Issues in Information Systems
Volume 24, Issue 4, pp. 357-366, 2023

DOI: https://doi.org/10.48009/4_iis_2023_127

Pavlovian social media: responding to the "ding"

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Abstract

This research focuses on the impacts of social media applications and the varying degree of consequential outcomes in the machine-human interaction through a blurred cybernetic lens. Specific to this study, the focal point of this work is to create a framework to hone in on the deeper relationship between the machine and user to identify the behavior modifiers which influence Social Media responses. This study uses the BeReal social media platform as the model to analyze user response and their relationship with the system as well as their social network. This study further builds the foundation to design the experimentation to investigate the Critical Action Response of users in a machine-human integrated system. Furthermore, the research will be used in the design of further study, where it will articulate the variances of user behavior through a filtering perspective which encompasses machine control mechanisms, social network controls, situational awareness, and self.

Keywords: cyber-security, social-conformity, social-media, cybernetics, machine-human, behavior-modification

Introduction

The purpose of this study is to establish the framework to research the interaction of Social Media platforms and the user willingness to accept cyber security risk, threat exposure and exploitation. Specifically, this research will examine the *"BeReal"* Social Media platform, and trace through the user's response attributes with their behavioral actions. In addition, a deeper dive into their knowledge of potential cyber vulnerabilities and risk factors resulting from the user discretion using this application.

This research will compare reports and articles about BeReal to existing research on social media and social media addiction. We will examine the relationship between social media and its users, to gauge user response to notifications and other alerts, to establish a Pavlovian level human response to the "ding", where the background of this work will be the foundation of this study using the relationship between our thirst to engage in technology as a society, and express the relationship we build with our tools and how they become extensions of our lives.

The literature review explores the plight of the modern technology users with the tangled web of Social Media discourse. As these constructs build within the study, its aggregate further defines the BeReal application as the model to analyze the machine-human interactions, thus defining a dissection of the interaction of the system and human response. Furthermore, a constructed model will be the lens for further analysis to better explore a postulate rationale to identify the mechanisms that may control or modify human behavioral response to the machine.

Background

As our society embraces new innovation it is diffused through various channels and social pathways, (Rogers, 2003), this drives us forward in the adoption of new experiences and social concordance; however, the unforeseen tangential outcomes of this inertia may lack the clarity of natural vulnerabilities embedded in our actions to the responses with these systems. As this study investigates Social Media systems, where the "machines" are considered, the technology integrated directly to a human user relying on a response action from them as part of the overarching completed circuit or system outcome.

Thereby users of these systems may be unknowingly subjecting themselves to significant exposure to cyber predators, sociological harm, and self-deprecating behavior. Furthermore, understanding the system and other reliance factors to derive the degree to which a user will allow themselves to be manipulated and act in response to a signal from a machine and assuring a favorable outcome to their social network. In addition, Wiener's cybernetic relationship between an automated controlling system extends the thought of the system autonomous place in our existence (Wiener, 1968). In addition, as Weizenbaum lifts the notion of the machine relationship simulating push rods in a machine (Weizenbaum,1976, pp. 38-43), one could associate the complete integration of the two into a harmonious one system.

With this concept, further adaptation of the machine-human accord embarks on our very own cognitive reactions and responses, whereas the triggers in our human responses integrate with the tools we use and become second nature. As to McLuhan's notion of unconscious responses engaging technology as an extension of the body (McLuhan, 1968, pp. 13- 20), possibly this could be a reflexive response that may impede rationale judgment during the machine-human interaction, which may set up the user for consequential outcome from this action.

Literature Review

The literature review for this research will explore the impacts of social media on the consumer. The study will analyze social media and explore these areas: addiction, behavioral responses, and peer pressure influences on behavior. The next area of discovery will focus on cognitive responses and unintended behavior modification, under the channels of vulnerability in a Cyber Security landscape. In addition, a functional comparison of four Social Media applications will be discussed to understand the general interactive relationship between the application and the user.

