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A comparison of social media behaviors between sexual minorities and heterosexual individuals

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ABSTRACT

Introduction: This study's aim was to identify key differences in social media behaviors of sexual minorities compared to heterosexuals. Importantly, identifying which social media behaviors are more prevalent for sexual minorities helps understand online behavioral differences and promote psychological well-being.
Method: Participants were recruited online ($N = 1294$) indicating use of Facebook or Twitter. They completed validated psychosocial questionnaires and responded to questions regarding specific social media behaviors. Univariate comparisons assessed differences in social media behaviors between the sexual minority group ($n = 178$) and the heterosexual group ($n = 1116$). A stepwise binary logistic regression model identified the specific social media behaviors that were most associated with the sexual minority group.
Results: The univariate comparisons identified many differences in social media behavior between the sexual minority and heterosexual groups. Based on the multivariate analyses, the key social media behaviors most associated with the sexual minority group included more hours on Twitter and a higher likelihood of downward social comparisons.
Conclusion: Due to the pervasiveness of social media, potentially negative impacts associated with the social media behaviors of sexual minorities should be further examined. Additionally, positive outcomes to social media behaviors should also be assessed to promote healthier social media use among sexual minorities.

Social media platforms, including Facebook and Twitter, are primarily used for individuals to publicly or privately share information, converse with friends and family, maintain social relationships, and to form new personal connections (Treem, Dailey, Pierce, & Biffl, 2016). Approximately 90% of young adults in the United States use social media (Pew Research Center, 2015). With its growing popularity, social media use has become a prominent topic in research, particularly focusing on mental well-being. Research findings suggest that social media behaviors, like connecting with people online, especially with close friends, can promote positive mental well-being (Burke & Kraut, 2016; Sheldon, Abad, & Hinsch, 2011), while other social media behaviors, like comparing oneself to others online, have shown to be damaging to mental well-being (Alfasi, 2019; Park & Baek, 2018; Robinson et al., 2018).

However, research in this area is lacking focus on social media behaviors of sexual minorities (specifically gays, lesbians, and bisexuals). Pertaining to the mental health of sexual minorities, the Institute of Medicine (2011) has found that sexual minorities are at higher risk of experiencing depression, suicidality, and substance use due to the victimization and daily struggles these individuals experience on the basis of their sexual orientation identities. To negate further chances of negative psychological effects, specifically driven by the consequences associated with social media behaviors, research on sexual orientation-based differences in social media use is needed to understand online behavioral differences and promote psychological well-being.

According to research conducted by the Gay, Lesbian, and Straight Education Network (GLSEN Gay, Lesbian, and Straight Education Network, 2014), sexual minority youth and young adults spend approximately 45 min longer on social media each day compared to heterosexual youth and young adults. Excessive time spent on social media has been shown to have psychological health implications such as increased stress levels, anxiety, depression, lower levels of self-esteem, diminished relationship quality, increased suicidal thoughts, and

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completed suicides among adolescence (Adams & Kisler, 2013; Kross et al., 2013; Pantic, Damjanovic, Tadorovic, Topalovic, Bojovic-Jovic, Ristic, & Pantic, 2012; Woods & Scott, 2016). However, utilizing social media moderately has also shown to enhance psychological health by increasing levels of self-esteem (Best, Manktelow, & Taylor, 2014), improving connections with others (Sheldon et al., 2011), and reducing feelings of depression (Deters & Mehl, 2012). Since the amount of time spent on social media influences psychological health, it is important to understand how sexual minorities compare with heterosexual individuals on their online behavior. With increased use, it makes sense that sexual minorities might report feeling a stronger need for social media and social media addiction tendencies, characterized as "being overly concerned about online activities, driven by an uncontrollable motivation to perform the behavior, and devoting so much time and effort to it that it impairs other important life areas" (Andreassen & Pallesen, 2014, p. 4054).

Research has also investigated how sexual minorities use social media to portray and develop their personal identities online (Alfasi, 2019; Brandes & Levin, 2014; Duguay, 2016; Fox & Ralston, 2016; Hillier & Harrison, 2007; & Vogel, Rose, Roberts, & Eckles, 2014a, b). The coming out process for sexual minorities can be stressful and discomforting, but with the use of social media, sexual minorities have reported that they are able to safely question, explore, and socialize their authentic, non-heteronormative identity by relating to others online in LGBQ communities (Fox & Ralston, 2016). Sexual minorities have also reported that social media allows them the opportunity to transition their developed identity to offline life (Fox & Ralston, 2016). However, evidence suggests that sexual minorities are also censoring what information and content is displayed on their personal networks, as well as which friends and family members have access to their social media accounts and what posts their social network community can view (Duguay, 2016; McConnell, Clifford, Korpak, Phillips II, & Birkett, 2017).

Other work has confirmed that the general population on social media tend to advertise predominantly idealized images of themselves (Alfasi, 2019; Gonzales & Hancock, 2011; & Vogel, Rose, Roberts, & Eckles, 2014a, b). Self-presentations on social media are shaped by social feedback from friends and followers, which can reinforce or discourage posters' behaviors (Brandes & Levin, 2014; Fox & Moreland, 2015). Although sexual minorities report that social media is beneficial in helping them identify and develop their sexual identity, there are some discrepancies as to how accurate their social media identity compares to their offline identity due to how tolerant their social media ecosystems are of sexual minorities (Devito, Walker, & Birnholtz, 2018). Therefore, it is important to further explore and compare online vs. offline identity overlap between sexual minorities and heterosexual individuals, defined as the commonalities of online and offline identities.

