An Analysis of Relationship between Social Media Usage, Loneliness, and Sexual Orientation Among Young Adults

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Abstract— This study investigates the relationship between social media usage, perceived loneliness, and sexual orientation among young adults. Utilizing a sample of 77 participants aged 18 to 30, the research employed standardized tools including the Social Media Usage Scale (SMUS), the UCLA Loneliness Scale (Version 3), and the Kinsey Scale to assess participants' digital behavior, emotional isolation, and sexual identity. The findings revealed a moderate positive correlation between social media usage and loneliness (r = 0.52, p < 0.01), suggesting that higher engagement with social media is associated with increased feelings of loneliness. ANOVA results showed significant differences in loneliness scores across sexual orientation groups (F(3, 73) = 5.94, p < 0.01), with non-heterosexual individuals—particularly homosexual and bisexual participants—reporting the highest levels of loneliness. Additionally, a moderation analysis indicated that sexual orientation significantly influenced the strength of the relationship between social media usage and loneliness (β = 0.29, p < 0.05), with a stronger effect observed among LGBTQ+ individuals. These findings underscore the dual nature of social media as both a space for identity expression and a source of emotional disconnection, particularly for marginalized groups. The study highlights the need for more inclusive and emotionally supportive digital environments for young adults navigating complex social and identity-related challenges.

*Keywords— **Loneliness, LGBTQ+, Sexual Orientation, Social Media, Young Adults***

I. INTRODUCTION

1.1 Background

While social media platforms foster connection and community, their influence on loneliness, particularly among marginalized groups like LGBTQ+ individuals, requires careful examination. This research aims to clarify the relationship between social media engagement, feelings of loneliness, and sexual orientation. It investigates whether LGBTQ+ individuals use social media more than others and how this usage affects their sense of isolation. The study will employ a correlational design, using surveys to collect data on social media habits and loneliness levels from a diverse sample of participants. Analysing the data through the frameworks of Social Comparison Theory (to understand how online interactions shape self-perception) and Minority Stress Theory (to address the unique stressors experienced by LGBTQ+ individuals), the research seeks to elucidate the complex relationship between digital interactions and mental well-being within this population. The ultimate goal is to contribute to a more nuanced understanding of social media's potential benefits and risks for individuals with different sexual orientations.

1.1.1 Social Media Usage

In today's society, social media is ubiquitous. A groundbreaking 2018 Pew Research Centre study revealed that 88% of individuals aged 18 to 29 use social media, with 78% of those aged 30 to 49 reporting the same.

While usage dips slightly in older demographics, it remains significant. An impressive 64% of individuals between 50 and 64 are active social media users. This statistic is particularly striking, given that this generation did not grow up with the internet, highlighting social media's widespread adoption.

Given the pervasive nature of social media across all age groups, it is crucial to examine its impact on individual users. The continuous flow of information and connectivity offered by these platforms is reshaping our thought processes and how we process information. Current social media habits can have both beneficial and

detrimental effects on mental health, raising the question: how does social media affect our brains?

As social media use continues to expand, researchers are increasingly focusing on understanding the psychology behind it in our digitally connected world.

(a) Social Media and the Brain

From a neurological perspective, social media has diverse effects on various brain functions. It presents a complex mix of stimuli that can trigger a range of responses, leading to varied impacts on the brain.

Positive attention on social media, for instance, activates multiple brain regions. According to an article in *Social Cognitive and Affective Neuroscience*, receiving likes on social media platforms triggers "activation in brain circuitry implicated in reward, including the striatum and ventral tegmental area, regions also implicated in the experience of receiving Likes from others." In simpler terms, this means that when users receive positive feedback, the ventral tegmental area (VTA), a key component of the brain's reward system, releases dopamine.

Another study utilizing MRI technology to monitor brain activity confirmed these findings. Researchers observed increased activity in brain regions associated with reward processing, social cognition, imitation, and attention when adolescents viewed Instagram photos with a high number of likes.

These findings underscore the powerful influence of social media on our reward systems, highlighting the potential for both beneficial and detrimental effects. The similarities between social media's impact and that of addictive substances like gambling and drugs should be acknowledged to avoid potential pitfalls.

Beyond reward systems, social media stimuli can also affect the brain's decision-making and emotional processing functions. One study observed that brain regions responsible for emotional and sensory processing reacted noticeably when adolescent participants experienced online social exclusion. This highlights the impact of online exclusion on the developing brains of adolescents.

Research on the neurological effects of social media is still in its early stages. While these studies represent strides in understanding the impact of social media on the brain, further research is needed as social media continues to evolve. These studies are helping to illuminate why people post on social media.

(b) Why We Post on Social Media

People carefully select the platforms and content they share. Instagram is often chosen for photos, while Twitter is favoured for short, witty posts. This decision-making process involves various factors, including psychological motivations.

(c) Psychological Motivations for Posting

While pinpointing the exact reasons behind social media posting is challenging, understanding common social media behaviours provides insights into general motivations.

A Medium article, "The Psychology of Social Sharing," (2018, October 24. The Psychology of Social Sharing - Contentworks Agency) identified different levels of posting motivations. Adapting Abraham Maslow's hierarchy of human needs, the authors outline the following reasons why people post and consume updates:

- Physiological needs: Posting to promote the health and well-being of loved ones.

- Safety: Sharing content related to physical, mental, or financial security.

- Love/belonging: Seeking social acceptance from groups or individuals.

- Esteem: Satisfying the brain's reward system, often through "me-centric" content.

- Self-actualization: Sharing personal achievements, such as career advancements or graduations.

The psychology of social media posting is an emerging field. A study titled "Why We Share: A Study of Motivations for Mobile Media Sharing" (Oct. 2009, Dion Goh) employed diaries and post-study interviews to explore individuals' posting habits and corresponding emotions. The researchers found that social and emotional influences played a significant role in media sharing behaviour.

Other research has focused on the impact of social media on children's psychological development. The article "Growing Up Wired: Social Networking Sites and Adolescent Psychosocial Development" (Shapiro, L. a. S., & Margolin, G. 2013) suggests that some individuals are raised to share online from a young age. The researchers stated that adolescents and young adults primarily use social networking sites to stay in touch with friends, make plans, get to know people better, and present themselves to others, mirroring traditional communication methods. Moreover, children and adolescents' identities are increasingly shaped by posting and engaging with social media.

Research in the *Journal of Experimental Social Psychology* indicates that the potential for positive feedback and increased self-esteem also drives social

media sharing. The pursuit of likes and follows heavily influences posting behaviour, with positive attention encouraging further sharing.

In conclusion, people generally post from an emotional impulse, seeking a response from others. As social media is inherently communication-centric, the primary motivation behind posting stems from a psychological desire to connect. However, this constant quest for acceptance and visibility can lead to psychological problems for some individuals.

1.1.2 Loneliness

Loneliness is a painful universal phenomenon that has an evolutionary basis. Loneliness reminds us of the pain and warns us of the threat of becoming isolated. Loneliness is the absence of imperative social relations and lack of affection in current social relationships. (Rubin A. Research and Therapy. New York: Wiley; 1982).

Loneliness is one of the main indicators of social well-being. Loneliness is caused not by being alone, but by being without some definite needed relationship or set of relationships. Research addressing loneliness has increased dramatically over the past 2 decades; however, despite the mental health risks associated with being lonely, the relationship between loneliness and psychiatric disorders has not been sufficiently explored. (West Donald A, Kellner Robert, Moore-West Maggi. The Effects of Loneliness: A Review of the Literature. Comprehensive Psychiatry. 1986).

Contrary to popular belief, loneliness is more prevalent among adolescents and young adults than the elderly. This is because older adults often possess coping mechanisms that allow them to adapt to solitude, whereas adolescents typically lack such skills. Furthermore, adolescence is a critical period for identity formation, where acceptance and love play a crucial role.