The Birth and Basics of BeReal

Created by former GoPro employee Alexis Barreyat and business partner Kevin Perreau, the BeReal app launched in late 2019, hitting the top spot-on Apple's App Store in the U.S. in July 2022. (Curry, 2023)

BeReal requires the user's name, date of birth, and mobile number to sign up. This is then used by the app to identify users when logging in. These data points and all user photos are stored on BeReal servers for three years from the last use of the app, or until a user makes a direct request to BeReal for their information to be deleted. (Antonelli, 2022)

According to Curry, American students are apparently abandoning Instagram in droves for the app, with the basic premise being to take a photo with the back and front camera at a random time each day. The randomness of the app is what BeReal markets as "genuine" moments in life to be shared with friends. (2023)

Social Media Addiction and Similar Social Media Applications

One of the first articles to discuss Social Media Addiction was Karaiskos, Tzavellas, Balta, and Paparrigopoulos in 2010. Their research was a case study focused on one female patient who used Facebook five hours a day. They winnowed down the term "internet addiction" to "Social Media Addiction", to describe the overuse of social media sites and applications.

While not a clinical diagnosis at that time, a myriad of studies has been conducted since, looking at the effects on the mental well-being of a wide range of age groups. These studies have looked at social media usage as a whole, or have focused on solitary apps and how they affect users. For this study, we examined studies that researched apps that had similar traits – or consequences – from a novice to addictive level usage of BeReal.

General social media addiction was researched in a two-step process by Hou, Xiong, Jiang, Song, & Wang (2019); looking at two different groups of college-aged students. The larger, first group was examined on how heavy social media usage (addiction) affected the mental well-being of the students. The smaller, second group was studied to see how the effects of an intervention would have on their social media usage going forward, as well as their overall mental health. (Hou, et al. 2019)

Rast, Coleman, & Simmers (2021) discussed social media and the Fear of Missing Out (FOMO) (2021). In this study participants performed a self-evaluation of their relationship with social media in several hour increments. Their notes were compared to the symptoms described in other research on social media addiction. The symptoms the participants mentioned included time distortion, brain, and behavior changes. The participants' outcomes included depression, anxiety, low self-esteem, poor sleep, feelings of guilt, diminished performance, and decreased cognitive capacity. As a result of the study, many of the participants noted an awareness of their emotional attachment to social media. (Rast, et al. 2021)

Yang (2016) focused exclusively on Instagram and how overuse can lead to feelings of loneliness and isolation among users. Ardiana and Tumanggor (2021) focused on Instagram usage in teenage subjects, finding a negative correlation between the amount of time high school aged students spent on Instagram compared to their self-esteem levels.

In the physical space, the PokemonGo app took off immediately, with 550 million downloads and $470 million in sales within three months of its July 2016 release. The game requires users to physically search for Pokemon characters using their mobile device as a compass / augmented reality tool. Multiple PokemonGo users ended up in various dangerous situations, including trespassing, bicycle accidents, and vehicle accidents, all in the name of "catching them all". (Wagner-Greene, et al 2017)

While there are no known studies investigating if BeReal can have the same effects on self-esteem as other social media apps, informal polling of a handful young adults has found a trend toward FOMO, as one friend may be preoccupied and not able to take part in the activities their social group posted pictures of at the time the BeReal app alerted the user(s).

Being a relatively newer app, there is little concern to date over any cybersecurity issues with the app. The French ownership of the app does not raise the same privacy concerns as TikTok and its ownership by Chinese interests (McDonald & Soo, 2023). However, where the app is used could be a concern if users are prone to use the app at their place of employment, rather than just during leisure hours. There are documented stories of nurses being terminated due to posting photos on social media that contained patient information in the background of their photos (Balestra, 2018).

Discussion

Understanding BeReal

The rationale behind the BeReal platform is to provide a channel for its user-base to experience an unfiltered genuine authentic snapshot of their peer's lives in any situation throughout the day. The BeReal application is a photo sharing Social Media platform which daily randomizes a notification to the users instructing them to take two simultaneous pictures using the front and rear camera on their smartphone, which is controlled through the installed BeReal app.

When the application initiates this request, the user will have a two-minute window to react to the BeReal ding notification. If the user responds within the two-minute window, then they are privileged to share additional photos that day with their followers. If they fail to meet the two-minute window request, and the user is not permitted to view their shared followers' posts for the day. While the timing of the daily alert is random, all users within a given time zone receive their alert at the same time that day (McCluskey, 2022). This human-machine interaction parallels the theoretical construct which Wiener, Weizenbaum and McLuhan indicated in their works as aforementioned in this research.

The dissection of this system will break it down into two distinct sections which are the control tier and the social tier. In Figure 1, the control tier represents the machine - human interaction of the Social Media system, and in Figure 3, the social tier represents the sharing of the user experiences within the system.

