

**Navigating Loneliness in a Technologically Mediated World**

by

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### **Abstract**

This Capstone project explores the multifaceted relationship between technology and loneliness, examining its psychological, social, cultural, and ethical dimensions. The first chapter introduces the inherent dualism of technology as both a potential alleviator and exacerbator of loneliness, highlighting its significant health and societal impacts, and outlining foundational models for understanding this complex interplay. The second chapter's literature review examines loneliness across different age groups and genders, considering the influence of stigma, self-esteem, fear of negative evaluation, role loss, and attachment styles. The chapter then examines cultural contexts, contrasting societal types and focusing on Canada's immigrant and Indigenous experiences. It also analyzes technology's dual capacity to connect and isolate, considering advancements like AR/VR, AI, and online support, while reviewing loneliness measurement methods. The final chapter discusses the ethics of using technology for loneliness (privacy, consent, bias, autonomy) via CPA guidelines, and proposes future research into diverse populations, ethical tech frameworks, and equitable interventions.

*Keywords:* loneliness, FOMO, technology and modern world, digital era and loneliness, social isolation, social connectedness, individualism/collectivism and loneliness, age and loneliness, loneliness stigma, AR/VR/AI, social robots, attachment style

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## Chapter One: Introduction

### Overview of the Topic

The proliferation of digital technologies has drastically reshaped the landscape of human interaction, bringing forth unprecedented opportunities for connection and new challenges to social well-being. Central to this evolving dynamic is the complex relationship between technology and loneliness. This introduction provides an overview of this interplay, delineates the purpose and significance of its study, and outlines its contributions to the field of psychology. As explained by Hughes et al. (2024), the relationship between technology and loneliness is multifaceted and often characterized by a fundamental dualism: technology is perceived as possessing the capacity to both alleviate and aggravate feelings of loneliness and social isolation. This means that while digital tools can enhance social connections when utilized for pro-social purposes, such as maintaining relationships or forming new ones, they can also contribute to social withdrawal and intensify loneliness if they displace genuine, high-quality social interactions or lead to unfavorable social comparisons. Hughes et al. observed that loneliness itself is increasingly understood as not just a transient subjective experience but also as a significant social and policy concern that calls for comprehensive solutions, with technology invariably implicated in both its propagation and potential mitigation.

A major aspect of this interplay is the common perception that technologically mediated connections are qualitatively different, and often inferior, to in-person contact (Hughes et al., 2024). This sentiment was particularly amplified during periods of enforced social distancing, like the COVID-19 pandemic, where reliance on digital communication highlighted both its utility and its limitations in fulfilling the nuanced needs of human sociality. Supporting this nuanced view, the American Psychiatric Association has reported that while a majority of

Americans acknowledge technology's role in helping form and maintain relationships, there remains a significant division regarding whether these digital interactions foster meaningful or superficial connections (Mental Health Weekly, 2024). This societal ambivalence underscores the complex and often contradictory impact of technology on social well-being. Psychological factors such as an individual's motivation for using technology, their level of digital literacy, and pre-existing social skills becomes crucial determinants of whether technology serves as a bridge or a barrier to social connection (Ko et al., 2022).

The ongoing debate about whether technologically mediated relationships are either meaningful or superficial also hints at a potential evolution in the societal understanding and expectations of what makes up a fulfilling social connection. If a substantial segment of the population perceives digitally fostered relationships as lacking depth, yet the use of technology for connection is pervasive and increasing, it raises critical questions about the long-term impacts on social norms and individual psychological well-being. This prompts further investigation into whether society is adapting to new, potentially less fulfilling forms of connection out of necessity or convenience, or if these new modalities can indeed offer unique forms of social fulfillment. This evolving definition can have major implications for psychological theories concerning relationship formation, maintenance, and overall well-being in the digital era.

### **Purpose and Significance of Examining Loneliness and Technology**

The primary purpose of investigating the intricate relationship between loneliness and technology is to achieve a deeper understanding of the contemporary experience of loneliness and to explore the reciprocal shaping process between technological advancements and societal conceptions of what being social connected means (Hughes et al., 2024). This exploration

involves examining how technology can serve as a conduit for enhancing positive human connections while also posing potential risks to them.

A compelling motivation for this field of study lies in the well-documented adverse health consequences associated with loneliness. Research has consistently linked loneliness to a range of serious health issues, including an increased risk of premature mortality, a risk comparable to that posed by smoking or obesity, as well as a higher incidence of coronary heart disease, stroke, depression, cognitive decline, and Alzheimer's disease (Hughes et al., 2024). The gravity of these health impacts underscores the urgency of understanding factors that contribute to loneliness, including the role of technology. In their study, Jovicic and McPherson (2019) observed that loneliness is as detrimental to our health as smoking 15 cigarettes per day. If loneliness carries mortality risks on par with established public health threats like smoking and obesity, then interventions aimed at mitigating loneliness, including those that thoughtfully leverage technology, could create substantial benefits in terms of public health expenditure, morbidity rates, and overall longevity (Hughes et al., 2024). This perspective reframes research in this area as an essential component of preventative healthcare strategies and societal well-being initiatives.

Beyond direct health impacts, the consequences of widespread loneliness can create significant socio-economic ripple effects. The documented health issues stemming from loneliness invariably lead to increased healthcare utilization, reduced workforce productivity due to illness or cognitive impairment, and a greater strain on social support systems and community resources (Hughes et al., 2024). Therefore, efforts to understand and alleviate loneliness, potentially through the strategic use of technology, are not solely about enhancing individual well-being but are also intertwined with broader economic stability and the efficient allocation of

societal resources. As society becomes increasingly reliant on digital platforms for communication, essential services, and social engagement, individuals who are unable or hesitant to participate in the digital world risk further marginalization and an intensified sense of isolation. Marginalized groups, including many older adults, newcomers, and low-income populations, often face significant barriers to digital connection, such as the high cost of devices and internet services, lower digital literacy, and a lack of confidence or skills to navigate online platforms effectively. This demographic and technological shift creates a pressing need for the development of inclusive technological designs, targeted digital literacy programs, and policies that ensure equitable access to the potential benefits of technology for social connection.

The main research question addressed by this Capstone project is how does the increasing digitization of modern life contribute to the complexity of loneliness? The Capstone aims to answer this by deducing the sub-questions such as how does technology function as both an alleviator and aggravator of loneliness across different demographic groups, what psychological mechanisms (e.g., attachment styles, self-esteem, FOMO) mediate the relationship between technology use and loneliness? And how can counselling professionals ethically leverage technology to address loneliness while mitigating risks like privacy violations and reduced human connection? Loneliness, as we will see in the following chapters, has significant health and emotional impacts but unfortunately is often overlooked. This Capstone speaks to fellow practitioners in the field about the significance of addressing loneliness, especially in a world where technology can be found at every turn.

This Capstone provides critical insights for diverse stakeholders: hospital administrators designing evidence-based patient support programs, telehealth providers addressing isolation in remote care, school counsellors developing effective digital literacy programs, and parents

navigating technology's complex role in their children's social well-being. It can further inform policy makers to utilize the findings to develop evidence-based public health initiatives and guidelines concerning technology use and social well-being and technology developers creating ethical algorithmic systems, apps, and chatbots for marginalized populations. Ultimately, by clarifying the nuanced relationship between technology and loneliness, this work empowers all individuals and contributes to building a more genuinely connected society.

### **Contributions to the Field of Psychology**

Research at the intersection of loneliness and technology has made several pivotal contributions to the field of psychology. It has significantly advanced the understanding of the complex dynamics among technology, the subjective experience of loneliness, and overall health outcomes (Hughes et al., 2024). This line of inquiry offers novel insights into how loneliness is perceived, experienced, and potentially managed in contemporary, technologically saturated societies.

Research in this field has informed the design of technologies that are more attuned to social and emotional needs of humans. Furthermore, this research has been instrumental in the development and critical evaluation of psychological interventions, particularly technology-based interventions designed to reduce loneliness and enhance mental well-being (Jiménez et al., 2021). However, it is important to note that the efficacy of such interventions remains a subject of ongoing debate and necessitates further rigorous investigation to establish best practices and identify specific contexts in which they are most beneficial (Jin et al., 2021). Ultimately, investigations into loneliness and technology can help refine and expand existing psychological theories of social connection, attachment, and well-being to more accurately account for the pervasive and multifaceted influence of technology in modern life (Levine, 2025).

Finally, the interdisciplinary nature of this topic fosters collaboration and the integration of knowledge across various subfields of psychology. For instance, understanding how technology impacts loneliness during adolescence requires insights from developmental psychology; designing effective interventions draws heavily on clinical psychology and behavior change principles; and analyzing group dynamics and social influence in online communities involves core concepts from social psychology (Ell et al., 2025). This inherently cross-cutting nature encourages a more holistic and integrated psychological understanding, breaking down traditional sub-disciplinary silos and fostering a richer, more comprehensive approach to complex human behaviors in the digital age.

Furthermore, it is specifically beneficial for counsellors and mental health practitioners as they can gain a deeper understanding of how technology influences their clients' experiences of loneliness, informing assessment and intervention strategies, informing and advocating for the development of therapeutic modules addressing digital literacy and mindful technology use and offering ethical guidelines for integrating AI tools (e.g., chatbots, social support groups etc. for between-session support) without compromising therapeutic alliance. This research will also equip counsellors to address ethical considerations (detailed in Chapter Three) related to clients' digital lives, such as privacy, online safety, and the potential for technology to exacerbate vulnerabilities. It also supports counsellors in helping clients navigate the dual nature of technology, empowering them to harness its benefits while mitigating risks to their mental well-being and social health.

### **Positionality Statement**

A persistent observation throughout my internship has been the prevalence of loneliness, frequently serving as an underlying factor for presenting concerns like anxiety, depression, and

interpersonal challenges. This sparked a deep curiosity about its origins and effective interventions. My personal experiences of attending numerous family gatherings and cultural events out of obligation rather than genuine enjoyment or connection has led me to a deeper understanding that loneliness is often a hidden experience, capable of existing even when someone appears socially well-connected. Much like other mental health struggles, loneliness can be easily misconstrued or dismissed because its manifestations are not always outwardly visible. Being an immigrant, when I first relocated, it was a strange sensation of feeling disconnected. During that time, the technological advancements of being able to video call friends and family back home, who were living across the seven seas, in a different time-zone, felt like the greatest boon given to me. In such a digitally connected world, it made me curious as to how loneliness has persisted to survive and made me question if we have actually moved towards feelings of ‘connectedness’ or rather the opposite?

### **Methodological Approach**

This Capstone project employs a comprehensive literature review methodology to explore the multifaceted relationship between technology and loneliness. Anchored in a pragmatic research paradigm, this capstone seeks to understand the practical consequences of the technology-loneliness relationship. The focus is on synthesizing knowledge that can directly inform the development of effective, evidence-based strategies for counselling professionals. The literature was gathered through systematic searches of academic databases, including PsycINFO, PubMed, Scopus, Web of Science, and scholarly search engines like Google Scholar. Key search terms included, but were not limited to ‘loneliness,’ ‘social isolation,’ ‘technology,’ ‘social media,’ ‘internet use,’ ‘digital connection,’ ‘mental health,’ ‘counselling,’ ‘AI,’ ‘VR,’ ‘attachment styles and technology,’ and ‘cultural differences in loneliness.’

The selection criteria prioritized peer-reviewed articles, meta-analyses, systematic reviews, and seminal theoretical works published primarily between 2005 and 2025 to ensure contemporary relevance, although foundational earlier works were also included. The gathered literature was then synthesized thematically, focusing on identifying key concepts, patterns, debates, and gaps in the existing research. Validation of information involved cross-referencing findings across multiple sources and prioritizing studies with robust methodologies. This approach allows for a broad yet in-depth understanding of the current state of knowledge on the topic, forming the basis for the discussions in subsequent chapters.

### **Foundational Models of Loneliness**

Three prominent models provide a basis for understanding the subjective experience of loneliness, which in turn informs how technology's impact is assessed.

#### ***Cognitive Discrepancy Model***

Daniel Perlman and Letitia Anne Peplau's (1981) cognitive discrepancy model defines loneliness as a distressing emotional state that arises from a perceived discrepancy between an individual's desired and actual social relationships, particularly concerning their quantity or, more importantly, their quality (Yanguas et al., 2018). It is the subjective appraisal of this gap, rather than the objective number of social contacts, that leads to feelings of loneliness (Arnold et al., 2021).

Technology can significantly influence both components of this discrepancy. For instance, exposure to idealized portrayals of social lives on social media platforms might inflate an individual's desires or expectations for social connection, thereby widening the perceived gap between their ideal and their reality (Saeidnia et al., 2025). The unique insight from this model is

that a key driver of modern loneliness may be a “comparison-induced discrepancy,” where technology doesn’t just fail to meet needs but actively elevates desires to unrealistic levels.