Besides using social media to develop and construct an online identity, research has shown that social media users engage in social comparisons of themselves versus their online friends (Throuvala, Griffiths, Rennoldson, & Kuss, 2019). The idea of comparing oneself to others, as to provide a scale of self-evaluation, is based on Festinger's (1954) concept of social comparison theory. Upward social comparison occurs when individuals compare themselves to others they view as superior as a means of motivation to drive themselves towards self-improvement (Wood, 1898). Downward social comparison happens when individuals compare themselves to others they view as inferior, which may help users to enhance their self-perception (Willis, 1981). The outcomes of upward social comparisons on social media networks have demonstrated highly negative psychological effects, showing that upward social comparisons can decrease one's sense of self-worth and is associated with anxiety, stress, and depressive symptoms (Alfasi, 2019; Park & Baek, 2018; Robinson et al., 2018). Individuals that participate mostly in upward social comparisons have reported more envy (Park & Baek, 2018), exhibited poorer evaluations of themselves (Alfasi, 2019), felt more inadequate (Vogel, Rose, Okdie, & Eckels, 2014, b), and reported greater body shame (Hana, Ward, Seabrook, Jerald, Reed, Giaccardi, & Lippman, 2017) than those who participated in downward social comparisons. The psychological effects of downward social comparisons differ from upward social comparisons in that downward social comparisons are shown to improve one's psychological well-being but are evoked by negative affect (Willis, 1981). In other words, when an individual has negative thoughts, they reflect on others' flaws or misfortunes to stimulate a better image of themselves. Because the presence of negative psychological thoughts in both upward and downward social comparisons may be detrimental to social media users' well-being, it is important to investigate sexual orientation-based differences in online social comparisons.

Another noteworthy behavior that is prevalent when using social media is the desire to stay socially connected and to avoid being absent while others are having rewarding experiences, otherwise known as the Fear of Missing Out (FOMO) (Przybylski, Murayama, DeHaan, & Gladwell, 2013). Humans have a natural need to belong. Through social media, users can stay informed on what others are doing by following others' posts, and this awareness may facilitate social inclusion. However, FOMO has been shown to increase negative affect. Research investigating this phenomenon has found that individuals with higher levels of FOMO tend to spend more time on social media, often report more negative mood states, and have lower life satisfaction (Przybylski et al., 2013; Roberts & David, 2019). They may also experience more depression and negative physical symptoms (Baker, Krieger, & LeRoy, 2016). Information on FOMO among people of different sexual orientations is limited, and it is worthwhile to investigate how sexual minorities may compare to heterosexual individuals in terms of this specific social media behavior.

1. The present study

The purpose of this study is to compare sexual minorities and heterosexual individuals on a variety of social media factors that stem from prior research and to examine underexplored factors linked to sexual minority online behavior. A richer understanding of how sexual minority people may differ in their social media use will benefit efforts aimed to support the LGBQ community in online settings. While many social media platforms exist, this study focused specifically on Facebook and Twitter because a) these are two of the most commonly used social media platforms, b) they incorporate both private and public settings, and c) they contain the ability to post both statements or pictures with counted likes and comments.

Based on previous findings from the literature reviewed above, four primary hypotheses were made: (H1) greater need for social media and social media addiction will be associated with the sexual minority group because sexual minorities have been shown to spend more time on social media compared to heterosexual individuals; (H2) less online vs. offline identity overlap will be associated with the sexual minority group due to sexual minorities' high censoring of personal information about their sexual identity compared to heterosexual individuals; (H3) higher scores on upward and downward social comparisons will be associated with the sexual minority group due to maintaining self-presentation compared to heterosexual individuals; and lastly, (H4) higher FOMO scores with be associated with the sexual minority group because of their higher need to belong and connect during their coming out process compared to heterosexual individuals. In addition to these hypotheses, we also posed one exploratory research question, asking "What other specific social media behaviors will be associated with the sexual minority group compared to heterosexual individuals?"

2. Method

2.1. Participants and procedure

The participants in this study included 1294 adults recruited online

using the Amazon Mechanical Turk (mTurk) survey administration system, and all participants received compensation for their time. Participants completed validated psychosocial questionnaires and responded to questions regarding demographic factors and specific social media behaviors. All participants included in this study provided information regarding their sexual orientation and indicated that they regularly use either Facebook or Twitter. This study was approved by the Institutional Review Board, and all participants provided consent to participating in this study.

2.2. Measures

The demographic data included gender identification, age, race, ethnicity, and sexual orientation measured by sexual identity. Measures assessing social media behaviors included both validated questionnaires and specific items developed purposely for this study.