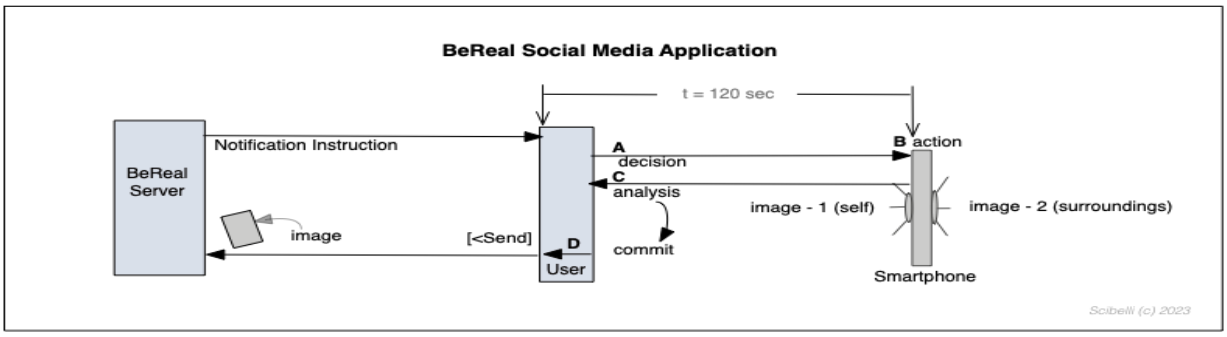

Figure 1: Illustrates the BeReal system interaction between the machine - human control tier of the Social Media platform.

The machine-human control tier in Figure 1, represents the functional control mechanism where the system will signal the user to perform the task of capturing an unadulterated snapshot of their surroundings within a limited time constraint of two minutes. As the application waits for the user response, the "machine" will indicate to the user the narrowing window as their time decreases, thereby applying a machine-controlled pressure to the user to complete the task. Once the task is completed, it is then committed to the BeReal system, where it will be marked with the measured performance metrics of the user's ability to be authentic according to the intent of the application design. (BeReal, 2023)

At this layer of the BeReal user experience, noteworthy to mention is an adapted Shannon-Weaver Communications Model in Figure 2, which provides the overarching message communication structure underlying the BeReal machine-user interaction (C. Shannon & W. Weaver, 1953).

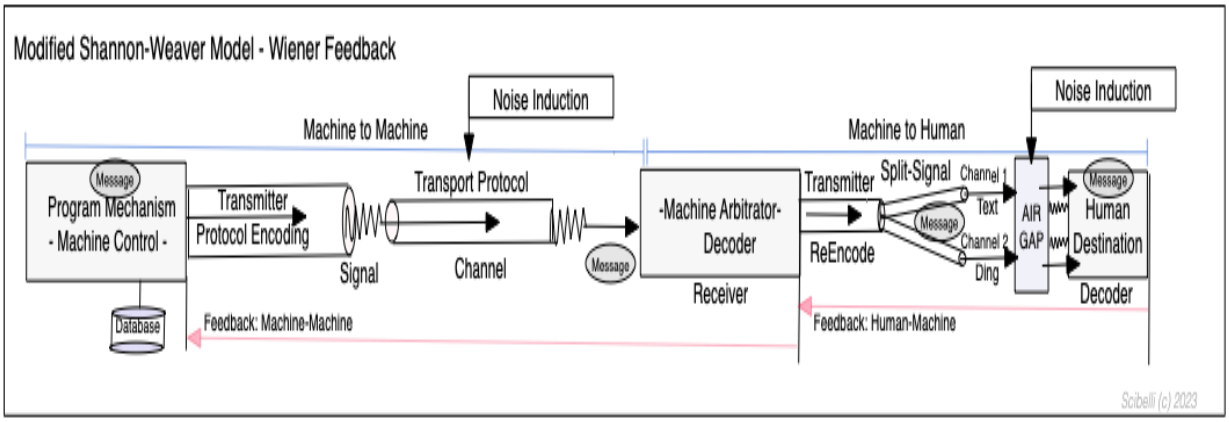

Figure 2: Illustrates a modified Shannon-Weaver Communications model with the Wiener feedback channel bridging a two-way communication between machine and human.

The Social Tier of the BeReal dissection as shown in Figure 3, demonstrates the users social network consisting of group clusters and a shared public space. Represented in this model are the beliefs of unforeseen user forces of its inherent design, where the perceived earned score of being the most authentic user you could be is driven by both the machine, thus being the computing platform, and the peer social network of the user. As previously stated, the system is the functional control mechanism with the authoritative message for the user to respond to its command, and the social pressure and conceived behavioral influence are rendered from the user's social network, where from a philosophical perspective, the expectations are set for the user to be the most authentic and real person they could be, thereby the name of the product *BeReal*.

