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Social Isolation, Fear of Missing Out, and Social Media Use in Deaf and Hearing College Students

Conor Lake

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Experimental Psychology

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Abstract

This study investigated the relationships between social isolation, fear of missing out, self-esteem, and social media usage, and whether these relationships are different in deaf and hearing college students. Data were collected from 191 individuals (46 Deaf/Hard of Hearing, 145 hearing) via an online survey. Variables included number of social media accounts, time spent (in hours) on social media, number of times per day social media is accessed, FOMO, social media use, hearing status/identity, self-esteem, social isolation, and social media disorder. Correlational tests were conducted separately for hearing and for Deaf/HH participants. The groups had an unequal distribution of gender, which was evaluated via chi-square tests and determined to be statistically significant. A two-way multivariate analysis of variance (MANOVA) was conducted to investigate whether the gender or hearing identity of participants influenced the results. Gender was not significant in the distribution, but hearing identity was significant. With the exception of the number of social media accounts, the hearing identity groups did not differ on social media use. However, the DHH participants scored higher on the social media disorder scale and lower in self-esteem. Neither scale was normed for the DHH community, so these findings should be interpreted with caution. There was not a relationship between social media use and FOMO in Deaf/HH participants but a relationship between FOMO and number of accounts and hours per day was seen in the hearing group. Overall, the quantity of social media use was not correlated with social isolation, self-esteem, or FOMO, with two exceptions (number of accounts and hours per day in hearing). There was a relationship between social media use and social media disorder, which was expected. These results indicated that how individuals interact with social media might be more meaningful to examine than how frequently they use it.

Social Isolation, Fear of Missing Out, and Social Media Use in Deaf and Hearing College Students

Social isolation is described as the deprivation of social connectedness. It has been characterized by inadequacy in the quality and quantity of social relations with others in various settings as well as the experience of an individual being kept apart from others (Zavaleta, Samuel, & Mills, 2017; Riva & Eck, 2016). Human interactions take place at various levels: individual, group, community, and the larger social environment (Zavaleta, Samuel, & Mills, 2017). Social isolation draws concern to the quantity of social relations (number of friends or the frequency of interactions with others) and their quality (whether or not they satisfy the individual's social standards). Lacking social connectedness often leads to an increased desire to belong. Individuals' experience of being excluded suggests that they are being relationally devalued by another individual, group, or community (Richman & Leary, 2009).

Social media has become an alternative social setting for many people to connect to family and friends. In today's society we are constantly exposed to a variety of social media platforms such as Facebook, Twitter, YouTube, and Tumblr. Billions of social media accounts are being utilized every day. Although social media platforms provide a beneficial method of connecting with peers, it also can create and expose users to negative experiences such as cyberbullying, poor academic performance, addiction, depression, and social exclusion. Deaf college students frequently face separation and alienation from both deaf and hearing peers because of communication abilities and/or preferences as well as being stereotyped (Kersting, 1997). These experiences often occur during orientation and the first year of college.

The current study examined the effects of social isolation, FOMO, and social media use in deaf and hearing college students. Correlational tests among hearing groups were conducted to

examine the relationships between social media use variables, social isolation, acculturation (only for deaf and hard of hearing students), self-esteem, FOMO, and social media disorder. Out of these correlations, relationships were identified and interpretations were made among deaf and hearing groups.

Social Isolation and the Need to Belong

Human beings have a need to be connected in stable relationships, and a large proportion of one's thoughts, feelings, and actions often aims to satisfy this need (Baumeister & Leary, 1995). Belonging to a group helps individuals to feel accepted and achieve a sense of stability. The need to belong includes the need for positive and pleasant social contact with other individuals who are familiar to the person. Social media interactions and experiences may be a source of motivation for individuals to combat experiences and feelings of social isolation. Additionally, social media may make it easier for individuals to find and fulfill the need to belong.

The Belongingness Hypothesis (Baumeister & Leary, 1995) assumes that the majority of individuals' actions in their everyday lives serve a purpose to fulfill the need to belong. This hypothesis states that human beings have a drive to form and maintain a minimum quantity of lasting, positive, and significant interpersonal relationships. Two criteria need to be met to satisfy belongingness: 1) frequent, affectively pleasant interactions with a few other people, which 2) take place in the context of a temporally stable and enduring framework of affective concern for each other's welfare. When the criteria are met, the need to belong is satisfied. It is predicted under this hypothesis that because the need to belong is important, individuals will resist dissolution of social bonds (Watt & Badger, 2009). Social media interactions might assist individuals in satisfying the conditions by easing the difficulties of connecting with friends and

family members. Social media interactions may differ from in-person in respect to the ways individuals attempt to have frequent and pleasant interactions with a few people. On social media, there are features that allow individuals to pick and choose the content of specific peers to be visible more than others. Individuals may utilize this feature to have pleasant interactions as well as keep tabs on those who would have mutual concern. There is no feature similar to this in regard to in-person interactions, individuals may limit their friend group and focus on those that provide frequent and pleasant interactions as well as mutual concern.

Social isolation is a threat to individuals' satisfaction with their relationships and life that can include self-imposed isolation, i.e., separating oneself from others voluntarily. The frequency of social isolation differs among age groups. Child & Lawton (2019) investigated loneliness and social isolation among young adults and late middle-age adults. Young adults (21-30 years old) report twice as many days spent isolated (2.04 days versus 1.08 days) than late middle-age adults (50-70 years old), despite having larger social networks.

Social exclusion. Social exclusion is a type of social isolation that includes two categories of behavior: rejection and ostracism. Rejection is characterized by direct negative attention toward a person indicating they are not wanted (Riva & Eck, 2016). This direct negative attention can include actions such as dehumanizing language, discrimination, and macroaggressions (Riva & Eck, 2016). Ostracism is characterized by the experience of being ignored in some capacity. Ostracizing actions include avoidant eye gaze, withholding information, language exclusion, and uncomfortable silence (Riva & Eck, 2016). Social exclusion, whether one is rejected or ostracized, can be a threat to a person's sense of social connectedness. When excluded, people are deprived of belongingness and will seek to fulfill that

need in order to relieve the discomfort of being excluded (Maner, DeWall, Baumeister, & Schaller, 2007).

Individuals may experience negative physical and psychological consequences when their social connectedness is threatened via exclusion (MacDonald & Jensen-Campbell, 2011). Individuals associate social rejection with having one's feelings hurt and feelings of anxiety and hostility (Leary et al., 1998). Social exclusion often causes an immediate reaction of numbness, including a loss of sensitivity to physical pain and a lack of emotion (Baumeister, Brewer, Tice, & Twenge, 2007). In one study, socially excluded college undergraduate students demonstrated reduced intellectual performance on tasks like IQ tests and reading comprehension (Baumeister, Twenge, & Nuss, 2002).

Experiences of social exclusion can have negative psychological influences such as decreased self-regulation, increased aggression, and retaliatory behaviors. Self-regulation is an important executive function that facilitates one's social life. Baumeister, DeWall, Ciarocco, and Twenge (2005) demonstrated that social exclusion could impair self-regulation. For example, excluded individuals were less likely to engage in healthy eating and drinking behaviors compared to their accepted peers. Social exclusion also could impact individuals' academic performance through behaviors such as impulsivity, reduced persistence, impaired attention, and having less success in making oneself do something they experience as unpleasant.

When ostracized, individuals report lower levels of belonging. Filipkowski & Smyth (2012) conducted two studies into in-person and online ostracism. In the first study they investigated how people would anticipate their psychological outcomes, such as their moods and self-feelings (an awareness of the physiological state of their bodies), when reacting to ostracism (Grossi et al., 2014). In the second study they investigated participants' experiences of both

online and offline ostracism. They questioned whether ostracism would lead to lower anticipated positive affect, self-esteem, self-feeling (i.e., awareness of physiological discomfort during interactions), and higher anticipated negative affect. Additionally, they investigated whether participants' psychological outcomes varied according to the ostracism condition.

Two hundred and seventy-six participants were recruited and assigned to read vignettes describing in-person or online ostracism. Participants completed measures of their mood, self-esteem, self-feeling, as well as extraversion, interaction anxiousness, inclusion and belonging, and self-worth. The first study found that participants generally expected unpleasant outcomes when being ignored. Participants reported expecting and feeling more negativity when excluded in-person than in an online chat room setting. In the second study, 77 subjects reacted to ostracism in social experiences when randomly assigned either to an online or in-person condition, with no hypothetical vignettes. The second study focused on interactions in-person and in a chat-room with confederates who would interact based on a script. Overall ostracism method, in both conditions, predicted an increase in negative affect. A greater increase of negative affect was found for in-person exclusion. They found that both ostracism conditions, online and in-person, resulted in reports of low inclusion, high exclusion, and a decrease in both positive and negative affect. These results demonstrate that online interactions can have similar effects to those experienced with in-person interactions.

Social isolation occurs because of the inadequacy of interactions they have with peers. Young adults are more likely to report more days a week spent socially isolated than late middle-age adults, despite having a larger network of peers. This may be due to the environments and experiences young adults are going through during that period of their lifetime. Social media can impact individuals' perception and feelings of social isolation. With more frequent visits to

social media sites, there is an increase in perceived social isolation. Online interactions through social media can have the same effects as interactions experienced in person interactions. Attention should be turned to young adults and college students, especially in the current climate of COVID-19, which may turn young adults to social media more often to alleviate the feelings of social isolation.

Social Media

Social media is defined as a group of internet-based applications that allow the creation and exchange of user-generated content (Kaplan & Haenlein, 2010). Social media empowers sharing and access to cooperation towards a common goal or creating and maintaining new friendships or relations (Jue, Marr, & Kassotakis, 2010). People commonly use social media to share information, post personal content such as videos and photos, keep up with current events, and keep in touch with family, friends, and partners. Social media is easily accessible via apps on smartphones and on the web on a desktop computer or laptop. One could participate in many social media platforms, such as Facebook, Twitter, Instagram, Snapchat, Tumblr, Reddit, LinkedIn, YouTube, and others (See Appendix C for a list of commonly used platforms and their descriptions).

Over time, the landscape of social media has evolved in regard to the individuals' diversity of social media usage, i.e., utilizing a number of different available platforms and motivations behind each platform use. In 2018, Facebook and YouTube were the two most utilized social media platforms available. Young adults (18-24 years old) in the United States stand out among other age groups for utilizing a wide variety of social media platforms. The Pew Research Center identified that 78% of individuals in this age range utilize Snapchat, the majority of whom visit the platform several times a day, and 94% use YouTube (Smith &

Anderson, 2018). About two-thirds of U.S. adults (68%) now are Facebook users. It also noted a significant increase in U.S. adults who are Instagram users (35%), up seven percent from a reported 28% in 2016 (Greenwood, Perrin, & Duggan, 2016). Pinterest, the idea sharing and "pinning" site, is more popular among women (41%) than men (16%).

Social media and mental health. Research on social media use has examined its relationship to a variety of issues such as anxiety, depression, self-esteem, isolation, and the fear of missing out (FOMO). Advocates, policymakers, doctors, and parents of adolescents and young adults have voiced concerns over whether utilizing social media platforms could negatively impact one's mental health. Negative consequences include risk behavior participation, cyberbullying, and a multitude of health problems (e.g., sleep disturbance and internet addiction). Social media use seems to be related to limited self-regulation and increased susceptibility to peer pressure (American College of Obstetricians and Gynecologists' Committee on Adolescent Health Care, 2016). Such concerns have led to research focusing on the effects of social media on mental health.

Social media use has been associated with anxiety and depression symptoms among young adults in the U.S. Primack et al. (2017) investigated the relationship between utilizing multiple social media platforms and reported anxiety and depression symptoms by surveying a nationally representative sample of 1,787 U.S. adults between the ages of 19-32. Anxiety was assessed by utilizing a four-item scale developed by the Patient-Reported Outcomes Measurement Information System (PROMIS). The four items asked participants about how frequently they had experienced anxious symptoms in the last seven days. Depression was assessed by utilizing another four-item scale developed by the PROMIS. This scale asked participants about how frequently they experienced feelings of being hopeless, worthless,

helpless, or depressed in the last seven days. The items on both scales were scored on a five-point Likert scale ranging from 1"Never" to 5 "Always." Primack examined frequency of visits and minutes spent per day by dividing the data into four quartiles (0-30, 31-60, 61-120, and more than 120 minutes). Additionally, they separated the data regarding perceived social isolation into three categories: low, medium, and high. The use of multiple social media platforms was assessed by utilizing the Pew Internet Research Scale. Results indicated that increased use of social media is associated with higher reported levels of anxiety and depression symptoms. Those who used 7-11 platforms had three times the odds of reporting high levels of depressive symptoms compared to those that used 0-2 platforms. Additionally, those who used 7-11 platforms had more than three times the odds of reporting high levels of anxiety symptoms.

The increased reported levels of anxiety and depression symptoms related to the use of multiple social media platforms may have several explanations. One possibility is that individuals' participation in multiple social media platforms may lead to multitasking between platforms, which is related to poor cognitive and mental health outcomes (Becker, Alzahabi, & Hopwood, 2013; Chen & Yan, 2016; Kiisel, 2012; Litsa, 2014; Ophir et al., 2009; Richards et al., 2015). Another possible reason for the increase in anxiety and depressive symptoms while utilizing multiple platforms could be due to the need to manage the unwritten rules of each platform. Each social media platform has its own set of unwritten rules and cultural assumptions that users learn over time in order to utilize the platform to the fullest. Consistently ensuring the expectations and assumptions related to each platform are met could lead to depression and anxiety symptoms.

The discussion thus far has focused on the relation of social media and anxiety/depression symptoms in general but few research have focused on rumination, which is a

characteristic of depression. Feinstein et al. (2013) investigated the role of rumination in the relationship between negative social comparison on Facebook and depressive symptoms. They predicted that negative social comparison on Facebook would be associated with increases in rumination, which would increase depressive symptoms. Subjects in this study were 268 undergraduate students who completed an online survey and a follow-up survey three weeks after initial participation. Utilizing a path analysis, the investigators found a link between Facebook use and depressive symptoms, leading to concerns of "Facebook Depression." Social comparison on Facebook, rumination, and depressive symptoms were all positively and significantly associated with each other. Results were consistent with the claim that negatively comparing oneself to others put individuals at risk for rumination, in turn leading to depressive symptoms.

The majority of studies looking at social media and mental health have focused on negative outcomes (depression and rumination) instead of positive outcomes (authenticity and life satisfaction). To evaluate the association of social media use with positive outcomes, Reinecke & Trepte (2014) conducted a two-wave, 6-month longitudinal study investigating authenticity and well-being on social networking sites. Reinecke and Trepte had several hypotheses focused on authenticity, satisfaction with life, positive and negative affect, and participants' experience of these variables and their effects over time. The general prediction was that reciprocal effects would be seen between authenticity and well-being. Participants in the study were 374 individuals recruited via Facebook and StudiVZ, the two most popular social media platforms in Germany. The first wave was an online survey completed by 566 participants in October 2010. Six months later, 457 participants completed the second wave using the same online survey as the first wave. Participants were directed to create a unique identifier code using

a formula that would allow them to remember the code the second time they took the survey. Only the 374 participants who had matching identifier codes in both waves were included in the analysis. Results indicated that positive affect had significantly positive effects over time. Reinecke & Trepte concluded that both positive and negative experiences on social media were authentic. Negative affect and low levels of well-being were associated with decreased authenticity. Additionally, they concluded that authenticity on social media has a positive effect on individuals' well-being.

Richards et al. (2015) reviewed previous research on the impact of social media on the health of children and young people. One of the few topics they focused on was self-esteem and well-being. They noted that more recent studies have stressed the importance of the relationship between social media and self-esteem and well-being (Gonzales & Hancock, 2011; Gross, Juvonen, & Gable, 2002; Valkenburg, Peter, & Schouten, 2006). Gonzales & Hancock found that self-esteem was highest when students viewed or updated their social media profiles. They note that this is contributed by the students selecting the best photo for their profiles. Valkenburg, Peter, & Schouten recruited 881 young people in a Dutch study. They found that positive feedback on the social media site utilized enhanced self-esteem and well-being while negative feedback did the opposite. Tazghini & Siedlecki (2013) investigated online behavior and self-esteem in college students. They found that students with low self-esteem were more likely to 'untag' photos of themselves that they found unattractive and be more likely to accept friend requests from individuals they do not know well. Additionally, Schwartz (2010) investigated narcissism, self-esteem, and loneliness among college students. They found that the more time students spent on Facebook, the lower their self-esteem would be. They noted that self-esteem was negatively correlated with the frequency of status updates, Facebook intensity,

and update intensity, on Facebook. Schwartz suggests that having the feature of Facebook status updates provides more meaning to subjects' lives and lowers their self-esteem.