2.2.1. General social media behaviors

The Social Media Intensity Scale (Ellison, Steinfield, & Lampe, 2007) assesses the participant's intensity of use for both Facebook and Twitter. This scale includes six questions assessed on a 5-point Likert scale ranging from *Strongly disagree* to *Strongly agree*. Examples of specific items include "I feel out of touch when I haven't logged onto Facebook for a while" and "Twitter is part of my everyday activity." For this sample, the overall mean intensity score for Facebook was 3.31 (sd = 0.24), and the overall mean intensity score for Twitter was 2.90 (sd = 0.13). The Social Media Intensity Scale's reliability was found to be strong for Facebook (Cronbach's $\alpha = 0.91$) and Twitter (Cronbach's α = 0.93).

The Need for Participating in Social Media Scale (Park, Kee, & Valenzuela, 2009) assesses motivations for use of any social media platform. This measure included 12 statements using a 6-point Likert scale ranging from *Strongly disagree* to *Strongly agree*. Examples of items for this scale include, "I use social media to meet interesting people" and "I use social media because it is entertaining, funny, and exciting." For this sample, the overall scale demonstrated excellent reliability (Cronbach's $\alpha = 0.91$) and the mean Need for Participating in Social Media score was 3.6 ($sd = 0.7$).

The Bergen Social Media Addiction Scale (Andreassen, Torsheim, Brunborg, & Pallesen, 2012) assesses overall social media addiction using the six core features of addiction, which include salience, mood, modification, tolerance, withdrawal, conflict, and relapse related to social media use during the past year. This questionnaire uses a 5-point Likert scale, with responses ranging from *Very rarely* to *Very often*. An example of an item from this scale is, "How often during the last year have you felt an urge to use social media more and more?" For this sample, the mean social media addiction score was 2.2 ($sd = 0.2$) and the overall scale demonstrated excellent reliability (Cronbach's $\alpha = 0.91$).

To assess social comparisons, two statements were included which focused on each participant's perception of their upward and downward comparisons of themselves with respect to others on social media. Each item was rated on a 5-point Likert scale with responses ranging from *Not at all* to *A great deal* (Vogel Rose, Roberts, & Eckles, 2014a, b). The two items for this measure included, "When comparing yourself to others on social media, to what extent do you focus on people better off/worse off than you?" For this sample, the mean upward comparisons score was 2.4 (sd = 1.3), and the mean downward comparisons score was 2.1 (sd = 1.2).

The Social Media vs. Offline Identity Overlap measure (adapted from Shamir & Kark, 2010) consists of a display of seven images, each containing two circles (one shaded and one white) progressing from no overlap of the two circles to complete overlap of the two circles. Participants are asked to identify the image that best matches the extent of overlap in their online and offline identities. The larger the value, the greater the similarities between their online and offline identities. For this sample, the average score for was 4.8 (sd = 1.7).

The Fear of Missing Out (FOMO) Scale was included in this study (Przybylski et al., 2013). This is a 10-item questionnaire measured on a 5-point Likert scale ranging from *Not at all true of me* to *Extremely true of me*. Example items include, "I fear others have more rewarding experiences than me," and "It bothers me when I miss an opportunity to meet up with friends." The mean score for this sample was 2.4 ($sd = 0.2$) and the overall scale demonstrated excellent reliability (Cronbach's α = 0.93).

2.2.2. Specific social media behaviors

To guide the study of the research question, the research team conducted a focus group (n = 12) to develop additional survey items and statements regarding specific social media behaviors common for both Facebook and Twitter. This focus group led the authors to include several additional measures of specific social media behaviors. For instance, the number of friends and followers, as well as individuals that the participants followed, were assessed. In addition, using a single-item 5-point Likert scale ranging from *Strongly disagree* to *Strongly agree*, other social media behaviors assessed included: 1) the participants' self-censorship on social media, 2) the degree to which participants were bothered if tagged in photos and posts, 3) the extent to which participants felt safe online, and 4) the extent to which the participants wanted to "go viral" or felt that they were noticed online. Additional items were included to determine the reasons for posting online. Examples of reasons include, "post to aggravate or annoy," and "to debate to educate others."

2.3. Statistical analysis

All analyses were conducted using SPSS version 24.0 (Armonk, NY: IBM Corp).

Univariate comparisons were conducted to assess differences in demographics and social media behaviors between individuals identified as a sexual minority (n = 178, 13.76%) and those who identified as heterosexual (n = 1,116, 86.24%). For comparisons of categorical variables, chi-square tests of independence were used. For comparisons of continuous variables, independent t-tests were used.

A stepwise binary logistic regression model was used to evaluate which of the demographic and social media behaviors were most associated with the sexual minority group. Listwise deletion was used to account for missing data in the regression model and only variables significant at the univariate level were included in the model. To determine significance, an alpha level of 0.05 was used for all analyses. A post-hoc power analysis was conducted based on an independent t-test, with alpha = 0.05 and a small effect size (d = 0.25), which exhibited sufficient obtained power (1-β = 0.87).