### *Social Needs Approach*

Robert Stuart Weiss’s (1973) social needs framework distinguishes between two fundamental types of loneliness, stemming from the unfulfillment of different social provisions: emotional loneliness and social loneliness (Yanguas et al., 2018). Emotional loneliness results from the absence of a close, intimate attachment figure, someone who provides affection, support, and a sense of security. Yanguas et al. outlined that social loneliness, on the other hand, arises from the lack of a wider network of social relationships or a sense of belonging to a community, which provides companionship, shared interests, and a feeling of integration.

Different forms of technology may cater to, or fail to satisfy, these distinct social needs. For instance, one-to-one communication applications like messaging or video calls might offer avenues to address emotional loneliness by fostering dyadic connections (Petersen et al., 2023). Online forums or social gaming communities might target social loneliness by providing a sense of group membership (Châtel et al., 2024). However, the capacity of these technologically mediated interactions to genuinely fulfill these deep-seated needs for emotional intimacy and social integration remains a key area of investigation, with evidence suggesting that the quality and depth of these connections are paramount (Hughes et al., 2024). This can lead to a modern predicament where an individual feels socially connected in many online spaces yet remains profoundly emotionally desolate, creating a nuanced form of loneliness where the appearance of social activity masks a deeper emotional void.

### *Evolutionary/Biopsychosocial Model of Loneliness*

John T. Cacioppo's evolutionary/biopsychosocial model of loneliness posits that perceived social isolation, or loneliness, functions as an aversive signal, analogous to physical pain, hunger, or thirst, which evolved to motivate individuals to reconnect with others and maintain social bonds crucial for survival and well-being (Hawkley & Cacioppo, 2010). When loneliness is triggered, it initiates a state of implicit hypervigilance for social threats in the environment. According to Hawkley and Cacioppo, this heightened vigilance leads to cognitive biases, where lonely individuals are more likely to perceive the social world as threatening, expect negative social interactions, and selectively attend to and remember negative social information. These biases can, in turn, elicit behaviors from others that confirm the lonely person's negative expectations, creating a self-fulfilling prophecy that perpetuates their isolation despite a desire to connect. This model also emphasizes the profound physiological and health consequences linked to chronic loneliness.

Technology use can interact with this model in complex ways. Problematic or passive consumption of social media, for example, might exacerbate this hypervigilance for social threat, perhaps by amplifying the fear of missing out (FOMO) or exposing individuals to negative online interactions like cyberbullying or social exclusion (Gupta & Sharma, 2021).

### **Common Ways in Which Technology Intersects With These Models**

Across these foundational models, several overarching themes emerged regarding technology's interaction with the core constructs of loneliness. A primary shared insight is technology's dual capacity to both connect and isolate. In each model, technology is presented as a tool that can potentially bridge social gaps by facilitating connections, satisfying certain needs,

or offering positive experiences but can just as easily widen those gaps by creating unrealistic expectations, failing to provide genuine fulfillment, or amplifying social threats.

A second critical theme is the paramount importance of the quality of interaction. All three models implicitly or explicitly argue that technologically mediated interactions often struggle to provide the same depth, intimacy, and security as in-person contact. This concern over quality is central; a high quantity of superficial online connections may fail to bridge the perceived discrepancy between desired and actual relationships (Cognitive Discrepancy), inadequately satisfy deep-seated needs for emotional and social integration (Social Needs), or fail to quiet the aversive biological signal of isolation (Evolutionary Model).

Finally, technology consistently alters social expectations and perceptions. By presenting curated, often idealized versions of others' social lives, digital platforms can inflate an individual's desires for connection, create a sense that their own social provisions are lacking, or trigger feelings of social threat when their life seems to fall short.

## **Key Terms**

### ***Digital Literacy***

Digital literacy encompasses the set of skills and competencies required to effectively find, evaluate, create, communicate, and use information through digital technologies (Ko et al., 2022). It includes not only technical proficiency but also critical thinking about online content and an understanding of the social and ethical implications of digital engagement.

### ***Fear of Missing Out***

Fear of missing out (FOMO) is defined as a pervasive apprehension that others might be having rewarding, exciting, or fulfilling experiences from which one is absent (Gupta & Sharma, 2021). This feeling is often characterized by a persistent desire to stay continually connected

with what others are doing, typically facilitated by constant monitoring of social media and online updates.

### ***Loneliness***

Loneliness is predominantly defined as a subjective and distressing emotional experience that arises when there is a perceived discrepancy between an individual's desired social relationships and their actual social relationships, particularly concerning the quality rather than merely the quantity of these connections (Jin et al., 2021).

### ***Problematic Technology Use (Including Problematic Internet Use)***

Problematic technology use, often encompassing problematic internet use, is an umbrella term used to describe a pattern of technology or internet engagement that is characterized by being risky, excessive, impulsive, or generally maladaptive, leading to significant distress or demonstrable impairment in various aspects of an individual's life, including physical health, emotional well-being, social functioning, or occupational/academic performance (Hughes et al., 2024).

### ***Social Isolation***

In contrast to the subjective nature of loneliness, social isolation refers to an objective state characterized by a demonstrable lack of social contact, a scarcity of meaningful and sustained communication with others, or limited engagement in social activities and networks (Yanguas et al., 2018). It is a quantifiable measure of an individual's social disconnectedness, such as the size of their social network or the frequency of their social interactions.

### **Summary and Outline of Following Chapters**

The relationship between technology and loneliness is undeniably complex, characterized by a profound duality where digital tools can serve as both conduits for connection and catalysts

for isolation. Addressing the challenge of loneliness in the digital age requires a multi-pronged approach. This includes promoting digital literacy and critical engagement with online content, designing technologies that prioritize genuine connection and well-being, fostering awareness of the potential for problematic use, and ensuring equitable access to the benefits of technology. For the field of psychology, continued research is essential to deepen the understanding of these dynamics, to develop evidence-based guidelines for healthy technology use, and to inform interventions that effectively leverage technology's potential to combat loneliness and enhance human connection in an increasingly interconnected world. The focus must remain on how technology can serve human needs for belonging and meaningful relationships, rather than inadvertently undermining them.

This Capstone project is structured into three chapters to systematically explore the relationship between technology and loneliness. Chapter One (this chapter) has provided an overview of the topic, outlined the purpose and significance of the research, discussed its contributions to psychology and specific utility for counselling practice, presented the author's positionality, defined key terms, and stated the guiding research questions and methodological approach. Chapter Two is a literature review on this topic which will delve into the existing body of research, examining loneliness across different age groups and genders, the influence of stigma, self-esteem, fear of negative evaluation, role loss, and attachment styles. It will also analyze technology's dual capacity to connect and isolate, considering advancements like AR/VR, AI, and online support, and review methods for measuring loneliness. Chapter Two also examines cultural contexts, including Canada's immigrant and Indigenous experiences. Finally, Chapter Three will critically discuss the ethical considerations arising from the use of technology in addressing loneliness, applying the Canadian Psychological Association's (CPA, 2017)

*Canadian Code of Ethics for Psychologists*. It will then translate insights from the preceding chapters into potential counselling practice strategies and outline future directions for research and intervention, aiming to foster a responsible and effective approach to leveraging technology for enhanced human connection.

## Chapter Two: Literature Review

Loneliness, a universal yet deeply personal experience, has garnered renewed scholarly focus in our current digital age. This chapter delves into the intricate connection between loneliness and the proliferation of technological advancements. Synthesizing interdisciplinary research from fields such as psychology, sociology, media studies, and human-computer interaction, this review maps the evolving terrain of loneliness in an era significantly shaped by social media, virtual reality, and other technological advancements. The core aim of this paper is to explore the multifaceted relationship between loneliness and technology within the digital sphere.

This literature review is structured to provide a comprehensive understanding of this complex phenomenon. It will begin by examining how loneliness manifests across different age groups, including older adults, adolescents and younger adults, and middle-aged adults, highlighting the unique challenges and technological interactions pertinent to each demographic. Subsequently, the chapter will explore the influence of gender on the experience and reporting of loneliness, considering how societal norms and digital communication styles may differ. The pervasive issue of stigma associated with loneliness, and how it acts as a barrier to help-seeking, will then be discussed, including its manifestations in the digital age.

Following this, the review will investigate the critical roles of self-esteem, fear of negative evaluation, and role loss in the context of loneliness, particularly how these psychological factors are affected by and interact with technology use. A significant section is dedicated to attachment styles, outlining how secure, anxious, dismissive-avoidant, and fearful-avoidant patterns influence individuals' online behaviors and their susceptibility to loneliness. The chapter will then broaden its scope to consider cultural contexts, examining both global

distinctions (individualistic versus collectivistic cultures) and the specific experiences within Canada, focusing on immigrant and Indigenous populations and their unique engagement with technology to navigate loneliness.

A pivotal part of this review addresses technology's dual role as both a potential connector and an isolator, analyzing the impact of various technologies such as social media, augmented reality (AR), virtual reality (VR), and artificial intelligence (AI) in mitigating or exacerbating loneliness. Finally, the chapter will scrutinize the methodologies employed to measure loneliness, covering traditional self-report scales like the UCLA Loneliness Scale and the De Jong Gierveld Loneliness Scale, their psychometric properties (reliability, validity, cross-cultural validity), and the emerging role of technology in loneliness assessment, including passive sensing and AI-driven analytics.

Through this structured exploration, the chapter aims to lay a thorough foundation for understanding the intricate dynamics between loneliness and technology, thereby setting the stage for the subsequent discussion in Chapter Three on ethical considerations and applied counselling practices in this rapidly evolving landscape.

### **Age and Loneliness**

Given that the aging process inherently involves distinct life transitions and evolving social roles, positioning age as a critical determinant in loneliness research is empirically justified. Each developmental stage, from adolescence to late adulthood, presents unique psychosocial challenges that systematically influence vulnerability to isolation, warranting age-sensitive analysis in studies of social connectedness. Some researchers have also deemed that age across adulthood has no association with loneliness; however, most researchers seem to agree that all age groups experience loneliness in a different way (Huxhold & Henning, 2023). Hence,

the following subsections will explore different age groups and how uniquely each age-group experiences loneliness.

### ***Older Adults***

Loneliness among older adults (50+ years) is often linked to cumulative life transitions, including retirement, bereavement, and declining health (Franssen et al., 2020). Hawkley et al. (2020) and Kotwal et al. (2021) concluded that older adults experience chronic loneliness, particularly after the loss of a spouse, reduced mobility and geographic distance from family, financial income decline, health decline and cognitive decline. Kotwal et al. also highlighted the fact that this population might find it harder to cope with loneliness compared to the younger age group because for the younger age group, loneliness might become a motivating factor to connect with others, but this may not be the case for older adults. This isolation is starkly exemplified in Japan's *kodokushi* (lonely deaths) phenomenon, where elderly individuals die alone and remain undiscovered for weeks or months due to fractured family structures and societal neglect (Dahl, 2019). Dahl attributed this crisis to Japan's rapidly aging population, urbanization, and cultural shifts away from multigenerational households, leaving many older adults without caregivers or social networks. These converging factors underscore how late-life transitions can create a fertile ground for profound and persistent loneliness.

However, K. Li et al. (2024) emphasized that resilience moderates this relationship: older adults with strong coping mechanisms, such as volunteering or engaging in hobbies, reported lower loneliness levels despite physical limitations. As individuals transition into later life, the erosion of these foundational structures can trigger profound psychological consequences, including identity disruption, diminished self-efficacy, and existential distress. Symanyuk et al. (2019) further highlighted that this life stage often involves a complex interplay of emotional and

cognitive challenges such as reevaluating one's life narrative, confronting mortality, and navigating increased dependency, all of which increase feelings of isolation. The authors recommended that these individuals find new hobbies and interests, new ways of defining who they are and their roles. Akhter-Khan et al.'s (2022) study interestingly highlighted grandparental caregiving (taking care of grandchildren or children in general) and volunteering as being most effective in helping reduce loneliness in this population.

Innovative interventions are emerging to address this crisis as well. For example, Sakuma Crume(2020) described how Japan has pioneered the use of robotic companions like PARO (a therapeutic seal robot) to provide emotional support for isolated older adults, much like a support animal but you are exempt from taking care of the animal. According to Sakuma Crume, these robots simulate conversation, recognize emotions, and even remind users to take medication, offering a semblance of companionship. While she noted that these robots help in reduction of experiences of loneliness, critics have argued that such technologies risk normalizing the replacement of human connection with artificial substitutes, particularly in cultures already struggling with social atomization (Gasteiger et al., 2021). While technology interventions generally show a positive influence on reducing loneliness and social isolation in older adults, their effectiveness depends on factors like study design, training time, and the facilitation of existing relationships (Balki et al., 2022). For homebound older adults, individualized technology training can improve well-being by increasing digital literacy and access to online social activities (Gadbois et al., 2022). Therefore, while technology offers promising avenues for intervention, its successful application hinges on a human-centered approach that prioritizes genuine social connection.