Social isolation and social media. The Belongingness Hypothesis may manifest on social media. Individuals may observe how their friends online present themselves and conform to avoid the dissolution of bonds, or in other words, being unfriended. However, it is possible that not every individual reacts this way on social media compared to in-person socialization. Individuals experiencing social isolation and/or social exclusion may turn to social media platforms (e.g. Facebook, Twitter, Instagram, Snapchat, etc.) as an outlet to escape their feelings of isolation. However, exclusion can also occur online on various platforms. Primack et al. (2017) investigated individuals' social media exposure and usage and how it influences their feelings of social isolation. The investigators utilized a sampling frame for the recruitment of their participants that represented 97% of the U.S. population. Participants were a nationally representative sample of 1,787 adults between the ages of 19-32 recruited from October-November of 2014. The investigators assessed social media use by asking subjects to estimate their time spent and frequency on eleven social media sites: Facebook, Twitter, Google+, YouTube, LinkedIn, Instagram, Pinterest, Tumblr, Vine, Snapchat, and Reddit. Differences in the usages (scrolling, posting, liking, among other activities) across platforms were not investigated, instead, the investigators were interested in the total amount of time spent on social media sites and the number of different platforms used. Logistic regression was utilized to assess associations between social media use and social isolation while several covariates, such as age, sex, relationship status, and educational level, were controlled.

Participants who visited any combination of social media platforms more than 58 times per week had triple the odds of increased social isolation (OR =3.4, 95% CI= 2.3, 5.0) in

comparison to those who visited social media platforms fewer than nine times per week (OR= 1.8, 95% CI= 1.3, 2.6). The number of social media platforms an individual utilized was associated with symptoms of depression and anxiety (Primack et al., 2017). However, only 3% of the sample reported using all eleven social media platforms investigated. The authors concluded that subjects who utilized social media platforms frequently and for longer duration seem to feel more socially isolated than their counterparts who utilize social media less.

In a follow-up study, Primack and colleagues investigated the relationship between positive and negative experiences and perceived social isolation on social media (Primack et al., 2019). They conducted a cross-sectional study of 1178 subjects between 18-30 years of age, assessing their social media use and perceived social isolation. All subjects were registered undergraduate and graduate students in August 2016. The age groups were broken down into four groups (18, 19-20, 21-24, and 25-30). Participants' perceived social isolation was assessed using the Patient-Reported Outcomes Measurement Information System (PROMIS), a four-item scale. Positive and negative experiences on social media were assessed by asking participants to estimate the percentage of their social media experiences that were positive or negative. Multivariable logistic regression was utilized to assess the association of reports of positive and negative experiences on social media with perceived social isolation. Negative experiences on social media were associated with higher feelings of social isolation, which were not reduced by positive experiences on social media. This finding is consistent with the negativity bias concept, where individuals tend to give greater weight to negative experiences than positive experiences (Rozin & Royzman, 2001).

Fear of isolation. Social media can be utilized as a way to prevent isolation. Lee and Cho (2018) investigated whether Facebook use driven by fear of social isolation affects users'

perception of the social support they have. Three hundred and sixteen current Facebook users were recruited via email invitation to participate in an online survey containing items regarding fear of isolation, other-directed vs. inner-directed self-presentation, social comparison, and perceived social support. Self-presentation is how individuals attempt to present themselves online. Other-directed self-presentation is how individuals present themselves with influence of external events and/or trends to gain social approval, for example, when individuals criticize others because their peers are doing so to the same group. Inner-directed self-presentation is how individuals present themselves based on standards they were raised to believe in, for example, when individuals speak their minds and are not restrained by the reaction of the public. A moderated mediation analysis was performed using the PROCESS macro, a computational tool used for process modeling and analysis, to examine variables (Hayes, 2012). Moderated mediation analysis was a method used to analyze four or more variables in a mediated relationship between fear of isolation (IV) and perceived social support (DV). In this study, the mediating variables were social comparison, inner-directed self-presentation, and other-directed self-presentation. Facebook use was the moderator between the mediators and perceived social support.

It was found that the higher the fear of isolation, the more likely participants monitored their friends' activities online for self-evaluation, regulated their self-presentation, and withheld their true self. Social comparison negatively predicted perceived social support, but only for heavy Facebook users. No effects were found for moderate and light Facebook users. Inner-directed self-presentation positively predicted social support, but only for those with moderate or high levels of Facebook use. Other-directed self-presentation had no significant association with perceived social support. The fear of isolation had a negative indirect effect via social

comparison on perceived social support among heavy Facebook users. Results suggest that those fearful of social isolation were more likely to monitor peers for social comparison and suppress their true self online to appear likeable. As they spend more time on Facebook, their sense of social connectedness with peers is weakened. This study has some parallels with Reinecke & Trepte (2014) as they both discuss authenticity or true self. While Lee & Cho did not explicitly state authenticity, true self is assumed to be similar. Suppression of one's true self due to monitoring their friends' activities on social media to appear likeable is similar to having negative affect which led to decreased authenticity online.

Self-esteem and social media. Self-esteem refers to an individual's subjective evaluation of their worth as a person (Orth & Robins, 2014). Social media can have an impact on self-esteem depending on the type of feedback one gets on the platforms they use. A majority of social media platforms available in the app market have utilized "likes" or "up-votes" as a main feature of their platform. Feedback on social media can provide a boost or a blow to one's self-esteem. Gonzales & Hancock (2011) investigated how self-awareness and self-presentation (through posts and engagement) influences self-esteem. Results suggested that once individuals were aware of how they present themselves online, self-esteem increased. For example, participants who viewed their Facebook profile after updating it reported greater self-esteem.

Self-presentation and receiving feedback online with likes, specifically on photographs of oneself, can lead to an impact on self-esteem. Burrow & Rainone (2017) investigated the relationship between positive social media feedback, in "likes", and self-esteem. They conducted two studies, testing the idea that individuals' responses to positive social media feedback depends on their sense of purpose, which is thought to be a source of prosocial motivation that would lessen one's sensitivity to social media feedback. The first study focused on self-esteem

increasing as a function of the number of likes an individual receives on their personal photographs posted on Facebook. Respondents (n= 246) between the ages of 18 and 69 completed an online survey. The survey included measures of purpose in life and self-esteem. Facebook information was not directly measured but reported by the respondents. Participants were asked to report the total number of friends in their network, how many likes their current profile picture has, and the average number of likes their profile pictures tend to receive. Results supported the prediction that, at lower levels of purpose, the number of likes individuals received on a personal photo posted on Facebook were strongly and positively associated with levels of self-esteem (Burrow & Rainone, 2017). Individuals with high purpose already had high self-esteem, so the number of likes was not associated with increased self-esteem, likely due to a ceiling effect.

The second study focused on addressing limitations of the first study, such as bias due to the dependence on memory recall, which can be inaccurate. The second study also focused on self-esteem and purpose in life. This time the study was experimental in nature, with the manipulated variable being the number of likes participants received on their personal photographs posted to a test social media site. One hundred and two participants, mostly female, were recruited for the second study. Participants in the second study were told they would be testing a new social media site and had to create a profile including a personal photograph. The results of the second study were consistent with the first, suggesting that receiving a high number of likes reliably predicted higher self-esteem (Burrow & Rainone, 2017). Individuals who had a stronger sense of purpose did not have affected self-esteem when their social value was assessed via likes on social media. The results of both studies found that individuals' perceptions of themselves and their values depend on others' responses, even on social media sites, unless they

had high self-esteem. This study demonstrated that self-esteem can be impacted by experiences on social media.

In the world of social media, the use of a wide variety of social media platforms have created different potential outcomes for users. Past research has focused on the negative outcomes of social media, while few have focused on positive outcomes. People who utilize social media more frequently and for longer durations seem to feel more socially isolated than those that use social media less. When utilizing social media, people may become more self-aware, especially of how they present themselves online. Individuals who are more aware of how they present themselves online had higher self-esteem. Additionally, the kind of feedback one receives on social media sites can impact self-esteem. When one receives more positive feedback, their self-esteem increases. Individuals' perceptions of themselves depend on the feedback of others, which can occur with in-person or online interactions with others. Self-esteem can be impacted by the experiences on social media, both positively and negatively. Young adults, especially college students, may be a vulnerable population to be affected by social media. College students, more specifically freshmen, are introduced into a new environment and may experience social isolation and FOMO. They may turn to social media to search for positive feedback in order to alleviate their negative experiences and feelings.

Fear of Missing Out (FOMO)

Being exposed to content published on social media platforms, such as photos, status updates, and videos may lead to individuals feeling they are missing out on valuable experiences. This particular feeling is colloquially referred to as "FOMO," or "fear of missing out." The fear of missing out is defined as an apprehension of being absent from other individuals' rewarding experiences (Przybylski, Murayama, DeHaan, & Gladwell, 2013). Social media may induce the

fear of missing out (FOMO) among those exposed to certain content posted by peers. Social media platforms amplify exposure to others' experiences, extending FOMO experiences to more individuals. Depression and anxiety has been at the center of several FOMO studies.

FOMO has not been examined as a sole issue in social media. Instead, it has been investigated in relation to variables such as quality of life, negative affect, social engagement, and problematic internet and smartphone use. Elhai et al. (2018) conducted a correlational study examining the relationship between these variables and FOMO. Participants completed an online survey consisting of several scales. It was found that FOMO was related to the demographic characteristics of the 296 participants from a large Midwestern university's psychology department. Women had higher FOMO scores than men. Individuals who identify as white had higher FOMO scores than racial or ethnic minorities. In addition, those in non-cohabiting relationships had higher FOMO scores than those in cohabiting relationships. FOMO was found to be related to all measures of negative affectivity, social use of smartphones, and problematic smartphone use. The results of this study suggested that negative affect is the biggest mediator in which FOMO will lead to problematic smartphone use.

Social media use can have a negative psychological impact on individuals, especially adolescents. Oberst, Wegmann, Stodt, Brand, & Chamarro (2016) conducted a correlational study, examining the negative consequences of heavy social media use in adolescents and how FOMO plays a role. They recruited 1,468 social media using adolescents between the ages of 16-18 years old in Spanish speaking countries via an online survey. They found that individuals with low psychological need satisfaction had a higher risk of experiencing FOMO. Oberst et al. (2016) also revealed that the psychopathological symptoms of anxiety and depression in females were significant predictors of negative consequences of social media use. It is noted that during

the period of adolescence, there is an increase in depression prevalence in females independent of social media use (Derdikman-Eiron et al., 2012; Salmela-Aro et al., 2017). The authors suggest that in males, depression showed no effects on negative consequences and is not mediated by FOMO and social network intensity. The findings overall suggest that higher psychopathological symptoms trigger higher social media engagement. It is important to note that this particular study took place in Spanish-speaking countries in Latin America and with a sample of adolescents, which will not be the age range focus for the present study. The results of this particular study can be utilized as a starting point for using the FOMO scale in investigating problematic social networking sites and contribute to the discussion of how social media can be addictive.

FOMO and the college experience. FOMO seems to be a common experience, frequently mentioned in the media and popular culture. Individuals currently in a transition moment in their life may experience FOMO. Milyavskaya, Saffran, Hope, and Koestner (2018) investigated FOMO and its prevalence, dynamics, and consequences in college freshmen in Ottawa, Canada. Experience sampling in the first study was utilized to assess FOMO among college freshmen. Experience sampling is a self-reporting methodology in which researchers collect information about individuals' experiences in various topics by asking basic questions. They aimed to determine how frequently FOMO is experienced as well as when. Milyavskaya and colleagues expected FOMO to be more frequently experienced on weekends than on weekdays, and later in the day compared to early in the day during more common leisure times. Data was collected through an online survey and nightly diary entries. Milyavskaya and colleagues recruited 159 college freshmen who had smartphones for this study. The results found the opposite of their expectations. Participants experienced FOMO frequently and later in the day

and week, more specifically while doing a necessary task such as studying for a test or working. Additionally, they found that more frequent experiences of FOMO was associated with an increased negative affect, more stress, fatigue, sleep issues, and physical symptoms. As predicted, FOMO was found to be higher later in the day, especially on Thursdays, Fridays, and Saturdays which are all peak social days and times.

A second experimental study was done to investigate FOMO and distinguish it from general self-regulation and explore links with social media. Three hundred and four American adults were recruited through Amazon Mechanical Turk to complete a survey. It was hypothesized that people can experience FOMO even when engaged in a focal activity. It was also hypothesized that FOMO was equally likely to be experienced with and without the use of social media. Participants read nine possible scenarios and asked to rate how they would have felt in that situation. The different scenarios included an alternate activity (party, watching tv, or party with social media) and a planned activity (assignment, reading, or seeing a friend). All responses were rated on a five-point Likert scale ranging from 1 (Not at All) to 5 (Extremely). Experiences of FOMO were assessed using one item ("How strongly would you feel that you were missing out on the second option?"). Distraction and focus on the current activity were assessed as well using two items. Regret was measured using one item. Frequency of FOMO was also assessed with a single question ("How often do you experience FOMO?") with answer choices: Never, less than once a month, once a month, 2-3 times a month, once a week, 2-3 times a week, daily). Intensity was also assessed ("When you do experience FOMO, how intense is it?") and recorded on a seven-point Likert scale ranging from *Not at all* to *Extremely*.

Results supported the hypothesis that FOMO experienced with social media was the same as FOMO experienced through direct social contact. Individuals experience FOMO no matter

where they are or how they learn about the alternate activity. No difference was found between two solitary activities, which demonstrated that when an individual is alone, equivalent FOMO is experienced during both required and volitional activities. For example, FOMO can be equally experienced in required activities, such as homework, and an intentional activity, such as painting for enjoyment. This finding suggests that FOMO is not only experienced when self-control is applied to a required activity at the expense of a more interesting activity but also highly experienced when an alternative activity is social. FOMO is experienced less when participating in an activity with another person. Participants who reported they would experience FOMO in an imagined situation also reported less positive affect and more negative affect. More distraction, less focus on the current activity, and increased regret were also reported. FOMO can intrude on individuals' experiences of in-the-moment activities and experiences. However, everyone experiences and chooses to respond to FOMO differently. Some individuals may choose the best option of an activity while others choose an activity that is "good enough." Those that maximize the best option are more likely to engage in social comparison and susceptible to regret for not selecting the alternate activity (Schwartz et al., 2002). These individuals may be most affected by FOMO experiences.

The results of past research on social isolation, social media use, self-esteem, and FOMO have established several key findings. Social media experiences can influence feelings of social isolation and increase self-esteem depending on feedback and when individuals are aware of how they are presented online. Experiencing FOMO online is the same as direct social contact and occurs frequently and later in the day during necessary tasks. Most of the past research has focused on the negative psychopathological outcomes of utilizing social media. The current study also will examine social media in relation to positive correlates, such as self-esteem. None

of the studies reviewed accounted for individuals with disabilities such as the Deaf and hard of hearing population. Including this population will provide more insight into how social media impacts this population specifically. It will additionally open opportunities for discourse on the advantages and disadvantages of social media use.

Social Isolation and Social Media in the Deaf and Hard of Hearing Population

The majority of the research into social media and its influence on individuals' everyday lives has been focused on the hearing population. The Deaf and Hard of Hearing (DHH) community is rarely included in studies focusing on social isolation, social media platforms, and how it influences individuals as well as a community as a whole. The Annual Disability Statistics Compendium from the Institute on Disability at University of New Hampshire reported that 11.4 million individuals living in the United States have a hearing disability as of 2016 (Institute on Disability, 2017). Individuals in the DHH community may rely more on technology and social media sites to connect with the rest of the world than their hearing counterparts. A limited body of research has investigated DHH users' online activity and experiences.

DHH children and online friendships. DHH children face several challenges in forming friendships. Misunderstanding their peers and the impatience of their hearing counterparts are two of the biggest issues that DHH adolescents face while forming friendships. Blom and colleagues (2014) conducted a questionnaire-based study examining the frequencies and motivations of engagement in online activities (such as updating profiles, posting status updates, browsing friends' profiles, etc.) and social exchanges, both in person and online, of DHH and hearing students in both the Netherlands and the United States. The quality of online and offline friendships and its relation to the adolescents' well-being were also examined. Participants were 113 DHH and 109 hearing students from the Netherlands and the United States between the ages

of 18 and 25. Participants were asked to take a questionnaire about their online activities, friendship qualities, and well-being. Results found that the DHH students' friendship qualities and well-being were similar to those of their hearing peers. The quality of friendships that were a mix of online and offline were positively related to individuals' well-being. These mixed friendships were proposed to be the most important type of friendship for both DHH and hearing individuals (Blom et al., 2014). The motivation behind utilizing social media was slightly different among students in the two countries. American students, both DHH and hearing, were more likely than their Dutch counterparts to be motivated to use social media because their friends are online. Additionally, American students also were more likely to use social media to voice their opinion on various topics (Blom et al., 2014). More Dutch students reported having a profile to read private entries or leave comments on their peers' profiles.