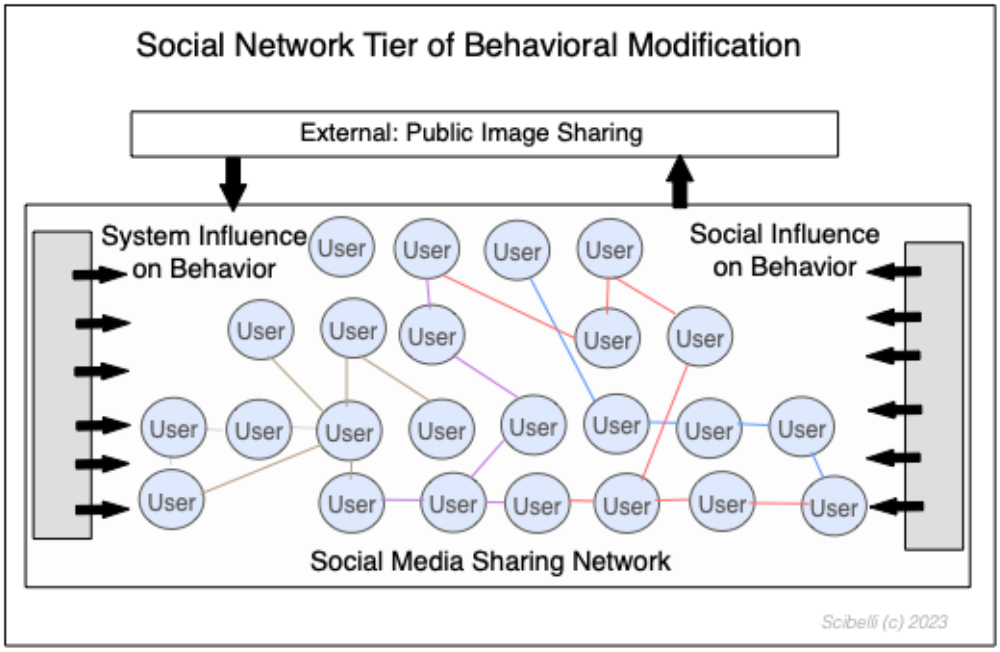

Figure 3: Illustrates the BeReal user life snapshot sharing in the social tier of the Social Media platform.

In combining the Machine Control Tier (MCT) and the Social Network Control Tier (SNCT), these become the influencers in the decision that will be made by the user as demonstrated in the Critical Action Response Model (CARM) illustrated in Figure 4. This is the fulcrum for study where this research hinges on the action of the users and the influence factor which will weigh on the outcome of their decision. Note that MCT and SNCT will as well be balanced with the user's self-cognitive rationale and situational awareness of that instance of the response.

In applying these forces to user decision making, understanding how these influences could modify user behavior in which their conformity is likely to align with the SNCT. According to early research done by Asch (1955), his experimentation indicated conformity being a strong outcome based on social alignment. Furthermore, one should also consider other facets that dovetail into conformity actions as brought forward by Scheff (1988) using Durkheim's work in social influences. According to Blommaert (2018), their works further embraced Durkheim and Parsons research on extrapolating the sociological effects in social networks of Internet groups.

As further investigation is done in the next phase of study of the Critical Action Response of social media users, these works will be applied to the development of understanding the human factors in the decisions and actions through the mechanisms of the BeReal application. It is clear that there is a social weight behind the conformity measures of the user, but one wonders to what degree does the Machine Control Tier (MCT) play into the overall conformity pressures, thereby a deeper dive into the Critical Action Response Model in Figure 4, would highlight this area of investigation.