For counsellors working with older adults, a multifaceted approach that addresses loss, identity, and coping is essential for fostering connection and well-being. It is crucial to assess for recent or cumulative losses and explore the emotional impact of these transitions. Therapists can guide older clients in redefining their identity and purpose post-retirement or after other significant life changes, while also exploring coping mechanisms that bolster self-efficacy. Furthermore, counsellors should explore the client's openness to and accessibility of technology-based interventions, emphasizing that their effectiveness is often tied to individualized training and the facilitation of social connections. Promoting digital literacy can be a practical and empowering intervention, enabling homebound older adults to access online communities and reduce their sense of isolation.

### ***Adolescents and Younger Adults***

The experience of loneliness in adolescents and young adults is uniquely shaped by the intersection of developmental upheaval and deep immersion in a digital world that often magnifies social pressures. Contrary to the common belief that loneliness is primarily an issue for the elderly, research has indicated a high prevalence in this younger demographic, rooted in social and developmental challenges (Heinrich & Gullone, 2006). This could be clarified perhaps with other studies who talk about adolescents who struggle with loneliness, however, that loneliness being rooted in social and developmental upheaval. Korzhina et al. (2022) wrote about how young adults face various experiences including academic pressure, body image concerns, groupism, popularity, and so on, which are all key drivers to loneliness but their stigma around mental health prevents them from seeking the required help making them vulnerable to loneliness even more. The authors also highlighted the population's ineffective coping style, such as using extensive social media and trying to hide themselves via online disclosures further

pushing the skills to engage in face-to-face interaction and also engaging in the hookup/casual sex culture that prioritizes their physical needs above their emotional needs serve as drivers for loneliness as well.

The pervasive influence of social media creates a unique landscape where loneliness is often amplified by unrealistic social comparisons and FOMO. Platforms like Snapchat and Instagram, which facilitate the sharing of curated and retouched images, can foster an unattainable ideal of perfection, leading to significant distress (Vuong et al., 2021). The algorithmically driven content on platforms like TikTok can intensify feelings of FOMO by showcasing idealized lifestyles and achievements, creating immense pressure on young adults whose sense of self is still developing (Hatano et al., 2022; Schreurs & Vandebosch, 2022). This digital environment fosters a culture of comparison that can leave many feeling inadequate and disconnected.

This intense online social pressure often translates into a fear of negative evaluation and appearance anxiety, which can lead to social withdrawal and a self-perpetuating cycle of isolation. The fear of being judged as weird or different can cause young people to retreat from social situations (Geukens et al., 2020). In South Korea, this fear manifests in “appearance anxiety,” where teens undergo cosmetic surgery or extreme dieting to conform to K-pop beauty standards perpetuated on social media, further alienating those who cannot meet these ideals (Vuong et al., 2021). Appearance anxiety has been further linked to having a direct correlation with social anxiety creating further isolation leading to these children and adolescents being discriminated against either for their looks, connections, wealth, and so on, creating a different kind of isolating/lonely experience (Gao et al., 2023). Ultimately, the fear of not measuring up in a hyper-visible world is a powerful driver of loneliness for this age group.

Counsellors working with this demographic must adopt a digitally-informed approach to address the unique drivers of their loneliness. It would be essential to routinely inquire about their social media use, paying attention to platforms that may amplify FOMO (e.g., TikTok ) or contribute to unrealistic social comparisons and appearance anxiety (e.g., Instagram, Snapchat). Therapeutic interventions can focus on media literacy, helping young clients critically evaluate the curated nature of online content and its impact on their self-esteem and body image. Addressing the fear of negative evaluation and its link to social withdrawal is key; cognitive behavioral therapy techniques can help challenge maladaptive thought patterns and encourage gradual exposure to social situations. By integrating an understanding of the digital world into therapeutic practice, counsellors can better support young people in navigating the complexities of modern social life.

### ***Middle-Aged Adults***

Loneliness in middle-aged adults is a complex and under-researched phenomenon, largely driven by the unique pressures of being the sandwich generation and navigating significant life and career transitions. While some studies suggested this group reports less loneliness, it is crucial to recognize that they are the least studied demographic in this area, making definitive conclusions premature (Surkalim et al., 2022). This age group often juggles the demanding and competing responsibilities of caring for both children and aging parents, alongside career pressures, which are major contributors to stress and isolation (Lei et al., 2022). More recent research indicated that financial instability in a competitive job market, coupled with declining mental and physical health, is exacerbating loneliness in this cohort (Infurna et al., 2024). These intersecting responsibilities and stressors create a unique vulnerability to loneliness for middle-aged adults.

The traditional buffers against loneliness, such as marriage, can become fragile during this life stage, and emerging anxieties about aging can further compound feelings of isolation. While marriage is often seen as a protective factor, marital conflict can create a profound sense of emotional and social isolation, and divorced individuals often report increased loneliness compared to their single counterparts (Barreto et al., 2021; Dykstra & Fokkema, 2007). Another significant, yet often overlooked, factor is ageism anxiety, which is particularly relevant for this demographic as they navigate the precursors of aging (Bergman & Segel-Karpas, 2021). This anxiety has been shown to be a key contributor to loneliness in middle-aged adults. These challenges are often borne in silence, as this population is less likely to seek help due to the stigma of not “having it all together” (Jovicic & McPherson, 2019). The erosion of traditional social supports and the rise of new anxieties create a precarious social landscape for many in midlife.

While the internet can offer a means of connection, its impact on loneliness in middle-aged adults is nuanced and dependent on the nature of its use. Research has suggested that moderate internet use (1-5 hours per day) can reduce feelings of loneliness (Q. Li et al., 2024). However, the purpose of online activity is a critical factor; for instance, searching for health-related information, particularly for those with limiting illnesses, has been associated with increased loneliness (Hosea et al., 2024). This highlights that not all forms of digital engagement are equally beneficial in mitigating social isolation.

### **Gender**

In addition to the already discussed intertwined relationship of loneliness with several factors, gender further adds to the mix. Barreto et al. (2021) wrote about how gender, age and culture interact to predict loneliness. The authors concluded that men are more prone to

loneliness than women; their study further specified that young men living in individualistic cultures are most vulnerable to loneliness. The authors also highlighted the fact that women are more likely to report loneliness than men, due to certain gender stigmas. Heinrich and Gullone (2006) agreed with this as they wrote about how women tend to report more loneliness than men when self-reporting measures through sentences such as 'I am lonely,' but not when the measure does not use the specific self-labelling or use of the word 'lonely.' Understanding this existence of stigma, Nicolaisen and Thorsen (2013) decided to classify 'sometimes lonely' as 'lonely' in their study.

While these reporting discrepancies complicate the picture, other research highlighted specific life circumstances and societal events where women demonstrably experience higher levels of loneliness. For instance, Barreto et al. (2021) also mentioned some studies conducted with older women showing that women are lonelier than men but they highlighted that women usually outlive men, which likely causes them to be the caretaker of their spouses and eventually they lose their spouses, leading to loneliness. Interestingly, Wickens et al. (2021) conducted a study during the COVID-19 pandemic where they also concluded that women felt lonelier than men. They also cited several other studies that took place during the pandemic which drew the same conclusion. Wickens et al. proposed that this phenomenon could be because of the social isolation practice that was heavily implemented during the pandemic. This could be further clarified by a study done by Cacioppo et al. (2015), which highlighted various types of loneliness, including intimate loneliness (emotional loneliness), relational loneliness (social loneliness), and collective loneliness. Among these, the authors observed that women are more affected by relational/social loneliness which is perceived absence of quality friendships or family support derived from society. Perhaps the social isolation then creates more

relational/social loneliness which would affect the women more during the pandemic when compared to men.

The quest for social connection extends beyond in-person interactions, and the digital world introduces its own set of gendered dynamics as gender differences may also exist in communication styles online, impacting the quality of digital interactions and their ability to alleviate loneliness (Bhat et al., 2024). Furthermore, Wodika et al.'s (2024) research indicated that non-binary and transgender students often display high levels of loneliness, underscoring the need to move beyond binary understandings of gender in this context. Examining how different genders utilize technology as a coping mechanism for loneliness also reveals variations. For instance, males might use the internet more for e-mail communication, while females' internet use for health-related information searches is often higher (Wallinheimo & Evans, 2021).

Ultimately, the relationship between gender and loneliness is not a simple question of who suffers more, but a complex tapestry woven from reporting biases, life circumstances, social context, and evolving gender identities. The evidence shows that while men may be culturally conditioned to hide their loneliness, women can be more vulnerable in specific situations like widowhood or periods of social isolation, and non-binary individuals face their own distinct challenges. Given these nuances, it is imperative for a counsellor to assess loneliness using varied and sensitive questioning techniques for all clients. To be truly effective in practice, it is vital to hold space for these individual differences and to maintain an inclusive, non-binary approach to counselling.

### **Stigma**

Loneliness in the digital age continues to be associated with a significant social stigma (Dwyer, 2024). Historically viewed as a shameful condition, indicative of being a social outcast,

this stigma can profoundly affect individuals' willingness to acknowledge and address their feelings of isolation. The fear of being perceived as self-absorbed, unattractive, or antisocial can prevent individuals from disclosing their loneliness both online and offline (Mejova & Hommadova Lu, 2023). Barreto et al. (2022) also pointed to a common attribution bias where loneliness is attributed to internal, controllable factors within the individual, such as personality flaws or a lack of effort in forming connections. The authors observed how this perspective often neglects or downplays the significant role of external and structural factors, such as major life events (e.g., bereavement, relocation), changes in social networks, socioeconomic status, or experiences of discrimination, which can profoundly impact an individual's social connections and feelings of loneliness. This tendency to blame the individual reduces empathy and the likelihood of offering support. Barreto et al. found that the fear of being judged negatively, coupled with self-blame, prompts many individuals to hide their loneliness from others. The experience and expression of loneliness are significantly shaped by societal gender norms, particularly traditional or hegemonic masculine norms. These norms typically emphasize traits such as strength, stoicism, self-reliance, emotional control, rationality, dominance, risk-taking, the primacy of work, and the avoidance of any display of vulnerability or weakness (Nordin et al., 2024). This often translates into a societal pressure for men to suppress emotions, particularly those perceived as "feminine" or indicative of weakness, such as sadness or fear, encapsulated by adages like "men don't cry."

Apart from gender/personal stereotype and stigma, institutional stigma is also important to be discussed. The contemporary recognition of loneliness as a significant public health issue contrasts sharply with its historical framing. For much of modern history, loneliness was largely minimized or viewed through lenses that deflected institutional responsibility. It was often

considered an individual failing, a private sorrow, a matter of personal disposition, or even a spiritual condition to be addressed through personal fortitude or religious solace, rather than a societal problem requiring broad-based public health interventions (Snell, 2015). This perspective is distinct from earlier historical views of solitude, which could be seen positively as a path to spiritual development or intellectual reflection. Healthcare systems often overlook loneliness as a legitimate concern. Jovicic and McPherson (2019) found that 80% of general practitioners in the UK lacked training to address loneliness, dismissing it as a “normal part of aging” or adolescence.

Technology and social media, while offering avenues for connection, can also inadvertently perpetuate or challenge these stigmatized views (Dwyer, 2024). Technology also provides opportunities to destigmatize loneliness. Dwyer noted that public health campaigns and online initiatives utilize digital platforms to encourage open conversations and normalize the experience of feeling alone. Representing loneliness as a common human experience can help reduce the associated shame and encourage individuals to seek support (Hughes et al., 2024). It is also worth considering whether certain technology-based interventions, such as using social robots for companionship, might carry their own stigma or be perceived as a substitute for genuine human interaction (Balki et al., 2022).

Counsellors must actively work to create a non-judgmental space, recognizing the profound social stigma surrounding loneliness that can prevent disclosure and help-seeking. Counsellors need to focus on challenging attribution biases by exploring external and structural factors contributing to a client’s loneliness, rather than framing it solely as an individual failing.

### **Self-Esteem and Fear of Negative Evaluation**

Low self-esteem is a powerful predictor of loneliness, operating in a vicious, bidirectional cycle. It is a core characteristic of lonely individuals, as low self-worth can lead to negative interpretations of social cues and avoidance behaviors that perpetuate isolation (Heinrich & Gullone, 2006; Skoko et al., 2024). In turn, the experience of loneliness further erodes an individual's self-esteem (Jovicic & McPherson, 2019). This negative loop is often exacerbated by problematic internet use, where engagement with social media can foster upward social comparisons and FOMO, diminishing self-worth and heightening feelings of inadequacy (Gupta & Sharma, 2021; Zhang et al., 2025). For adolescents in particular, low self-esteem is strongly correlated with a fear of negative evaluation, which encourages the very social avoidance that fuels loneliness (Geukens et al., 2020).