Internet use for DHH community. Choudhury, Dinger, and Fichera (2017) conducted a study investigating social media use in the DHH community, especially focusing on hearing aid users. The purpose of the study was to analyze the participation of individuals in the DHH community who utilize hearing aids, by searching for "hearing aid" content and information posted on social media platforms. A systematic survey of online hearing aid user related searches was conducted to investigate social media usage. Four social media platforms (Facebook pages, Facebook groups, Twitter, and YouTube) and two social media websites were chosen for this study. The two social media websites included in the study were hearing aid forums and blogs. Twitter had the most related accounts with 174 accounts. All accounts combined had more than 113,000 followers and 254,681 published tweets (Choudhury, Dinger, & Fichera, 2017).

Twitter and Facebook were identified as the platforms with the strongest activity by the hearing aid community. Hearing aid users utilized social media for various purposes, but

primarily to gather information and seek advice and support. It was noted that health care support providers, physical and mental, dominated the social media landscape when hearing aid related content are at the center of focus. However, Choudhury and colleagues only focused on a few platforms/websites, which they in turn suggested for future social media research to expand more than just four platforms. Additionally, they did not compare social media activity between DHH hearing aid users and hearing populations. The authors did not explore the hearing loss of users who subscribe or follow certain pages, channels, etc. It should be considered how many users are members of the DHH as well as how many are older individuals with age-related hearing loss compared to those born deaf and whether or not this makes a difference in the research. This information is important because DHH individuals are not often utilized as target populations in social media research.

DHH college students' participation on social media. Social media has not been studied as a whole for the DHH individuals in college. Cuculick's 2014 dissertation investigated "Facebooking" among deaf college students. Two broad research questions were proposed: 1) what are the Facebook experiences of deaf college students and what do these experiences mean to them? and 2) what are the academic benefits of Facebook for deaf college students? For the purpose of the current study, the results of the first research question in Cuculick's qualitative study will be discussed as it is more relevant. Participants were 15 college students from National Technical Institute for the Deaf (NTID) at Rochester Institute of Technology (RIT) who responded to an advertisement for the study.

Participants were asked to complete Facebook daily log charts for one week, reporting how many times they logged into Facebook, how much time was spent on Facebook, what they posted, whether they interacted with other people via commenting and posting on friends' posts

and/or profiles, and other kinds of activity on Facebook. Participants were also asked to "friend" the researcher's Facebook page, established only for the purpose of reviewing participants' activities between April and May 2012. Participants were removed or "unfriended" at the conclusion of the study. A two-hour focus group was conducted to discuss deaf college students' experiences on Facebook and participants were videotaped at this focus group. Additionally, one-on-one individual interviews were also conducted for those who were unable to attend the focus group.

The study yielded intriguing results in regard to the Facebook experiences of deaf college students. Prior to sharing the collected data and results, Cuculick noted that historically, deaf individuals tend to find out information later than their hearing counterparts (Ladd, 2003; Lane, 1984; Padden & Humphries, 1988; Padden & Humphries, 2006). Out of the 15 participants, fourteen completed the Facebook daily logs. Fifty-one percent of participants reported commenting on friends' photos, followed by 47% reporting posting on friends' walls (now called profiles). When asked about the context of participants' posts on Facebook, the majority of them reported posting about themselves (8), followed by friends (6) and family (5). Most of the reported time spent on Facebook was longer than one hour per day, followed by 30 minutes. The reported time was the average of time spent per day over a period of seven days. Participants reported reading status updates the most (75) followed by reading responses to other people (49), and other people's profiles (41). In regard to writing/posting, updating statuses was not at the forefront of participants' Facebook activity. Writing private messages to someone (36) and responding to comments on one's status updates (33) were activities participants frequently participated in the most.

In conclusion, Cuculick noted that Facebook was utilized by deaf college students as a means of communicating with their peers and families, minimizing communication barriers. Deaf college students spent a significant amount of time on Facebook, according to participants' daily Facebook log chart, logging an average of 101 minutes per day, which comes out to about 707 minutes on Facebook per week (Cuculick, 2014). Cuculick noted that such findings supported prior research on hearing college students and their experiences on Facebook (Towner & Lego Munoz, 2011) where hearing participants spent between 10-60 minutes on Facebook per day. The data collected from deaf college students indicated that deaf students spent significantly more time on Facebook in comparison to their hearing comparts as found in the Towner and Lego Munoz study. Given the temporal differences in the two studies and the rapid rise of social media use during the time between the studies, these direct comparisons may not be valid.

Not only does Facebook assist deaf students as a communication tool, it also allows them to participate in their communities. Participants in the study were able to communicate with their families, college communities, and their communities outside of college. This study looked at the number of minutes according to daily log entries. The current study will shift focus from participants estimating time, in minutes to hours, spent on social media. Cuculick found that deaf students spent more time online than the students in Towner & Munoz's (2011) study, which was extended into the current study as an expected outcome. Although this study focused solely on Facebook, the current study will look at multiple platforms. Looking at more than one social media platform may provide some insight into the differences and impact on feelings of social isolation, self-esteem, and occurrences of FOMO in both the DHH and hearing communities. There is a potential bidirectional relationship between online activities and deaf culture and

identity. It is possible that deaf culture and identity can shape individuals' online activities as well as the other way around.

Deaf culture. The role of online activities and experiences that DHH individuals have over time may influence and shape their understanding and experiences of deaf culture and identity. The consideration of culture is important when examining the DHH community because the population is heterogeneous, and the acculturation may have an impact on individuals' online interactions. Individuals in the DHH community have the opportunity to embrace the culture that has been cultivated if their identity and social orientation aligns with the DHH community. Glickman (1996) developed deaf identity theory, classifying the stage of individuals' identity development. This theory models four stages of identity development: culturally hearing, marginal, immersion, and bicultural. Culturally hearing classification indicates that the individual perceives being deaf as a medical problem that must be fixed. Marginal classification indicates that the individual has trouble connecting to deaf or hearing culture. The third stage, immersion, is when one is assimilated to and enthusiastic about Deaf culture. When one is classified as bicultural, the fourth stage, they have obtained comfortable interactions within both deaf and hearing cultures. Glickman notes the importance that individuals do not have to follow the sequence of the deaf identity theory, it can be impacted immediately from birth and possibly depends on individuals' upbringings. For example, a deaf child born to deaf parents can be born into deaf culture. It is possible that individuals can go through the stages and end in one stage. For example, an individual with a marginal identity can get involved more in deaf culture. At that point, hearing culture is rejected. When it comes to holding a bicultural identity, it can further be classified into one of seven identity categories that one may experience based on their exposure to the Deaf community: balanced bicultural, deaf-dominant bicultural, hearing-

dominant bicultural, culturally isolated, culturally separate, culturally marginal, and culturally captive (Holcomb, 1997).

Individuals who are assimilated, or acculturated, to deaf or hearing culture may have their behaviors, competency, knowledge, identity, and preferences investigated to determine their acculturation among the two cultures. Maxwell-McCaw (2001) developed five domains of acculturation that must be investigated: cultural identification, cultural involvement, cultural preferences, language competence, and cultural knowledge. These five dimensions of acculturation are part of the Deaf Acculturation Scale (Maxwell-McCaw & Zea, 2011), a measure utilized to identify how acculturated one is with deaf and hearing cultures.

Very few studies have investigated acculturation and identity among college students. Weldon (2016) conducted a causal-comparative study investigating acculturation styles among deaf college students in Texas. An online survey, via SurveyMonkey, was utilized. The survey consisted of a demographic questionnaire and the Deaf Acculturation Scale, a 58-item scale that asks participants about their identity, involvement, knowledge, competencies, and participation among both deaf and hearing cultures. Participants rated items on a five-point Likert scale that ranges from 1 *(strongly disagree)* to 5 (*strongly agree).* Of the 92 participants that completed the full survey, the majority (42.4%) were found to be acculturated to deaf culture and the rest to hearing (20.7%), bicultural (27.2%), and marginal (9.8%). Weldon also hypothesized that there is a relationship between hearing status (i.e., deaf, hard of hearing, or bilingual) and acculturation style. The findings supported this hypothesis with 54.8% of deaf identified students selecting deaf acculturation and 60.7% of hard of hearing identified students selecting hearing acculturation. Additionally, those that identified as deaf also were more likely to select

bicultural. It is important to note that this particular study may not be representative of the DHH population and acculturation patterns across the United States.

Deaf identity. An individual's acculturation may be different from their deaf identity. For example, one may be acculturated to both deaf and hearing cultures while considering themselves to be one particular identity, such as culturally deaf. The DHH community has to navigate through a hearing world, finding themselves and figuring out how they identify. Sheridan (2008) notes that exploring one's deaf identity is a task that every DHH individual must complete during their adolescence. Individuals within the DHH community may have one of a variety of identities that align them with the deaf, hearing, or both communities. The Social Identity Theory (Tajfel, 1981) suggests that group relationships and social orientations are important for individual identity. If an individual with a minority status is not comfortable with a specific minority group, they will not join until they perceive the group in a positive light. This theory may be applied to deaf students in all levels of education.

Kluwin and Stinson (1993) applied this theory to deaf high school students to measure their social orientation and peer interaction. They recruited 451 high school students in mainstream to complete the Social Activity Scale. This instrument contains items in three areas: participation, relatedness, and perceived social competence. Each area has a set of questions regarding deaf peers and a set regarding hearing peers. Peer interaction was assessed within three constructs: preferred mode of communication, preferred associate, and social focus (Kluwin & Stinson, 1993). The results indicated that 29.2% of students reported that they preferred to be associated with deaf students, and 16% of students reported that they preferred to be associated with hearing students. The modal response (40.6%) was a preference to be associated with both deaf and hearing students. Additionally, 14.2% of students reported that they have few friends,

whether both deaf or hearing students (Kluwin & Stinson, 1993). Social Identity Theory plays an important role in the DHH community. Identity is formed through preferred in-person associations. When DHH individuals find their preferred associations in person, they start to develop and form a specific identity.

The importance of deaf identity has been raised but very few have investigated its effects on individuals within the DHH community. Bat-Chava (2000) conducted two studies based on the Social Identity Theory. Data were collected from 267 deaf adults through a questionnaire and an interview of a subset of the questionnaire sample. Several constructs were assessed: importance of sign, importance of speech, group identification, attitudes towards deaf people, family deafness, school deafness, and self-esteem. It was found that culturally deaf and bicultural individuals had higher self-esteem (M= 3.27, 3.24 on a 4-point scale) than culturally hearing deaf adults (M= 3.05). It is important to note that this study took place in New York City in 1994 with a sample that consisted of individuals from different regions of the United States. This may not be representative of the deaf cultural landscape today in 2020.

Deaf identity can have an impact on individuals' psychological well-being. Another study investigating the impact of deaf identity on psychological well-being was conducted by Chapman and Dammeyer (2017). Data were collected from 742 adults with hearing loss between ages 16-64 by the Danish National Centre for Social Research (Larsen, Sommer, & Bengtsson, 2014). Participants were asked to take an online survey that measured self-perceived identity and psychological well-being. Self-perceived identity was assessed with a single-item question regarding which group of people they have most in common with, focusing on the four groups within the construct of deaf identity (culturally deaf, culturally hearing, bicultural, and marginal). Individuals with a marginal identity have difficulty connecting with deaf and hearing cultures.

Psychological well-being was measured with the five-item World Health Organization Well-Being Index (WHO-5; Topp, Østergaard, Sondergaard, & Bech, 2015). The WHO-5 asks participants to rate items on a six-point Likert scale, ranging from *not present* (0) to *constantly present* (5). Results indicated that out of the four identity groups, individuals with a marginal identity (M= 46.9) scored lower in psychological well-being than the three other groups (M=65.5 for deaf, M=66.0 for hearing, and M=66.9 for bicultural). These results indicate that those identified as bicultural have the highest psychological well-being, followed by those with a deaf identity. It is important when including the DHH community in on-going and future studies that focus on mental health to investigate acculturation to see if that continues to play a role. Chapman and Dammeyer (2017) also investigated the relationship between hearing devices, such as cochlear implants, and deaf identity. Chi-square statistics were conducted to analyze the data regarding identity. Results indicated that those without a cochlear implant were significantly more likely to have a deaf identity ($X^2 = 22.58, p < .001$), while those with a cochlear implant were significantly more likely to have a hearing identity ($X^2 = 25.47, p < .001$). Deaf identity is an important component in embracing an already cultivated deaf or hearing culture and socializing with peers.

Individuals in the Deaf and hard of hearing community utilize social media as a communication and participation tool. Deaf individuals, historically, tend to find out information later than their hearing counterparts (Cuculick, 2014). Focusing on a sole platform, Facebook, revealed that DHH college students spent 707 minutes a week on social media, which was more than hearing counterparts in a 2011 study (Towner & Lego Munoz, 2011). The Deaf community has culture and individuals have their respective journeys to embracing and assimilating into deaf or hearing cultures. Individuals' journeys into deaf and/or hearing cultures can impact their

self-esteem and psychological well-being. In 1994, culturally deaf and bicultural individuals had higher self-esteem than culturally hearing deaf adults (Bat-Chava, 2000). It is important to investigate the multiple facets of deaf identity and development, especially today with the widely normalized use of social media. In 2017, it was found that those identified as bicultural had the highest psychological well-being (Chapman and Dammeyer, 2017). It is vital to investigate the role that social media may have in general well-being as well as social isolation and FOMO among individuals in the DHH and hearing communities, especially college students.

Purpose of Present Study

Social isolation is characterized as the inadequacy in an individuals' quality and quantity of social relations in various settings (Zavaleta, Samuel, & Mills, 2017; Riva & Eck, 2016). Studies have shown that when individuals frequently use social media, the more they will feel socially isolated (Primack et al., 2017). Negative experiences on social media lead to higher feelings of social isolation but positive experiences do not seem to affect feelings of social isolation (Primack et al., 2019). Self-esteem can be impacted by experiences and feedback on social media, e,g, receiving a high number of likes on their posts might boost self-esteem (Burrow & Rainone, 2017). FOMO may occur when individuals experience social isolation. Additionally, exposure to others' posts on social media may boost individuals' occurrences of FOMO. FOMO in college students has previously been investigated but primarily focused on freshmen. It was found that FOMO was frequently experienced later in the day and week, especially while doing a necessary task such as studying. Additionally, when provided with activity choices, FOMO is more likely experienced when the alternative activity is social (Milyavskaya et al., 2018). In comparing DHH and Hearing individuals and their social media usage, differences have been found in their motivations and online activities (Blom et al., 2014).

A follow up investigating social media usage differences between DHH and Hearing communities would be beneficial as there are more social media platforms in 2020 compared to 2014. The DHH community is rarely utilized as the target population in studies focusing on social isolation and/or social media. In this study, the relationship between social isolation, fear of missing out, and social media use will be investigated among deaf and hearing college students. Additionally, the association between social media use and self-esteem will be examined. This study will address the following research questions:

Research Question 1 (RQ1): What is the relationship between social isolation and social media use in DHH and hearing college students?

Research Question 2 (RQ2): What is the relationship between social media use and self-esteem in DHH and hearing college students?

Research Question 3 (RQ3): What is the relationship between hearing status/identity and social media use?

Research Question 4 (RQ4): What is the relationship between social media and the fear of missing out for DHH and hearing college students?

Method

Participants

The sample consisted of 191 undergraduate students (46 DHH, 145 hearing) from a large technological university in the Northeastern U.S. Participants ranged in age between 18 to 39 years with the mean age of 20.28 (SD = 2.545). Ninety-one participants were female (32 DHH, 59 hearing) and 100 were male (14 DHH, 86 hearing). Two hundred and seventeen subjects initially completed the survey but data of 26 subjects had to be deleted due to incomplete/unclear responses and/or failure to follow the attention check. Participants who identified as non-binary or other were removed altogether because of the small number in their group and the need to statistically analyze the role of gender on the dependent variables. The concern of attrition among DHH participants arose during the current study. The primary investigator noted an amount of DHH participants closing the survey, leaving it incomplete before or after taking the Deaf Acculturation Scale portion of the survey.