3. Results

All data were screened for missing values and outliers. Values for the variables examined in this participant sample were 97.4% complete with a random distribution of missing data. Univariate comparisons were conducted to assess differences in demographics and social media behaviors between sexual minority and heterosexual participants. Table 1 shows the comparisons of the demographic variables. The heterosexual group's mean age was significantly higher than the sexual minority group's mean age ($p < .001$). There were no significant differences in gender between the two comparison groups ($p > .05$). For race there were significant differences, such that the heterosexual group had a higher percentage of Caucasian participants compared to the sexual minority group ($p < .001$). The sexual minority group also had a significantly higher proportion of Hispanic participants compared to the heterosexual group ($p < .001$) Participants were asked to identify their sexual orientation and Table 2 shows the breakdown of the subgroups that make up the composite sexual minority group used for this study.

Table 1
Demographic comparisons.

	Sexual Minority N = 178	Heterosexual N = 1116	Statistical Significance
Age	32.0 (9.7)	36.4 (11.9)	p < .001
Gender			
Male	45.5%	52.0%	p = .233
Female	51.1%	48.0%	
Gender Non-Conforming	2.2%	0.0%	
Transgender	1.1%	0.0%	
Race			
Caucasian	56.1%	71.1%	
African American	6.9%	7.3%	
Asian American or Pacific Islander	13.3%	9.6%	
Native American or Alaskan Native	5.8%	2.8%	
South Asian or Middle Eastern	12.1%	6.2%	
Mixed or Additional Race	5.8%	3.0%	p < .001
Ethnicity			
Hispanic	23.6%	10.2%	p < .001

Table 2
Sample demographic breakdown of specific responses (subgroups) to sexual orientation.

	Sexual Minority Group N = 178
Sexual Orientation	
Lesbian	9.6%
Gay	9.0%
Bisexual	69.7%
Queer/Questioning	3.9%
Asexual	1.7%
Pansexual	6.2%

3.1. General social media behaviors and validated measures

Comparisons of general social media behaviors and of the validated social media measures are shown in Table 3. For both Facebook and Twitter, there were no significant differences between the two comparison groups for social media intensity or the number of friends on Facebook, and the number of followers and following on Twitter (all *ps* > .05). The sexual minority group reported significantly more hours per day on both Facebook and Twitter (*ps* < .001). Likewise, the sexual minority group showed significantly higher scores for the need for social media ($p < .001$) and for social media addiction ($p < .001$). Furthermore, the sexual minority group indicated higher scores on both upward social comparisons ($p < .001$) and for downward social comparisons ($p < .001$). When comparing the online vs. offline identity overlap, there were no significant differences between the two comparison groups ($p > .05$). Lastly, comparisons of the fear of missing out measure showed that participants in the sexual minority group scored significantly higher as compared to the heterosexual group ($p < .001$).

Table 3
Comparisons of general social media behaviors between sexual minority and heterosexual participants.

	Sexual Minority N = 178	Heterosexual N = 1116	Statistical Significance
Social Media Intensity			
Facebook	3.3 (1.1)	3.3 (1.1)	p = .987
Twitter	3.0 (1.3)	2.9 (1.2)	p = .314
Number of Friends/ Followers			
Facebook	455.4 (640.1)	431.8 (591.4)	p = .655
Twitter Followers	265.1 (715.9)	292.1 (924.9)	p = .715
Twitter Following Others	257.3 (620.1)	259.5 (969.2)	p = .955
Hours per Day			
Facebook	6.6 (7.0)	4.6 (5.7)	p < .001
Twitter	5.1 (6.9)	2.5 (4.4)	p < .001
Need for Social Media	3.9 (1.2)	3.5 (1.1)	p < .001
Social Media Addiction	2.6 (1.4)	2.2 (1.0)	p < .001
Social Comparisons of Others …			
(Upward) Better than me	2.8 (1.4)	2.3 (1.3)	p < .001
(Downward) Worse than me	2.6 (1.4)	2.0 (1.1)	p < .001
Online-Offline Identity (higher value = greater match)	4.7 (1.7)	4.8 (1.8)	p = .895
Fear of Missing Out	27.6 (10.2)	23.3 (9.6)	p < .001

3.2. Specific social media behaviors

Comparisons of specific social media behaviors are shown in Table 4. While there were no differences between the sexual minority group and the heterosexual group on their responses regarding "feeling safe on social media" and being bothered if tagged in unflattering pictures or posts (*ps* > .05), there were significant differences on other social media behaviors. Those in the sexual minority group indicated higher likelihood of "hoping to go viral" on social media ($p < .001$), being bothered if tagged in *any* post or picture ($p = .026$), and indicated they were more likely to unfollow others because of their posts ($p = .018$).

When comparing the two groups on censorship, there were no significant differences between the groups in the likelihood of censoring their social media posts because of friends or family, school or work, or to avoid judgment (all *ps* > .05). When asked about debating online, there were no differences between the two comparison groups in responses for debating (all *ps* > .05). While there were also no differences between the two comparison groups regarding their enjoyment of trolling ($p > .05$), those in the sexual minority group did rate significantly higher on the likelihood of posting in order to annoy or aggravate others ($p < .001$).

Table 4
Comparisons of specific social media behaviors between sexual minority and heterosexual participants.