However, high self-esteem can act as a critical buffer in this cycle, and technology's role is not solely negative. The impact of digital tools is complex, with the potential to enhance self-worth through positive social feedback, online support, and fulfilling the fundamental need for belongingness (Baumeister & Robson, 2021; Smith et al., 2021). Factors like online self-disclosure can moderate the negative effects of smartphone use, and for some populations, such as older adults, increased technology use has even been linked to higher self-worth (Karsay et al., 2019; Wilson, 2017). Because self-esteem is a key mediator between technology use and loneliness (Xie et al., 2022), building it should be a primary therapeutic goal. Therefore, counsellors should help clients identify strengths and challenge negative self-talk while also exploring their relationship with social media, particularly patterns of upward social comparison and fear of negative evaluation.

### **Role Loss**

Interestingly, role loss is one of the other factors that can hinder self-esteem, which in turn creates loneliness. Toyoshima's (2025) study concluded that when an individual is able to form a certain role in society via social roles or job roles (i.e., role identity), they are less prone to loneliness. This study found that to effectively decrease loneliness, it is not enough for an individual to be participating in community activities but it is important for the individual to have formed some sort of a trust as well as a role in the community. For older adults, low self-esteem often stems from "role loss," such as retirement, empty nest syndrome, or declining physical independence (Dawson et al., 2023). K. Li et al. (2024) introduced the concept of "generativity crisis," where older adults who can no longer contribute to society through work or caregiving, struggle to derive self-worth. This crisis is particularly pronounced in cultures that equate value with productivity, such as the United States and Germany (Luhmann et al., 2022).

As one loses the role that they have identified with for a long time, it could be useful for counsellors to work on finding new roles for these clients. This could include encouraging them to engage in new hobbies or volunteer work in societies and finding new ways to contribute and feel valued.

### **Attachment Styles**

Since we are talking about the human need for connection, it feels imperative to discuss attachment theory. Attachment theory provides a foundational lens for understanding how early relational experiences shape lifelong patterns of connection and loneliness (Bowlby, 1969).

Bowlby's work emerged from observations of children separated from caregivers during World War II, revealing that humans possess an innate need for secure bonds, a need that persists into adulthood. By dividing attachment styles into secure, anxious, and avoidant, Bowlby illuminated

how childhood caregiver quality influences adult strategies for seeking (or avoiding) intimacy. This framework is indispensable for analyzing loneliness in the digital age, where technology mediates human connection in unprecedented ways. Bowlby divided the attachment styles as secure, insecure (anxious), and avoidant. Social media platforms and mobile dating applications have become ubiquitous tools for initiating, developing, and maintaining social and romantic relationships (Käcko et al., 2024). This pervasiveness necessitates a thorough examination of how these technologies interact with fundamental psychological processes like attachment and the experience of loneliness.

### ***Secure Attachment***

Secure attachment arises when caregivers consistently attune to a child's emotional and physical needs, fostering trust and self-worth (Bowlby, 1969). These individuals develop healthy emotional regulation and view relationships as safe havens. Individuals with a secure attachment style, characterized by a positive internal working model of themselves as lovable and worthy, and of others as generally reliable and responsive (Kidd et al., 2011). They tend to experience lower levels of loneliness compared to their insecurely attached counterparts (Bernardon et al., 2011). This inner sense of security and trust typically translates into healthier and more adaptive patterns of online behavior.

Securely attached individuals are likely to use technology, including social media and dating applications, in a balanced and purposeful manner. Their online activities are often geared towards seeking genuine connection, obtaining social support, and maintaining existing relationships, rather than being driven by an excessive need for validation or a fear of being alone (Hughes et al., 2024). Their online interactions often serve as an extension and enrichment of their offline social lives, used to strengthen established bonds rather than to compensate for

perceived deficits in face-to-face relationships (Santoro et al., 2024). Consequently, they are less prone to developing problematic internet use or social media addiction, as they are less likely to rely on online platforms as a primary coping mechanism for unmet emotional needs or distress (Eichenberg et al., 2024). Secure attachment, therefore, appears to function as a protective factor, enabling individuals to leverage the connective benefits of technology while being more resilient to its potential pitfalls, such as social comparison or the superficiality that can contribute to feelings of loneliness.

### *Anxious Attachment*

Anxious attachment stems from inconsistent caregiving, where a child's needs are sometimes met and sometimes ignored (Bowlby, 1969). Anxious-preoccupied attachment is characterized by a profound fear of rejection and abandonment, coupled with an intense desire for closeness, reassurance, and validation from others (Wang & Xuan, 2024). This underlying insecurity often predisposes individuals with this style to experience higher levels of loneliness.

Their engagement with online platforms, particularly social media and dating apps, is frequently driven by this quest for validation and a need to monitor the security of their relationships (Young et al., 2020). On dating apps, for instance, their motivations often center on finding love and bolstering their self-worth, sometimes leading to behaviors like "reassurance seeking" (Balki, 2025). This pattern of intense online engagement can readily escalate into problematic social media use or dating app addiction, often marked by compulsive checking for messages, likes, and other forms of social feedback (Liu & Ma, 2019; Young et al., 2020). The impact on their loneliness is often paradoxical. While they actively and sometimes desperately seek connection online, the very nature of many digital interactions, which can be ambiguous, superficial, or carry the risk of rejection (e.g., being "ghosted" or ignored) can trigger their deep-

seated attachment anxieties. If their profound needs for consistent intimacy and validation are not reliably met in the online environment, their sense of loneliness may, in fact, be exacerbated (Young et al., 2020). Research by Ma and Zhang (2024) suggested that attachment anxiety moderates the effect of social media posting on loneliness, indicating a complex interplay where even active attempts at online engagement can have varied outcomes depending on the individual's level of anxiety. This attachment style vividly illustrates how the digital pursuit of connection, when fueled by underlying anxieties, can become a source of further distress and potentially amplify, rather than alleviate, feelings of loneliness.

Counsellors working with anxiously attached individuals should hence be aware of their potential for problematic social media use driven by a need for validation and reassurance. Therapeutic interventions could focus on building self-esteem, developing healthier coping mechanisms for underlying attachment anxiety, and fostering realistic expectations about online interactions to mitigate the risk of digital engagement exacerbating loneliness. Exploring patterns of 'reassurance seeking' on dating apps or social media can be a valuable part of therapy.

### ***Dismissive Avoidant Attachment***

Individuals with a dismissive-avoidant attachment style typically hold a positive view of themselves but a more negative or distrustful view of others. They place a high premium on independence and self-reliance and are often uncomfortable with emotional closeness and interdependence (Dan et al., 2020).

Their use of technology, including social media and dating apps, is often characterized by a more instrumental or superficial approach, aimed at maintaining control and emotional distance. On dating platforms, they may show a preference for casual relationships over committed ones, a pattern that aligns their discomfort with deep emotional involvement and

vulnerability (Rochat et al., 2019). While some research has indicated that avoidant attachment negatively predicts addiction to social networking sites, other studies suggested individuals with this attachment style might use social media to maintain relationships at a distance or to alleviate boredom (Lui & Ma, 2019). This usage could still become problematic if it serves as a primary means of compensating for offline social deficits without fostering genuine intimacy (Young et al., 2020). Their inherent avoidance of deep intimacy, even in online contexts, can hinder the formation of fulfilling connections. This may contribute to a distinct, perhaps unacknowledged, form of loneliness characterized by a lack of meaningful engagement and emotional depth in their relationships (Borawski et al., 2022). The dismissive-avoidant style thus demonstrates how technology can be utilized to reinforce pre-existing patterns of emotional distancing, potentially offering a superficial sense of connection or control but ultimately preventing the development of the deeper bonds necessary to truly combat loneliness.

### ***Fearful-Avoidant Style***

Fearful-avoidant attachment is characterized by negative internal working models of both the self (as unworthy or unlovable) and others (as untrustworthy or rejecting) (Dan et al., 2020). This results in a deeply conflicted state where individuals simultaneously desire closeness and intimacy but also harbor a strong fear of the vulnerability and potential pain associated with it (Bernardon et al., 2011). This internal conflict typically predisposes them to experience significant and often distressing levels of loneliness.

The online behavior of individuals with fearful-avoidant attachment often reflects this internal push-pull dynamic. They might actively seek connection on social media or dating apps, driven by their need for belonging, but then quickly withdraw, self-sabotage, or become highly anxious if they perceive any sign of criticism, rejection, or potential engulfment (Kidd et al.,

2011). The digital environment, with its potential for misinterpretation of cues and rapid shifts in interaction, can be particularly challenging for them. They are notably vulnerable to negative online experiences and may be at a higher risk for developing problematic social media use as they navigate this internal turmoil (Santoro et al., 2024). Their online interactions can be fraught with anxiety, hypervigilance to social cues, and a tendency to misinterpret ambiguous signals negatively (Bernardon et al., 2011). Consequently, according to Bernardon et al., their loneliness levels are often high, stemming from the persistent and painful conflict between their fundamental human need for connection and their profound fear of the vulnerability that genuine intimacy entails. The researchers noted that the fearful-avoidant style exemplifies perhaps the most tormented form of engagement with online platforms, where the digital world can become a particularly challenging space, often amplifying their fears and, as a result, their loneliness.

While these individual attachment styles provide a powerful micro-level lens for understanding loneliness, they do not exist in a vacuum. The expression of these attachment patterns, the social expectations surrounding relationships, and even the stigma associated with loneliness are all profoundly shaped by the broader cultural context. Therefore, to fully grasp the complexities of loneliness in the digital age, it is essential to bridge our understanding of individual psychology with an analysis of cultural forces.

### **Culture: Global Context**

Cultural norms profoundly shape how loneliness is experienced, expressed, and addressed. In individualistic cultures, such as the United States, loneliness often stems from unmet expectations of independence and personal achievement (Barreto et al., 2021). Social media amplifies these pressures by fostering upward social comparison, where users measure their worth against curated, idealized lifestyles (Vuong et al., 2021). The experience and

expression of loneliness are profoundly shaped by cultural context. The broad cultural dimensions of individualism and collectivism provide a useful, albeit generalized, framework for understanding these variations. These cultural orientations influence social structures, relationship expectations, communication styles, and societal responses to loneliness, including associated stigma and help-seeking behaviors.

### ***Individualistic Culture***

Individualistic cultures, prevalent in nations such as the United States, Canada, and many Western European countries, place a strong emphasis on personal independence, autonomy, individual achievement, and self-expression (Barreto et al., 2021). Social relationships in these contexts are often viewed as voluntary and are formed based on individual choice rather than prescribed social obligations. While this cultural orientation can foster personal freedom and diverse social networks, it also presents unique pathways to loneliness. Barreto et al. observed that the pronounced focus on self-reliance may make individuals hesitant to admit vulnerability or seek support when feeling lonely, as this could be perceived as a personal failing or a contradiction to the ideal of independence. Furthermore, high social and geographical mobility, often pursued for individual career or personal development, can lead to the disruption of established social networks and a sense of rootlessness (Luhmann et al., 2022). The cultural encouragement of a wide array of weaker, chosen ties might sometimes come at the expense of the deeper, more consistently supportive connections necessary to stave off feelings of loneliness.

Cross-national studies have consistently found that individuals in more individualistic countries report higher levels of loneliness compared to those in more collectivistic societies (Barreto et al., 2021). For example, North Americans generally report greater loneliness than

individuals from more collectivistic cultural backgrounds (Dwyer, 2024). Barreto et al. (2021) found that a particularly vulnerable demographic within individualistic cultures appears to be younger men. The authors noted that this heightened vulnerability may stem from a confluence of factors: the societal pressure for self-reliance clashing with the normative identity exploration and network instability characteristic of youth. The impact of major life transitions also appears to be culturally moderated; for instance, retirement is associated with increased loneliness in individualistic societies like Australia and the United States, particularly if involuntary, whereas it is linked with lower loneliness in the more collectivistic context of China (Hagani et al., 2024). This suggests that cultural scripts surrounding aging, the value of work, and the availability of alternative social roles in later life are crucial determinants of loneliness.

### ***Collectivistic Culture***

Collectivistic cultures, characteristic of many societies in Asia, Africa, and Latin America, emphasize group goals, interdependence, social harmony, and strong, often extended, family and community networks (Barreto et al., 2021). An individual's identity is often deeply interwoven with their membership and role within these groups. These cultural tenets can provide significant protective factors against loneliness. The inherent emphasis on in-group cohesion and the ready availability of social support from family and community members can act as robust buffers (Dwyer, 2024). The cultural value placed on mutual responsibility and care often ensures that individuals are embedded within supportive networks throughout their lives.

However, collectivistic cultures are not immune to loneliness. The subjective experience of loneliness can still arise from a perceived lack of quality within existing relationships, feeling misunderstood by in-group members, or experiencing social exclusion or ostracism, which can be particularly painful within tightly-knit social structures (Barreto et al., 2021). The strong

pressure to conform to group norms and maintain social harmony might also make it challenging for individuals to openly express feelings of loneliness or dissatisfaction with their social relationships, potentially leading to a more hidden or suppressed form of loneliness (Dwyer, 2024). Hence, rather than being viewed primarily as an individual failing, expressing loneliness might be perceived as a threat to social cohesion or an implicit criticism of the group's ability to provide for its members, thus leading to strong cultural pressure to conceal such feelings.