Participants were recruited in two ways. A university-provided SONA system utilized subject participation in exchange for class credit in a psychology course of their choice (for undergraduates). Students recruited through SONA would scroll through a list of potential studies to participate in, whether it may be online or in-person studies. Each study listed has a description that allows potential subjects to decide whether or not to participate. This option is typically only for students currently enrolled in a psychology course that offers SONA credit for students' participation.

Additional participants were recruited via email/paper advertisement with a provided link or QR code. Paper advertisements was utilized but the campus shut down due to COVID-19. Therefore, email advertisements were needed to be conducted. The primary investigator chose to use student email lists from each college. The primary investigator had planned to contact all 11

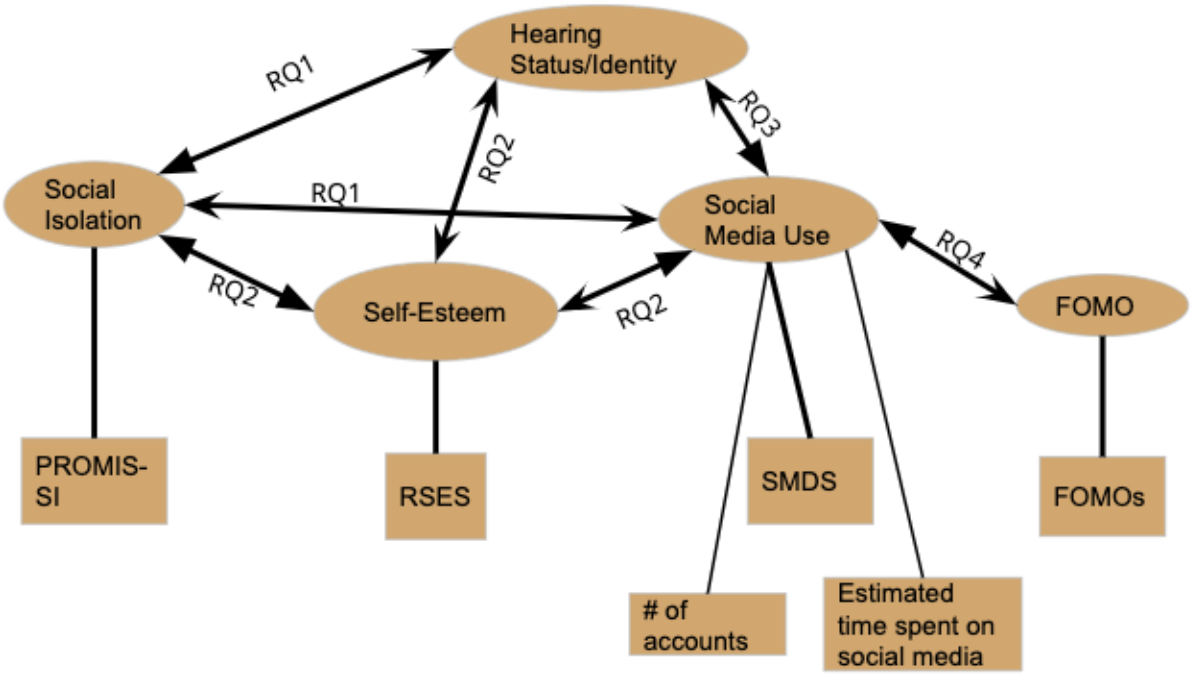
colleges on campus. Three colleges (business, college for the deaf, and computing and information sciences) were initially contacted to ask for permission to email students about the current study. The colleges for the deaf and computing and information sciences permitted email advertisement with approval of an email script. Those recruited via email advertisement were sent a mass email advertisement. On the day the email was sent to students in the computing college, the hearing sample surged and surveys were completed.

Incentives such as an entry into a drawing for a $50 gift card for Barnes and Noble or Amazon were provided for subjects who were recruited via email advertisement or who participated through the SONA system but preferred the gift card entry over SONA credit. The majority of the participants selected the raffle entry to participate in the gift card giveaway compared to receiving SONA credit (134 chose raffle entry; 57 chose SONA credit).

Design

The independent variables for this study were the participants' number of social media platform accounts, estimated time spent in hours on social media, and the hearing status/identity of participants (DHH or hearing). The dependent variables were social isolation, self-esteem, social media disorder and fear of missing out. Figure 1 below displays how the variables will connect with each other as well as which research questions will be focused on within each variable.

Figure 1. Study Design Concept Map



Materials

Participants completed an online survey, which contains a demographic questionnaire (See Appendix A), items from the Patient-Reported Outcomes Measurement Information System Social Isolation Scale (HealthMeasures PROMIS, 2017), the Fear of Missing Out Scale (Przybylski et al., 2013), the Deaf Acculturation Scale (Maxwell-McCaw & Zea, 2011), the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and the Social Media Disorder Scale (van den Eijnden et al., 2016). All scales, other than the demographic questionnaire, are located in Appendix B.

Demographic information. The demographic questionnaire included in the survey consists of questions such as participants' age, gender, hearing status, active on social media, and preferred social media platforms (e.g. Facebook, Twitter, Instagram, Snapchat, Tumblr, and Reddit) (See Appendix A).

Patient-Reported Outcomes Measurement Information System- Social Isolation Scale. The Patient-Reported Outcomes Measurement Information Systems Social Isolation Scale (PROMIS-SI) is an 8-item questionnaire focused on social isolation. Each item is rated on a 5-point scale regarding participants' perceptions of themselves in different situations (HealthMeasures PROMIS, 2017). Ratings on the items range from 1 (Never) to 5 (Always) on statements including: "I feel left out…" and "I feel that people barely know me.." The total score will indicate whether the participant is experiencing a degree of social isolation (See Appendix B). Higher scores indicate more perception of social isolation, and lower scores indicate less perception of social isolation. Scores are converted using the short-form conversion provided by PROMIS. Using the scoring tables, the raw score is converted to a scale score which also provides the standard error. This PROMIS-SI scale has been validated against other commonly used social isolation measures. The PROMIS-SI scale can be administered on a computer or on paper. Hahn et al. (2014) utilized the PROMIS Social Isolation Scale and noted that the scale demonstrated good criterion validity with a negatively moderate Pearson correlation between PROMIS-SI and Short Form-36 (SF-36) and the Functional Assessment of Cancer Therapy-General Population (FACT-GP) well-being subscale (-.30 to -.57). Hahn also noted that the PROMIS-SI also demonstrated good construct validity with the social isolation scale being higher for those participating in a study online than those completing the measures in person (effect size of 0.45). Stacciarini, Smith, Garvan, Wiens, and Cottler (2015) note that the 8-item PROMIS-SI scale demonstrated positive internal consistency and reliability using Cronbach's alpha in a study investigating mother-adolescent relationships ($\alpha = .93$ for mothers and $\alpha = .90$ for adolescents). It is important to note that the PROMIS-SI has not been normed for DHH participation.

Fear of Missing Out Scale. The Fear of Missing Out Scale (FOMOs) is obtained from Przybylski et al.'s 2013 study which focused on the motivational, emotional, and behavioral correlates of FOMO. Przybylski et al. drafted 32 items assessing FOMO for an HTML questionnaire. However, in a second study, they utilized a final 10-item version of the scale to assess for overall FOMO scores in participants (See Appendix B). Items were ranked on a 5-point scale of how much participants agreed with the statement of their general experiences, ranging from 1 (Not at all true of me) to 5 (Extremely true of me). Total scores indicate how much general experiences of FOMO participants may have experienced. Items on this scale included statements such as: "I fear others have more rewarding experiences than me" and "It bothers me when I miss an opportunity to meet up with friends." Lower overall scores indicate lower occurrences of FOMO, and higher scores indicate higher occurrences of FOMO. Dogan (2019) assessed FOMOs to be a reliable scale with an assessed Cronbach's alpha ($\alpha = .81$). Alt (2015) concluded FOMOs is a valid scale with positive intercorrelations among measured factors such as social engagement, news information engagement, and commercial information engagement ($.33 < r < .39; p < .01$). It is important to note that the FOMOs has not been normed for DHH participation.

Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale (RSES) is a 10-item scale obtained from Rosenberg's 1965 study which focused on adolescent self-image. Ten items were rated on a 4-point scale, ranging from 1 (Strongly agree) to 4 (Strongly disagree). Items in this scale include statements such as "I feel that I'm a person of worth, at least on an equal plane with others" and "I take a positive attitude toward myself." More positive responses recorded by participants indicate higher self-esteem. The RSES was found to be reliable due to internal consistency (Cronbach's α=.81; Schmitt & Allik, 2005). A study by Silber & Tippett (1965)

showed the test-retest of the RSES to be reliable (0.85). Rosenberg (1965) evaluated construct validity by assessing the negative correlations with anxiety (-.64), depression (-.54), and anomie (-.43). Sinclair et al. (2010) assessed item convergent validity and considered it to be satisfactory among the 18-25-year-old age group (r = 0.55-0.84). It must be noted that the RSES has not been normed for DHH participation.

Social Media Disorder Scale. The Social Media Disorder Scale (SMDS; van den Eijnden, Lemmens, & Valkenburg, 2016) is a 9-item scale that focuses on distinguishing between disordered or addicted and high-engaging non-addicted social media users. This scale was derived from the Internet Gaming Disorder Scale that was utilized in an online survey consisting of 3 scales which assessed social media use in adolescents. It is important to note that the DSM-5 listed the assessment of internet gaming disorder using the Internet Gaming Disorder Scale and it has also been utilized for assessing social media addiction in adolescents, which is not recognized in the DSM-V. The nine items on this scale cover different symptoms ranging from preoccupation to conflict. Participants reflect on their experiences on social media over the past year and respond yes/no if they have experienced stated occurrences. This scale typically takes 2 minutes to complete. Examples of statements provided on the scale include: “often felt bad when you could not use social media,” “regularly neglected other activities (e.g. hobbies, sports) because you wanted to use social media,” and “often used social media to escape from negative feelings?” van den Eijnden, Lemmens, and Valkenburg conceptualized IGD and SMDS as meeting five of the nine DSM-5 criteria for IGD. Higher scores on the SMDS (See Appendix B) indicate the possibility of a social media addicted user, while lower scores indicate high-engaging non-addicted social media user. Those that meet or exceed five or more of the criteria for IGD reached the diagnostic cut-off for SMDS and were categorized as a possible social

media addicted user. Those that met below five of the nine items were categorized as a high engaging non-addicted social media user. This 9-item scale demonstrated good internal consistency and test-retest reliability (Cronbach's alpha= 0.94, 0.50, $p < 0.001$). Validity was evaluated by assessing convergent and criterion validity. The 9-item scale demonstrated satisfactory convergent validity with positive correlations between compulsive internet use and self-declared social media addiction ($r > 0.50$, $r > 0.48$). Criterion validity was evidenced by significant correlations with related constructs such as depression, self-esteem, loneliness, attention deficit, impulsivity, and frequency of daily social media use (all at least $p < 0.001$). It must be noted that the SMDS has not been normed for DHH participation.

Deaf Acculturation Scale. The Deaf Acculturation Scale (DAS; Maxwell-McCaw & Zea, 2011) is a 58-item measure assessing cultural identity for DHH populations. The DAS consists of two acculturation scales: acculturation to deaf culture (DASd) and acculturation to hearing culture (DASh). There are five domains of the DAS: cultural identification, cultural involvement, cultural preferences, language competency, and cultural knowledge. These five domains are parallel among the two acculturation scales. Participants are asked to rate themselves on a five-point Likert scale ranging from 1 (*strongly disagree)* to 5 (*strongly agree)*. There are two methods of scoring the DAS. The first method is providing the separate totaled score for each acculturated scale. The totaled score is done by adding the average score from each subscale in the DASd and DASh respectively and dividing by the number of subscales. The second method of scoring consists of finding the total overall acculturation style by sorting participants into one of four categories. Participants are assigned a high/low score on both acculturation scales. In order to be assigned a high score, a score of 3 or above must be obtained. In order to be assigned a low score, a score of 2.9 or below must be obtained. The four categories

of acculturation styles are: hearing acculturated, marginal, deaf acculturated, and bicultural. The DAS was found to be reliable with Cronbach's alpha coefficient scores for the DASd subscales (α=.84-.92) and the DASh subscales (α=.71-.85). The alpha for the overall DASd and DASh scales were strong (α=.95, α=.91; Maxwell-McCaw & Zea, 2011). Construct validity was evidenced by the aligned acculturation based on participants parents' hearing status. Deaf individuals with deaf parents (M=4.35) scored higher on deaf acculturation compared to deaf individuals with hearing parents (M=3.96, t=-11.33). Additionally, deaf individuals with hearing parents (M=3.15) scored higher on hearing acculturation compared to deaf individuals with deaf parents (M=2.83, t=9.13; Maxwell-McCaw & Zea, 2011).

Procedure

All eligible participants earning class credits completed the battery online through the RIT SONA system. Non-SONA participants participated in the survey directly through Qualtrics, a survey tool, on survey.rit.edu. Once participants started the survey, they were asked to complete a demographic questionnaire. Participants then completed the scales in this specific order: PROMIS-SI, FOMOs, RSES, and SMDS. At the end of the SMDS, there was an attention check item, asking participants to check "Strongly disagree" to ensure they were not providing random responses. All measures were provided to participants in the same order. Upon completion of the survey, participants were directed to indicate whether they wanted SONA credit or entry into the giveaway. The survey took approximately 5-15 minutes to complete.

A pilot was conducted to see how long it takes for participants to complete and reported time and necessary adjustments were made. Six total participants (three DHH, three hearing) were recruited via email advertisement. Participants were current undergraduate students at RIT/NTID. Individuals in the pilot group were asked to complete the online survey and provide

feedback when finished. Feedback from pilot participants included the identification of grammar errors, they recommended one change. The time they took to complete the survey ranged from 5-12 minutes, they noted that the items were easy to read and the survey was easy to complete. Additionally, they noted one feature to include for individuals taking surveys such as holding control (for PC users) or command (for Apple users) when selecting multiple responses.

General readability of the survey items was verified by utilizing the Flesch-Kincaid scale in Microsoft Word, indicating that individuals with disabilities should be able to read the items. Utilizing the Text Readability Consensus Calculator, items from all scales were scored at the fourth-grade level, fairly easy reading level, and the age of fourth and fifth graders. The consensus calculator was utilized via readabilityformulas.com, an online tool owned by My Byline Media (Readability Formulas, n.d.). My Byline Media is a crowdfunded journalism online resource. The calculator utilized seven readability formulas to calculate overall reading difficulty, reading age, and grade level of a specific text. The seven readability formulas included: Flesch Reading Ease Formula, The Flesch-Kincaid Grade Level, The Fog Scale, The SMOG Index, The Coleman-Liau Index, The Automated Readability Index, and The Linsear Write Formula. All scales' readability were verified and adjusted for DHH reading skill levels accordingly to pilot group feedback.

Analyses

Bivariate correlational tests were conducted to examine the relationship between the number of social media accounts, number of times per day social media was accessed, time spent (in hours) on social media, social isolation, FOMO, self-esteem, and social media disorder. Hearing status/identity was used to divide the sample to compare correlations. A chi-square test was conducted to investigate the uneven gender distribution across hearing identities in the

sample. Additionally, a two-way MANOVA was used to investigate the relative influence of gender and hearing identity among the variables.

Results

The analyses focused on participants' (N = 191) responses to the scale items in the survey. Data were collected and analyzed for Hours A Day, FOMOs, RSES, SMDS, PROMIS-SI, and the DAS among hearing identity (Deaf, Hard of Hearing, and Hearing with Deaf and Hard of Hearing combined as Deaf/HH). Bivariate Pearson correlations were run to investigate the relationship between the dependent variables by hearing identity. This allowed the investigator to examine, for example, whether or not Deaf/HH individuals show a higher relationship between social isolation and social media use than their hearing counterparts. Additionally, chi-square tests and MANOVA were conducted to analyze the role of gender and hearing identity within the variables.

Descriptive Statistics

Descriptive statistics are presented in Table 1. Overall, participants reported having a mean of 4.52 social media accounts (SD = 2.639) and accessing social media a mean of 19.34 times per day (SD = 27.683) for a total mean of 3.31 hours per day (SD = 2.526) on social media. Hearing participants reported using a mean of 4.68 accounts (SD = 2.857), while Deaf/HH participants reported a mean of 4.00 accounts (SD = 1.713). Hearing participants reported a mean of 3.16 hours a day (SD = 2.632) and Deaf/HH participants reported a mean of 3.78 hours a day (SD = 2.118).

