Understanding the Effect of Social Media Usage Type and Extraversion on Loneliness

Jinwoo Hwang, Akshay Kulkarni, James Wang, Jason Tu, and Benjamin Wolfson

College of Computing, Georgia Institute of Technology

Research Methods

Dr. Meghan Babcock

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Abstract

Loneliness is a pervasive emotion, especially in modern-day society's interconnectedness. Previous findings have associated social media usage and extraversion with this feeling. Analyzing social media, we discovered two usage types: active and passive. Active social media use consists of liking, commenting, and interacting with content, while passive use is browsing. Extraversion was determined through the IPIP-NEO-R Extraversion scale, and loneliness was measured through the UCLA Loneliness Scale. 120 participants were sampled from an undergraduate level psychology course at a large state institution with ages ranging from 18 to 22 years old. By performing a 2x2 between-subjects study, we discovered key insights into social media usage and extraversion's effects on loneliness. Significant effects were found with social media usage type and extraversion having main and interaction effects on loneliness. These findings suggest social media usage type and extraversion have measurable impacts on loneliness. Future design decisions on personalization of social media platforms based on user personalities and engagement profiles can help reduce loneliness.

Understanding the Effect of Social Media Usage Type and Extraversion on Loneliness

Commonly characterized as feeling isolated from society, loneliness is a feeling that affects us all. Whether intentionally or circumstantially, it is core to the fabric of being human. However, loneliness has increasingly become an issue in present-day society (Tiwari, 2013). Despite this emotion having associations with detrimental life conditions (Stravynski & Boyer, 2001), loneliness has quickly become one of society's lesser recognized challenges. Social media has been seen to have a significant impact on loneliness (Twenge, Spitzberg, & Campbell, 2019), but warrants further investigation. Although many studies have explored the association between social media and loneliness (Hunt, Young, Marx, & Lipson, 2018; Ryan, Allen, Gray & McInerney, 2017; Pittman, 2018), very few have investigated the methodologies used within testing social media usage. Social media has been categorized into active and passive usage with significant results stemming from variable usage of social media sites and depression symptoms (Aalbers, McNally, Heeren, de Wit & Fried, 2019). Because of the established effect of social media on loneliness, and the discovery of different types of social media usage patterns, the possibility that social media patterns may have been influential variables in previous studies should be considered. Adjacent to social media usage, extraversion has also been shown to have an effect on loneliness (Correa, Hinsley & Gil de Zúñiga, 2010). As an addendum to our research on social media usage patterns, extraversion, which may have a relationship with social media (Blackwell, Leaman, Tramposch, Osborne & Liss, 2017), may help unveil more societal factors affecting loneliness in today's contexts.

Analysis of Potential Factors of Loneliness

Differentiating Social Media Usage

Recently, social media and loneliness have gained attention in conjunction with mental health (Berryman, Ferguson & Negy, 2017). Usage of platforms such as Facebook, Instagram, and Snapchat, have sharply increased within the last few years and have now become integral parts of daily life for most individuals, especially young adults (Thorisdottir, Sigurvinsdottir, Asgeirsdottir, Allegrante & Sigfusdottir, 2019). There are conflicting results on whether more social media use is negatively or positively correlated to loneliness. Vally and D'Souza conducted an experiment that showed abstaining from social media results in a higher amount of perceived loneliness (Vally & D'Souza, 2019), while other researchers found that higher social media use is linked to higher loneliness (Ndongeni, 2017). However, the consensus seems to be that there is a positive correlation between social media use and loneliness, but few experimental studies have been conducted to investigate a causal role in this relationship (Hunt et al., 2018). Within these studies, none differentiate to account for more nuanced social media usage patterns among users; different people use social media in unique ways. Primack et al. (2017) mention active and passive social media use as a key differentiation to potentially account for more subtle measures of usage segmentation. Furthermore, active and passive social media use patterns have been shown to have correlative results in emotional distress and mental state, but there are no studies performed in experimental environments to explore causality (Thorisdottir et al., 2019; Escobar-Viera, Shensa, Bowman, Sidani, Knight, James & Primack, 2018). With no studies available on the causality between both active social media use and loneliness and passive social media use and loneliness, this study will explore the effects of passive social media use and active social media use on loneliness. This study is significant because it is one of the first to explore the effects of both active and passive social media use as separate constructs and will

look at the effect of each one separately on perceived loneliness. This study will not only continue with justifying research in this relationship but also gain new insights in social media use type in a causal fashion.