According to Dwyer, empirical findings have generally indicated lower reported levels of loneliness in collectivistic cultures due to higher social integration. However, the picture is complex. For example, one meta-analysis found greater mean levels of loneliness in adolescents in countries with higher collectivism scores, suggesting that factors such as unmet social needs or the quality of expected versus actual support within the collective can still lead to loneliness (Adamczyk & Ewa, 2023).

### ***Differences in Technology Use***

The patterns of social media use and their impact on loneliness are not uniform across cultures but are shaped by prevailing cultural values. For instance, behaviors such as self-disclosure, the seeking and provision of social support online, and the types of connections prioritized can differ significantly between individualistic and collectivistic cultures (Yin et al., 2018). Users from collectivistic cultures (e.g., China, Malawi) may leverage social networking sites more intensely for maintaining strong in-group ties and seeking social assurance, reflecting cultural emphases on interdependence and belonging. In contrast, Yin et al. observed that users in individualistic cultures (e.g., the U.K., U.S.) might focus more on self-presentation to a wider audience, entertainment, and the cultivation of a broad network of weaker ties. The researchers noted that relationship between specific social networking site usage patterns and well-being

appears to be moderated by cultural background, suggesting that interventions aimed at promoting healthy technology use must be culturally sensitive.

### **Culture: Canadian Context**

Canada, with its official policy of multiculturalism and significant immigrant population, alongside its diverse Indigenous peoples, presents a unique context for examining the interplay of culture, technology, and loneliness. The “digital divide,” the difference between those who can use digital technologies efficiently and those who can’t, emerges as a crucial social justice and human rights issue rather than just a technical lag. An important ethical and legal framework for comprehending the implications of digital exclusion is provided by the United Nations General Assembly’s 2016 declaration confirming internet access as a fundamental human right (Sanders & Scanlon, 2021).

### ***Digital Divide***

The digital divide is a multifaceted and systemic injustice that is fueled by a complex interaction between differences in digital infrastructure, financial limitations, different levels of digital literacy, and the accessibility of content that is inclusive of all cultures and languages (Hollimon et al., 2025). Not all populations are equally impacted by this injustice; those that are already marginalized are disproportionately affected, according to Hollimon et al., which exacerbates social stratification, increases economic gaps, and severely limits opportunities for advancement. The connection between the digital divide and social exclusion is bidirectional and perniciously self-reinforcing (Molala & Makhubele, 2021). The digital divide is simultaneously a symptom of existing social inequalities and a potent cause of new and exacerbated forms of exclusion. As a symptom, it mirrors and magnifies pre-existing societal problems. The divide manifests most acutely among groups where economic resources are scarcest, and among

populations already contending with vulnerabilities related to age, disability, income, or immigration status (Raihan et al., 2024). In this sense, digital inequality is a reflection of broader structural forces that have historically marginalized these communities.

Digital literacy is now a fundamental necessity for economic survival rather than a specialized skill. According to projections, López-Aguado et al. (2022) observed that digital/internet-based skills will be necessary for between 85% and 90% of all future employment positions. This requirement extends beyond highly skilled professional positions to manual and service-oriented occupations like security guards, warehouse workers, and cleaners, where digital tools are being used more and more for scheduling, communication, and training. As a result, those who lack digital competency face significant barriers to professional growth and employment, which directly contributes to unemployment and poverty (Molala & Makhubele, 2021). Education is also getting increasingly digitalized every day. From submitting assignments online, to having access to plethora of research articles online, technology has severely taken over the education system. Unfortunately, either due to no internet access, lack of knowledge on how to access such resources, or due to insufficient funding to purchase required hardware for the access of resources, students can face major drawbacks when compared to their other peers who don't have such barriers. This digital exclusion exacerbates pre-existing educational inequalities, leading to significant knowledge gaps, lower academic performance, and long-term disadvantages for the most vulnerable students (Workie et al., 2022). The healthcare sector's increasing reliance on digital tools presents another significant barrier. Hollimon et al. (2025) argued that the growth of telemedicine, the use of mobile applications for patient monitoring, and the shift to online portals for accessing electronic health records and communicating with providers all presume a level of digital access and literacy that many do not

possess. This digital disparity can prevent individuals from accessing timely medical advice, managing chronic conditions effectively, and receiving essential health information, leading to poorer health outcomes, particularly for older adults and those with low digital skills.

### ***Canadian Immigrants***

Immigrants in Canada often face a heightened risk of loneliness. Lin (2023) noted that this vulnerability stems from a confluence of factors including the loss of established social networks from their home countries, language barriers that impede communication and integration, experiences of discrimination, the psychological stress associated with acculturation, and socioeconomic disparities. According to Lin, national studies, such as one conducted during the COVID-19 lockdown, revealed a significant prevalence of severe loneliness (34.7%), with women, younger individuals, those living alone, and immigrant men being among those at higher risk. Su et al.'s (2022) study on older Chinese immigrants in Canada during the COVID-19 pandemic found that loneliness negatively impacted their psychological well-being, while perceived social support served as a protective factor. Similarly, Au et al.'s (2024) study with older Arabic-speaking immigrants, especially refugees and those with lower levels of acculturation, reported significant loneliness and social isolation. The process of acculturation, adapting to the host culture, and enculturation (i.e., maintaining one's heritage culture) plays a critical role in the well-being of immigrants (Su et al., 2022). Lower levels of acculturation are often linked to increased loneliness, as individuals may struggle to navigate the new social environment and form meaningful connections (Au et al., 2024).

Technology serves a dual acculturative function for many immigrants. Au et al. (2024) argued that technology is a vital tool for maintaining transnational ties with family and friends in their countries of origin, providing crucial emotional support and a sense of continuity, which

can alleviate feelings of loneliness. Simultaneously, the authors noted that technology can aid integration into Canadian society by facilitating access to local information, essential services (including healthcare), and connections with co-ethnic communities within Canada. However, an over-reliance on technologically mediated transnational ties, without sufficient local engagement, might inadvertently sustain feelings of loneliness in the new environment if it hinders broader social integration. The balance between using technology to maintain heritage connections and to foster new local ones is likely crucial for mitigating loneliness and promoting overall well-being among immigrant populations (Guan, 2021). Despite the benefits, significant barriers to technology use exist for many older immigrants, including limited digital literacy, lack of access to affordable technology and internet services, and language barriers, as many digital platforms are primarily in English or French (Au et al., 2024). Consequently, digital literacy programs must be culturally and linguistically tailored to be effective for these communities.

For many refugees and migrants, digital needs are necessarily secondary to more immediate and pressing survival and assimilation concerns. However, there is also a clear demand for specific digital skills that are directly relevant to their settlement journey. These include learning how to conduct online transactions safely, protecting themselves from online risks, managing their finances securely, and accessing essential public services online. Hence isolation or inaccessibility from digital literacy, will create major barriers for immigrants causing a ripple effect to their mental wellbeing.

### ***Indigenous People in Canada***

Although Canada is an individualistic country, historically the Indigenous peoples in Canada had collectivistic values. Indigenous peoples in Canada—First Nations, Métis, and

Inuit—have distinct cultural perspectives on community and connection that are deeply rooted in interconnectedness, collective well-being, strong kinship systems, and a profound spiritual connection to the land (Ali-Hassan et al., 2020). However, the enduring and devastating legacy of colonialism, including policies of forced assimilation enacted through mechanisms like the residential school system, the Sixties Scoop, ongoing systemic discrimination, and the widespread disruption of traditional governance, economies, and ways of life, has inflicted profound intergenerational trauma (McKenzie et al., 2016). This historical and ongoing context has led to the erosion of traditional social structures, significant loss of Indigenous languages and cultural practices, and a deep sense of cultural discontinuity. Ali-Hassan et al. (2020) observed that these factors are major contributors to social isolation, loneliness, and disproportionately high rates of mental health challenges within many Indigenous communities. Further, the authors noted that Indigenous older adults, as keepers of knowledge and culture, are often at a particularly high risk of social isolation due to systemic oppression, racism, the marginalization of their languages, and the cumulative impact of historical injustices. For Indigenous youth, the loss of ancestral language can sever crucial intergenerational connections and weaken their cultural identity, potentially fostering feelings of alienation, anomie, and contributing to mental health issues (Khawaja, 2021).

Despite these barriers, Indigenous communities and individuals are increasingly harnessing technology as a tool for fostering connection, promoting cultural revitalization, and enhancing well-being. Digital platforms enable communication across vast geographical distances, helping to maintain vital family and community ties, which is particularly crucial for those living in remote areas or separated from their home communities and support networks (Ali-Hassan et al., 2020). Technology is also being innovatively employed for cultural

preservation and revitalization. Initiatives include the development of Indigenous language learning applications, online platforms for sharing traditional stories and cultural teachings, and digital archives for preserving Indigenous knowledge. During the COVID-19 pandemic, technology played a critical role in keeping Indigenous older adults connected to loved ones, community events, and essential health information (McIlduff et al., 2022). Furthermore, online entrepreneurship offers avenues for Indigenous artists and creators, particularly women, to share their cultural products and achieve economic empowerment (Ali-Hassan et al., 2020). For Indigenous youth, digital storytelling projects, online forums, and social media groups can offer spaces for cultural expression, peer support, and navigating the impacts of historical trauma in culturally relevant ways. However, for technology to be truly beneficial and empowering, initiatives must be Indigenous-led, prioritizing principles of digital sovereignty (Indigenous control over their own digital data and infrastructure), cultural safety, and community-defined needs. This approach is essential to ensure that technology serves as a tool for self-determination and healing, rather than becoming another instrument of assimilation or external control (Hudson & McMahon, 2022).

### **Technology's Dual Role: Connector and Isolator**

The proliferation of digital technologies, particularly the internet and social media, is a defining feature of modern life, fundamentally reshaping how individuals learn, work, and interact (Smith & Alheneidi, 2023). These technologies present a compelling paradox: while offering unprecedented tools and platforms for connection across geographical and social boundaries, they are simultaneously implicated in rising societal concerns about loneliness and social isolation (Cao et al., 2025). The relationship is not straightforward; technology's impact appears to be contingent on a complex interplay of factors, including how it is used, by whom,

and in what context. While technology provides myriad avenues for interaction, the pervasive nature of digital connectivity itself can, paradoxically, contribute to feelings of fragmentation and division. The critical consideration is that while these tools can facilitate connection, their inherent design and prevalent usage patterns may inadvertently foster conditions that either lead to, or exacerbate, loneliness. The architecture of digital platforms, for example, might prioritize engagement metrics over the cultivation of deep, meaningful relationships, thereby creating a landscape where superficial interactions abound but fail to satisfy fundamental human needs for authentic connection. The integration of technology to aid loneliness in the modern day and age seems to be a work in progress, however the following section will highlight some literature where this integration has worked well. Evaluating such literature will give us a broader view and also perhaps give us inspiration to create a positive change with the help of technology. The “stimulation hypothesis” posits that internet use can enhance existing relationships and facilitate the formation of new ones, thereby reducing loneliness (Smith & Alheneidi, 2023). This is supported by findings that technology can help overcome physical and geographical barriers to connection, a benefit especially relevant for older adults, individuals with mobility limitations, or during periods of widespread social isolation, such as the COVID-19 pandemic (Su et al., 2022). A 2025 meta-analysis by Cao et al. (2025) found a significant negative association between internet use and loneliness in older adults, particularly when the internet was used for communication, underscoring its general positive potential when applied appropriately.

Since social media being a double-edged sword, the relationship between self-esteem and loneliness and the FOMO phenomenon has already been discussed in the previous subsections, this section will focus on other technological advancements. Augmented reality (AR) and virtual reality (VR) technologies hold the potential to create immersive experiences that simulate social

presence, which could be particularly beneficial for reducing loneliness in individuals who are physically isolated, such as older adults in residential care or during periods of widespread social distancing like the COVID-19 pandemic (Lee et al., 2021). According to Lee et al., immersive technologies like AR and VR aim to create a stronger sense of “being there” during remote social interactions, potentially making these connections feel more engaging and less isolating. Studies with older adults in social-VR environments have reported positive reactions, high engagement, and a willingness to form connections, suggesting potential in this area, though more robust research is needed (Kalantari et al., 2023). Social VR games, for example, enable users to interact within shared virtual environments, potentially fostering a sense of connection and shared experience (Lee et al., 2021).

Early research into the efficacy of these technologies has yielded mixed results. Some studies, such as the one by Kalantari et al. (2023), reported positive reactions from users, particularly older adults, who find social VR environments engaging and enjoyable, with perceived spatial presence being a key factor in these positive outcomes. The researchers found that older adults reported high levels of engagement in a novel social-VR environment and perceived it as a usable and enjoyable means for meaningful interaction. However, systematic reviews often concluded that the evidence base for AR/VR significantly reducing loneliness is still limited or of low quality, necessitating more rigorous research (To-Miles et al., 2022). A critical finding by Lee et al. (2021) highlighted the nuanced impact of VR—while social VR involvement had a direct positive effect on well-being, for users with low self-esteem and low social connectedness, high involvement in social VR games actually increased depression. This underscores that the psychological state of the user can significantly moderate the technology’s impact.