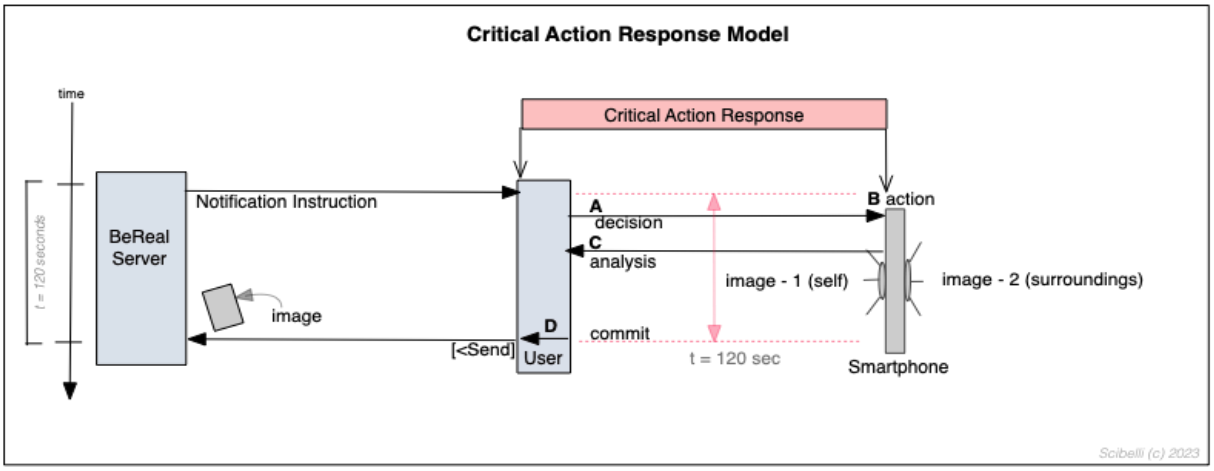

Figure 4: Demonstrates the application-user relationship highlighting the Critical Action Response, where a user will be prompted to take action in a given situation.

Critical Action Response Model

This study pinpoints the activities inside the sphere of vulnerability of user response to the application. The Critical Action Response Model (CARM) was created to depict the segment of the machine-human interaction where decisions are made by the user. This captious moment requires the user to take immediate action in a situation under pressure of time and outcomes. In the model, once the notification instruction arrives on the user's smart-device, a decision must be made to proceed with capturing the real surroundings of the user under the pressing tick of each second being monitored and the perspective of less delay in

response is more favorable to the community of the Social Media platform. The user will have an option to retake the snapshot if it was not desirable; however, in addition to the time constraint observations, the community is cognizant of retakes which is considered in perception of the realness of the user's actions.

Assessing the CARM illustrations shown in Figure 4, defines the key measurement points starting from the decision to proceed at the A tag reaching to the end point D, where the user commits their irrefutable actions into the system. During this short window, several different factors may weigh in the decision and action of the user Critical Action Response, where they converge into a point of final analysis identified at the C indicator in the diagram. The momentary time between C and final commit D, allows the user final assessment of the information assembled in the image before its final commitment in the Social Media platform.

In the exploration of the Critical Action Response segment in Figure 4, one must consider the areas of influence on the user during that moment in their machine-human interaction, where they must react within the two-minute window with the intent to be as a real and authentic of a user as possible, thus with a reaction response speed closest to zero as possible. In this assertion, their judgment to achieve this objective will be influenced by four areas as identified in Figure 5. Identified is this paradigm are four categories including the Machine Control Tier, Social Network Tier, Self, and Situational. Within these groupings, a deeper dive is necessary to further extrapolate the behavior modifiers that may exist, and this would be earnest in the next phase of the study which is being proposed in this work.