Impact of Present-Day Extraversion on Loneliness

Extraversion, commonly characterized as enjoying the company of others, plays a significant role in determining loneliness (Thomas, Orme & Kerrigan, 2019). Extraverts tend to exhibit high levels of sociability and outgoingness (Parija & Shukla, 2014). Thus, extraversion, being congruent with definitions of loneliness, emerges as the most important subcomponent of personality from the Five-Factor Model when examining the influence of personality traits on loneliness (Tang, Wang & Norman, 2013). This operational linkage between extraversion and loneliness defines a possible causal relationship between the two factors. As society progresses and social media platforms grow in number and use, extraversion will continue to be influenced through not only increased amounts of communication, but increased levels of communication frequency facilitated primarily by social media outlets due to increased acceptance and normalization (Pittman, 2017). Landmark studies have shown extraversion to be correlated with loneliness (Jones, 1981; Stokes, 1985). However, these studies have been conducted without research into the effect of the internet. Although the effect of extraversion on loneliness has been psychometrically shown through morphometric analysis of the left dorsolateral prefrontal cortex (Kong, Wei, Li, Cun, Xue, Zhang & Qiu 2014), Kong and colleagues could not ascertain the directional influence between extraversion and loneliness on brain region size. In a more recent context, research into the effect of extraversion and loneliness related to depression in an online context has yielded a significant interaction effect (Parija & Shukla, 2014). By exploring the

direct relationship between extraversion and loneliness, we can further contribute to the greater corpora of literature regarding personality traits affecting negative feelings.

Contribution

Loneliness has been proven as an emotion that can have debilitating effects on the human condition. From the extensive literature review, we can conclude three major findings: social media use impacts loneliness, active and passive social media usage patterns are different enough to warrant further study, and extroversion has an association with loneliness. By utilizing aspects of Media Synchronicity Theory (MST) and Pittman's (2017) findings on the effects of perceived intimacy and social media use we can create an operational definition of passive social media use to contextually optimize the differences between passive and active social media use for a given platform. This feeds into a study that could help benefit the general public by discovering how social media behavior and extraversion affect loneliness. From this information, social media platforms may be able to help decrease feelings of loneliness by adjusting engagement vectors, while individuals may be able to be more self-aware of their extraversion affecting their loneliness.

Hypotheses

From existing literature, we discovered multitudes of research concerning the effect of social media on loneliness. However, the existence of passive and active social media (Escobar-Viera et al., 2018; Pagani, Hofacker & Goldsmith, 2011) usage brings a different perspective on how social media influences perceptions of loneliness. To those ends, we can hypothesize that individuals actively browsing through social media will feel significantly less lonely than those passively browsing. Additionally, we can hypothesize that more extroverted individuals will feel

significantly less lonely than those who are less extroverted. Lastly, we hypothesize social media use type and extraversion will significantly simultaneously affect loneliness.

Method

Participants

Our sample consisted of 120 participants ranging from 18-22 years old from undergraduate level psychology courses at a large state institute. The sample was 10% Hispanic, Latino, or Spanish origin, 10% White/Caucasian, 10% Black/African American, 10% American Indian or Native Alaskan, 10% Asian, 10% Native Hawaiian or Other Pacific Islander, 10% Other, and 20% not reporting. Additionally, our sample was 50% male and 50% female. Participants were rewarded with course credit for participation in this study. Exclusionary policy was applied to fulfill the requirement of being able to interact with digital technology. The study was conducted in an indoor classroom.

Materials

To measure extraversion, we used the IPIP-NEO-R scale (Johnson, 2014). For loneliness, we relied on the UCLA loneliness scale (Russell, 1996). The scales produced Cronbach's Alpha values of 0.624 and 0.970, respectively, indicating universal, sufficient, internal consistency reliability. Both scales are included in Appendix B for reference. As for a differentiation between active and passive social media use, we used Instagram, a photo and video-based social media site. Rationale for Instagram is its consistency in interface and ability to have specific content be displayed. Although the researchers did not control for exact content shown, the social media feed presented to participants fell under the category of food. This was done in hopes of presenting a neutral medium that is consistent across social media posts. Additionally, Instagram

was chosen for its ubiquity and ease of interaction for our active social media variable. Users can only like and comment on posts. A sample feed is presented in Appendix A.