The creation and use of support groups online and certain apps that aid in connection is a prime example of technology used right. Bravata et al. (2023) noted that digital platforms can create spaces for individuals to connect around shared experiences, interests, or challenges, fostering peer support and a sense of belonging that can mitigate feelings of isolation. The authors pointed to the Wisdo app, for example, which is a peer support platform that connects users based on shared life experiences; their prospective cohort analysis demonstrated significant decreases in loneliness, depression, and anxiety among its users. Boucher et al. (2021) pointed to applications designed to teach coping skills such as mindfulness, gratitude, and strategies for active social connection can empower users to manage feelings of loneliness more effectively. For example, they noted that Happify Health, a digital mental health intervention, was found in a qualitative study to help participants adopt skills like mindfulness and gratitude, and to shift towards more active coping strategies to address loneliness.

Artificial intelligence is increasingly being integrated into tools designed to offer companionship and alleviate loneliness. According to Yang et al. (2025), these range from chatbots and virtual assistants to sophisticated social robots like Paro, primarily targeting populations such as older adults or individuals in isolated living situations. These AI systems aim to provide emotional support, simulate conversations, facilitate connections with loved ones, and offer personalized engagement through technologies like speech recognition, emotion recognition and simulation, natural language processing, and machine learning. Yang et al. also found that AI-enabled interventions, particularly social robots capable of emotional engagement and personalized interaction, led to significant reductions in loneliness among older adults. However, the researchers noted that the effectiveness of AI interventions can be limited by factors such as short intervention durations or infrequent interaction.

Social robot companions, as discussed above, equipped with speech and emotion recognition have shown efficacy in reducing loneliness in this demographic by offering personalized engagement and emotional interaction (Yang et al., 2025). Online platforms that enable individuals to share skills or find volunteering opportunities can foster social connections and a sense of purpose, both of which are protective against loneliness (Kellezi et al., 2019). Volunteering, in particular, has been linked to significantly lower levels of depression and loneliness in older adults (Mayers et al., 2024). Virtual friendly visitor programs have also shown potential in reducing loneliness by facilitating interaction and social networking (Gordon et al., 2024).

Despite the potential benefits, significant ethical considerations surround AI companionship. Concerns include the risk of users developing emotional dependency on artificial entities, the authenticity of AI-driven relationships, and the possibility that such technologies might inadvertently erode human emotional resilience or displace genuine human connections if not developed and deployed responsibly (Mishra et al., 2025). The objective should be to create technologies that augment or facilitate genuine human connection, or provide meaningful companionship where human interaction is severely restricted, rather than attempting to wholly replace it. The perceived inferiority of technologically-mediated connections compared to in-person contact remains a relevant consideration (Hughes et al., 2024).

After careful consideration of the literature discussed above, it can be concluded that the development of both immersive and intelligent technologies for loneliness mitigation underscores a crucial point—their success is not guaranteed by technological sophistication alone. Technologies rely heavily on a human-centered design approach that prioritizes the nuanced emotional and social needs of users over mere simulation of interaction. Without this

careful consideration, there is a risk of creating “illusions of companionship” that may offer superficial comfort but fail to address the deeper roots of loneliness, potentially even leading to further isolation from authentic human relationships.

When clients use or consider AI companions, counsellors should facilitate a discussion about realistic expectations, the authenticity of AI-driven relationships, and the ethical concerns around emotional dependency and potential displacement of human connection. The goal should be to augment, not replace, human interaction. Counsellors can also potentially use certain VR technologies as therapeutic intervention on a case-by-case basis. Perhaps using VR to create a virtual space of relaxation can help a client feel like they are in a safe/relaxing space and this can be paired with some breathing exercises which can help induce relaxation in clients. However, always being mindful of the aforementioned considerations is imperative; assessment of risks of loneliness/technology use should be an ongoing process for counsellors.

### **How Is Loneliness Measured?**

The cornerstone of traditional loneliness measurement lies in self-report questionnaires, designed to capture the individual’s subjective experience (Ell et al., 2025). Given that loneliness is defined by a perceived discrepancy between desired and actual social connection, asking individuals directly about their feelings remains the most common approach (Maes et al., 2022). Assessing loneliness is a complex clinical task that demands far more than the simple administration of a questionnaire. Effective and ethical assessment requires a synthesis of theoretical clarity, psychometric rigor, cultural humility, and technological vigilance.

Developed by Russell et al. (1978, 1980), the University of California, Los Angeles (UCLA) Loneliness Scale is arguably the most widely utilized instrument for measuring loneliness (Ell et al., 2025). The original 20-item version (and its revisions) aims to assess the

overall frequency or intensity of loneliness. Numerous shorter versions have been developed for efficiency, including an 8-item (ULS-8), 6-item (ULS-6), and a 3-item (UCLALS3) scale, which have been employed in various studies, including those involving technology-based assessments or specific populations like older adults or caregivers (Maes et al., 2022).

The De Jong Gierveld Loneliness Scale (DJGLS) was developed by De Jong Gierveld and colleagues, and exists in an 11-item form as well as a 6-item short form (DJGLS-6) (Maes et al., 2022). The DJGLS was specifically designed to differentiate between distinct dimensions of loneliness, primarily social and emotional loneliness, based on Weiss's (1973) theory of social needs (Mansfield et al., 2021). Single-item measures are particularly used in large-scale population surveys or when brevity is essential, researchers often employ single, direct questions to screen for loneliness (Maes et al., 2022). These typically ask respondents how often they feel lonely (Blodgett et al., 2025).

A key theoretical underpinning for many multi-item scales is the distinction between social loneliness and emotional loneliness (Mansfield et al., 2021). Social loneliness refers to the perceived lack of a wider social network, integration, or sense of belonging, while emotional loneliness stems from the absence of close, intimate attachments or relationships (Maes et al., 2022). The DJGLS was explicitly designed to capture these two dimensions. Maes et al.'s analysis suggested that while the UCLA scale is often treated as a measure of general loneliness, the scale's items may implicitly tap into both dimensions, though often with a potential bias towards social aspects, and its ability to clearly separate these dimensions is debated.

A counsellor must recognize that standard Western scales are fundamentally limited and potentially harmful when applied uncritically across cultures. When working with immigrant clients, scales should be used with extreme caution and subordinated to qualitative inquiry.

When working with Indigenous clients, these scales should be set aside in favor of decolonizing, strengths-based, and community-led approaches that honor holistic worldviews and respect Indigenous ways of knowing.

### ***Reliability***

Generally, established multi-item scales demonstrate good reliability. Meta-analytic reviews show high internal consistency for the UCLA scale (mean Cronbach's alpha  $\approx 0.87$ ) and the DJGLS (mean Cronbach's alpha  $\approx 0.84$ ) (Maes et al., 2022). Test-retest reliability also appears adequate for the UCLA scale and the short form of the DJGLS. Single-item measures, however, face more skepticism regarding reliability. Critics have argued they capture more random errors or temporary state fluctuations compared to multi-item scales (Mund et al., 2022). Nonetheless, Mund et al. pointed to some validation studies that found single-item reliability estimates exceeding conventional cutoffs (e.g.,  $> 0.70$ ), suggesting they can be reliable under certain conditions.

The primary clinical limitation of the UCLA scale is that it functions as a blunt instrument. It can reliably indicate if a client is lonely and to what degree, but it provides little to no insight into the type of loneliness they are experiencing (Bandari et al., 2021). It yields a single score for "general loneliness," leaving the counsellor without the specific diagnostic information needed to differentiate between a deficit in social network versus a deficit in intimate attachment. Consequently, it offers limited guidance for tailoring a specific and targeted intervention plan.

On the other hand, the DJGLS allows a counsellor to calculate separate scores for social and emotional loneliness, providing immediate diagnostic clarity (De Jong Gierveld & Van Tilburg, 2006). This moves the assessment beyond a simple "lonely" or "not lonely"

determination and provides a more detailed map of the client's relational world. It directly answers the critical question of what kind of connection is missing, thereby guiding the counsellor toward the most appropriate category of intervention.

### *Validity*

With the UCLA Scale, while often used as a unidimensional measure of general loneliness, factor analyses frequently suggest multidimensional structures (two or three factors) (Maes et al., 2022). However, according to Maes et al., these factors often appear to reflect methodological artifacts like positive versus negative item wording, rather than distinct theoretical dimensions like social versus emotional loneliness. Confirmatory factor analyses often yield poor fit for simple models. Furthermore, Maes et al. noted that the scale includes items that arguably do not measure loneliness directly (e.g., "I am an outgoing person," "I am unhappy being so withdrawn"), raising questions about construct purity.

Although the DJGLS is designed to measure social and emotional loneliness, its factor structure is also debated. Studies have reported unidimensional solutions, two-factor solutions based on item wording (positive/negative), and even three- or four-factor solutions (Maes et al., 2022). The scale also includes an item ("I experience a general sense of emptiness") considered by some as not directly measuring loneliness. Despite these structural debates, systematic reviews indicate moderate-to-high quality evidence supports its structural validity and internal consistency, though evidence for content and construct validity is weaker (Alsubheen et al., 2023).

When looking at single-item measures, validity critiques have centered on their susceptibility to social desirability bias—that is, individuals may underreport loneliness due to stigma (Alsubheen et al., 2023). The lack of standardization, with variations in wording and

response formats across studies, makes comparisons difficult (Mund et al., 2022). Crucially, single-item measures may yield lower prevalence estimates than multi-item scales and potentially identify a different subset of individuals as lonely, questioning whether they capture the same construct or its full complexity (Reinwarth et al., 2023). However, studies have also shown that single-item scores correlate highly with multi-item scores and exhibit similar patterns of association with other variables (nomological nets), suggesting they do tap into a core aspect of loneliness (Mund et al., 2022).

### **The UCLA Loneliness Scale Versus the De Jong Gierveld Loneliness Scale**

A direct comparison of the two leading loneliness scales reveals critical differences in their theoretical fidelity, structural integrity, and suitability for specific research applications. While both have psychometric limitations, the DJGLS demonstrates clear advantages in certain domains.

#### ***Theoretical Fidelity: Intent Versus Outcome***

The most fundamental difference between the two scales lies in their relationship to theory. The DJGLS was explicitly designed from its inception to operationalize Weiss's distinction between social and emotional loneliness (De Jong Gierveld & Van Tilburg, 2010). Its items were purposefully written to tap these distinct domains, giving it strong face and content validity with respect to this guiding theory. In contrast, the UCLA scale was developed as a unidimensional measure of general loneliness (Pollet et al., 2022). Attempts to retrospectively map the scale's empirically derived factors onto the social/emotional distinction are psychometrically problematic, as these factors are often confounded by item wording artifacts (Penning et al., 2013). The theoretical alignment of the DJGLS is by design; any such alignment with the UCLA scale is post-hoc and tenuous.

### ***Factorial Integrity and Method Effects***

Penning et al. (2013) observed that both scales are susceptible to method effects arising from the use of balanced positive and negative item wording, which can create artificial factors. However, the impact of this issue appears to differ between the two scales. In the UCLA scale, the researchers noted that the method effect is often so powerful that it obscures any other underlying structure, making it difficult to extract theoretically meaningful dimensions. In the DJGLS, while method effects are still present, Penning et al. argued that the theoretically intended two-factor structure is more robust and is often recovered in factor analyses, suggesting the theoretical signal is strong enough to be detected alongside the methodological noise.

### ***Measurement Invariance***

A critical point of differentiation emerged from studies of measurement invariance, which assessed whether a scale functions equivalently across different groups or time points. This property is essential for making valid comparisons in developmental or longitudinal research. A key head-to-head comparative study by Penning et al. (2013) provided decisive evidence on this front.

Penning et al.'s (2013) analysis found that the R-UCLA scale demonstrated limited support for measurement invariance across different age groups and over successive measurements. This is a significant weakness, as it implies that a change in a person's score over time might reflect a change in how they interpret the questions rather than a true change in their level of loneliness. In stark contrast, the same study found that the DJGLS exhibited strong measurement invariance across both age groups and time points. This finding powerfully supported the "relative utility of the DJGLS scale for research involving middle-aged and older adults" and, by extension, for any longitudinal study tracking the trajectory of loneliness. For a

large and important segment of loneliness research focused on aging and life-course development, the most popular tool (UCLA scale) is demonstrably inferior to the more robust DJGLS. This raises the possibility that a portion of the existing longitudinal research that has relied on the UCLA scale may contain unacknowledged measurement error, warranting a cautious interpretation of its findings. To further illustrate these points, Table 1 in the Appendix provides a side-by-side comparison of the two scales.