	Sexual Minority N = 178	Heterosexual N = 1116	Statistical Significance
Social Media General			
Feel safe on social media	3.2 (1.2)	3.2 (1.1)	p = .922
Hope to "Go Viral"	2.5 (1.5)	1.9 (1.2)	p < .001
Bothered if tagged in posts or pics	2.9 (1.4)	2.7 (1.3)	p = .026
Bothered if tagged in unflattering pics	3.3 (1.4)	3.2 (1.4)	p = .496
Bothered if tagged in unflattering posts	3.4 (1.3)	3.2 (1.4)	p = .068
Unfollow people because of posts	3.3 (1.3)	3.1 (1.4)	p = .018
Debate/Trolling on Social Media			
Friendly Debates	1.9 (1.3)	1.9 (1.3)	p = .723
Debate to Educate Others	1.9 (1.4)	1.9 (1.3)	p = .893
Debate to Change Minds	1.7 (1.3)	1.6 (1.3)	p = .346
Debate to Upset Others	1.2 (1.2)	1.0 (1.2)	p = .267
Enjoy Trolling	1.1 (1.3)	1.0 (1.2)	p = .223
Post to annoy or aggravate	2.5 (1.4)	2.0 (1.2)	p < .001
Censor self because of …			
Friends/Family	3.3 (1.4)	3.2 (1.4)	p = .156
Employer/School	3.3 (1.3)	3.2 (1.4)	p = .309
Avoid Judgment	3.0 (1.3)	2.9 (1.3)	p = .188

3.3. Multivariate analysis

A stepwise multivariate binary logistic regression model was developed to identify the key social media behaviors associated with the sexual minority group (See Table 5). All variables significant at the univariate level were included in the model and the demographic variables (age, race, and ethnicity) were also included. The omnibus test was significant, $X^2 = 59.745$, $p < .001$, and the -2Log Likelihood = 852.299, with a Nagelkerke R-Square = 0.093. The primary social media behaviors associated with the sexual minority group included: Greater use of Twitter (hours/day) ($p = .003$) and higher likelihood of making downward social comparisons ($p = .021$).

4. Discussion

The current study evaluated social media differences between two sexual orientation groups. Results from univariate analyses generally supported our hypotheses, confirming that sexual minorities, compared to heterosexual individuals, scored higher on (H1) the need for social media and social media addiction, (H3) both upward and downward social comparisons online, and (H4) FOMO. Although these social media behavioral differences were found between the sexual minority group and the heterosexual group at the univariate level, increased hours per day on Twitter and the greater likelihood of making downward social comparisons were the primary social media behaviors associated with the sexual minority group at the multivariate level.

These findings reveal a strength of this study, in that we've moved beyond examining single variables at the univariate level. By considering many social media factors in a regression model, we can identify which factors significantly relate to sexual minority people. Oftentimes, negative consequences are associated with social media use regardless of sexual orientation. Our regression results may suggest that sexual minorities and heterosexuals are actually quite similar in their social media behaviors, at least when considering all of the factors measured in this study. Overall, this study contributes to scholarship by providing a greater understanding of sexual minority social media use and could be useful in outreach strategies to promote sexual minority wellbeing, marketing efforts on Twitter, and directions for future research. Further, our work suggests that measuring online behavior specific to unique groups is complex and deserves additional study.

Previous research describes prominent, negative psychological effects associated with excessive time spent on social media, including increased stress levels, anxiety, depression, thoughts of suicide, and low self-esteem (Adams & Kisler, 2013; Kross et al., 2013; Pantic et al., 2012; Woods & Scott, 2016). Online support groups could reach sexual minority people on social media to provide awareness and information on the possible contribution of excessive social media use on mental health, as well as different ways to manage use. Future research could employ effective mechanisms to promote time restricted social media use. Time-restricted use may benefit people, as moderate social media use has been shown to promote more positive psychological effects such as reducing feelings of depression (Deter & Mehl, 2013) and increasing levels of self-esteem (Best et al., 2014). By aiding sexual minorities in their conscious awareness of their social media use, efforts may be made to help manage the psychological effects that are associated with prolonged social media exposure.

Findings from this study also uniquely show that sexual minorities participate in downward social comparisons more than heterosexual individuals. One speculation for this result might be because of the victimization sexual minorities encounter on the basis of their sexual orientation identities (Institute of Medicine, 2011), and downward social comparisons on social media may be a coping tool. In other words, the greater occurrence of downward social comparisons found in the sexual minority group might reflect how this group uses social media as a psychological mechanism to enhance their own subjective well-being. Although it seems as though downward social comparisons would benefit sexual minorities' mental health, Willis (1981) has shown that individuals who continuously participate in downward social comparisons tend to be more unhappy than others. Future research should investigate the underlying reasons why sexual minorities practice more downward social comparisons.

In addition to these results, the univariate analyses found that, in general, sexual minorities show higher prevalence in other social media behaviors: the need for social media, social media addiction, upward social comparisons, and FOMO. Despite these results, these social media behaviors were not significant when compared with the heterosexual group at the multivariate level. Past research would suggest that a greater need for social media and increased social media addiction are associated with psychological symptoms such as stress, anxiety, and depression (Barry, Sidoti, Briggs, Reiter, & Lindsey, 2017; Hussain & Griffiths, 2018) use of Facebook and upward social comparisons contributes to lower trait self-esteem (Vogel, Rose, Okdie, & Eckels, 2014, b), and FOMO is positively associated with poorer mood states and lower life satisfaction (Przybylski et al., 2013; Roberts & David, 2019).