Variables

Our independent variables are social media use type and extraversion. To manipulate social media use type, we categorized levels of social media use types as control, passive, and active. To control social media use, the participant skipped using social media. For passive social media use, participants were instructed to scroll and view the social media posts without liking or commenting on posts. For active social media use, participants were encouraged at the start to like and comment on posts. We did not further encourage participants during the experiment or assign them a target number of interactions to prevent researcher pressure from affecting the study. As for extraversion, we asked participants to fill out the IPIP-NEO-R scale at the end of the study. Since both independent variables, extraversion and social media usage mode, were partitioned into two distinct levels and participants only experienced our manipulated variable once, the design of our study was classified using a 2 x 2 between subjects framework.

As for our dependent variable, loneliness, we directed participants to fill out a UCLA loneliness scale.

Procedure

To begin, participants were asked to fill out a consent form. Participants were also told the study would be approximately 20 minutes in length. After receiving consent, participants were assigned to either the control, passive, or active social media use groups based on their participant number (to allow for equal sizes of each level). If a participant was assigned to

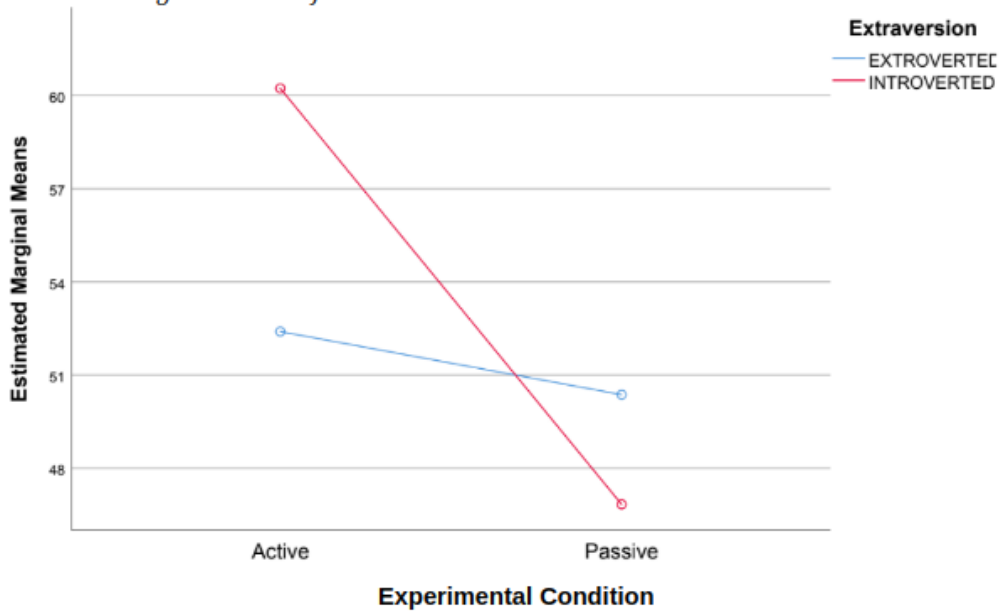
control, they skipped the social media use and proceeded straight to filling out the UCLA loneliness scale. This variable assignment indicates a quasi-experiment.

If a participant was assigned to either passive or active social media use, they proceeded to use social media in said assigned fashion for fifteen minutes. Following social media use, they filled out a UCLA loneliness scale. For all levels of social media use, to finish the study, participants were directed to fill out the IPIP-NEO-R scale to measure extraversion.

Results

Figure 1

Estimated Marginal Means of Loneliness



A 2 (Extraversion: Introverted, Extraverted) x 2 (Browsing Mode: Active, Passive) mixed-subjects factorial analysis of variance (ANOVA) was conducted in order to examine the effect of browsing mode and varying levels of extraversion on perceived loneliness. There was a significant main effect of browsing mode on loneliness, $F(1, 116) = 279.390$, $p < .001$, $\eta_p^2 = .707$, supporting our first hypothesis. Post-hoc tests using Bonferroni correction indicated that active

browsers (M=56.317, SE=0.326) felt significantly lonelier than passive browsers (M=48.600, SE=0.326). There was a significant main effect of extraversion on loneliness, $F(1, 116) = 21.688$, $p < .001$, $\eta_p^2 = .158$, supporting our second hypothesis as well. There was a significant interaction effect of social media type and extraversion affecting loneliness, $F(1, 116) = 151.550$, $p < 0.001$, $\eta_p^2 = 0.566$. Post-hoc tests using Bonferroni correction indicated that less extraverted individuals (M=53.533, SE=0.326) felt significantly less lonely than more extraverted individuals M=53.533, SE=0.326. There was a significant Browsing Mode x Extraversion, $F(1, 116) = 151.550$, $p < .001$, $\eta p2 = .566$. We examined the effects of Browsing Mode and varying degrees of Extraversion on perceived loneliness. The Cronbach's Alpha reported for the UCLA Loneliness scale was 0.624, while the IPIP-NEO-R Extraversion scale had a Cronbach's Alpha of 0.970, establishing internal validity for both scales.