### ***Cross-Cultural Validity***

A significant limitation of many traditional scales is their questionable validity across diverse cultural contexts (Stegen et al., 2024). The experience and expression of loneliness are profoundly shaped by cultural norms and values, such as the societal emphasis on individualism versus collectivism (Barreto et al., 2021). The most prominent measurement tools, including both the UCLA and DJGLS scales, were developed and validated primarily in Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies (Cheung et al., 2020). Applying these instruments in diverse global contexts without rigorous adaptation and validation is problematic. They may fail to capture culturally specific manifestations of loneliness or contain items whose meanings do not translate properly (Auné et al., 2019). Consequently, any direct cross-national comparisons of loneliness prevalence based on these unadapted scales must be considered “tentative” at best, as they may not be comparing the same underlying construct (Cheung et al., 2020). This lack of cross-cultural equivalence implies that comparing loneliness levels across nations using these standard scales may be misleading. Cultural dimensions, such as individualism-collectivism or power distance, have been shown to moderate reported loneliness prevalence, further highlighting the need for culturally sensitive assessment (Stegen et al., 2024).

These psychometric challenges, especially concerning dimensionality and cross-cultural applicability, suggest that while traditional scales are indispensable for capturing the subjective nature of loneliness, they are imperfect instruments. Their limitations are particularly relevant now that loneliness is recognized as a global public health issue requiring assessment across diverse populations. This highlights how specific items can lack cross-cultural equivalence even when the overall scale shows promise. The evidence suggests that while these scales can often be adapted to function reliably within a given culture, their utility for direct between-culture comparison is severely limited.

### ***Role of Technology in the Measurement of Loneliness***

Technology has permeated loneliness research and assessment in various ways, ranging from facilitating traditional methods to enabling entirely new approaches. Information and communication technologies are frequently used to administer traditional self-report loneliness scales for instance, online surveys, facilitated through platforms like Zoom or WeChat, became particularly crucial during the COVID-19 pandemic, allowing researchers to recruit participants and collect data remotely while adhering to social distancing protocols (Umoh et al., 2022). Technology enables researchers to reach diverse and geographically dispersed populations, including older adults and immigrant communities (Su et al., 2022).

The large, complex datasets generated by passive sensing necessitate advanced analytical techniques. Artificial intelligence and machine learning algorithms, such as Random Forest, XGBoost, Support Vector Machines, and K-Nearest Neighbors, are increasingly used (Qirtas et al., 2025). According to Doryab et al. (2019), these algorithms are trained on sensor data paired with “ground truth” labels, typically derived from participants’ self-reported loneliness scores on traditional scales. The goal is to build models that can classify individuals into loneliness levels

(e.g., high vs. low) or predict changes in loneliness based purely on their passively collected behavioral data.

Furthermore, AI techniques like Natural Language Processing, speech recognition, and emotion recognition are being explored to analyze communication patterns. This includes analyzing transcribed speech for linguistic markers of loneliness or assessing interactions with AI agents like social robots or voice assistants, often within the context of interventions designed to alleviate loneliness (Yang et al., 2025).

The integration of passive sensing and AI represents a potential paradigm shift in loneliness measurement. It moves beyond infrequent, subjective self-reports towards objective, continuous, and potentially more nuanced assessments of behavior patterns associated with loneliness. This shift promises real-time monitoring and earlier detection but simultaneously introduces a new set of methodological, ethical, and practical challenges.

### **Summary**

This chapter has systematically reviewed the extensive and multifaceted relationship between loneliness and technology, revealing a complex interplay of psychological, social, and cultural factors. The literature underscored that loneliness is not a monolithic experience but varies significantly across different age groups, is influenced by gender dynamics, and is often compounded by pervasive social stigma that hinders help-seeking. Furthermore, individual characteristics such as self-esteem, fear of negative evaluation, role loss, and particularly attachment styles, play crucial roles in shaping how individuals experience loneliness and engage with technology. Cultural contexts, whether broadly defined as individualistic or collectivistic, or specifically examined within diverse populations like Canadian immigrants and Indigenous

peoples, also profoundly moderate these experiences and the ways technology is adopted and utilized.

A central finding reiterated throughout this review is the dual role of technology. Digital platforms, social media, virtual reality, and artificial intelligence offer unprecedented avenues for connection, support, and even novel forms of companionship; yet, they concurrently harbor risks of increased isolation, superficial engagement, social comparison, and the erosion of genuine human interaction. The discussion on AI companions, for instance, highlighted their potential benefits in reducing loneliness among older adults but also touched upon the ethical considerations regarding dependency and the authenticity of such relationships, emphasizing the need for human-centered design. This points to an emerging dilemma for counsellors and developers alike: how to ethically contribute to or guide the creation of technologies that genuinely alleviate loneliness without inadvertently replacing essential human connection or causing harm. The very tools designed to connect can, if not mindfully engaged with or ethically designed, exacerbate feelings of inadequacy or detachment.

Moreover, the review of methodologies for measuring loneliness indicated an evolving field. While traditional self-report scales remain foundational, their limitations, especially in cross-cultural contexts, are apparent. The emergence of technology-based assessments, including passive sensing and AI analytics, offers new avenues for objective and continuous measurement but also introduces fresh methodological and ethical challenges.

Crucially, this review underscores that technological advancements are not a fleeting trend but a persistent and accelerating force in contemporary life. The continuous evolution of digital tools and platforms means that their influence on social connection and loneliness will only deepen. This reality necessitates that the counselling profession adapts proactively.

Counsellors must begin to incorporate new, nuanced methods to assess the role of technology in their clients' lives when addressing loneliness, moving beyond simplistic views to understand the qualitative nature of online interactions and their impact. Instead of shying away from these advancements, there is a growing imperative to explore new ways of making constructive use of technology, whether by guiding clients towards more mindful engagement, leveraging platforms for positive connection, or even understanding how technology can aid in the assessment process itself.

The comprehensive landscape painted in this chapter, highlighting the complexities of loneliness in a technologically saturated world, the dual-edged nature of digital tools, and the evolving methods of assessment, sets a critical foundation. It calls for a deeper examination of the ethical responsibilities and practical strategies required by the counselling profession. Therefore, Chapter Three will provide this crucial transition from theory to application. The chapter is structured to first address the ethical considerations inherent in this work, using established frameworks like the Canadian Psychological Association's (CPA, 2017) *Canadian Code of Ethics for Psychologists* to guide the discussion. Chapter Three will also highlight many ethical considerations needed for counsellors in such a technologically mediated world, such as data security, algorithmic bias, risk of dehumanization with AI advancements, consent needed during technological interventions etc. Following this ethical analysis, the chapter will then delineate concrete, applied practices for counsellors, offering tangible strategies for navigating the challenges and leveraging the opportunities presented by technology in the context of client loneliness.

### **Chapter Three: Discussion and Applied Practices**

As seen from the Chapter Two, the integration of technology into strategies for assessing and mitigating loneliness introduces a unique set of ethical challenges that demand careful consideration. These challenges span issues of privacy, informed consent, algorithmic fairness, and the fundamental dignity of the individuals involved. This chapter will explore these ethical dimensions, apply the Canadian Psychological Association's (CPA, 2017) *Canadian Code of Ethics for Psychologists* and identify crucial directions for future research and practice. The potential for technology to offer solutions must be balanced against the risks of privacy infringement, bias, and the potential erosion of genuine human connections. In approaching the discussion of these ethical considerations and the subsequent applied practices for counselling, my positionality, as outlined in Chapter One, significantly informs my perspective. My experiences as an intern observing loneliness as a frequent underlying factor in clients' presenting concerns, coupled with my personal journey as an immigrant leveraging technology to maintain connections across distances, highlight both the critical need for effective interventions and the potential complexities of relying on technology. This dual awareness underscores the importance of developing nuanced, ethical, and client-centered approaches when integrating technology into counselling for loneliness, ensuring that strategies are both empowering and mindful of individual and cultural contexts.

#### **Ethical Consideration**

##### ***Privacy, Surveillance, and Data Security***

A primary ethical concern revolves around privacy, particularly with technologies designed to detect or infer loneliness through passive monitoring. Qirtas et al. (2025) found that the use of passive sensing technologies, leveraging data from smartphones which uses passive

data collection from GPS, usage patterns, Bluetooth etc., wearables (e.g., smart watches) take data from activity levels, sleep patterns, and in-home sensors like motion-detector, contact, electricity usage etc., and offer the potential for unobtrusive, continuous assessment of behavioral markers associated with loneliness. The authors identified patterns such as reduced time spent outside the home, changes in phone usage, and altered sleep or activity levels as potential indicators of loneliness. Shah and Househ (2025) noted that AI analysis of social media content (e.g., sentiment analysis on Twitter or Reddit posts) is being explored to understand public expressions of loneliness. Hence, using technology has the potential to detect certain behavioral markers of loneliness.

However, these methods inherently involved collecting vast amounts of sensitive personal data, raising significant privacy risks (Demiris, 2020). Older adults, a common target group for loneliness interventions, have expressed concerns about surveillance, likening sensor technology to Big Brother, and fearing potential data misuse (Cho et al., 2025). The very act of monitoring behaviors to infer an internal, subjective state like loneliness pushes the boundaries of personal privacy. Furthermore, the data collected for these purposes is often vulnerable.

Problematic internet use, which is correlated with loneliness, is also linked to poorer cybersecurity practices, making individuals potentially more susceptible to phishing, malware, and other online threats (Deutrom et al., 2021; Smith & Alheneidi, 2023). Ensuring robust data security measures and transparent data handling policies is therefore paramount, yet often challenging in complex technological systems (Smith & Alheneidi, 2023). The potential for technology to identify individuals at risk must be carefully weighed against the fundamental right to privacy and the potential harms of unwarranted surveillance.

Since mental health apps on smartphones and wearables as discussed above are being used by many people these days, counsellors can do certain risk-assessment by guiding clients through discussions about the technology they use (e.g., mental health apps, social media for support) by co-exploring terms of service, data privacy settings, and the nature of AI interactions. Sample questions for clients could be, “What do you know about how this app uses your information?” “What are your expectations from this AI companion?” This way, it becomes an open dialogue between the client and counsellors to build rapport as well as maintain this ethical standard. Lui et al. (2022) mentioned the privacy concerns regarding passive tracking in their article which reviewed certain ethical considerations not being followed by very popularized Apple Watches and other tracking devices. Apple smartphones and watches have apps like ‘mindfulness’ and ‘health’ which tracks the user’s heart rate, steps, and sleep and these physical indicators can be translated to assess the person’s emotional and mental states. The authors also noted that certain insurance companies have now collaborated with such technologies in order to gather data about their clients. Adil et al. (2024) wrote about how mental health assessments can be expensive, time consuming, and come with risks of social abandonment, which creates hesitation in clients to seek mental health support from counsellors or other mental health helpers. The authors pointed out that Apple Watches can be helpful with tracking moods of the client and other aforementioned factors, which can help users to assess risks of certain mental health issues by themselves with the help of the apps. However, the authors clearly stated that these devices should only be taken as a support medium for mental well-being as serious mental health concerns, data recollection bias, etc., make it unreliable for an actual diagnosis. Since technology is in the uprise, counsellors are likely to see more advancements, apps, tracking devices, and so on, and hence it becomes imperative for

counsellors to have an open discussion about the passive data tracking as well as risks of relying on the technologies solely to help with their mental health. Counsellors should also only work in their scope of competence and should not interpret the data from such devices (wearables) outside their competence, upholding the CPA's (2017) *Codes of Ethics*. This could look like asking about the high stress levels on a particular day as shown by the device and asking the client to walk us through what was happening for them that day. An example of an unethical way to interpret the data would be diagnosing the client with a heart disorder or other medical disorders that are beyond the scope of competence for a counsellor. It is best to refer them elsewhere where the clients would be able to confirm their diagnosis or any other conditions that may require another professional's help.

Apart from this, many devices like smart speakers (popular ones include Alexa and Google Home) can also passively take data from phone conversations and live conversations, which can further make it easier to breach a client's privacy; accordingly, it is imperative that clients and counsellors are mindful of conversations they are having in the presence of these technologies, both outside and inside sessions (Lau et al., 2018). In light of this article, one might even suggest counsellors not use such technologies in their counselling rooms.

### ***Informed Consent in Digital Interventions***

The principle of informed consent, a cornerstone of ethical practice, faces unique hurdles in the context of technology-based loneliness interventions. Obtaining truly informed consent requires that individuals fully understand the nature of the technology, the data being collected (especially through passive means), how it will be used (e.g., by AI algorithms), the potential risks and benefits, confidentiality limits, and their unequivocal right to withdraw participation at any time (CPA, 2017). This is inherently difficult when dealing with complex, rapidly evolving

technologies like AI, VR, or passive sensing systems, whose workings may not be easily explainable or fully understood even by developers (Demiris, 2020).