Table 1

Descriptive Statistics - Overall, Deaf/HH, & Hearing (N = 191, 46, 145)

	Mean Statistic (Overall)	Std Deviation (Overall)	Mean Statistic (Deaf/HH)	Mean Statistic (Hearing)	Std Deviation (Deaf/HH)	Std Deviation (Hearing)
# of accounts	4.52	2.639	4.00	4.68	1.713	2.857
Hours Per Day	3.31	2.526	3.78	3.16	2.118	2.632
Access Per Day	19.34	27.683	18.53	19.59	23.279	28.983
Social Media Disorder	1.77	1.886	2.80	1.44	2.339	1.592
Social Isolation	21.08	6.862	21.37	20.99	7.558	6.652
FOMO	23.86	7.490	23.46	23.99	7.716	7.440
Self-Esteem	25.89	1.942	25.28	26.08	1.870	1.931

The overall preferred platform among participants varied, with the most frequently selected platform being Snapchat (34.0%), followed by Instagram; (32.1%, see Table 2). It is important to note that 28.8% of respondents selected two or more preferred platforms (See Appendix D). However, the majority of the participants (56%) selected only one platform. For the purposes of this study, results are presented by participant endorsement of single platforms. The majority of Deaf/HH participants reported Instagram (33.7%) or Snapchat (30.4%) as their most preferred platform (see Table 2). Hearing participants also reported that Snapchat (34.9%) and Instagram (33.6%) were their most preferred platforms.

With the Social Media Disorder Scale, there was a difference in the percentage of participants in each hearing group met and/or extended beyond the diagnostic cut-off to be classified as a disordered, or addicted, social media user. Overall, 8.7% of the sample met or exceeded the diagnostic cut-off. Six hearing individuals met or exceeded the diagnostic cut-off (4.2%), and 11 individuals in the DHH group met or exceeded the diagnostic cut-off for the scale (23.8%). It is important to note that this scale has not been normed for the DHH community and therefore the scores may reflect something other than disordered social media use..

Table 2

Preferred Social Media Platform Overall & by Hearing Identity

Platform	Frequency (Overall)	Percentage (Overall)	Frequency (DHH)	Frequency (Hearing)	Percentage (DHH)	Percentage (Hearing)
Facebook	39	12.1	17	22	18.5	9.5
Twitter	29	9.0	7	19	7.6	8.2
Tumblr	10	3.1	4	6	4.3	2.6
Instagram	103	32.1	31	78	33.7	33.6
Snapchat	109	34.0	28	81	30.4	34.9
Other	31	9.6	5	26	5.4	11.2
Total	321	99.9%	92	232	99.9%	100%

A plurality of Deaf/HH participants (32.6%) reported being most comfortable sharing content on Snapchat (see Appendix E). Facebook is the platform on which they are least comfortable sharing content (52.2%; see Appendix F). Similarly, a plurality of hearing participants reported being most comfortable sharing content on Snapchat (46.9%; see Appendix E), and least comfortable sharing content on Facebook (62.1%; see Appendix F).

Deaf Acculturation Scale Results

The DAS was utilized to collect responses from Deaf/HH participants to analyze their acculturation. The DAS revealed that the modal acculturation of the Deaf/HH participants is bicultural (47.8%; see Table 3).

Table 3

Acculturation of DHH Participants

	Frequency	Percent	Cumulative Percent
Bicultural	22	47.8	75.9
Deaf Acculturated	9	19.5	87.4
Hearing Acculturated	13	28.2	92.1
Marginal	2	4.3	99.0
Total	46	100.0	100.0

The acculturation identity of Hearing Acculturated had the next highest percentage of participants (28.2%). The acculturation identity of Marginal had the lowest percentage of participants (4.3%). This particular identity means that a participant is having trouble identifying, acculturating with both deaf and hearing cultures.

Bivariate Correlations

Bivariate correlations were conducted to examine the multiple variables of social media use, social isolation (both the four-item and eight-item versions), FOMO, self-esteem, and social media disorder within hearing status groups. The correlations for the Deaf/HH group also included the DAS subscales.

In the Deaf/HH group, social isolation was not significantly correlated with any of the social media use variables. However, social isolation did have a significant correlation with FOMO ($r = .439$, $p > .001$; see Table 4). Additionally, social isolation had a negative relationship

with self-esteem ($r = -.349$, $p < .05$). FOMO had a positive correlation with social media disorder ($r = .313$, $p < .05$). Deaf/HH participants' response to how many times a day they access social media was positively correlated with how many accounts they have ($r = .323$, $p < .001$). Additionally, the hours per day spent on social media was positively correlated with how many accounts they have ($r = .368$, $p < .05$) and social media disorder ($r = .514$, $p > .01$). The DASd (deaf acculturation) was negatively correlated with DASh (hearing acculturation; $r = -.577$, $p > .01$) and with the number of hours spent on social media per day ($r = -.320$, $p < .05$).

Table 4

Bivariate Correlations for Deaf and Hard of Hearing

N = 46	# of Accounts	Hours Per Day	Access Per Day	Social Isolation	DASd	DASh	FOMO	Self-Esteem	Social Media Disorder
# of Accounts	1	.368*	.323**	.057	-.088	.058	-.074	.069	.252
Hours Per Day	.368*	1	.230	-.213	-.320*	.155	-.025	.055	.514**
Access Per Day	.323**	.230	1	-.207	-.003	.077	.033	.175	.051
Social Isolation	.057	-.213	-.207	1	.105	-.094	.439**	-.349*	.073
DASd	-.088	-.320*	-.003	.105	1	-.577**	.026	-.222	.005
DASh	.058	.155	.077	-.094	-.577**	1	.080	.182	-.158
FOMO	-.074	-.025	.033	.439**	.026	.080	1	-.362	.313*
Self-Esteem	.069	.055	.175	-.349*	-.222	.182	-.362*	1	-.188
Social Media Disorder	.252	.514**	.051	.073	.005	-.158	.313*	-.188	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

When examining the correlations for the Hearing group, social isolation had a positive correlation with FOMO (r = .430) and a negative correlation with self-esteem (r = -.430). The hours per day spent on social media was positively correlated with the number of accounts (r = .303), number of times accessing social media per day (r= .261), FOMO (r = .286), and social media disorder (r = .234, all $p < 0.01$; see Table 5).

Table 5

Bivariate Correlations for Hearing Participants

(N = 145)	# of accounts	Hours Per Day	Access Per Day	Social Isolation	FOMO	Self-Esteem	Social Media Disorder
# of accounts	1	.303**	.261**	.047	.286**	-.116	.234**
Hours Per Day	.303**	1	.245**	-.076	.263**	-.012	.282**
Access Per Day	.261	.245**	1	.031	.158	.013	.222**
Social Isolation	.047	-.076	.031	1	.430**	-.437**	.107
FOMO	.286**	.263**	.158	.430**	1	-.355*	.404**
Self-Esteem	-.116	-.012	.013	-.430**	-.355**	1	-.141
Social Media Disorder	.234**	.282**	.222**	.107	.404**	-.141	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

In Hearing participants, FOMO was significantly correlated with social media disorder (r = .404), and social isolation (r = .430; all p < 0.01). In addition, FOMO was negatively related to self-esteem (r = -.355). Self-esteem also had a negative correlation with social media disorder (r = -.141, $p < .01$), and with social isolation (r = -.430, $p < .01$).

The relationship between social isolation and social media use in DHH or hearing college students did not show a positive correlation. The data revealed a few differences in correlations among hearing identities. For the DHH participants, there was a correlation between hours a day and social media access (r = .368) as well as access and number of accounts (r = .323). For hearing participants, there was a correlation between accounts and hours a day as well as hours a day and social media access (r = .303; r = .245). The data investigating the relationship between FOMO and social media revealed that hearing participants had a slightly stronger correlation between FOMO and Social Media Disorder (r = .404) compared to DHH participants (r = .313). The DHH group showed a stronger correlation between hours per day and Social Media Disorder (r = .514) than the hearing group (r = .282). Overall, however, the patterns of correlations were mostly consistent across hearing groups.

Gender Distribution Across Hearing Identified Groups

Chi-square tests were conducted to investigate whether the differences in the gender distribution across hearing identity groups were significant (DHH: Female = 32, Male = 14; Hearing: Female = 59, Male = 86; See Table 6). The chi-square is significant (X^2= 11.673; p = .001; See Table 7), indicating that the hearing identity groups also differ on gender distribution. Further analysis was performed to investigate the role of gender in any differences across hearing groups on the dependent variables.

Table 6

Hearing Identity * Gender Crosstabulation

Hearing Identity	Female	Male	Total
DHH	32	14	46
Hearing	59	86	145
Total	91	100	191

Table 7

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11.673*	1	.001		
Continuity Correction**	10.544	1	.001		
Likelihood Ratio	11.868	1	.001		
Fisher's Exact Test				.001	.001
N of Valid Cases	191				

* 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.22.

** Computed only for a 2x2 table

Multivariate Tests

A two-way, multivariate ANOVA was conducted to investigate whether or not gender influenced the data as compared to participants' hearing identity. The dependent variables explored in the MANOVA include number of accounts, hours per day spent on social media, number of times social media was accessed, social isolation, FOMO, self-esteem, and social media disorder.

Table 8

Multivariate Tests

Effect		Value	F	Hypothesis df	Error df	Sig.
Gender	Wilk's Lambda	.983	.454	7.000	180.000	.867
Hearing Identity	Wilk's Lambda	.874	3.722	7.000	180.000	.001
Gender * Hearing Identity	Wilk's Lambda	.980	.518	7.000	180.000	.820

The interaction between gender and hearing identity was not significant, $F(7, 180) = .518$, $p > 0.05$; $\Lambda = 0.980$. There was a statistically significant main effect for hearing identity, $F(7, 180) = 3.722$, $p < 0.05$; $\Lambda = 0.874$ (see Table 8). The main effect for gender was not significant, $F(7, 180) = .454$, $p < 0.05$; $\Lambda = 0.983$. This indicates that gender does not likely play a significant role in group differences while hearing identity does play a role in some variables.

Table 9

Tests of Between-Subjects Effects

Dependent Variable	Gender F (p)	Hearing Identity F (p)	Gender * Hearing Identity F (p)
# of accounts	**6.319 (.013)***	**4.774 (.030)***	.706 (.402)
Hours Per Day	.644 (.423)	1.301 (.256)	.451 (.503)
Access Per Day	.238 (.626)	.120 (.729)	.000 (.990)
Social Isolation	.018 (.895)	.164 (.686)	.009 (.923)
Social Media Disorder	.785 (.377)	**16.791(.000)***	.390 (.533)
Self-Esteem	.016 (.899)	**5.976 (.015)***	.715 (.399)
FOMO	.558 (.456)	.000 (.993)	2.300 (.131)

* indicates significant variables.

The tests of between-subjects effects (see Table 9) was conducted and examined each variable under different conditions as well as an interaction between the conditions. In this case, the conditions were gender and hearing identity. None of the interactions examined were significant. The main effects on the number of accounts revealed statistical significance with gender F (7, 180) = 6.319, $p > .05$, and hearing identity F (7, 180) = 4.774, $p > .05$. The profile plot indicates that hearing female subjects had more accounts than male. The main effects on social media disorder revealed there was no statistical significance for gender F(7, 180) = .785, $p < .05$ but there was a significance with hearing identity F(7, 180) = 16.791, $p > .05$. The profile

plot indicates that participants who identified as Deaf/HH had higher scores. The main effects on self-esteem revealed that there was no statistical significance with gender $F(7, 180) = .016$, $p < .05$. However, there was statistical significance with hearing identity $F(7, 180) = 5.976$, $p > .05$. The profile plot indicates that hearing participants had higher self-esteem. There were no effects onFOMO or social isolation observed. All profile plots of gender and hearing identity among variables can be seen in Appendix G.

Summary

This study revealed several findings. There was not a positive correlation between social isolation and social media in DHH or the hearing college students. FOMO was positively correlated with social isolation and social media disorder and negatively correlated with self-esteem in both DHH and hearing groups. The DASd subscale had a negative correlation with the number of hours per day spent on social media. Deaf and hard of hearing participants scored higher than their hearing counterparts on the social media disorder scale. Additionally, DHH participants had lower scores on the self-esteem scale than their hearing counterparts. Investigating the effects of gender and hearing identity showed no significant interaction effects.

Discussion

The purpose of this study was to investigate the relations between social isolation, fear of missing out, and social media use among deaf and hearing college students. Deaf and Hard of Hearing individuals are rarely included in research focusing on social media and mental health. DHH individuals should be included in this venue of research because of the community's reliance on technology and social media to keep in touch with family and friends. Including DHH individuals in this research provides evidence-based information to educate the community on the effects of social media, especially with social isolation and FOMO. Four research questions were proposed for examination.

Relation of results to research questions

Research Question 1-What is the relationship between social isolation and social media use in DHH and hearing college students?

It was expected that individuals who report experiences of being socially isolated would report more hours spent on social media platforms. However, there was no identified relationship between social isolation and social media for either hearing identity group. The distribution of the sample based on hearing identities was examined closer among all variables to examine the variability. The distribution of the DHH sample in social isolation was fairly normal with no skew. The distribution for hearing participants on the other hand had a slight positive skew. When looking at social media use variables, the number of accounts, hours per day, and access per day all were positively skewed for hearing participants. DHH participants also had a positive skew in access per day, but not as strong as their hearing counterparts. This indicates that there was some asymmetry in the distribution of participants', in both hearing identities, scores in

social isolation. The asymmetry in the data might play a role in the lack of an observed relationship between social isolation and the social media use variables in this study.

Past research (Primack et al., 2017) indicated that when participants report more frequent social media use for long durations, they seem to feel more socially isolated. It is important to note the differences between Primack's study and this one. Primack and colleagues conducted a cross-sectional study utilizing a large nationally representative sample. They recruited 1,787 participants that represented 97% of the U.S. population, while the current study had 191 participants from a single university campus.

Primack and colleagues used different methods of analysis than the current study. They analyzed social media use, in time and frequency, by separating the data by quartiles. They found statistical significance, especially in the higher quartiles which indicated more perceived social isolation (PSI) when examining time and frequency separately. Primack found that participants in the highest quartile had twice the odds of having greater PSI compared to those in the lowest quartile when examining time. Participants in the highest quartile also had three times the odds of experiencing PSI compared to those in the lowest quartile when examining frequency (Primack et al., 2017).

In regard to the measures utilized, there were differences between Primack and colleagues' and the current study. To measure perceived social isolation, Primack and colleagues utilized a four-item scale whereas the present study utilized an eight-item version from the same source, the Patient-Reported Outcomes Measurement Information System. The present study included both the four-item and eight-item versions of the social isolation measure to look for a possible explanation for the findings. It was ruled out because the correlations between these two versions were equivalent or stronger when compared in the bivariate correlations among hearing

identities. Participants in the current study were asked to estimate the time, in hours, spent on social media while Primack asked theirs to estimate time in minutes. It is possible that examining hours is too blunt of a measure for social media use compared to minutes. The larger spread of variables and levels of use examined by Primack allowed for finer tuned analyses which could detect small effects compared to the current study. Utilizing logistic regression in the data analyses similarly to Primack would possibly have made a difference if variables examined were set in binary such as yes/no.

Primack and colleagues made sure to ask participants to only provide estimates in their answers for personal social media use, not work-related social media use. The current study did not make that clarification prior to the distribution of the survey. It is unknown if participating subjects in the current study had to utilize social media for their employment. They may have included it as there was no explicit instruction not to do so. The differences between personal and work social media use can impact the number of hours individuals spend on social media as well as the number of accounts and how many times a day it is accessed. It is possible that individuals who use social media for work access it more often and have multiple accounts than those that use social media for personal use. The present study did not ask how long one is on a particular social media platform. Utilizing social media use for work may inflate the quantity of reported social media use, possibly diluting the social media use that could be related to social isolation.

There was a large difference between Primack and the current study in the time participants reported spending on social media. The current study found a higher overall mean number of 3.31 hours, approximately 198 minutes, per day participants spent on social media. Primack found an overall mean number of 61 minutes, which is one hour, that participants spent

on social media. This may indicate that social media use is more prevalent nowadays compared to the time Primack's data was collected. Additionally, the current participants were younger than the participants in Primack's study. While there may have been a relationship between social isolation and social media in the past, it may not be the case today. Social media use may be increasing each year, becoming more ingrained in individuals' daily lives. It is possible that participants in the current study grew up with social media and may be more experienced and exposed to social media, and that today the amount of time college students spend on social media is not related to social isolation.

Research Question 2- What is the relationship between social media use and self-esteem in DHH and hearing college students?