Another finding that should be further analyzed is the unsupported second hypothesis regarding sexual minorities' online vs. offline identity overlap. This finding might reveal that sexual minorities and heterosexual individuals do not differ in the way they represent themselves online and offline on a univariate level. One possible explanation for this result could be that both sexual minorities' and heterosexual individuals' online identities are equally influenced by social feedback from friends and followers (Brandes & Levin, 2014; Fox & Moreland, 2015). In other words, followers' social reinforcement or discouragement of particular posts and pictures could influence social media users' self-presentation efforts regardless of sexual identity. This may also pertain to sexual minorities level of "outness" with their sexual orientation, which would also influence offline and online identity overlap, depending on how supportive or rejecting social media followers are (Jackson & Mohr, 2016). Future research should use other online and offline identity overlap measures to further explore any identity discrepancies between sexual minorities and heterosexual individuals.

4.1. Limitations

A limitation in this study is that we only analyzed data within two social media platforms, Facebook and Twitter. It would be beneficial if future research would extend analyses to incorporate other social media platforms, like Instagram, Snapchat, Reddit, Tumblr, YouTube, or TikTok, to compare social media behaviors of sexual minorities and heterosexual individuals, as people use various platforms in unique ways and with different audiences in mind (Humphreys, 2018). Research has shown that the format design of social media platforms, such as the extent to how publicized users' "likes" and comments are or the degree to which users' identities remain authentic or anonymous, influences

Table 5
Stepwise Binary Regression determining key social media factors related to those who identify as a sexual minority, based on significant univariate comparisons. (Controlling for demographics: age, race, and ethnicity).

	Beta	SE	Wald X^2	p-value	Odds Ratio	95% CI Lower	95% CI Upper
Twitter Hours per Day	.049	.017	8.810	.003	1.050	1.017	1.085
Downward Social Comparisons	.181	.078	5.359	.021	1.198	1.028	1.397
Constant	−1.562	.403	15.048	.000			

how openly sexual minorities express themselves online and use social networking (Cho, 2018; Haimson & Hoffman, 2016). Differentiating which social media behaviors are associated with which type of social media platforms will further aide in conceptualizing how to reverse negative psychological side effects, and could perhaps reveal if sexual minorities use certain social media platforms more than heterosexual individuals, and if certain social media platforms are associated with higher negative psychological health risks more than others.

A second limitation in this study is that we exclusively looked at correlational effects, which restricts us to only speculate inferences as to why sexual minorities engage in specific social media behaviors more than heterosexual individuals. Future studies should investigate causal relationships as to why sexual minorities are experiencing more maladaptive behaviors like social media addiction, need for social media, and FOMO. By understanding the causal reasons for engaging in these types of behaviors, researchers can develop and implement effective strategies to prevent or deter negative psychological consequences.

A third limitation in this study is a risk of response bias in collecting data through survey methods. There is a possibility that participants felt the need to respond to questions on the survey in a certain way to attribute to what they suspected was the desired outcome. Future research may want to take additional steps to guard against social desirability bias.

Another limitation in this study is that we did not examine or measure participants' self-awareness of their social media behaviors. Perhaps if future research investigates sexual minorities' level of awareness of social media addiction, need for social media, social comparisons, and FOMO then this can further guide direction on how to tailor treatment options. For example, sexual minorities with more awareness of their social media behaviors and those with less awareness of their social media behaviors could use different methods of mindfulness techniques when using social media to maintain their mental well-being (Weaver & Swank, 2019).

Lastly, this study is limited as the sexual minority group includes participants who identify as lesbian, gay, bisexual, queer/questioning, asexual, and pansexual. Although sexual minorities often have similar social and psychological experiences, by collapsing these individuals into a single group, we may be missing the opportunity to identify differences in social media behaviors that occur between individuals based on their specific sexual orientation. Further research could be conducted on larger samples to address this.

5. Conclusion

The overall findings of this study highlight key differences in social media behaviors associated with sexual minority individuals compared to heterosexual individuals. Now that this study has established a better understanding of the social media behaviors sexual minorities engage in more often, there is also a better understanding of how these specific social media behaviors may further impact sexual minorities' psychological well-being. Considering the potential negative psychological consequences of these particular social media behaviors, individuals with higher risk of mental health issues, including sexual minorities, should be made aware of the impact of their social media use. Developing interventions to advise sexual minorities on strategies to prevent or overcome the potential negative effects of social media behaviors and to improve mental well-being is the next step in preventing sexual minorities' psychological distress. Possible strategies may include creating an awareness of how both upward and downward social comparisons can affect individuals, and also asking individuals to track their use of social media, as well as their general affect when using social media. Empowering individuals with the tools to self-manage their behaviors on social media can foster positive outcomes.