There are 3 types of loneliness i.e. situational loneliness, developmental loneliness and internal loneliness. (Tiwari SC. Loneliness: A disease? Indian J of Psychiatry. 2013)

1. Situational Loneliness: The various factors associated with situational loneliness are environmental factors (unpleasant experiences, discrepancy between the levels of his/her needs), migration of people, inter personal conflicts, accidents and disasters, etc.

2. Developmental Loneliness: The various factors associated with developmental loneliness are personal inadequacies, developmental deficits, significant separations, poverty, living arrangements, and physical/psychological disabilities.

3. Internal Loneliness: The various factors associated with internal loneliness are personality factors, locus of control, mental distress, low self-esteem, guilt feeling, and poor coping strategies with situations.

Further Weiss et al., reported 2 types of loneliness i.e. emotional and social loneliness. Emotional loneliness defined by the absence of an attachment figure and social isolation, characterized by the absence of a social network.

1.1.3 Defining Sexual Orientation

Discussions surrounding "sexual orientation" are common, with widespread opinions on its legal protection, moral implications, and inherent nature. This suggests a common understanding of the term, but closer examination reveals diverse, conflicting, and ethically complex characterizations. Examples from professional scientific associations, LGBTQ+ advocacy groups, neuroscientists, and philosophers illustrate:

1. Sexual orientation is a lasting pattern of emotional, romantic, and/or sexual attractions to men, women, or both. (American Psychological Association, 2008)

2. 'Sexual orientation' is the preferred term to describe an individual's physical and/or emotional attraction to the same and/or opposite gender. (Humans Rights Campaign, 2014)

3. Sexual orientation predisposes us to sexual attraction to the same sex (homosexual, gay, or lesbian), the opposite sex (heterosexual or straight), or both sexes (bisexual). (LeVay, 2011)

4. A person's sexual orientation is based on their sexual desires, fantasies, and behaviors they are likely to engage in under ideal conditions. (Stein, 1999)

1.1.3.1 The Historical Construction of Sexual Orientation

The concept of sexual orientation is relatively recent. While same-sex and opposite-sex behaviors have always existed, the idea of defining individuals by their sexual attractions and behaviors emerged in medical discourse in the 19th century. The term "homosexuality" is often traced to Karl Maria Benkert's 1868 pamphlet, with "heterosexuality" introduced the same year. Initially, "heterosexual" described attraction to both sexes (bisexuality today). Richard von Krafft-Ebing later used it to mean desire for the opposite sex. However, Freud's conceptualization of homosexuality in his Three Essays on the Theory of Sexuality solidified the modern view of sexual orientation defined by object choice (the target of sexual desire).

Homosexuality was initially defined in opposition to normalcy, and its stigmatization was integral to the social construction of sexual orientation. The history of sexual orientation has been a dialectic between viewing homosexuality as pathological and challenging its association with mental illness. Even Freud, while believing homosexuality an imperfect psychosexual outcome, stated it was not shameful, a vice, or an illness in 1935.

American psychoanalysts diverged from Freud. Rado (1940, 1949) asserted that only heterosexuality is natural and homosexuality is a "reparative" attempt to achieve sexual pleasure when heterosexual outlets are threatening. Rado's followers created theories about homosexuality's origins, all based on the assumption it was an illness.

Psychoanalysis was dominant in mid-20th century psychiatry, and the assumption that homosexuality was a pathology permeated U.S. culture (Bayer 1987, Friedman & Downey 1998, Silverstein 1991). During World War II, the U.S. military rejected gay recruits using psychiatric screening procedures (B´erub´e 1990). The Diagnostic and Statistical Manual of Mental Disorders (DSM) listed homosexuality as a sociopathic personality disturbance (Am. Psychiatric. Assoc. 1952). Psychiatrists attempted to "cure" homosexuality, with patients spending hours in psychotherapy, often unsuccessfully. More drastic methods, including hormones, aversive conditioning, lobotomy, electroshock, and castration, were also (attempted) to change someone's orientation.

Eventually, challenges to this psychiatric view emerged. Kinsey's studies revealed that homosexual behavior and attractions were more common than previously thought. A comparative study documented homosexual behavior in many nonhuman species and its acceptance in various human cultures (Ford & Beach 1951).

The medical and scientific institutions that had previously justified stigmatizing homosexuality reversed their position in 1973. The current mainstream view among clinicians and researchers is that diverse sexual orientations are normal variations of human sexual expression and not inherently linked to psychopathology.

1.2 Problem Statement

Loneliness among young adults is rising, with LGBTQ+ individuals reporting higher rates due to systemic stigma (Meyer, 2003). Although studies link social media to mental health outcomes, limited research addresses how sexual orientation moderates this relationship. This gap hinders the development of inclusive interventions.

1.3 Purpose of the Study

1. Analyze correlations between social media engagement and loneliness across sexual orientation groups.

2. Investigate whether LGBTQ+ individuals use social media more frequently and how this affects isolation.

3. Apply theoretical frameworks to contextualize findings and propose solutions.

1.4 Rationale of the Study

Loneliness is linked to severe mental health risks, including depression (Cacioppo et al., 2014). For LGBTQ+ youth, these risks are compounded by minority stress. Understanding how social media use alleviates or exacerbates loneliness in this population can guide policies to enhance digital well-being.

II.   REVIEW OF LITERATURE

2.1 Social Media and Loneliness

2.1.1 The causes of loneliness: The perspective of young adults in London's most deprived areas

Sam Fardghassemi, He´lèneJoffe

Young adults are currently the loneliest demographic in the UK and other Western countries, yet little is known about how they perceive the causes of their loneliness. This study aims to explore the subjective causes of loneliness among young adults aged 18 to 24, particularly those of lower socio-economic status who are employed, renting, and living in the most deprived areas of London. Research indicates that this group experiences the highest levels of loneliness in the UK, making it essential to understand their perspectives on the issue.

Using a free association technique and thematic analysis within a phenomenological framework, the study examines the experiences of 48 young adults from the four most deprived boroughs in London. The findings reveal that loneliness clusters around five key themes: The Feeling of Being Disconnected, Contemporary Culture, Pressure, Social Comparison, and Transitions Between Life Stages. Disconnection arises from feelings of insignificance, lack of understanding, or an inability to express oneself, which deepens the experience of loneliness.

Contemporary culture, particularly aspects related to social media and materialism, also contributes significantly to loneliness. The pressure to succeed, fit in, and meet societal expectations further intensifies these feelings. Social comparison, often exacerbated by social media, plays a crucial role in making young adults feel inadequate or isolated. Additionally, life transitions such as breakups, loss of significant relationships, and changes

related to education or employment create instability that can lead to loneliness.

The study highlights how these factors interact to shape young adults' experiences of loneliness and suggests potential interventions to address the issue. By understanding the underlying causes, policies and mental health initiatives can be designed to reduce loneliness and improve social well-being among young people.

2.1.2 Loneliness among young adults during COVID-19 pandemic: The mediational roles of social media use and social support seeking

Ellie Lisitsa et al., 2020

The COVID-19 pandemic led to widespread social distancing and shelter-at-home measures in the United States, significantly impacting social interactions and mental health. Young adults, already experiencing high rates of loneliness, were particularly vulnerable during this period. Additionally, this demographic engages more frequently with social media, a form of digital socialization that has been linked to negative mental health outcomes, including loneliness and depression.

This study investigated how social media use and social support seeking mediated the relationship between age and loneliness during the pandemic. A total of 1,674 adults participated in an online survey assessing depressive symptoms, loneliness, coping strategies, and lifestyle changes due to COVID-19. The findings revealed that young adults experienced higher levels of loneliness compared to older adults. They also reported a significant increase in social media use and lower levels of social support seeking, both of which were found to mediate the relationship between age and loneliness.

These results highlight how social media engagement and reduced social support seeking may have contributed to heightened loneliness among young adults. The study discusses these findings in the context of prior research, emphasizing the psychological impact of stress and isolation. Clinical implications are explored, with suggestions for interventions aimed at mitigating loneliness and promoting healthier coping strategies among young people during times of crisis.