It was expected that the more social media use individuals report, the more likely they would be to report higher self-esteem. This expectation was based on the study conducted by Burrow and Rainone (2017) where they found that positive feedback on social media boosted self-esteem. However, there was no relationship between social media use and self-esteem in either group, although there was a weak negative relationship between self-esteem and social media disorder in the hearing participants ($r = -.141$). The similar correlation in DHH participants ($r = -.188$) is nonsignificant, possibly due to lower power in that smaller group. This might indicate that the experiences and impact social media has on individuals' relationship with others may negatively impact their self-esteem**.** For example, if disordered social media use creates conflict and disrupts individuals' relationships with their friends and family, it is possible lower self-esteem may occur. It also is possible that low self-esteem may be a risk factor for social media disorder. Individuals may develop a dependence on looking for validation through the feedback on their social media accounts and become a disordered user.

DHH participants had lower scores on the self-esteem scale (M = 25.28) compared to their hearing counterparts (M = 26.08). With self-esteem in DHH participants this particular finding was contrary to the expectations as it was not the anticipated result. It is important to note that previous research on self-esteem and social media use did not specifically include the DHH population. Additionally, it is important to acknowledge that the self-esteem scale was not normed for DHH participation. The responses provided by the DHH participants may not accurately reflect the construct that the scale is attempting to measure. There may be different explanations for the responses that DHH participants have given. More research including this population and norming the scale is needed. Because of that, interpreting the results and making definitive comparisons should be taken cautiously.

Research Question 3- What is the relationship between hearing status/identity and social media use?

Deaf and hard of hearing individuals may rely more on social media than their hearing counterparts because it is a form of communication and keeping in touch with others that is easier than in-person communication, especially when the languages used are different (e.g., spoken English vs. American Sign Language). It was expected that DHH social media users will report more time, in hours, and will be more likely to be classified as a disordered user than their hearing counterparts. The results revealed no relationship between hearing status and the social media use variables (i.e., number of hours per day and number of times social media is accessed per day). There was no significant difference in the number of hours.

It was expected that DHH individuals would be more likely to be classified as a disordered social media user. This expectation is based on Cuculick's dissertation where she discovered that DHH participants spent more time on social media than hearing participants from

a 2011 study. The results of the current study seem to confirm this expectation. DHH participants had higher scores on the social media disorder scale (M = 2.80) than their hearing counterparts (M = 1.44). Additionally, DHH participants showed a stronger correlation between the amount of time spent on social media and their scores on the social media disorder scale (r = .514) than the hearing participants (r = .282). The significance of this difference in correlations was not tested but the correlation was weak for hearing and moderate for DHH.

The social media disorder scale has a five or more items as the criteria for the diagnostic cut-off point. Participants from each group did meet or exceed the diagnostic cut-off for the social media disorder scale to be classified as a disordered user. A higher proportion of DHH individuals met the criteria as a disordered user than those in the hearing group. This may be an indication of more inclination towards social media consumption and addiction among DHH participants compared to hearing participants. However, the social media disorder scale was not normed for DHH use and may indicate something other than social media addiction.

The deaf acculturation subscale of the DAS had a negative relationship with the amount of time spent on social media, indicating a possibility that those that are deaf acculturated may use social media less. It may depend on the length of time they are on social media daily. This was the opposite of what was expected. The self-esteem scale was not normed for use by deaf and hard of hearing individuals. Their responses may not reflect self-esteem. Future research is needed with the self-esteem scale and DHH participation.

Hearing individuals had more accounts, which might seem contrary to the expectation that DHH students would use social media more. Hearing participants reported having significantly more social media accounts (4.68 accounts) than their DHH peers (4.00 accounts). It is unclear whether individuals have multiple accounts on a single platform or multiple

accounts across a few different social media platforms. It is possible that participants spend more time on one particular platform compared to several platforms. Looking at the results obtained from conducting the MANOVA revealed that the number of accounts individuals report was significant across hearing identity and gender but not in the interaction. Hearing identity was significant in the social media disorder scale. DHH participants scored higher in the social media disorder scale than their hearing counterparts.

Research Question 4- What is the relationship between social media and the fear of missing out for DHH and hearing college students?

It was expected that the more participants are exposed to social media platforms, they would be more likely to report FOMO. FOMO was not related to social media use other than the number of accounts in the hearing group. FOMO was related to social media disorder in both groups. Additionally, FOMO was related to social media use and social media disorder in DHH participants. However, it was not correlated with hours per day or the number of accounts. FOMO may have a potential role in disordered social media use. It may drive DHH users to access social media more to keep up to date with the current trends and feel like they are a part of something. For hearing users, having multiple social media accounts may drive their motivation to alleviate their experiences of FOMO. They may follow a specific trend or individuals on different accounts to feel included.

FOMO was negatively correlated with self-esteem. This may indicate that individuals with low self-esteem would be more likely to experience FOMO. It is possible when individuals with low self-esteem utilize social media, they see peers posting photos and videos enjoying themselves at an event or a specific place, FOMO may be experienced right there and then. For

example, if one with low self-esteem is using Snapchat and views a story about a local party they are not in attendance of, they may experience FOMO.

It was expected that both FOMO and social isolation would be related to social media use but neither was related. However, FOMO was moderately related to social isolation in DHH and hearing groups. It is possible that when individuals experience FOMO, they may feel socially isolated because they are not a part of whatever event they are missing out on. Because FOMO was not related to social media use, it may be an indicator that when individuals find out about an event through other means. When individuals find out through word of mouth, texting, calling (audio and/or video calling), this may potentially be when FOMO occurs in person. Additionally, because it was related in both DHH and hearing groups, this may indicate that individuals experience FOMO similarly when they find out about a specific event regardless of hearing identity.

In DHH participants, there was not a relationship between social media and FOMO, more specifically with the number of accounts and hours per day. This finding may suggest that DHH participants could potentially experience FOMO through other mediums, such as video calling. Exploring FOMO and including video calling may find differences but further research is needed. Hearing participants, on the other hand, had a stronger relationship between social media use and FOMO. Hearing participants had significant correlations between FOMO and the number of accounts and hours per day spent on social media. This finding indicates that hearing participants may be impacted by social media use and experience FOMO more than their DHH peers. It is possible that hearing participants may have accounts on multiple social media platforms to feel like they are a part of something, that they are not missing out on an event or trend. Those correlations provide an insight into the differences in social media use among

hearing identities, especially when investigating the topic of FOMO. FOMO may drive people to social media, allowing them to be part of something in some capacity.

Implications

There were several implications of the current study. The study found no correlation between social isolation and social media use among participants of either hearing identity. However, there were some differences among hearing identities. DHH participants had higher scores on the social media disorder scale than their hearing counterparts. In regard to the social media use variables, hearing participants had a correlation between accounts and FOMO. The number of accounts might be related to FOMO because individuals may have the desire to keep updated on their friend group in all aspects. It is possible that the different accounts one has may serve different purposes. For example, one may not share content about a party on Facebook but might on Snapchat. Being exposed to an unknown event such as a party may cause an occurrence of FOMO. This may indicate the possibility that the more accounts one has on platform(s), the more likely hearing participants experience FOMO. DHH participants did not have this particular correlation. It is possible that this was different for DHH participants because FOMO may arise in a different method of keeping contact, such as Facetime or another video calling application that individuals have on their smartphones.

The DHH group had significantly higher scores on the social media disorder scale than their hearing counterparts and reported a higher mean of hours per day spent on social media. There was a positive relationship between social media disorder and the hours per day DHH participants are on social media. It is possible that the DHH participants utilize social media more and may be more likely to be disordered social media users. Additionally, these results indicate a potential impact of social media use on individuals' deaf identity and culture

alignment. For example, DHH individuals that are potentially disordered social media users and have more exposure to the content of a mix of both DHH and hearing peers online may align with a bicultural identity and acculturation. The Social Identity Theory (Tajfel, 1981) focused on interaction with groups of various identities. While the current study did enquire about DHH participants' interactions and experiences in deaf and hearing cultures to investigate which culture they most aligned with, it was not directly asked what groups they interact with the most on social media platforms. Because specific interaction was not directly asked, this theory could not have been applied in the current study. Glickman (1996) discussed the main stages of deaf identity. It is possible that social media use could play a role in DHH individuals' usage of social media acting as a medium that allows individuals to transition from one identity to another over time.

In the current study, DHH participants had lower self-esteem scores than their hearing counterparts. In addition, self-esteem was negatively correlated with both social isolation and FOMO. There was not a significant relationship between self-esteem and social media use variables or social media disorder in DHH participants. The negative relationships were not further examined beyond the bivariate correlations. It is possible that external factors other than social media use may impact participants' self-esteem, including individuals' perception of the role they have in their friend group, others' attitudes towards them, their perception of stability, as well as the environment of their home life (on-campus and/or off-campus).

DHH participants took the Deaf Acculturation Scale which provided insight into the overall and individual acculturation of the DHH sample. The majority of the DHH participants were found to have a bicultural acculturation. This may indicate a possibility that individuals' acculturation may shape their social media experiences and interactions. For example, it is

possible that an individual with a bicultural acculturation may have social media experiences and interactions with both deaf and hearing peers online. Further research is needed to examine these specific interactions and whether or not acculturation has a role in DHH experiences on social media.

Limitations

There were several limitations of the current study. First, the hearing group was considerably larger than the DHH group, which may partially account for the differences found in the correlations explored. The groups had uneven and significantly different proportions of male and female participants. Gender might be related to some of the variables, which lead to some adjustment in the planned analyses to account for it. It is important to note that participants' gender did not significantly influence the data. The campus shutdown due to COVID-19 resulted in fewer options for advertising the project to students for participant recruitment. This forced the primary investigator to move from paper to email advertisement to student lists within individual colleges on campus. When the mass advertising email was sent to students in the computing and information sciences college, the required number of hearing participants surged and was quickly reached, becoming the larger group in the study. This also may account for the number of male participants within the hearing group, as the number of male students in computing majors traditionally far exceeds the number of female students.

The recruitment of the sample was an additional limitation due to the convenience of the sample. The current study took place at a technological university where there may possibly be a higher rate of social media use compared to other universities. There might be a degree of homogeneity in social media use that might not have been seen if participants were recruited from multiple universities. However, by recruiting on one campus, there was a potential

decreased variance that could have been attributed to the cultural and social aspects of the university.

It is possible that results could have been different if the sample size was larger similar to Primack et al. (2017) as well as the method of analysis. Their large sample size provided more statistical power to explore more detailed analyses. Primack and colleagues analyzed the data by groups. They analyzed social media use specifically focused on time, in minutes per day, and frequency, in visits per week. Additionally, they focused on grouping subjects by the level of perceived social isolation (low, medium, or high PSI) and explored the comparisons rather than correlations. Analyzing by groups for the current study could have provided additional, detailed, insight into any differences among hearing identities. More specifically, would we have seen higher numbers in DHH individuals' PSI depending on their time and frequency on social media? That specific question could possibly be utilized in future research.

Detailed information by platform was not examined in the current study which did not provide specific insight on the impact of social media. Future research should ask more in-depth questions about the use of different social media platforms and the activities participants engage in when using these platforms. Future research could focus on specific platforms that were found to be preferred among participants in each hearing identity group, such as Instagram and Snapchat. Focusing on specific platforms, instead of social media use as broad focus, could provide detailed insight into how one single platform impacts individuals' lives off social media. Additionally, the current study did not investigate how social media was used, whether people used it for contact, communication, posting content, general scrolling, among other uses.

Concern about the participation of the DHH sample arose in the current study. The concern of attrition arose in observing the collected data as multiple participants would not

participate further in the study before or after the DAS portion occurred. Because of this, their responses had to be removed from the final collected data. The length of the study may have been a factor in whether or not DHH participants would complete the survey in its entirety. Future research that utilizes an online survey and focuses on including the DHH community in the sample may want to consider distributing a shorter survey overall to ensure full participation, especially from DHH participants. Additionally, the DHH participants were not asked about their utilization of any hearing assisted technologies such as hearing aids or cochlear implants. Individuals' experiences on social media may be different regardless of whether or not they utilize hearing assisted technologies.

Directions for future research

This study points to several directions for future social media research. The DHH population should be taken into account in future research as the current study revealed some differences between the DHH and hearing population of college students. First, the differences in social media use among hearing identities could be explored further. The current study found that DHH individuals reported more hours a day on social media and scored higher on the social media disorder scale than their hearing counterparts. Future research could obtain more detailed information regarding the number of accounts on respective accounts. The number of platforms investigated could be narrowed down to two or three platforms. The social media disorder scale could be utilized to examine whether disordered use depends on the platform or if it is more generalized within individuals.

More generally, future research would have to be more specific about frequency and duration over a period of time, not focused on a single day. Additionally, future research would have to inquire more about how social media is used rather than focusing entirely on frequency

and duration, such as asking participants to report how they utilize a specific platform. For example, how do participants use Facebook when they access that platform, are they generally scrolling, making posts, liking and/or commenting on others' posts?

There was a positive relationship between FOMO and social isolation in both DHH and hearing participants. Participants' activity on platforms could play a role into how much FOMO and social isolation they experience daily/weekly. Do participants that generally use social media to scroll and look at peers' posts have more frequent occurrences of FOMO and social isolation compared to those that post and share personal content often? Frequency of specific actions on social media may be related to occurrences of FOMO and social isolation. Additionally, more detailed surveys could be done in the future to explore activities by platform. Each social media platform has specific features that appeal to users. Said features could be related to their social media use, specifically hours per day, access per day, and the number of accounts they have on the platform.

Specific identity or belongingness theory mentioned in prior research could be focused on in future research. For example, Cuculick (2014) mentioned the Access Participation Theory that was brought up by Hopper (2001) which focused on informal learning experiences and perceptions outside of the classroom. This specific theory was not primarily focused in other previous literature reviewed or in the current study. With the current study taking place at a higher education institution, it could be applied in future studies to see if social media plays a role in supporting Deaf and Hard of hearing students in education if they are able to connect and communicate with classmates online via social media.

FOMO and social media activity in students of various majors could be focused on in future research. The current study did not ask for participants' majors. However, the timing of

participants' recruitment and surge of survey completions particularly from hearing individuals leads the primary investigator to assume that the majority of hearing participants came from one specific college on campus. If the major was asked to be reported by participants, it could have provided some insight into which majors in college have the most occurrences of social isolation experiences, FOMO, social media use, and whether it impacts their self-esteem. For example, are computational or science majors more likely to experience more FOMO than liberal arts or business majors because of the heavy demand and dedication their major requires to be successful?

Future research should continue to investigate the relationship between self-esteem and social media in DHH individuals, perhaps with focus on fewer social media platforms. In the current study, there was no identified relationships with self-esteem and social media use variables or social media disorder. Focusing on fewer more commonly used platforms, such as Instagram and Snapchat for example, may allow participants to disclose more about how they utilize each platform to provide a more accurate report. More detailed experiences on fewer platforms reported by participants may allow clearer insight into platform differences and how social media activities specifically impacts self-esteem. It would provide less stress on the participants to focus on a select few platforms rather than having to provide a rushed estimate on a variety of platforms. As for the scale chosen, the research community should be sure to utilize a self-esteem measure that has been validated by the DHH community.

Additionally, future research could focus on the impact specific social media experiences have on self-esteem. There are a variety of experiences on social media that individuals may have. Such experiences could include having disagreement in the comments of posts, little or negative reactions to others' posts, and emotions that may be evoked by posts. Future research

could follow the same experimental method as Burrow & Rainone (2017) and manipulate specific experiences and measure the effects of social media and self-esteem. It could provide a more detailed understanding of how individuals use and react to experiences on social media.

Future research could focus on the acculturation of DHH participants. The majority of the DHH participants in the current study are aligned with the bicultural identity, experiencing and assimilated in both deaf and hearing cultures, which could account for participants' social media environment and experience as well. It is possible the social circles that individuals interact with has an impact on the content and interaction they have on social media. In addition to acculturation, social media has a potential role in assisting individuals develop and possibly transition from one deaf identity to another. Future research could examine deaf identity in longitudinal studies. For example, one may start out as culturally hearing and explore and possibly develop a bicultural identity over time. This may be similar for their acculturation, but it might be dependent on the experiences they have and the hearing identity of others online. Additionally, future research could examine how their interactions differ between online and in-person. The current study had a small sample size of participants who identified as Deaf or Hard of Hearing. Because of the sample size, an analysis of how acculturation was related to the other variables was not possible. Future social media studies that collect larger DHH sample sizes could focus on whether or not acculturation was related to any of the variables investigated.