Discussion

The data supports our hypotheses, and indicate the potential effect of social media browsing behavior and extraversion on loneliness. Looking into the effect of extraversion on loneliness, we see that it has a significant difference in estimated means. This significant difference can be interpreted as loneliness being dependent on levels of extraversion. This finding makes sense from a definitive standpoint, and is in-line with other literature. This same dataset also showed our primary hypotheses to be supported. Social media browsing mode does have an effect on perceived loneliness.

The most significant result that came from our research is the interaction effect of our two independent variables.

Figure 2

Estimated Marginal Means of Loneliness

Theoretical Implications

As Berryman, Ferguson, and Negy (2017) described, social media and loneliness have an impact on mental health. As well, Thomas, Orme, and Kerrigan (2019) have shown the significant role that extraversion has in determining loneliness. While our results support their claims, the interaction between both variables of social media usage type and extraversion creates a deeper understanding of each role. The association of both has little exploration (Blackwell, Leaman, Tramposch, Osborne, & Liss, 2017). Our results allow for more discovery that could lead to applicable results in our society, social media applications, and understanding of personality types in affecting loneliness.

Strengths and Limitations

College-aged students use social media more than any other adult age group (Berryman et al., 2017). For a significant amount of these young adults, using social networks has become a

near prerequisite for social interaction, and in many cases serves as a direct substitute entirely (Berryman et al., 2017). Ultimately, this results in these users being more likely to be affected by potential issues relating to social media usage (Berryman et al., 2017). As our study sample is composed entirely of college students, its results can be applied and extended to a prime demographic of these platforms for potential insight into user behavior to inform new design decisions. This also means, however, that our result generalizability is potentially limited to fewer age groups than had we used a more evenly-distributed aged sample.

An important component of the experimental design was controlling the Instagram feed content by using a pre-established account which followed only food-related accounts. The idea behind this was to provide a social-neutral content base, as to not influence our participants' feelings of loneliness. However, since eating is generally an activity done in the company of friends, this could have induced feelings of isolation. Additionally, aversions or inclinations towards certain food groups that appeared in the image feed could have skewed results.

Level of extroversion was an important distinguishing element in our study. In order to ensure that our participants were unprimed, we administered the IPIP-NEO-R Extraversion scale test after Instagram exposure. Using a median split, the extraversion score was categorized into two levels for data analysis: extravert and introvert. Segmenting an independent variable that is naturally a gradient has drawbacks, the most important of which is losing the ability to see the effects of usage type across extroversion as a scale.

Future Work

Future studies should incorporate different types of content. Text-based social media may offer different emotions compared to the image-based social media platform used, Instagram. Additionally, the forced usage of Instagram may present confounding effects. Some individuals may not use Instagram, or may not naturally feel like they should comment or like. These innate inclinations may negatively impact our study by increasing loneliness, since it may be perceived that the researchers assumed all participants already used Instagram. Furthermore, the content used were solely food-related pictures. Participants may feel ostracized by the presence of food, whether that be through dietary restrictions, or a general distaste of food. An alternative could be a longitudinal study, observing users in a more naturalistic setting, to potentially remove these confounding variables and create multiple studies with high internal validity to align and provide ecological validity.

Based on the study results, further directions into the fine-tuning of browsing mode operational definitions should be considered. Defining stricter guidelines for active browsing (such as target likes, or measuring engagement levels) can provide valuable insight into a causal relationship in the opposite direction. Perhaps loneliness drives a certain browsing mode of social media more than another browsing mode.

Conclusion

The significant results discovered in this paper present novel findings and suggest detailed paths into developing social media to combat loneliness. By designing to fit different levels of extraversion and encouraging users to use a specific type of browsing mode, social media can decrease loneliness while potentially increasing engagement metrics. This combination of benefit, both psychologically and commercially, through decreased loneliness

and increased engagement, result in a series of yet-to-be-defined tasks and policies for future iterations of social media platforms. Extraversion's impact on loneliness cannot be disregarded. Although current social media platforms present the same user experience no matter the user, providing adaptive interfaces, despite inconsistencies across users, may be the correct approach. This marriage of psychology and computing, human-computer interaction, provides more than just this conclusion that extraversion and social media browsing mode affect loneliness, it provides a front of knowledge yet to be discovered and utilized to guide better thinking and policies for creating a more empathetic and global citizenship.

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