Instagram use are inconsistent in predicting problematic smartphone use (Rozgonjuk, Elhai, et al., 2021; Rozgonjuk et al., 2020). Future studies will do well to include both self-reported and tracked data of broadcasting-related feature use and examine how they differ in predicting problematic Instagram use.

**Theoretical Implications**

The present study tested the predictive power of U&G theory in differentiating media habits from problematic media use. First, we confirm that U&G theory is a useful framework to explore the formative stage of habitual and problematic media use. The regression models explained 47% and 43% of variance in habitual and problematic Instagram use, respectively. Notably, both Instagram feature use and affordance-based gratifications contributed to the total explained variance in the dependent variable, and the increment of variance in each block is significant.

In addition, we find that habitual and problematic media use are associated with different use patterns—broadcasting is more related to problematic media use whereas lurking and connection are associated more strongly with habitual media use. Given that broadcasting, such as updating one’s profile on social media, involves more cognition and affective engagement compared to passive lurking and social connection (Alhabash et al., 2019), cognition is critical in differentiating problematic from habitual Instagram use. This argument is echoed by Seo and Ray (2019), who found that routine seeking (i.e., a preference for familiar situation) and cognitive rigidity (i.e., the reluctance to change one’s mind) were positively related to habitual SNS use but not problematic SNS use. Also, Vishwanath (2015) found that habitual Facebook users are more likely to fall victim to social media phishing as they have formed ritualized use pattern, thus relaxing their cognitive involvement while using the platform. Thus, we argue that problematic Instagram use involves more cognition and engagement, whereas habitual Instagram use involves less thinking. Future studies should take into consideration the cognitive dimension when differentiating habitual and problematic media use.

Furthermore, this study is among the first to examine the role of affordance-based gratifications in habitual and problematic media use. We find that habitual use is strongly related to navigability-based gratifications (e.g., play), whereas problematic Instagram use is positively correlated with modality-based gratifications (e.g., novelty). The significant role of affordance-based gratifications supports the idea that technology itself is also responsible for unintended consequence of media use, thus supporting the central argument in U&G 2.0 (Sundar & Limperos, 2013). Therefore, a significant theoretical contribution of this study is that affordance-based gratifications can hold the key to distinguishing between habitual and problematic Instagram use aside from users’ innate needs and Instagram behaviors.

**Practical Implications**

In addition to theoretical implications, our findings have practical implications for social media users, parents and teachers, as well as for technology companies. Given that media habits begin with regular media use, which may turn into problematic Instagram use if the obtained gratifications become a conditional response to negative mood states (LaRose et al., 2003), our findings may help lay users understand how habitual and problematic Instagram use is formed. By enhancing ones’ awareness of the social media use experience, one may avoid developing a pattern of problematic media use.

Beyond promoting self-awareness, parents and teachers could also benefit from our findings as they suggest antecedents of habitual and problematic media use. If a college-age student spends a vast amount of time expressing and presenting himself/herself and derives enjoyment from new features on Instagram, she/he is likely to develop problematic use. Thus, timely interventions may be needed to help these “at-risk” young users.

Also, findings from this study could help technology companies reconsider their strategies for protecting their users from developing problematic use. As it stands today, Instagram only provides an activity dashboard to help users monitor their amount of Instagram use. Considering that time duration alone is not a good indicator of media addictions (Griffiths, 2010), its effectiveness in preventing problematic Instagram use is questionable. Thus, we suggest that Instagram redesign their addiction prevention function by considering limiting the use of broadcasting-related features after a certain number of posts. Furthermore, given that the gratification of novelty is significantly higher for those who are problematic than those who are habituated, product managers should have intervention programs ready when promoting new features or endlessly serving up novel content, in order to ensure users’ digital well-being.
Limitations and Future Studies

Findings of this study should be interpreted with the following limitations. Due to the cross-sectional nature of the survey, the present study cannot address causality. While gratifications are hypothesized to be antecedents of habitual and problematic Instagram use, media habits and problematic media use may cause new gratifications as people tend to rationalize their media consumption (Newell, cited in LaRose, 2010). Future studies can explore differential changes in gratifications in the development of habitual and problematic use.

Furthermore, given that U&G studies have long been criticized for relying on retrospective survey data (Ruggiero, 2000) that only moderately correlate with actual behavioral measures (Parry et al., 2021), relying solely on self-reported data of Instagram feature use may not be sufficient to assure internal validity of the findings. Thus, we suggest future studies use behavioral tracking data to examine actual feature usage and its relation to self-reported habitual and problematic use tendency.

While gratifications from technological affordances can partly predict habitual and problematic Instagram use, this study did not examine the source of affordance-based gratifications. That is, which features on Instagram could give rise to the pleasurable experience and further promote habitual and problematic use. Given that updating profile on Facebook is related to the gratification of agency enhancement and sharing stories to others is related to the gratifications of community-building (Jung & Sundar, 2018), investigating the indirect effect of broadcasting-related features on problematic Instagram use via modality- and agency-based gratifications will be a fruitful area for future studies.

Finally, this study finds that broadcasting is a positive predictor of problematic Instagram use. However, we did not take the intended audiences into account when examining this bivariate relationship. It is likely that broadcasting with strong ties in mind may be more beneficial to one’s health and well-being and therefore less problematic compared to broadcasting to a wider audience. Future studies would do well to examine nuances in the relationship between broadcasting and problematic Instagram use by considering users’ intended audience.

Conclusion

Despite the limitations, this study finds that habitual and problematic Instagram use are distinct concepts, as they are related to the use of different features and obtaining different affordance-based gratifications. While the present study tends to draw a line between these two concepts, future studies should examine under what conditions a pleasurable media habit may progress to problematic use. Such explorations can advance theories about the progression of problematic social media use.

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Appendix

Measures for Affordance-Based Gratifications

The followings are statements describing the attitudes and feelings after Instagram use. To what extent, do you agree or disagree?

1 = strongly disagree to 7 = strongly agree

Novelty
- The experience of Instagram use is unusual
- Instagram is unique compared to other social media

Agency-Based Gratifications

Agency enhancement
- Instagram gives me the power to broadcast to my followers
- Instagram allows me to assert my identity

Community-building
- Instagram helps me to be part of a community that I would not otherwise have been part of
- Instagram allows me to build a network that could bring me social support

Interactivity-Based Gratifications

Activity
- I can perform a number of tasks on Instagram
- I feel active when I use Instagram

Responsiveness
- Instagram responds well to my requests
- Instagram allows me to be in control

Navigability-Based Gratifications

Play
- It is fun to explore Instagram
- I enjoy escaping into a different world when using Instagram

Browsing
- Instagram allows me to browse freely
- Instagram allows me to surf for things that I am interested in

Modality-Based Gratifications

Being-there
- Instagram helps me immerse myself in places that I cannot physically experience
- Instagram creates the experience of being present in distant environments