Conclusion

The purpose of the current study was to investigate social isolation, fear of missing out, and social media use in deaf and hearing college students. The hearing identity of the participants did play a role in the sample and was identified in the group differences. For example, the Deaf and hard of hearing participants reported lower self-esteem and higher scores in social media

disorder than their hearing counterparts. This indicates that deaf and hard of hearing participants may be more likely to be an addicted, or disordered, social media user than hearing participants. The current study is relevant to the field of social media research because society has become more reliant on social media in recent years, particularly given the current climate of COVID-19, to keep in touch with friends and family members among other motivations for social media use. The usage of social media can bring advantages to one's life such as communication and keeping up to date with the current events. It is important to keep in mind that social media can negatively impact individuals depending on their experiences such as frequency, length, and how it influences their interactions with family and friends. Deaf and hard of hearing individuals' experiences with social media should continue to be examined and compared to the hearing population. By including the deaf and hard of hearing population in social media studies, evidence-backed discourse and exchange of information regarding the impact of social media on mental health can be continued in an inclusive manner.

Appendix A

Demographic Questionnaire

1) Hearing Status/Identity:
    - Deaf
    - Hard of Hearing
    - Hearing
2) Age: _____
3) Gender
    - Male
    - Female
    - Non-binary
    - Other
4) Are you active on social media?
    - Yes
    - No
5) If you said yes to the previous question, how many social media accounts do you have (this includes more than one account on a single platform)?

    _____
6) What is your preferred platform for posting personal content (e.g. selfies, videos, photographs)? Select all that apply
    I. Facebook
    II. Twitter
    III. Tumblr
    IV. Instagram
    V. Snapchat
    VI. Other
7) What platform do you feel most comfortable sharing content on?
    I. Facebook
    II. Twitter
    III. Tumblr
    IV. Instagram
    V. Snapchat
    VI. Other
8) What platform do you feel least comfortable sharing content on?
    I. Facebook
    II. Twitter
    III. Tumblr
    IV. Instagram
    V. Snapchat
    VI. Other
9) Approximately how many hours a day do you use social media?

    _____

10) Approximately how many times in a day do you access social media (e.g. checking notifications, general scrolling, etc.)?

_____

Appendix B

Patient-Reported Outcomes Measurement Information System Social Isolation Scale

Please respond to each item by marking one box per row

	Never (1)	**Rarely (2)**	**Sometimes (3)**	**Usually (4)**	**Always (5)**
I feel left out..*					
I feel that people barely know me..*					
I feel isolated from others..*					
I feel that people are around me but not with me..*					
I feel isolated even when I am not alone..					
I feel that people avoid talking to me..					
I feel detached from other people..					
I feel like a stranger to those around me..					

***bolded items are from the four-item version of the scale**

Fear of Missing Out Scale

Using the scale provided, please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item.

	Not at all true of me (1)	Slightly true of me (2)	Moderately true of me (3)	Very true of me (4)	Extremely true of me (5)
I fear others have more rewarding experiences than me.					
I fear my friends have more rewarding experiences than me.					
I get worried when I find out that my friends are having fun without me.					
I get anxious when I don't know what my friends are up to.					
It is important that I understand my friends "in jokes".					
Sometimes, I wonder if I spend too much time					

keeping up with what is going on.					
It bothers me when I miss an opportunity to meet up with friends.					
When I have a good time, it is important for me to share the details online (e.g. updating status).					
When I miss out on a planned get-together it bothers me.					
When I go on vacation, I continue to keep tabs on what my friends are doing.					

Rosenberg Self-Esteem Scale

Below is a list of statements dealing with general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole, I am satisfied with myself.	☐	☐	☐	☐
2. At times I think I am no good at all.	☐	☐	☐	☐
3. I feel that I have a number of good qualities.	☐	☐	☐	☐
4. I am able to do things as well as most other people.	☐	☐	☐	☐
5. I feel I do not have much to be proud of.	☐	☐	☐	☐
6. I certainly feel useless at times.	☐	☐	☐	☐
7. I feel that I'm a person of worth, at least on an equal plane with others.	☐	☐	☐	☐
8. I wish I could have more respect for myself.	☐	☐	☐	☐

9. All in all, I am inclined to feel that I am a failure.	☐	☐	☐	☐
10. I take a positive attitude toward myself.	☐	☐	☐	☐

Social Media Disorder Scale

Please respond yes or no if you have experienced the provided statement in the past year.

In the past year, have you...	Yes	No
Recently found you can't think of anything else but the moment you will be able to use social media again?		
Regularly felt dissatisfied because you wanted to spend more time on social media?		
Often felt bad when you could not use social media?		
Tried to spend less time on social media, but failed?		
Regularly neglected other activities (e.g. hobbies, sport) because you wanted to use social media?		
Regularly had arguments with others because of your social media use?		
Regularly lied to your parents or friends about the amount of time you spend on social media?		
Often used social media to escape from negative feelings?		
Had serious conflict with your parents, brother(s), or sister(s) because of your social media use?		

Deaf Acculturation Scale (DASd)

Please respond to each item by marking one option per row.

Item	Strongly Disagree (1)	Disagree (2)	Agree Sometimes (3)	Agree (4)	Strongly Agree (5)
I call myself deaf					
I feel that I am part of the deaf community					
I am comfortable with deaf people					
Being involved in the deaf world (and with deaf people) is an important part of my life					
My deaf identity is an important part of who I am					
How much do you enjoy					
Reading magazines/books written by deaf authors					
Going to deaf events/parties/gatherings					
Going to theater events with deaf actresses/actors					
Watching ASL video tapes by deaf story-tellers or deaf poets					
Participating in political activities that promote the rights of deaf people					
Attending Deaf-related workshops (e.g., workshops on Deaf culture or linguistics in ASL)					
If you could have your					

way, how would you prefer the following situations in your life to be like?					
I would prefer my education to be at a deaf school.					
I would prefer if my roommate was deaf.					
I would prefer that my church/temple is mostly deaf.					
I would prefer my date/partner/spouse to be deaf.					
I would prefer my closest friends to be deaf.					
I would prefer my children to be deaf.					
I would prefer my work environment to be deaf.					
How well do you know					
Traditions and customs from Deaf schools					
Names of deaf heroes or well-known deaf people.					
Important events in Deaf history.					
Well-known political leaders in the Deaf community.					
Organizations run by and for Deaf people.					
How well do you sign using ASL?					
How well do you understand other people					

using ASL?					
When you sign using ASL, how well do other deaf people understand you?					
How well do you fingerspell?					
How well can you read other people's fingerspelling?					
How well do you know current ASL slang or popular expressions in ASL?					

Hearing Acculturation Scale (DASh)

Please respond to each item by marking one option per row.

Item	Strongly Disagree (1)	Disagree (2)	Agree Sometimes (3)	Agree (4)	Strongly Agree (5)
I am comfortable with hearing people.					
I call myself hearing-impaired or hard of hearing.					
Being involved in the hearing world (and with hearing people) is an important part of my life.					
I often wish that I could hear better or become hearing.					
I feel that I am part of the hearing world.					
How much do you enjoy					
Going to theater events with hearing actresses/actors					
Attending professional workshops in the hearing world.					
Participating in hearing political activities.					
Socializing with hearing people.					
Attending hearing gatherings/events/p					

arties.					
Participating in or attending hearing athletic competitions					
If you could have your way, how would you prefer the following situations in your life to be like?					
I would prefer my children to be hearing.					
I would prefer if my work environment to be hearing.					
I would prefer that my education to be in a hearing school or a mainstream environment.					
I would prefer my roommate were hearing.					
I would prefer my date/partner/spouse to be hearing.					
I would prefer my church/temple is mostly hearing.					
How well do you know					
Names of national heroes.					
Names of popular hearing actors and actresses.					
Important events in					

American/world history.					
Names of famous hearing political leaders.					
How well do you speak English, using your voice?					
In general, how well do hearing people understand your speech?					
How well do you lip-read?					
How well do you read English?					
how well do you write in English?					
How well do you know English idioms or English expressions?					

Appendix C
Social Media Platform Descriptions

Facebook: Founded in 2004, Facebook's mission was to give people a platform to build a community allow them to stay connected with friends and family, discover what is happening around the world, and share and express what matters to them (https://newsroom.fb.com/company-info/). On this platform, individuals can post personal and public content to the general newsfeed in which their friends would be able to see. Likes, posting, sharing, tagging, commenting, saving, and reacting are the main features of Facebook today.

Twitter: Twitter allows individuals to respond to respond to the question "What's Happening" in 280 characters in "tweets." Tweets can be sent from computers using the website, smartphones, and mobile devices such as tablets and watches. Individuals' accounts would be identified with a username they create and select at registration of their account (e.g. @BrunoMars). Twitter has several features that individuals can utilize, such as publishing tweets, retweeting (sharing) original tweets, liking tweets, direct messaging, and exploring current events in the "explore" tab (https://about.twitter.com/ for more information).

Instagram: Instagram, owned by Facebook, allows individuals to post photos and videos. There are several ways that photos and videos are shared with the public on Instagram, through posts to one's account, Instagram Story, and IGTV. A post to one's story allows posts to be posted for 24 hours before disappearing. Instagram has multiple features such as sharing, posting, direct messaging, tagging, advertising one's business utilizing the business account feature, and shopping (via Instagram Checkout and product advertisement) (https://help.instagram.com/ for more general information).

Snapchat: Snapchat, a camera focused company, aims to reinvent camera use by encouraging people to communicate creatively with others, learn about the world, and have fun. Snapchat has several features that users utilize. Such features include camera games, filters, posting photos/videos to one's story, messaging, sending cash, using Bitmoji to send your created avatar to others, setting subscriptions to keep up to date on favorite people and snapchat channels, and exploring snapchats posted geologically via the Map. Snapchat is utilized solely on smartphones such as iPhone and Android devices.

Tumblr: Founded in 2007, Tumblr allows users to express themselves in several ways. Individuals with a Tumblr account can post text, photos, videos, live videos, GIFs (even creating new GIFs from videos), and audio. Individuals' account pages are completely customizable, allowing them to change the colors, font, and the layout among others. Features that users utilize

include: following other accounts, following tags, reblogging, liking, direct messaging, and searching tags and popular posts (https://www.tumblr.com/about for more information).

LinkedIn: LinkedIn's mission is to connect professionals to the world and make them more productive and successful. This platform allows professionals to list their experiences, accomplishments, and future goals. Features include: posting resume to one's profile, posting/sharing content, follow companies and individuals, make connections with other known individuals, search and apply for jobs, and set alerts for specific job openings (https://about.linkedin.com/ for more information).

Reddit: Reddit connects individuals with communities around the world, specifically around their interests. Individuals with Reddit accounts can post content such as photos, videos, links, and stories. The communities that individuals follows can comment on content published in their community and discuss the topic. Community members around a specific interest can vote on comments and posts. The higher the post/comment is voted, the more popular and visible it becomes (https://www.redditinc.com/ for more information).

YouTube: YouTube aims to allow users with accounts to explore their freedom of expression, information, opportunity, and belonging. YouTube users utilize YouTube to post videos, publish comments, explore popular videos and topics, and learn about new things (https://www.youtube.com/yt/about/ for more information).

Appendix D

Selection of multiple platforms (N = 191)

# of Platforms Selected	Frequency	Percent of responses
1 platform	107	56.0%
2 platforms	55	28.8%
3 platforms	16	8.4%
4 platforms	7	3.6%
5 or more platforms	6	3.1%

Appendix E

Most Comfortable Social Media Platform by Hearing Identity

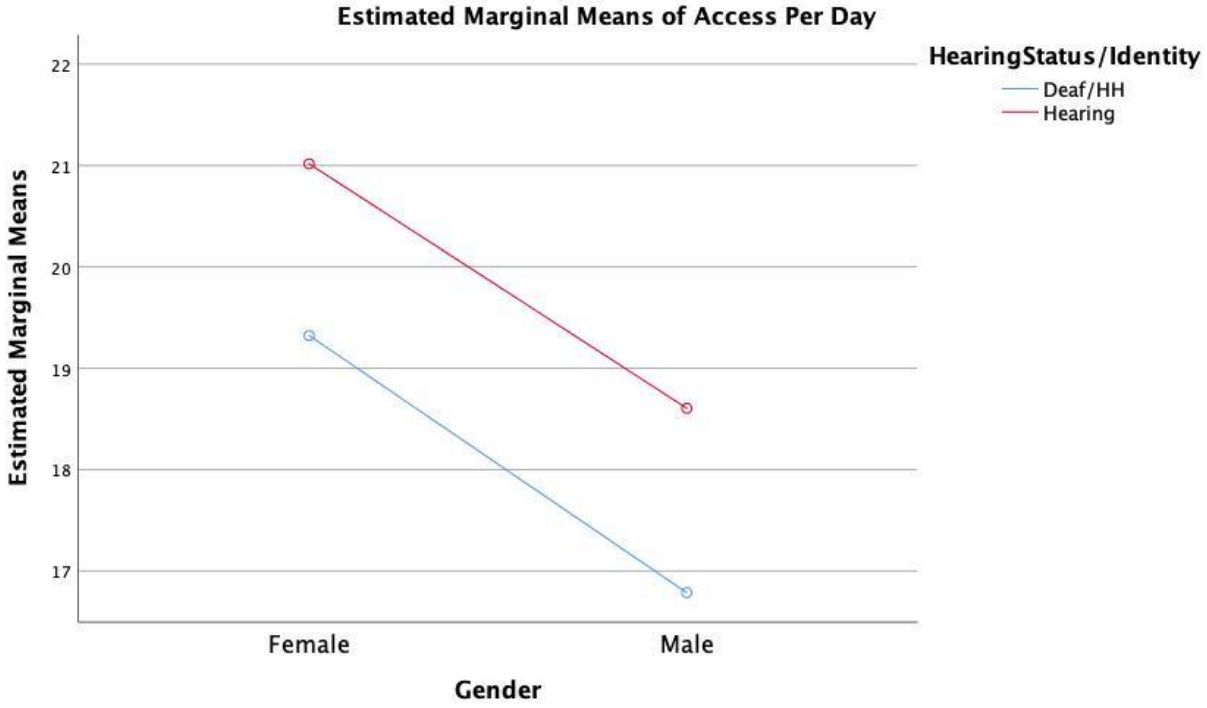
Platform	Frequency (DHH)	Frequency (Hearing)	Percent (DHH)	Percent (Hearing)
Facebook	8	8	15.2	5.5
Instagram	14	38	30.4	26.2
Snapchat	15	68	32.6	46.9
Tumblr	1	5	2.2	3.4
Twitter	5	11	10.9	7.6
Other	4	15	8.7	10.3
Total	46	145	100.0	100.0