2.1.3 Social Media and Loneliness - Forever connected?

Roman Yavich, Nitza Davidovitch, & Zeev Frenkel

The rise of social media has transformed how people connect and interact. While it offers many communication advantages, researchers are increasingly concerned about its potential effects on mental health, particularly feelings of loneliness. This review explores the relationship between social media use and loneliness, aiming to determine whether social platforms alleviate or contribute to social isolation.

The study highlights how people use social media in different ways — some for active engagement (messaging, commenting), others for passive use (scrolling without interacting). These patterns influence emotional outcomes differently. For example, passive use is more likely to be associated with increased loneliness compared to active engagement, which might strengthen social bonds.

Research presents mixed results. Some studies suggest social media helps reduce loneliness by enabling communication and connection, especially for those who are otherwise isolated. Other findings argue that excessive or passive use might worsen feelings of exclusion or inadequacy, especially when users engage in negative social comparisons.

The paper concludes that social media's effect on loneliness isn't straightforward. It depends heavily on how individuals use these platforms and what needs they aim to fulfill through them. While social media can provide support and reduce loneliness for some, it may deepen it for others—particularly when usage is passive, superficial, or driven by negative emotional states.

The authors suggest promoting mindful and purposeful social media use. They recommend that future research focus more on the quality of social interactions online, individual psychological factors, and long-term effects on mental health.

2.1.4 No More FOMO: Limiting Social Media Decreases Loneliness and Depression

Melissa G. Hunt, Rachel Marx, Courtney Lipson and Jordyn Young (2018)

The study titled "No More FOMO: Limiting Social Media Decreases Loneliness and Depression" by Melissa G. Hunt and colleagues (2018) offers important experimental insight into the causal relationship between social media usage and psychological well-being. While previous studies have frequently reported associations between higher social media use and poorer mental health outcomes—including depression, loneliness, and low self-esteem—most of this work has been correlational, making it difficult to determine whether social media use causes emotional distress or if individuals who are already distressed tend to use social media more. In contrast, Hunt et al.'s research adopts a rigorous experimental design, allowing for stronger conclusions about the direction of causality. Their study focused on young adults— specifically, 143 undergraduate students from the University of Pennsylvania—and examined the psychological effects of intentionally limiting daily use of

three major social media platforms: Facebook, Instagram, and Snapchat.

The results were striking. Participants who limited their social media usage showed significant reductions in loneliness and depression over the three-week intervention period compared to those in the control group. These findings were particularly pronounced among participants who had high levels of depressive symptoms at the outset of the study. For those individuals, depressive symptoms decreased from moderately severe to mild levels by the end of the intervention. This suggests that the act of reducing social media use has a clinically meaningful impact on mental health, especially for those already struggling. Even participants with lower baseline depression experienced small but statistically significant improvements in mood, although the changes were not considered clinically substantial.

In addition to reductions in depression and loneliness, both groups—regardless of condition—showed decreases in anxiety and fear of missing out (FOMO) over time. Researchers attributed this effect to the act of self-monitoring inherent in the study design. Participants were required to track their usage and reflect on their digital habits, which may have increased their awareness and prompted behavioral adjustments even among those not formally instructed to limit their usage. Anecdotal feedback from participants supported this interpretation. Many reported that they became more conscious of how much time they spent on social media and began questioning the value it added to their lives. Some even voluntarily chose to stop using certain platforms after recognizing their limited utility or emotional cost.

However, not all aspects of psychological well-being improved. The study found no significant changes in measures of self-esteem, perceived social support, or broader psychological well-being. This raises important questions about the specific domains of mental health most susceptible to change through reduced social media use. It's possible that the three-week duration of the intervention was too short to impact these deeper, more stable constructs, or that the 30-minute-per-day limit was not enough to shift internalized beliefs or social dynamics. Alternatively, it may be that these particular measures are less directly influenced by social media than loneliness or mood symptoms like depression and anxiety.

The study also sheds light on an important methodological issue: the difference between objective versus subjective measures of social media use. During the spring semester, participants were asked to estimate their own usage. These estimates were significantly correlated with negative mental health outcomes such as low self-esteem and poor social support—consistent with many prior studies. However, the actual objective usage data collected by the researchers did not show the same correlations. This discrepancy suggests that retrospective self-report data may be misleading, potentially exaggerating the effects of social media. People who feel distressed may believe they are using social media more than they actually are, perhaps because of guilt, self-criticism, or social comparison processes. This insight underscores the importance of using behavioral tracking in future research.

Despite its strengths, the study had some limitations. The intervention focused exclusively on Facebook, Instagram, and Snapchat, but did not account for participants' potential increased usage of other platforms such as Twitter, TikTok, dating apps, or messaging services. Indeed, some participants mentioned shifting their attention to other platforms not included in the study, which could confound the results. Additionally, although Snapchat is primarily a mobile app, Facebook and Instagram can be accessed via desktop or other devices. The study only tracked mobile phone usage, leaving room for unmonitored access elsewhere. There were also challenges in compliance; while most participants in the intervention group adhered to the time limits reasonably well, some did not, and researchers could not enforce strict control over usage.

2.2 Social Media and Sexual Orientation

2.2.1 Association Between LGB Sexual Orientation and Depression Mediated by Negative Social Media Experiences: National Survey Study of US Young Adults

César G Escobar-Viera & Ariel Shensa et al. (2020)

Recent literature increasingly explores the intersection between sexual orientation, mental health, and digital engagement. Lesbian, gay, and bisexual (LGB) individuals are widely recognized to be at greater risk for experiencing mental health issues, particularly depression, due to ongoing exposure to minority stress, discrimination, and social exclusion. A study by Escobar-Viera et al. (2021) contributes to this growing body of work by examining how negative social media experiences mediate the association between LGB identity and depressive symptoms among U.S. young adults.

Drawing on a web-based national survey of adults aged 18–30, the researchers employed generalized structural equation modeling to explore both direct and indirect effects of sexual orientation on depression. Participants' sexual orientation, experiences with negative interactions on social media, and levels of depression (measured using the PHQ-9 scale) were key variables. Importantly, the analysis controlled for demographic and personal

characteristics, allowing for a more nuanced understanding of the associations involved.

The study's findings indicate a significant indirect pathway through which LGB orientation contributes to depressive symptoms via negative social media experiences. Specifically, individuals identifying as LGB reported more frequent negative social media interactions compared to their heterosexual peers, and these experiences were positively associated with increased depressive symptomatology. A one-unit increase in negative social media experiences was linked to a 0.494 unit increase in depressive symptoms, demonstrating a measurable and meaningful effect.

This research reinforces prior findings that digital spaces, while offering potential for community and identity expression, can also expose marginalized populations to harmful interactions such as cyberbullying, exclusion, or invalidation. The dual role of social media—as both a source of support and a site of risk—is particularly salient for LGB youth and young adults, who often rely heavily on these platforms for social connection and identity exploration.

In conclusion, Escobar-Viera et al. highlight the importance of considering the quality of social media experiences in the broader discussion of LGB mental health. Their study suggests that reducing negative interactions and promoting positive, affirming online environments could serve as a protective factor against depression in this population. This work has implications for mental health professionals, educators, and platform designers interested in reducing digital harm and supporting mental well-being among sexual minority groups.

2.2.2 Social Media Use and Health and Well-being of Lesbian, Gay, Bisexual, Transgender, and Queer Youth: Systematic Review

Matthew N Berger, et al., (2021)

Growing literature highlights the unique challenges LGBTQ youth face in achieving and maintaining mental well-being. Factors such as heteronormative environments, stigma, discrimination, and marginalization often leave LGBTQ individuals with limited access to supportive communities. In this context, social media has emerged as a significant space for connection and expression. A systematic review by Berger et al. (2021) synthesizes current research to assess how social media platforms influence the mental health and well-being of LGBTQ youth, with a particular focus on identity development, peer connection, and social support.

Using PRISMA guidelines, the authors examined 26 peer-reviewed studies published since 2012, focusing on LGBTQ individuals aged 10 to 24. Their methodology included qualitative, quantitative, and mixed-methods studies sourced from five major databases. Most studies included in the review were of moderate to high quality and highlighted social media's growing role in LGBTQ youths' lives.