Author contributions

Sierra Kaiser: Methodology, Writing-Review and Editing. **Dalton Klare**: Methodology, Writing-Review and Editing. **Merab Gomez**: Writing-Review and Editing. **Natalie Ceballos**: Conceptualization, Methodology, Supervision, Writing-Review and Editing. **Stephanie Dailey**: Conceptualization, Methodology, Supervision, Writing-Review and Editing. **Krista Howard**: Conceptualization, Data curation, Formal Analysis, Methodology, Project Administration, Supervision, Writing-Review and Editing.

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Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chb.2020.106638.

References

Adams, S. K., & Kisler, T. S. (2013). Sleep quality as a mediator between technology-related sleep quality, depression, and anxiety. *Cyberpsychology, Behavior, and Social Networking, 16*(1), 25–30.

Alfasi, Y. (2019). The grass is always greener on my friends' profiles: The effect of Facebook social comparison on state self-esteem and depression. *Personality and Individual Differences, 147*, 111–117. https://doi.org/10.1016/j.paid.2019.04.032

Andreassen, C. S., & Pallesen, S. (2014). Social network site addiction: An overview. *Current Pharmaceutical Design, 20*, 4053–4061. https://doi.org/10.2174/13816128113199990616

Andreassen, C. S., Torsheim, T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook addiction scale. *Psychological Reports, 110*, 501–517. https://doi.org/10.2466/02.09.18.PR0.110.2.501-517

Baker, Z. G., Krieger, H., & LeRoy, A. S. (2016). Fear of missing out: Relationships with depression, mindfulness, and physical symptoms. *Translational Issues in Psychological Science, 2*(3), 275–282. https://doi.org/10.1037/tps0000075

Barry, C. T, Sidoti, C. L., Briggs, S. M., Reiter, S. R., & Lindsey, R. A. (2017). Adolescent social media use and mental health from adolescent and parent perspectives. *Journal of Adolescence, 6*, 1–11.

Best, P., Manktelow, R., & Taylor, B. (2014). Online communication, social media and adolescent wellbeing: A systematic narrative review. *Children and Youth Services Review, 41*, 27–36. https://doi.org/10.1016/j.childyouth.2014.03.001

Brandes, S. B., & Levin, D. (2014). "Like my status": Israeli teenage girls constructing their social connections on the facebook social network. *Feminist Media Studies, 14*, 743–758. https://doi.org/10.1080/14680777.2013.833533

Burke, M., & Kraut, R. E. (2016). The relationship between Facebook use and well-being depends on communication type and tie strength. *Journal of Computer-Mediated Communication, 21*. https://doi.org/10.1111/jcc4.12162, 265-28.

Cho, A. (2018). Default publicness: Queer youth of color, social media, and being outed by the machine. *New Media & Society, 20*(9), 3183–3200. https://doi.org/10.1177/1461444817744784

Deters, F. G., & Mehl, M. R. (2012). Does posting facebook status updates increase or decrease loneliness? An online social networking experiment. *Social Psychology and Personality Science, 4*(5), 579–586. https://doi.org/10.1177/1948550612469233

Devito, M. A., Walker, A. M., & Birnholtz, J. (2018). "Too gay for facebook": Presenting LGBTQ+ identity throught the personal social media ecosystem. *ACM on Human-Computer Interaction, 2*(44), 1–23. https://doi.org/10.1145/3274313

Duguay, S. (2016). "He has a way gayer Facebook than I do": Investigating sexual identity disclosure and context collapse on a social networking site. *New Media & Society, 18*, 891–907. https://doi.org/10.1177/1461444814549930

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication, 12*, 1143–1168. https://doi.org/10.1111/j.1083-6101.2007.00367.x

Festinger, L. (1954). A theory of social comparison process. *Human Relations, 7*(2), 117–140.

Fox, J., & Moreland, J. J. (2015). The dark side of social networking sites: An exploration of the relational and psychological stressors associated with Facebook use and affordances. *Computers in Human Behavior, 45*, 168–176. https://doi.org/10.1016/j.chb.2014.11.083

Fox, J., & Ralston, R. (2016). Queer identity online: Information learning and teaching experiences of LGBTQ individuals on social media. *Computers in Human Behavior, 65*, 635–642. https://doi.org/10.1016/j.chb.2016.06.009

(GLSEN) Gay, Lesbian, and Straight Education Network. (2014). The 2013 national school climate survey: Key findings on the experiences of lesbian, gay, bisexual and transgender youth in our nation's schools. Executive Summary. In *Gay, lesbian and Straight education network (GLSEN)*. Gay, Lesbian and Straight Education Network (GLSEN).

Gonzales, A., & Hancock, J. T. (2011). Mirror, mirror on my Facebook wall: Effects of exposure to Facebook on self-esteem. *Cyberpsychology, Behavior, and Social Networking, 14*(1–2), 79–83. https://doi.org/10.1089/cyber.2009.0411

Haimson, O. L., & Hoffman, A. L. (2016). Constructing and enforcing "authentic" identity online: Facebook, real names, and non-normative identities. *First Monday, 21*(6). https://doi.org/10.5210/fm.v21i6.6791

Hanna, E., Ward, L. M., Seabrook, R. C., Jerald, M., Reed, L., Giaccardi, S., et al. (2017). Contributions of social comparison and self-objectification in mediating associations between Facebook use and emergent adults' psychological well-being. *Behavior and Social Networking, 20*(3), 172–179. https://doi.org/10.1089/cyber.2016.0247

Hillier, L., & Harrison, L. (2007). Building realities less limited than their own: Young people practicing same-sex attraction on the internet. *Sexualities, 10*, 82–100. https://doi.org/10.1177/1363460707072956

Humphreys, L. (2018). *The qualified self: Social media and the accounting of everyday life*. Cambridge, Massachusetts: MIT Press.