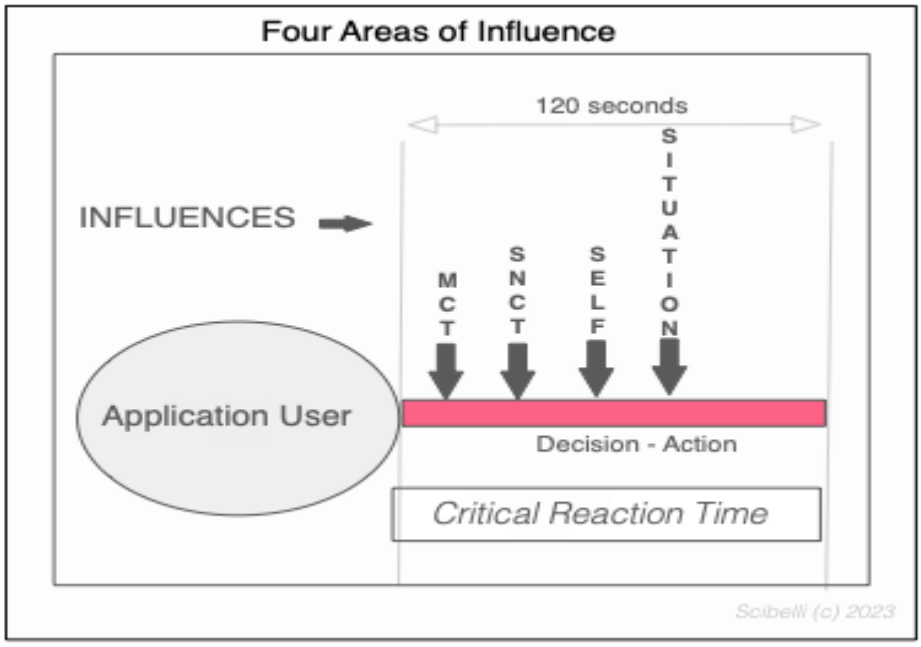

Figure 5: Illustrates the four influencing constraints in the Critical Action Response defining the Machine Control Tier (MTC), Social Network Control Tier (SNCT), Self and Situation.

Proposed Research

This research is to create the groundwork for a larger research project which will explore the degrees of behavior that users will allow themselves under the controls of a Social Media platform. The belief is that

there are potential degrees of risk and actions taken by users "under the influence of machine and social pressures," that may result in unfavorable or perilous outcomes. The study proposed will dissect the Critical Action Response of the user, in Figure 4, to understand the cognitive rationale between the (A) the decision of the user and (D) committing their action to the Social Media platform. This is the critical probe point of the research with the purpose to understand the behavior influences on the users and identify the potential harm resulting from this outcome.

The research questions will be developed in the next phase of this work; however, the theme of the questions will hinge on the concept of Social Media platforms overriding user discretions and influencing their behavioral responses and action. With the BeReal application as the example of the control mechanism in the machine-human interaction, where the users are instructed to take action within a specified window, in parallel with the social pressure of the followers in their social networks expecting the same, this system serves exemplarily as a model to investigate for this study.

In further substantiating this application as a model for this research, the BeReal application has been examined through preliminary experimentation by the authors of this study. As limited users of the app for the purpose of this proposed research, observations have been at the machine controls layer of this platform, where daily the random notification will alert the devices with "the ding" and message to take a picture of self and surroundings. In addition, the rewards of committing the response within the timeframe, and being allowed additional snapshots for meeting that criteria. The penalty of late responses did not have an impact on the experimentation. Functionally, familiarity of the application was gained; however, this experiment did not have the social pressure to respond as one would have as a normal user. Thereby, this test allowed for a deeper understanding of how it works and situational exposure throughout the day.

Methodology

The methodology that will be used for this proposed research will be of a quantitative quasi-experimental design, where will collect data through instrumentation for analysis and a written research paper will be constructed. The collection instrumentation for this study will be through an online survey instrument that will be created based on further analysis and review of the BeReal application through the lens of the CARM framework discussed in this work. In addition, the instrumentation will hinge on the specific research questions that will be defined in that phase of the study. The CARM in Figure 4, narrows the scope of the study to focus on the actions and outcomes of the users under the controls of the BeReal application. Furthermore, in unraveling the Critical Response Action as described from the CARM framework, these responses will be applied across the four areas of influences as defined in Figure 5, where the Machine Control Tier, Social Network Control Tier, Self and Situation factors will be examined and developed in the instrumentation in the follow up research approach.

The subjects used in this quasi-experimental design will be grouped into four different categories which will contain current BeReal users, Winthrop University students, Eastern Gateway Community College students and other Social Media users. Note that there may be random BeReal users, thus non-exclusive in the other groups; however, they will be identified in the survey instrument for analysis in the study. The analysis of the data collected in this study will be through statistical analysis software, SPSS, or other comparable products.

This research on BeReal needs to be performed soon, rather than later. The app's momentum appears to have slowed. Recent reports state monthly downloads have been slipping since September 2022. The

number of daily users dropped 61 percent from its peak, from roughly 15 million in October 2022 to less than six million in March 2023 (Holterman, 2023).

Conclusion

The appeal to escape the staged nature of most social media applications drew many users to BeReal. Conversely, the almost mundane nature of the users' posts has now apparently cooled interest in the application as indicated in the research. However, the interest in their reactions and the users' willingness to be part of the machine human experience still lends a deeper understanding of how the controls in this relationship affects behavior of the user. A deep dive into a user's motivations in the BeReal app using the Critical Response of the CARM model will illustrate a user's willingness to be trained by the machine in their hand.

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