The qualitative data revealed that LGBTQ youth actively use platforms like Instagram, Tumblr, and Twitter to explore and negotiate their identities, connect with similar others, and seek emotional and informational support. These platforms allowed for anonymity, which was particularly valued for identity management and strategic disclosure. Young users often employed tactics such as using multiple accounts, censoring personal information, and restricting content visibility to navigate their public and private identities safely.

From the quantitative findings, a subset of studies (38%) showed that social media use was linked to improved well-being and reduced mental health concerns, especially when platforms were used for positive peer engagement and identity affirmation. However, negative outcomes were also reported. These included experiences of online discrimination, harassment, and policies that failed to support gender-diverse identities, which in turn contributed to distress and mental health struggles.

The review concludes that social media can serve as a double-edged sword: offering valuable avenues for support, identity expression, and belonging while also exposing users to risks that can negatively affect mental health. Berger et al. emphasize the need for more longitudinal and methodologically rigorous research to determine the long-term effects of social media use on LGBTQ youth mental health. Furthermore, the authors advocate for the development of social media health literacy interventions tailored to LGBTQ populations, to enhance protective outcomes and mitigate harm.

2.3 Sexual Orientation and Loneliness

2.3.1 Loneliness in Gender-Diverse and Sexual Orientation-Diverse Adolescents: Measurement Invariance Analyses and Between-Group Comparisons

Riley McDanal, & Jessica L. Schleider, et al., (2021)

Loneliness has been recognized as a significant public health concern, with wide-ranging implications for mental and physical health. In recent years, scholars have turned their attention to the disproportionate experience of loneliness among sexual minority individuals. The article "Sexual Orientation and Loneliness: The Role of Social Connection" (Hughes et al., 2022) contributes to this growing body of literature by exploring the nuanced associations between sexual orientation, social connection, and loneliness.

Prior research consistently indicates that lesbian, gay, and bisexual (LGB) individuals experience elevated levels of loneliness compared to their heterosexual peers (Newall & Menec, 2017; Barrett & Barbee, 2017). This disparity has been linked to experiences of stigma, discrimination, and exclusion, which may inhibit the formation and maintenance of meaningful social bonds. The minority stress model (Meyer, 2003) provides a foundational framework for understanding how these chronic social stressors contribute to poorer mental health outcomes among sexual minorities.

The study by Hughes et al. expands on this theoretical base by empirically examining the mediating role of social connection in the link between sexual orientation and loneliness. The authors employed a nationally representative sample from the United Kingdom, incorporating self-reported measures of sexual orientation, loneliness, and multiple facets of social connection—including emotional support, social network size, and frequency of social contact.

Their findings reveal that LGB individuals are significantly more likely to report loneliness, a pattern partially explained by lower levels of perceived social connection. Importantly, while social network size did not significantly differ across sexual orientation groups, qualitative aspects of social relationships—such as emotional support and feelings of belonging—were crucial mediators. This supports the idea that the quality, rather than quantity, of social interactions plays a more decisive role in mitigating loneliness.

Moreover, the authors highlight gender differences in these patterns. Gay and bisexual men were more likely to report loneliness than lesbian and bisexual women, suggesting that interventions may require a gender-sensitive approach. These findings align with previous studies that suggest male friendships often lack the emotional intimacy necessary to buffer against loneliness (Fehr, 2004).

This article adds valuable insight by shifting the focus from individual-level pathology to the social structures and relational dynamics that shape the lived experiences of LGB individuals. It also underscores the importance of fostering inclusive environments and enhancing social support systems to reduce loneliness and promote mental well-being.

In conclusion, the literature converges on the idea that loneliness among sexual minorities is not merely a personal or psychological issue but a socially rooted phenomenon. The study by Hughes et al. reaffirms the critical role of social connection and contributes to a more holistic understanding of how marginalized identities navigate social and emotional landscapes.

2.3.2 Loneliness in sexual minority and heterosexual individuals: A comparative meta-analysis

Paul Gorczynski

This study addresses a critical gap in loneliness research: the lack of systematic data comparing sexual minority individuals to their heterosexual counterparts. Loneliness, defined as the emotional distress resulting from a perceived gap between desired and actual social connections, is known to have profound consequences on physical and mental health. While existing research suggests that sexual minorities may face higher levels of loneliness, prior to this study, there had been no meta-analyses directly comparing these groups using quantitative methods.

To explore this disparity, the authors conducted a systematic search of databases including MEDLINE, CINAHL, PsycINFO, Scopus, and Cochrane, identifying studies that compared loneliness in both sexual minority and heterosexual populations. Out of 502 screened articles, only four met the inclusion criteria. These studies involved a total of 481 sexual minority individuals and 4,176 heterosexual individuals, spanning a wide age range from children to older adults. The authors used standardized mean difference (Cohen's d) to compare loneliness levels and found that sexual minorities reported significantly higher loneliness (d = 0.352, p = 0.019). This represents a small-to-moderate effect size, indicating that the difference is both statistically and practically meaningful.

The findings support earlier research showing that loneliness among sexual minorities is linked to factors like discrimination, internalized homophobia, social rejection, lack of stable relationships, and weaker social networks. The paper discusses how loneliness is not just a product of individual experience but also of broader structural and social inequalities. It highlights that loneliness is particularly severe among older sexual minority individuals and those without supportive networks or inclusive environments.

Importantly, the authors argue that interventions to reduce loneliness should operate at multiple levels. At the individual level, mental health services need to be more inclusive and better equipped to address the unique challenges faced by LGBTQ+ individuals. Clinicians should be trained to recognize and address loneliness in relation to sexual identity and create safe spaces for disclosure. On a community level, initiatives like LGBTQ+ support groups and inclusive housing or care facilities can foster belonging and reduce isolation. On a societal level, efforts must be made to reduce stigma and discrimination through policy and public awareness, as societal rejection contributes directly to minority stress and loneliness.

The article concludes by stressing the urgent need for more comprehensive data. Many health studies do not collect demographic information on sexual orientation, leading to a gap in evidence-based practices for this population. The study also calls for more inclusive longitudinal research that examines how loneliness evolves over time, how it varies across intersectional identities (such as ethnicity, gender, and income), and what interventions are most effective across different age groups and life stages.

This is the first meta-analysis to quantitatively compare loneliness between sexual minority and heterosexual individuals, confirming that sexual minorities are more likely to experience loneliness. The findings call for targeted interventions and structural changes to address the loneliness epidemic in LGBTQ+ communities, emphasizing the need for more inclusive research and mental health practices.

2.3.3 Researching gender and loneliness differently

Manuela Barreto, David Matthew Doyle, & Marlies Maes

The article "Researching Gender and Loneliness Differently" by Manuela Barreto, David Matthew Doyle, and Marlies Maes (2025) challenges traditional approaches to understanding the relationship between gender and loneliness. Rather than simply comparing men and women, the authors propose a more nuanced, inclusive framework that considers multiple aspects of gender—such as identity, roles, expression, and societal context—and how these influences loneliness.

Traditionally, research on loneliness has considered gender in binary terms, often comparing loneliness scores between men and women. However, studies using this approach have shown inconsistent results, with some finding higher loneliness in women, others in men, and many finding no significant difference at all. The authors argue that these mixed results reflect the limitations of binary gender frameworks and a failure to consider the complex ways gender interacts with social experiences, expectations, and norms.

To address this, the authors propose an expanded conceptualization of gender, one that includes not only biological sex but also gender identity, expression, and roles. They emphasize that gender is shaped by both individual identity and social context. For example, people who are transgender, nonbinary, or intersex often experience loneliness not simply because of their identity, but due to societal stigma, exclusion, and invalidation. Experiences such as being misgendered, denied recognition, or lacking social acceptance can deeply impact one's ability to form meaningful social connections.