Institute of Medicine. (2011). *The health of lesbian, gay, bisexual, and transgender people: Building a foundation for better understanding*. https://doi.org/10.17226/13128

Hussain, Z., & Griffiths, M. D. (2018). Problematic social networking site use and comorbid psychiatric disorders: A systematic review of recent large-scale studies. *Frontiers in Psychiatry, 9*, 686. https://doi.org/10.3389/fpsyt.2018.00686

Jackson, S. D., & Mohr, J. J. (2016). Conceptualizing the closet: Differentiating stigma concealment and nondisclosure processes. *Psychology of Sexual Orientation and Gender Diversity, 3*, 80–92. https://doi.org/10.1037/sgd0000147

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., et al. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS One, 8*(8), 1–6. https://doi-org.libproxy.txstate.edu/10.1371/journal.pone.0069841.

McConnell, M., Clifford, A., Korpak, A., Phillips, G., II, & Birkett, M. (2017). Identity, victimization, and support: Facebook experiences and mental health among LGBTQ youth. *Computers in Human Behavior, 76*, 237–244, 10.10.16/j.chb.2017.07.026.

Pantic, I., Damjanovic, A., Todorovic, J., Topalovic, D., Bojovic-Jovic, D., Ristic, S., et al. (2012). Association between online social networking and depression in high school students: Behavioral physiology viewpoint. *Psychiatria Danubina, 24*, 90–93.

Park, S. Y., & Baek, Y. M. (2018). Two faces of social comparison on Facebook: The interplay between social comparison orientation, emotions, and psychological well-being. *Computers in Human Behavior, 79*, 83–93. https://doi.org/10.1016/j.chb.2017.10.028

Park, N., Kee, K. F., & Valenzuela, S. (2009). Being immersed in social networking environment: Facebook groups, uses and gratifications, and social outcomes. *CyberPsychology and Behavior, 12*, 729–733. https://doi.org/10.1089/cpb.2009.0003

Pew Research Center. (2015). *Social media update 2014*. Retrieved from: http://www.webcitation.org/6ajEhvS11.

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior, 29*, 1841–1848. https://doi.org/10.1016/j.chb.2013.02.014

Roberts, J. A., & David, M. E. (2020). The social media party: Fear of missing out (FoMO), social media intensity, connection, and well-being. *International Journal of Human-Computer Interaction, 36*(4), 386–392. https://doi.org/10.1080/10447318.2019.1646517

Robinson, A., Bonnette, A., Howard, K., Ceballos, N., Dailey, S., Lu, Y., et al. (2018). Social comparisons, social media addiction, and social interaction: An examination of specific social media behaviors related to major depressive disorder in a millennial population. *Journal of Applied Biobehavioral Research, 24*(1). https://doi.org/10.1111/jabr.12158

Shamir, B., & Kark, R. (2010). A single-item graphic scale for the measurement of organizational identification. *Journal of Occupational and Organizational Psychology, 77*(1), 115–123. https://doi.org/10.1348/096317904322915946

Sheldon, K. M., Abad, N., & Hinsch, C. (2011). A two-process view of Facebook use and relatedness need-satisfaction: Disconnection drives use, and connection rewards it. *Journal of Personality and Social Psychology, 100*(4), 766–775. https://doi.org/10.1037/a0022407

Throuvala, M. A., Griffiths, M. D., Rennoldson, M., & Kuss, D. J. (2019). Motivational processes and dysfunctional mechanisms of social media use among adolescents: A qualitative focus group study. *Computers in Human Behavior, 93*, 164–175. https://doi-org.libproxy.txstate.edu/10.1016/j.chb.2018.12.012.

Treem, J. W., Dailey, S. L., Pierce, C. S., & Biffl, D. (2016). What we are talking about when we talk about social media: A framework for study. *Sociology Compass, 10*(9), 768–784. https://doi.org/10.1111/soc4.12404

Vogel, E. A., Rose, J. P., Okdie, B. M., & Eckels, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture, 3*(4), 206–222. https://doi.org/10.1037/ppm0000047

Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014b). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture, 3*(4), 206–222.

Weaver, J. L., & Swank, J. M. (2019). Mindful connections: A mindfulness-based intervention for adolescent social media users. *Journal of Child & Adolescent Counseling, 5*(2), 103–112. https://doi-org.libproxy.txstate.edu/10.1080/23727810.2019.1586419.

Willis, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin, 90*(2), 245–271. https://doi.org/10.1037/0033-2909.90.2.245

Wood, J. V. (1989). Theory and research concerning social comparisons of personal attributes. *Psychological Bulletin, 106*(2), 231–248.

Woods, H. C., & Scott, H. (2016). #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal of Adolescence, 51*, 41–49. https://doi.org/10.1016/j.adolescence.2016.05.008