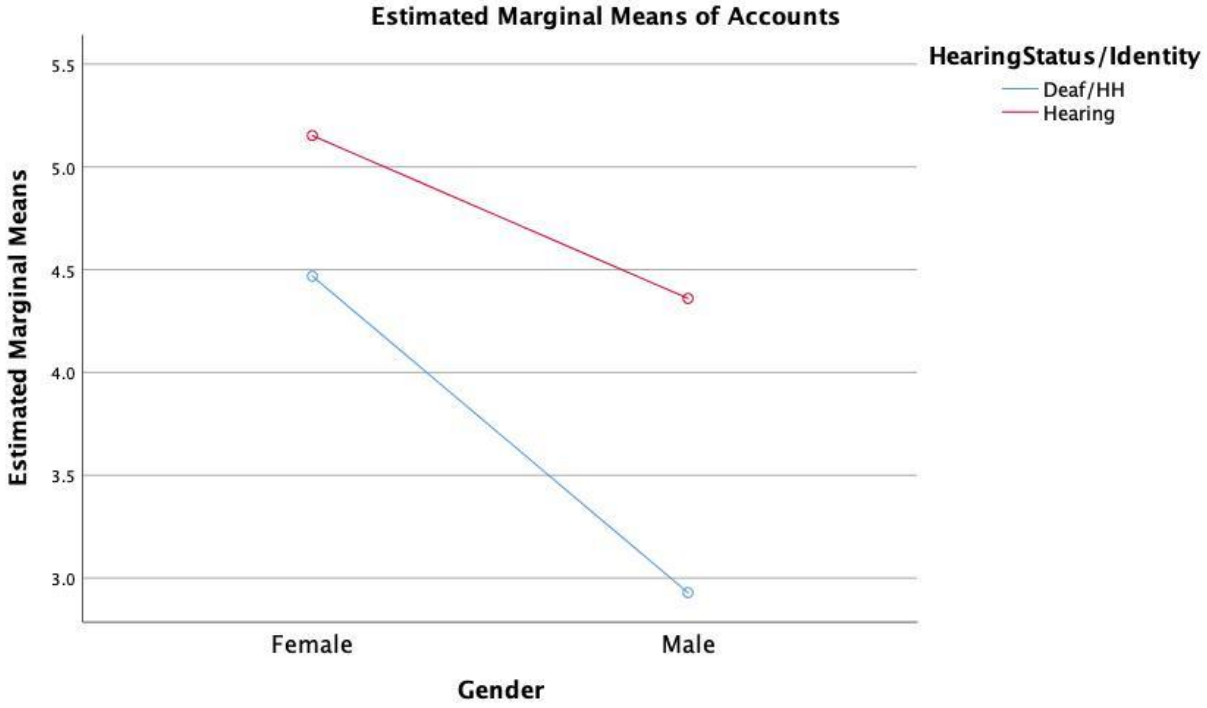
Appendix F

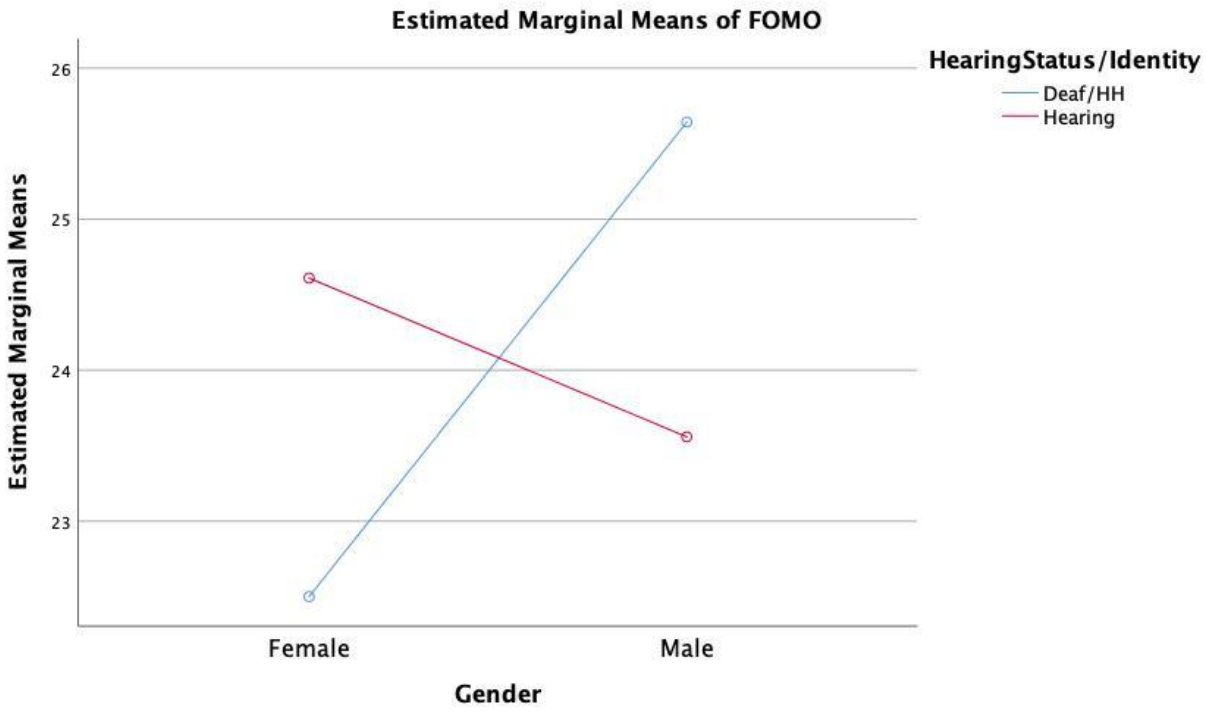
Least Comfortable Social Media Platform by Hearing Identity

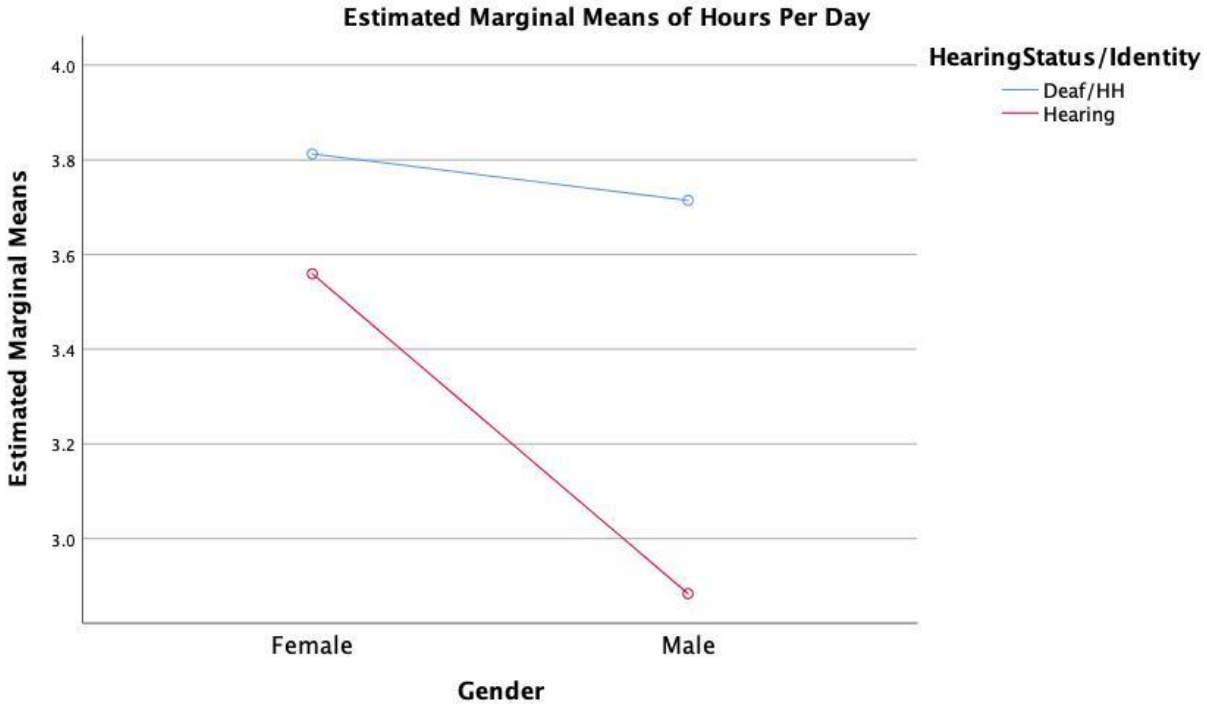
Platform	Frequency (DHH)	Frequency (Hearing)	Percent (DHH)	Percent (Hearing)
Facebook	24	90	52.2	62.1
Instagram	7	15	15.2	10.3
Snapchat	3	9	6.5	6.2
Tumblr	3	8	6.5	5.5
Twitter	7	18	15.2	12.4
Other	2	5	4.3	3.4
Total	**46**	**145**	**100.0**	**100.0**

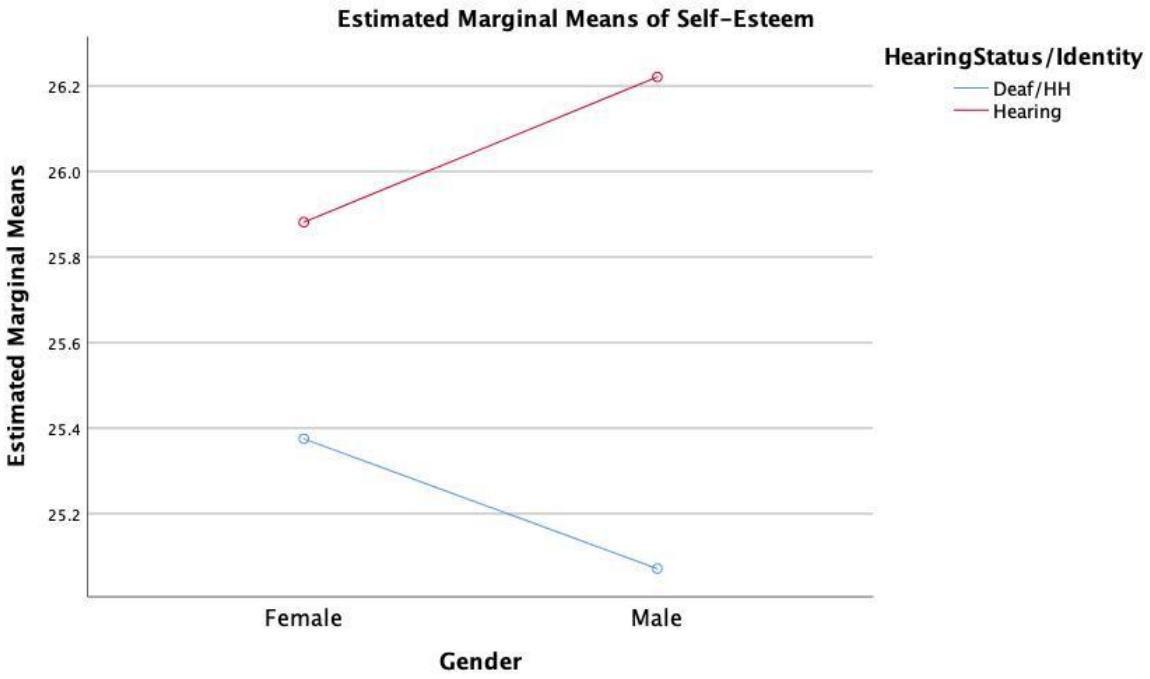
Appendix G

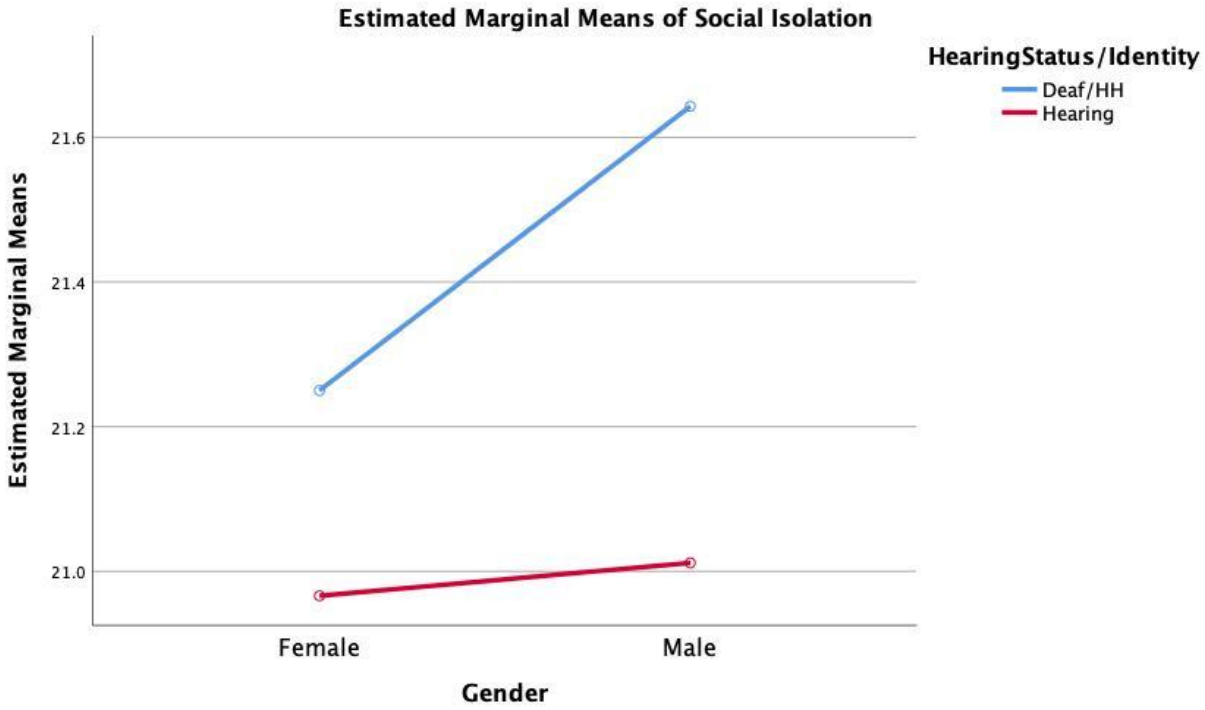

Estimated Marginal Means of Access Per Day
HearingStatus/Identity
Deaf/HH
Hearing
Estimated Marginal Means
22
21
20
19
18
17
Female
Male
Gender

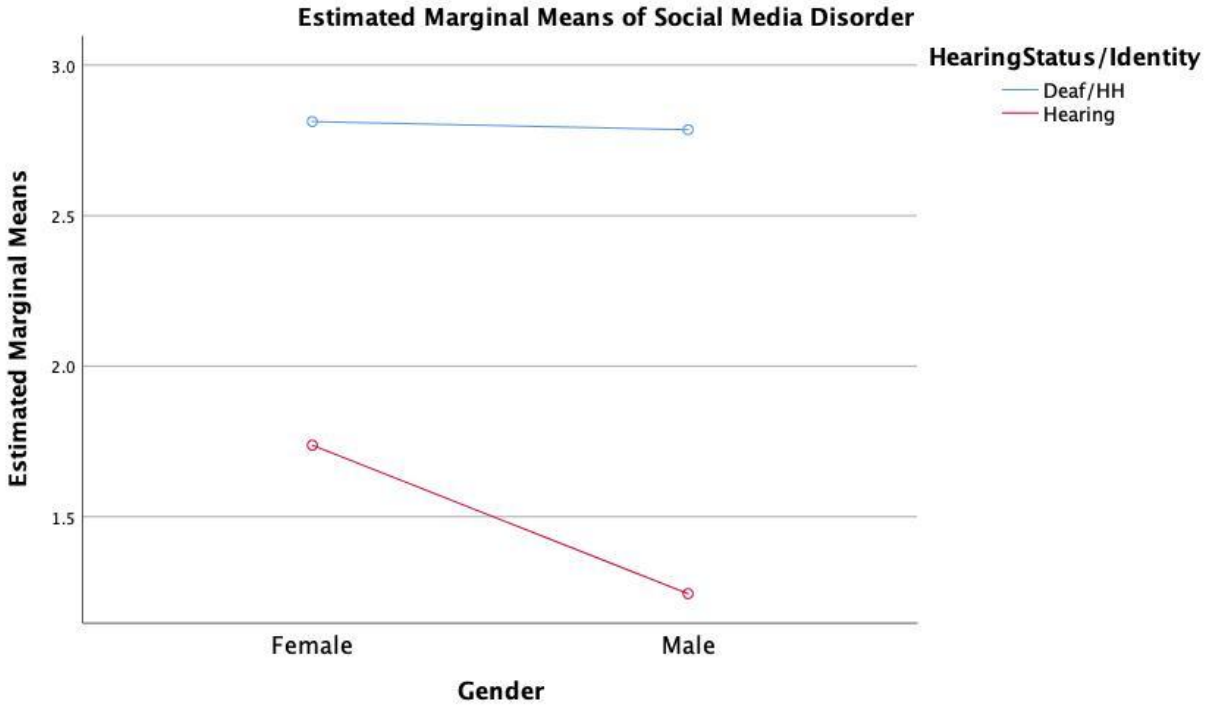

Estimated Marginal Means of Accounts
HearingStatus/Identity
Deaf/HH
Hearing
Estimated Marginal Means
5.5
5.0
4.5
4.0
3.5
3.0
Female
Male
Gender


Estimated Marginal Means of FOMO
HearingStatus/Identity
Deaf/HH
Hearing
Estimated Marginal Means
26
25
24
23
Female
Male
Gender


Estimated Marginal Means of Hours Per Day
HearingStatus/Identity
Deaf/HH
Hearing
Estimated Marginal Means
4.0
3.8
3.6
3.4
3.2
3.0
Female
Male
Gender


Estimated Marginal Means of Self-Esteem
HearingStatus/Identity
Deaf/HH
Hearing
Estimated Marginal Means
26.2
26.0
25.8
25.6
25.4
25.2
Female
Male
Gender


Estimated Marginal Means of Social Isolation
HearingStatus/Identity
Deaf/HH
Hearing
Estimated Marginal Means
21.6
21.4
21.2
21.0
Female
Male
Gender


Estimated Marginal Means of Social Media Disorder
HearingStatus/Identity
Deaf/HH
Hearing
Estimated Marginal Means
3.0
2.5
2.0
1.5
Female
Male
Gender

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