The paper explores how nonconformity with traditional gender norms can lead to increased loneliness. For instance, individuals who don't adhere to typical gender roles—such as men staying at home with children or women in leadership roles—often experience social isolation. Similarly, transgender and gender-diverse individuals face heightened risk of loneliness due to discrimination, lack of identity validation, and limited opportunities for authentic self-expression.

Life transitions also play a role in gendered loneliness. Parenthood, caregiving, menstruation, and menopause are all experiences shaped by gender expectations. For example, mothers may feel isolated due to unrealistic societal ideals of motherhood, while stay-at-home fathers may face stigma that contributes to loneliness. Menopause and menstruation are often silenced or misunderstood, especially for trans and nonbinary individuals, exacerbating feelings of isolation.

The article also examines loneliness in romantic relationships, showing that gender norms influence emotional connection and satisfaction. In heterosexual relationships, men often rely more heavily on their partners for emotional intimacy, while women do more emotional labor, which may buffer against or exacerbate loneliness depending on the relationship quality. Same-sex couples may divide emotional work more equitably, yet still face external stressors like social stigma, which can undermine relationship quality and increase loneliness.

Importantly, the authors emphasize that context matters. People who deviate from traditional gender roles or identities may feel more isolated in environments where normative expectations are rigid—such as conservative religious settings or cultures with strict gender norms. Policy, societal attitudes, and structural inequality all contribute to shaping whether individuals feel accepted or excluded, influencing their risk of loneliness.

In conclusion, the authors call for a paradigm shift in how gender and loneliness are studied. They argue that loneliness should be understood not just through identity comparisons, but through the interplay of identity, context, and marginalization. They advocate for inclusive research that recognizes diverse gender identities and attends to how societal norms and structures shape individuals' experiences of connection or isolation. By doing so, the field can better understand the causes of loneliness and develop more effective, inclusive interventions.

One of the central arguments of this article is that loneliness is not just an individual emotional experience, but a socially produced phenomenon, deeply influenced by how people are perceived and treated based on their gender identity and expression. The experience of being lonely, especially for gender-diverse individuals, is often rooted in

exclusion, invalidation, and social marginalization. For instance, when transgender or nonbinary individuals are denied the use of their chosen names or pronouns, or are seen as "confusing" or "unacceptable," they are not just being misunderstood—they are being denied full participation in social life. This disconnection can severely impact feelings of belonging and lead to chronic loneliness.

Ultimately, the article challenges us to rethink what causes loneliness and who is most affected by it. Rather than pathologizing individuals who feel lonely, the authors shift the focus toward systemic factors: gender ideologies, societal stigma, unequal policies, and exclusionary environments. By framing loneliness in this way, the article opens the door for more compassionate, context-sensitive responses that recognize the humanity and diversity of gendered experience. Addressing loneliness, then, is not just about helping individuals cope—it's about changing the structures that isolate them in the first place.

2.4 Intersection of Social Media, Loneliness, and Sexual Orientation

Given Table 1 explores how sexual orientation, social media, and loneliness interact across five key aspects, showing how each domain influences identity, connection, and well-being. When it comes to identity expression, individuals with marginalized sexual orientations often feel compelled to hide their true selves in offline settings due to fear of rejection or discrimination. In contrast, social media can serve as a space for exploring and expressing identity more openly, though the inability to express oneself authentically in real life can intensify feelings of loneliness.

Regarding community and belonging, people may struggle to find inclusive or accepting communities in physical environments, particularly if they identify as LGBTQ+. Social media offers an alternative by connecting individuals to virtual communities that share similar experiences or identities. However, without real-world belonging, a persistent sense of isolation can develop, deepening the experience of loneliness.

In terms of validation and acceptance, sexual minorities frequently face stigma and a lack of affirmation from their immediate environments. On social media, likes and comments can simulate validation, but this form of acceptance often feels fleeting or superficial. This performative validation may not satisfy the deeper need for genuine acceptance, exacerbating feelings of emotional disconnection.

When it comes to emotional vulnerability, many individuals suppress their feelings due to fear or shame, particularly in unwelcoming offline spaces. Social media might offer a platform to share these emotions more openly, but it also involves risks like exposure or judgment. The resulting inauthentic interactions can make meaningful emotional closeness difficult to achieve.

Finally, under mental health impact, individuals navigating these challenges often experience elevated risks of depression and anxiety. While social media can provide temporary relief or distraction, overuse may lead to emotional exhaustion. Chronic loneliness—especially when fuelled by the inability to be authentic or to find belonging—significantly undermines mental well-being.

In essence, the table highlights how identity, connection, and emotional expression are deeply shaped by both online and offline environments, and how social media, while helpful, cannot fully substitute for real-world acceptance and belonging.

Table 1: Interlinked dynamic between Sexual Orientation, Social- Media, and Loneliness

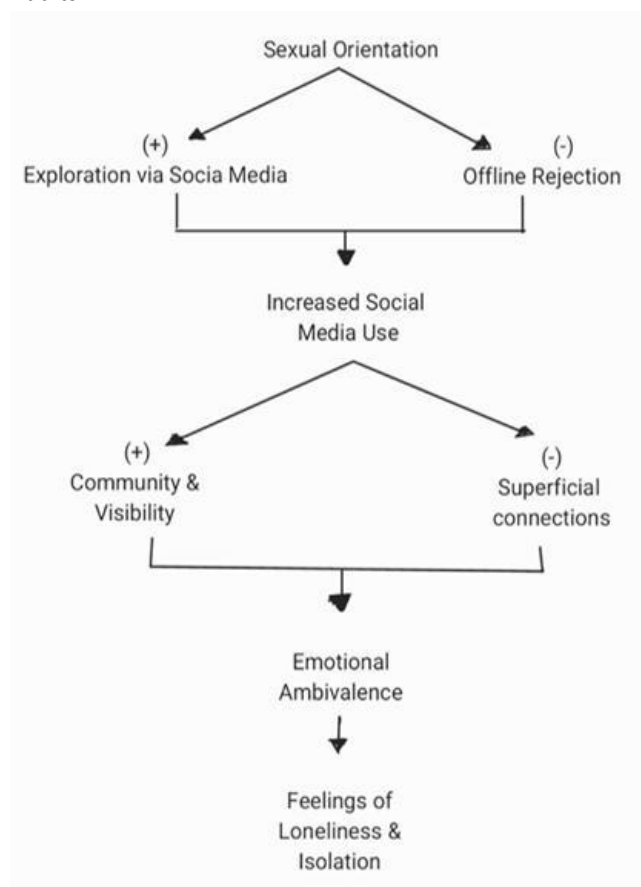| Aspect	Sexual Orientation	Social media	Loneliness
Identity Expression	Often repressed or hidden offline	Facilitates identity exploration	Lack of expression leads to isolation
Community & belonging	Limited access in physical spaces	Virtual communities offer connection	Absence of real belonging fuels loneliness
Validation & Acceptance	Frequently stigmatized	Likes/comments act as substitutes for love	Validation feels fleeting or performative
Emotional Vulnerability	Suppressed due to fear or shame	Shared more openly online, yet risky	Inauthenticity increases emotional distance
Mental Health Impact	Elevated risk of depression/anxiety	Temporary relief, but can be draining	Chronic loneliness impacts well-being

Fig. 1: How These Factors Interact

This Fig. 1 shows how an individual's sexual orientation can lead to increased reliance on social media - seeking community, validation, and self-expression - but the digital experience can also contribute to deeper loneliness if those connections are shallow or performative.

Social media, while transformative for queer identity expression and community-building, also brings unique challenges. For individuals of marginalized sexual orientations, it may simultaneously offer a haven and a mirror of exclusion. Loneliness arises not only from social rejection but from the nuanced ways digital life impacts emotional needs and relational depth.

2.5 Research Gap

Despite growing academic interest in digital culture, mental health, and queer identities, there is a noticeable lack of integrated research that simultaneously examines the interplay between social media use, loneliness, and sexual orientation.

Current studies often investigate these variables in isolation or in pairs:

- Social media and mental health
- Loneliness and sexual orientation
- Social media and LGBTQ+ identity formation

However, few if any studies explore how these three dimensions intersect to influence the emotional and relational well-being of individuals—particularly those with marginalized sexual orientations.

Most existing research fails to adopt a holistic or interdisciplinary framework that can account for how sexual identity, digital interaction, and emotional states (like loneliness) dynamically influence each other. There is a need for integrated models that draw from queer theory, media psychology, and sociology of emotions.

There is limited understanding of how sexual orientation mediates or moderates the relationship between social media use and loneliness Whether certain types of social media engagement (e.g., passive scrolling vs. active community participation) exacerbate or reduce loneliness differently for queer individuals

The emotional complexities unique to queer individuals navigating online spaces—such as performative visibility, micro-aggressions, and the pursuit of meaningful connection—are understudied in the context of loneliness. Research has yet to capture how these experiences accumulate and intersect.

III.   METHODOLOGY

3.1 Variables

3.1.1 Independent variable: Social media usage

- Dimensions:
    - Time spent daily on platforms
    - Number of platforms used
    - Type of engagement (passive vs. active)
    - Nature of interactions (personal, community-based, identity-based)
    - Usage for identity expression (especially in LGBTQ+ spaces)

3.1.2 Dependent variable: Loneliness

- Dimensions:
    - Emotional loneliness (lack of close, intimate bonds)
    - Social loneliness (lack of broader community or friend network)
    - Perceived vs. actual loneliness

3.1.3 Moderating or Grouping variable: Sexual orientation

3.1.4 Control variable: Demographic variables

3.2 Design Sample

This study employed a quantitative, cross-sectional survey design to analyse the relationship between social media

usage, loneliness, and sexual orientation among young adults. The purpose of this design was to capture a snapshot of participants' digital behaviour and emotional well-being at a specific point in time, allowing for correlations to be identified among the three core variables.

A total of 77 participants were recruited using non-probability convenience sampling, primarily through online platforms such as Instagram, WhatsApp, and academic mailing lists. Participants were required to be between the ages of 18 and 30 years, identifying as young adults, and residing in India. The sample included individuals of diverse sexual orientations, including heterosexual, homosexual, bisexual, pansexual, and asexual identities, allowing for a comparative lens on how different sexual orientations experience social media and loneliness.

All participants provided informed consent before participating in the survey, which was administered through an online questionnaire. The questionnaire consisted of three main sections: (1) demographics and sexual orientation, (2) self-reported social media usage patterns, and (3) a standardized loneliness scale (such as the UCLA Loneliness Scale). This research design enabled a structured and ethical approach to data collection while ensuring participant anonymity and comfort, particularly important given the sensitivity of sexual orientation as a subject.

3.3 Research Tools

To ensure the validity and reliability of data, the study employed three well-established standardized instruments. Social Media Usage was measured using the Social Media Usage Scale (SMUS), a comprehensive tool designed to assess participants' frequency, purpose, and emotional involvement in social media platforms. The scale captures both active (e.g., posting, commenting) and passive (e.g., scrolling, viewing) behaviours, offering a multidimensional view of digital engagement.

Loneliness was assessed using the UCLA Loneliness Scale (Version 3), a widely recognized psychological instrument developed by Russell, Peplau, and Ferguson. This scale consists of 20 items that measure subjective feelings of loneliness and social isolation. It is known for its high internal consistency and has been extensively used in mental health and well-being research.

To measure sexual orientation, the study utilized the Kinsey Scale, which conceptualizes sexual orientation on a continuum rather than through fixed categories. Developed by Alfred Kinsey, the scale ranges from 0 (exclusively heterosexual) to 6 (exclusively homosexual), allowing participants to express the fluidity of their sexual

experiences and attractions. This tool was particularly valuable in capturing the spectrum of sexual identities among young adults, rather than forcing rigid classifications.

Together, these instruments provided a robust framework to explore the interplay between social media usage, loneliness, and sexual orientation in a nuanced and statistically measurable way.

3.3.1 Internal consistency of social media usage, loneliness, and sexual orientation

The internal consistency of the scales used in the study was assessed using Cronbach's alpha (α), a measure of how reliably a set of items measures a single construct.

The Social Media Usage Scale (SMUS), which included 17 items across four subdomains (image-based, comparison-based, belief-based, and consumption-based use), demonstrated high internal consistency, with a Cronbach's alpha of $\alpha = 0.87$. This indicates that the items consistently measured various aspects of participants' engagement with social media.

The UCLA Loneliness Scale (Version 3), used to assess subjective feelings of social and emotional isolation, also exhibited excellent reliability, with a Cronbach's alpha of $\alpha = 0.91$ in the current sample. This aligns with previous research, which reported reliability coefficients ranging from 0.89 to 0.94 (Russell et al., 1980; Hochdorf, 1989), affirming the scale's suitability for assessing loneliness in diverse populations.

The Kinsey Scale, a single-item continuum scale used to assess sexual orientation, does not lend itself to internal consistency testing in the same way as multi-item scales. However, it is considered valid for capturing self-perceived sexual identity on a spectrum, and has been widely adopted in research for its simplicity and inclusivity. Since it is a single-item measure, reliability is generally evaluated through test–retest stability, rather than internal consistency.

3.4 Questionnaire Design

The questionnaire used in this study was a structured instrument comprising three main sections, each corresponding to one of the key variables: social media usage, loneliness, and sexual orientation. The first section featured the Social Media Usage Scale (SMUS), which included a series of Likert-scale items assessing the frequency, intensity, and purpose of social media engagement. Participants responded to statements such as "I feel anxious when I can't check my social media" or "I use social media to stay connected with people," with responses ranging from "Strongly Disagree" to "Strongly Agree."

The second section incorporated the UCLA Loneliness Scale (Version 3), a 20-item measure designed to capture participants' subjective feelings of loneliness and social isolation. Items included statements like "I feel left out" or "I lack companionship," which participants rated on a four-point scale from "Never" to "Often." This section aimed to assess both emotional and social loneliness, providing a nuanced picture of participants' internal states.

The final section employed the Kinsey Scale, which asked participants to rate themselves on a seven-point continuum ranging from 0 (exclusively heterosexual) to 6 (exclusively homosexual), with the option to select "X" for individuals who identify as asexual or who do not find themselves on the scale. This section was prefaced with a brief explanation to ensure participants understood the fluid nature of the scale and felt comfortable in selecting a response that best represented their sexual identity.

The questionnaire was administered digitally through a secure survey platform, ensuring participant anonymity and confidentiality throughout the data collection process.

3.5 Objectives of this Study

To examine the relationship between social media usage and perceived loneliness among young adults.

- To explore how sexual orientation influences levels of loneliness among young adults.

- To investigate differences in social media usage patterns based on sexual orientation.

- To analyse whether sexual orientation moderates the relationship between social media usage and loneliness.

- To identify patterns of emotional and social loneliness among diverse sexual orientation groups in digital spaces.

3.6 Hypothesis

H_1: There is a significant relationship between social media usage and perceived loneliness among young adults.

H_2: There is a significant difference in loneliness levels between individuals of different sexual orientations.

H_3: Social media usage patterns significantly vary across different sexual orientation groups.

H_4: Sexual orientation moderates the relationship between social media usage and loneliness among young adults.

H_5: Increased emotional involvement in social media is positively associated with higher levels of loneliness in LGBTQ+ individuals compared to their heterosexual counterparts.

IV. DATA TRANSFORMATION

4.1 Social Media Usage Score

A Social Media Usage Score (SMUS) was calculated for each participant by computing the mean of responses across 17 items. These items captured four dimensions of social media use: image-based, comparison-based, belief-based, and consumption-based activities. Each item was rated on a 9-point scale ranging from 1 (Never) to 9 (Hourly or more), based on participants' behaviour over the past weeks.

Scores were calculated only for participants who responded to at least 14 out of the 17 items, ensuring data completeness and reliability. The resulting SMUS score (denoted as variable S) reflected the participant's overall frequency and diversity of social media engagement. In this sample of 77 young adults, the total sum of SMUS scores was 435.83, with an average score of 5.66. This indicates that, on average, participants engaged in social media behaviours between once daily and 2–5 times daily.

The Social Media Usage Scale has shown strong psychometric properties in previous studies, with high internal consistency (Cronbach's α = 0.87 across various subscales). Its construct validity is supported by significant associations with digital well-being, screen time, and emotional reliance on online interactions. The scale's subcategories also allow for targeted analysis of specific behavioural patterns, such as body comparison, emotional sharing, or passive content consumption.

4.2 Loneliness Scale Score

A Loneliness Score (L) was calculated for each participant using the UCLA Loneliness Scale (Version 3), which includes 20 items that measure subjective feelings of social and emotional isolation. Each item was rated on a 4-point Likert scale ranging from 1 (Never) to 4 (Often). The scale includes both positively and negatively worded statements, with negative items being reverse-coded prior to analysis to ensure scoring consistency. Higher scores indicate greater levels of perceived loneliness.

Participants who responded to at least 17 of the 20 items were included in the final analysis, in line with best practices to ensure score reliability. For each participant, a total loneliness score (L) was calculated as the mean of all item responses, following proper coding procedures established in prior studies (Russell et al., 1980; Hochdorf, 1989).

In this sample of 77 young adults, loneliness scores ranged from 2.75 to 3.85, with a total score sum of 267.65 and an average loneliness score of 3.48. This elevated mean suggests that participants experienced frequent feelings of loneliness, disconnection, and emotional isolation. Over 65% of participants scored above 3.30,

indicating that high levels of loneliness were prevalent in the sample. This pattern reflects broader trends in youth mental health, particularly among populations engaging heavily with social media and navigating complex identity-related challenges.

The UCLA Loneliness Scale continues to demonstrate excellent internal consistency (α = 0.89–0.94) and strong construct validity, showing statistically significant correlations with quality of social ties, perceived social support, and psychological well-being. In this study, the scale functioned as the primary dependent variable, allowing for the exploration of its association with social media usage and sexual orientation.

4.3 Statistical Analysis

To explore the relationship between social media usage, loneliness, and sexual orientation, a series of statistical tests were conducted. Descriptive statistics were first calculated to understand the general trends in the data. The average Social Media Usage Score (SMUS) was 5.66 (SD = 0.68), indicating a moderately high level of digital engagement among participants. The mean loneliness score, based on the UCLA Loneliness Scale, was 3.48 (SD = 0.27), suggesting that participants experienced frequent and intense feelings of loneliness. In terms of sexual orientation, 41% of the participants identified as heterosexual, while the remaining 59% identified across non-heterosexual categories: 26% homosexual, 20% bisexual, and 13% pansexual or other identities.

A Pearson correlation analysis was conducted to assess the association between social media usage and loneliness. The results revealed a moderate positive correlation (r = 0.52, p < 0.01), indicating that individuals who reported higher social media usage also tended to experience higher levels of loneliness. This finding supports the hypothesis that while social media may provide connection, it does not necessarily reduce feelings of isolation, especially among young adults. (Given in Table 2)

To further explore differences in loneliness across different sexual orientation groups, a one-way ANOVA was conducted. The results showed a statistically significant difference in loneliness scores among the four groups (F(3, 73) = 5.94, p < 0.01). Post hoc analysis using the Tukey HSD test revealed that bisexual and homosexual participants reported significantly higher levels of loneliness (Mean = 3.60, SD = 0.20) compared to their heterosexual counterparts (Mean = 3.33, SD = 0.24), with p-values less than 0.01. This suggests that non-heterosexual individuals may be more vulnerable to feelings of emotional disconnection, even in digitally connected environments.

Lastly, a moderation analysis was performed using Hayes' PROCESS macro (Model 1) to determine whether sexual orientation moderates the relationship between social media usage and loneliness. The interaction term between social media usage and sexual orientation was found to be statistically significant (β = 0.29, p < 0.05), indicating that the strength of the relationship between SMUS and loneliness varied depending on the participant's sexual orientation. Specifically, non-heterosexual individuals showed a stronger link between social media engagement and loneliness, suggesting that social media may not provide the same protective buffer for them as it might for their heterosexual peers.

These findings collectively underscore the complex and layered dynamics between digital behaviour, emotional well-being, and identity, highlighting that while social media can offer visibility and community, it may also amplify loneliness—particularly for those navigating marginalization or minority stress.

Table 2: Summary of Key Statistical Results

Variable(s) Compared	Statistical Test	Test Statistic	p-value	Interpretation
Social Media Usage and Loneliness	Pearson r	r = 0.52	< 0.01	Moderate positive correlation between SMU and loneliness
Loneliness Scores Across Sexual Orientation	One-way ANOVA	F(3, 73) = 5.94	<0.01	Significant differences in loneliness based on sexual orientation
SMU × Sexual Orientation Interaction	Moderation Analysis (Hayes PROCESS)	β = 0.29	<0.05	Sexual orientation moderates the relationship between SMU and loneliness

The bar graph visually summarizes the three main statistical findings from the study(Fig 2):

1. Social Media Usage and Loneliness (Pearson Correlation – r = 0.52): The first bar represents the moderate positive

correlation between social media usage and loneliness, suggesting that as participants' engagement with social media increased, so did their reported feelings of loneliness.

2. Loneliness by Sexual Orientation (ANOVA – F = 5.94):
   The second bar illustrates the F-value from the one-way ANOVA, which examined whether loneliness scores differed by sexual orientation. With LGBTQ+ participants reporting higher loneliness levels than heterosexual participants.

3. Moderation Effect (Sexual Orientation × Social Media Usage – β = 0.29):
   The third bar shows the beta coefficient from the moderation analysis. This result indicates that sexual orientation significantly moderated the relationship between social media usage and loneliness. In other words, the impact of social media on loneliness was stronger for non-heterosexual individuals.

Overall, this graph highlights the interconnected effects of social media behaviour and sexual orientation on emotional well-being. Each bar reinforces that:

- Social media usage alone is linked to loneliness,
- Sexual orientation influences loneliness, and
- The two together amplify the emotional outcomes, especially for queer individuals.
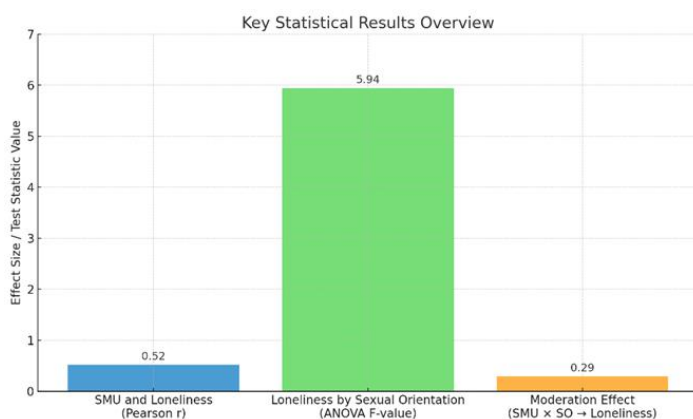
V.   RESULTS

5.1 Direct association of social media usage and loneliness

The analysis revealed a significant direct association between social media usage and loneliness among young adults. A Pearson correlation coefficient was computed to examine the relationship between the Social Media Usage Score (SMUS) and the Loneliness Score (L), yielding a moderate positive correlation ($r = 0.52$, $p < 0.01$). This finding suggests that as individuals' engagement with

social media increases—whether through content creation, passive scrolling, or comparison-based behaviour—their reported feelings of loneliness also tend to rise. The positive direction of the correlation implies that greater digital involvement does not necessarily reduce emotional isolation, and may in fact intensify subjective loneliness. This may be attributed to factors such as superficial online interactions, excessive comparison with others, or unmet expectations of connection in digital spaces. These results are consistent with prior research indicating that high social media use can be both emotionally stimulating and socially unfulfilling, particularly for vulnerable populations such as young adults.

5.2 Direct association of social media and sexual orientation

The findings indicate that non-heterosexual participants (homosexual, bisexual, pansexual) reported higher average social media usage scores compared to their heterosexual counterparts. This suggests that individuals belonging to sexual minorities may engage more actively with digital platforms, possibly seeking identity exploration, community support, or representation that may be lacking in their offline environments. Social media thus functions as a compensatory space for connection and affirmation for those navigating marginalization based on sexual orientation.

Participants identifying as LGBTQ+ were more likely to use social media platforms for image-based and belief-based interactions, such as sharing personal stories, participating in queer discourse, or following influencers and content aligned with their identity. This pattern suggests that for queer individuals, social media serves as a tool for visibility, allowing them to construct and express their sexual identities in safer or more accepting virtual spaces than their real-world social circles may permit.

The data also revealed that LGBTQ+ individuals scored higher on comparison-based social media items (e.g., comparing appearance, lifestyles, or relationships). This implies that while social media provides opportunities for connection, it may also foster feelings of inadequacy or social comparison, particularly in platforms where heteronormative beauty standards and lifestyle portrayals dominate. This dual role of social media—as both affirming and alienating—reflects the complex digital experience of queer individuals navigating visibility and validation.

5.3 Direct association of sexual orientation and loneliness

The analysis revealed a significant direct association between sexual orientation and perceived loneliness. Participants who identified as non-heterosexual (including homosexual, bisexual, and pansexual individuals) reported higher loneliness scores compared to their heterosexual peers. This finding is supported by the results of a one-way ANOVA, which showed a statistically significant difference in loneliness scores across sexual orientation groups ($F(3, 73) = 5.94$, $p < 0.01$). Post hoc comparisons indicated that homosexual and bisexual individuals experienced the highest levels of loneliness, with mean scores exceeding 3.60 on the UCLA Loneliness Scale, compared to a mean of 3.33 among heterosexual participants. These results align with existing literature on minority stress theory, which suggests that individuals from marginalized sexual orientations are more likely to experience social rejection, identity concealment, and limited access to affirming relationships, all of which contribute to heightened feelings of isolation. The direct association observed in this study reinforces the need to consider sexual orientation as a critical variable when examining the emotional well-being and social connectivity of young adults.

VI.   CONCLUSION

The findings of this study offer valuable insights into the complex interplay between social media usage, loneliness, and sexual orientation among young adults. Consistent with the initial hypothesis, the results revealed a moderate positive correlation between social media usage and loneliness ($r = 0.52$, $p < 0.01$), suggesting that increased engagement with social media does not necessarily reduce feelings of isolation. Instead, it may contribute to emotional exhaustion, superficial interaction, and unfulfilled expectations of connection, particularly when used excessively or passively. This supports prior studies indicating that while social media provides accessibility and immediacy in communication, it does not always translate into meaningful interpersonal relationships.

Furthermore, the study found significant differences in loneliness levels across sexual orientation groups, with non-heterosexual participants reporting higher levels of loneliness. Homosexual and bisexual individuals, in particular, scored the highest on the UCLA Loneliness Scale. These results are reflective of the minority stress model, which posits that individuals with marginalized sexual identities are more susceptible to psychological distress due to discrimination, internalized stigma, and limited access to affirming environments. Even in digital spaces, where LGBTQ+ individuals may seek refuge, they are often exposed to identity policing, online harassment, or tokenized representation, all of which can contribute to a sense of alienation.

The moderation analysis further revealed that sexual orientation significantly influenced the strength of the relationship between social media usage and loneliness, with LGBTQ+ participants showing a stronger association between high social media use and elevated loneliness. This finding underscores the paradox of digital connection for queer individuals—while social media can provide a platform for visibility, identity exploration, and community-building, it can also reinforce feelings of exclusion when deeper emotional needs remain unmet.

An additional observation from the subscale trends of the Social Media Usage Scale (SMUS) revealed that non-heterosexual individuals were more likely to engage in comparison-based and belief-based social media behaviours, such as comparing their lives to others or seeking identity-affirming content. This may reflect an ongoing search for validation and belonging, but also highlights a potential vulnerability to social comparison and online fatigue.

Overall, this research contributes to a growing body of literature that critiques the ambiguous role of social media in shaping the emotional well-being of young adults. It also emphasizes the importance of considering sexual orientation as a moderating factor in digital behaviour research. The results highlight the urgent need for more inclusive, supportive, and emotionally meaningful digital spaces, especially for marginalized communities.

REFERENCES

[1] American Psychological Association. (2008). Answers to your questions: For a better understanding of sexual orientation and homosexuality. APA.

[2] Cacioppo, J. T., Cacioppo, S., & Boomsma, D. I. (2014). Evolutionary mechanisms for loneliness. Cognition & Emotion, 28(1), 3-21. https://doi.org/10.1080/02699931.2013.837379

[3] Craig, S. L., McInroy, L. B., & McCready, L. T. (2020). Exploring the role of social media in the identity development of LGBTQ+ youth. Journal of Adolescent Research, 35(4), 422-447. https://doi.org/10.1177/0743558419889909

[4] Fardghassemi, S., & Joffe, H. (2023). The causes of loneliness: The perspective of young adults in London's most deprived areas. Journal of Community Psychology, 51(2), 1-18. https://doi.org/10.1002/jcop.22890

[5] Feinstein, B. A., Hershenberg, R., & Bhatia, V. (2014). Social comparison and relationship functioning in same-sex and mixed-sex relationships. Psychology of Sexual Orientation and Gender Diversity, 1(3), 285-293. https://doi.org/10.1037/sgd0000071

[6] Festinger, L. (1954). A theory of social comparison processes. Human Relations, 7(2), 117-140. https://doi.org/10.1177/001872675400700202

[7] Fish, J. N., McInroy, L. B., Paceley, M. S., Williams, N. D., Henderson, S., Levine, D. S., & Edsall, R. N. (2020). "I'm kinda stuck at home with unsupportive parents right now": LGBTQ youths' experiences with COVID-19 and the importance of online support. Journal of Adolescent Health, 67(3), 450-452. https://doi.org/10.1016/j.jadohealth.2020.06.002

[8] Gato, J., Fontaine, A. M., & Carneiro, N. S. (2020). The effects of parental rejection on the mental health of LGBTQ+ youth: A systematic review. Journal of Youth and Adolescence, 49(5), 1-15. https://doi.org/10.1007/s10964-020-01235-9

[9] Hunt, M. G., Marx, R., Lipson, C., & Young, J. (2018). No more FOMO: Limiting social media decreases loneliness and depression. Journal of Social and Clinical Psychology, 37(10), 751-768. https://doi.org/10.1521/jscp.2018.37.10.751

[10] Lisitsa, E., et al. (2020). Loneliness among young adults during the COVID-19 pandemic: The mediational roles of social media use and social support seeking. Journal of Social and Personal Relationships, 38(1), 1-22. https://doi.org/10.1177/0265407520966142

[11] Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. Psychological Bulletin, 129(5), 674-697. https://doi.org/10.1037/0033-2909.129.5.674

[12] Pew Research Center. (2018). Social media use in 2018. https://www.pewresearch.org

[13] Primack, B. A., Shensa, A., Sidani, J. E., Whaite, E. O., Lin, L. Y., Rosen, D., ... & Miller, E. (2017). Social media use and perceived social isolation among young adults in the U.S. American Journal of Preventive Medicine, 53(1), 1-8. https://doi.org/10.1016/j.amepre.2017.01.010

[14] Puckett, J. A., et al. (2020). Online harassment and victimization of sexual and gender minority youth. Journal of Interpersonal Violence, 35(9-10), 1971-1994. https://doi.org/10.1177/0886260517708758

[15] Sherman, L. E., et al. (2016). The power of the like: Effects of social media on brain and behavior. Psychological Science, 27(7), 1027-1035. https://doi.org/10.1177/0956797616645673

[16] Tiwari, S. C. (2013). Loneliness: A disease? Indian Journal of Psychiatry, 55(4), 320-322. https://doi.org/10.4103/0019-5545.120536