Studies using social robots with older adults, particularly those with dementia, highlighted the limitations of traditional, written consent forms (Hung et al., 2025). The authors also emphasized the fact that systematically excluding individuals unable to provide conventional consent raises equity concerns, potentially denying them access to beneficial interventions. Hung et al. suggested alternative approaches, such as relational consent (an ongoing dialogue), involving trusted caregivers or staff in the process, and carefully observing non-verbal cues, but these require careful implementation to uphold dignity and autonomy.

From the social needs theory as discussed previously, another ethical concern involves what AI companions can stimulate versus what they can genuinely fulfill. Hawkley and Cacioppo (2010) established that loneliness is the subjective distress that occurs when fundamental social needs, for attachment, integration, nurturance, and so on, are perceived as unmet. AI companions generally mimic the fulfillment of such needs by giving attention, remembering important dates in one's life, verbal affirmation, etc. However, this creates a gap between the stimulation/how the user feels vs the genuine result of fulfillment from one's social surroundings. Consequently, the technological goal of creating a more "successful" and engaging product (AI companions), is in direct and irreconcilable conflict with the core ethical principle of transparency and informed consent. Success in design can become synonymous with success in deception. Deception, whether intentional or not, is a core ethical failure. Developers must move beyond opaque terms of service and commit to radical transparency. The AI's non-sentient, non-conscious, and simulated nature must be made unavoidably clear to the user.

Furthermore, Kapur et al. (2025) argued that the repurposing of data originally collected for other purposes (e.g., administrative records, clinical notes) to train AI algorithms for loneliness assessment or intervention raises serious consent issues. The authors also observed how clients may be unaware their data is being used in this way, violating their privacy and potentially their trust in service providers. The opacity of many AI systems (the “Black Box” problem) makes it difficult for individuals to understand how decisions affecting them are being made, further undermining the possibility of truly informed consent. Ethical practice demands ongoing consent processes and heightened sensitivity to the vulnerabilities and capacities of participants engaging with these technologies.

### *Algorithmic Bias and Fairness*

Kapur et al. (2025) argued that the increasing use of AI in assessing or intervening in loneliness introduces the significant risk of algorithmic bias, which can perpetuate and even amplify existing societal inequalities. AI systems learn from data, and if that data reflects historical or systemic biases related to race, gender, socioeconomic status, age, disability, or culture, the resulting algorithms are likely to inherit these biases. In the context of social work and mental health, Kapur et al. noted that administrative data or case notes used for training AI may contain worker biases or reflect disproportionate surveillance of marginalized communities.

This bias can manifest in several ways relevant to loneliness. An AI system designed to detect loneliness based on behavioral patterns (e.g., from sensor data) might misinterpret the behaviors of individuals from certain cultural backgrounds or those with specific disabilities if its training data was not sufficiently diverse (Yang et al., 2025). Similarly, AI-powered chatbots or social robots designed to provide companionship might offer culturally inappropriate responses or fail to recognize distress signals if not developed with sensitivity to diverse communication

styles and emotional expressions (Kapur et al., 2025; Mishra et al., 2025). Such biases could lead to ineffective interventions, misdiagnosis, or the reinforcement of harmful stereotypes, potentially worsening feelings of alienation and loneliness for already vulnerable individuals. Ensuring fairness requires diverse datasets, transparency in algorithm development, ongoing auditing for bias, and culturally competent design processes (Yang et al., 2025).

The cognitive discrepancy model as discussed in the previous chapters can also provide a different lens to the surrounding ethics regarding this topic. Human connections are not perfect, there could be varying degrees of opinions, experiences, ideas and conflict that occur in human relationships. AI companions and tools can, however, set unrealistic standards as they are able to create an environment of constant availability, sharp recall of important information and events, endless patience and unconditional positive regard all the time (Ventura et al., 2025). This could lead to having unsatisfying human interactions because of a distorted way of thinking about how a relationship should be.

This highlights the importance for counsellors to understand how impactful technology use can be for their clients. It is important for counsellors to know what their clients are seeing online and how they are affecting their sense of belongingness or how it is either confirming their unhelpful thought patterns. The younger generation, as discussed in Chapter Two, can be more vulnerable to this, leading to self-esteem issues or other issues that exacerbate their sense of alienation. It could be helpful for counsellors to figure out a way in which technology and social media can be navigated safely. For instance, perhaps have a social media safety plan, where when certain unhelpful content comes up, clients are asked to report and block the page/account and do some affirmation practice before going back on their social media. It is also important for counsellors to be cautious of other software or apps that might show up in the field

in the future. The rise in technology has already taken space in the admin side of the counselling field, there are many software that are being designed to help counsellors with note-writing to save time. There is a possibility that new AI videos might be created for educational purposes of the clients which might be very informative and useful; however, it might be seeded in the algorithmic bias as discussed above. Hence, counsellors should always be thinking critically about the technological advancements they choose to use in their practice.

### ***Autonomy, Dignity, and the Risk of Dehumanization***

While technology can offer valuable tools for connection and support, its deployment in the context of loneliness raises ethical questions about user autonomy, dignity, and the potential for dehumanization. Interventions should ideally enhance an individual's sense of control and independence (Probst et al., 2024). However, Mishra et al. (2025) expressed concern that an over-reliance on technology, particularly AI companions or social robots, might replace rather than supplement genuine human interaction. The authors noted that this raises questions about the quality and authenticity of technologically mediated relationships and the potential for fostering emotional dependency on artificial entities. Through the lens of the evolutionary model of loneliness discussed in Chapter One, we can see that the biggest ethical consideration would be the AI companion's potential to foster over-reliance by short-circuiting the adaptive function of loneliness (Cacioppo et al., 2013). Loneliness, according to Cacioppo et al., evolved as a biological alarm system, a painful signal designed to motivate a specific, survival-critical action—the seeking and securing of genuine, reciprocal, and reliable social bonds. By silencing the motivational alarm bell of loneliness, AI companions risk neutralizing the very drive that is supposed to push individuals toward the difficult, messy, but ultimately necessary work of building and maintaining real-world relationships (Adhikari & Saxena, 2025). This can lead to a

progressive atrophy of social skills and an increasing withdrawal from human interaction. To prevent the inflation of social expectations, AI companions must be designed to avoid creating hyper-idealized, sycophantic personas.

The use of social robots, especially with vulnerable populations like older adults with dementia, also brings risks of infantilization or deception if users are not clear about the nature of the technology (Hung et al., 2025). Maintaining the dignity of the individual requires transparency and respect for their capacity to understand and interact with the technology. Furthermore, the perception that online interactions are often more superficial than face-to-face contact suggests that technology might address objective isolation but fail to meet the deeper human need for meaningful connection, potentially leaving users feeling emptier or more disconnected in the long run (Käcko et al., 2024). This shows up as a huge dilemma as on one hand, technological advancements are the future, and it might be wise for counsellors to help in creating technologies that target mental health wellbeing as they can use their valuable experience and insights; however, it also seems almost impossible to understand where to draw the line and set boundaries because it seems like what AIs and robots can offer is very non-human and based on a set of instructions (e.g., when prompt 'A' is given by the user, then suggest 'mindfulness'). Humans are complex beings and not all prompts will be effective for everyone and in fact it could be detrimental to others, and this would counteract the 'do no harm' policy that counsellors uphold. On the other hand, without proper guidance and advocacy, individuals might build AIs and robots that can further create more harm and complications in the field. Balancing the potential benefits of technological companionship with the preservation of human dignity and the value of authentic interpersonal relationships is a critical ethical tightrope to walk.

**CPA Code of Ethics for Psychologists**

The CPA's (2017) *Canadian Code of Ethics for Psychologists* provides a foundational framework for navigating the complex ethical terrain at the intersection of technology and loneliness. Its four guiding principles—respect for the dignity of persons and peoples, responsible caring, integrity in relationships, and responsibility to society—offer crucial guidance for psychologists involved in the research, development, or application of technologies aimed at addressing loneliness.

***Principle I: Respect for the Dignity of Persons and Peoples***

Principle I underscores the inherent worth of all individuals and their right to self-determination, privacy, confidentiality, and non-discrimination (CPA, 2017). Users must understand the purpose, risks (e.g., data breaches, potential for increased loneliness), benefits, limitations (e.g., AI inaccuracy, lack of true empathy from robots), and alternatives related to technologies like passive sensors, AI companions, or VR interventions (Cho et al., 2025). Consent must be voluntary, ongoing, and accommodate vulnerable individuals (e.g., older adults with cognitive decline) through adapted processes, potentially involving guardians while respecting the individual's assent or dissent (CPA, 2017).

The collection of sensitive behavioral or emotional data via technology demands stringent privacy protections (CPA, 2017). Psychologists must minimize data collection, ensure secure storage and transmission, clearly define the limits of confidentiality (especially regarding potential third-party data access or mandatory reporting triggers identified by AI), and address user concerns about surveillance (Deutrom et al., 2021). Records should only be identifiable as long as necessary (CPA, 2017).

Technologies must be designed and deployed equitably, actively mitigating algorithmic biases that could disadvantage marginalized groups based on race, age, culture, gender, or socioeconomic status (Kapur et al., 2025). Ensuring accessibility, addressing the digital divide in terms of cost, infrastructure, and digital literacy, is crucial for vulnerable populations often affected by loneliness, such as older adults, immigrants, and Indigenous peoples (Umoh et al., 2022).

***Principle II: Responsible Caring***

Principle II requires psychologists to actively promote well-being, maximize benefits, minimize harm, and act competently (CPA, 2017). Psychologists must possess adequate knowledge of the technologies they use or recommend, including their limitations, effectiveness, and potential biases. Given the mixed evidence on the effectiveness of many digital loneliness interventions, maintaining competence requires ongoing learning and critical evaluation (Jin et al., 2021). Awareness of personal biases regarding technology or loneliness is also essential (CPA, 2017).

A thorough risk/benefit analysis is mandatory before implementing any technological intervention (CPA, 2017). Potential benefits (e.g., increased connection, support) must demonstrably outweigh potential harms (e.g., privacy violations, data misuse, algorithmic bias, increased anxiety/depression, addiction, superficial connections, dependency on technology) (Mishra et al., 2025). This requires careful screening of participants and ongoing monitoring. If harm occurs or the intervention is ineffective, psychologists must act to offset or correct it, potentially discontinuing the intervention (CPA, 2017). This should also be carried out in sessions by collaboratively discussing with clients the potential benefits versus harms of specific online behaviors or tools in relation to their loneliness.

Responsible caring demands heightened sensitivity towards vulnerable individuals (CPA, 2017). Interventions must be tailored to their specific needs, capacities, and contexts for instance, culturally appropriate technology for Indigenous elders, accessible design for older adults (McIllduff et al., 2022; Probst et al., 2024). The potential for technology to exacerbate vulnerabilities for instance, financial scams targeting lonely older adults must be actively mitigated (Jentoft et al., 2024). Clients can be taught skills to catch such risks like scams or should be referred to another professional who can educate them and debrief them about potential harm regarding data privacy.

***Principle III: Integrity in Relationships***

Principle III emphasizes honesty, accuracy, objectivity, straightforwardness, and avoidance of conflicts of interest in all professional relationships (CPA, 2017). Psychologists must accurately represent the effectiveness and limitations of technological interventions for loneliness, avoiding exaggerated claims. Given the often low-quality or mixed evidence for many digital tools, honesty about the state of the research is crucial (Jin et al., 2021). Psychologists must strive for objectivity, acknowledging and managing personal biases and potential algorithmic biases in the technologies used (CPA, 2017).

Transparency is key. Users must be fully informed about how their data is collected, stored, and used, especially with AI and passive sensing technologies (CPA, 2017). The purpose and functioning of the technology, including any known biases or limitations, should be explained clearly (Kapur et al., 2025).

Psychologists must be vigilant about potential conflicts between their clients' well-being and commercial interests associated with technology development or promotion (CPA, 2017). Recommendations should be based on client needs and evidence, not financial incentives.

***Principle IV: Responsibility to Society***

Principle IV highlights psychologists' duty to use their knowledge for beneficial purposes, respect societal structures, and contribute to the development of a just society (CPA, 2017). Psychologists should contribute to understanding loneliness and developing effective, ethical interventions, including technological ones. This involves conducting rigorous research, disseminating findings responsibly, and participating in the discipline's self-evaluation. Addressing the "loneliness epidemic" requires a responsible, evidence-based approach (Lin, 2023).

Implementations of technology must consider the specific social, cultural, and legal contexts (CPA, 2017). This includes understanding cultural variations in loneliness, communication styles, and technology acceptance (Dwyer, 2024). Efforts should be made to ensure technology does not widen the digital divide or exacerbate existing social inequalities (Umoh et al., 2022).

Psychologists have a role in advocating for social policies and technological designs that promote genuine social connection and address systemic factors contributing to loneliness, such as social exclusion, poverty, or lack of community infrastructure (CPA, 2017). They should speak out against the misuse of psychological knowledge or technology that could harm individuals or society. The primary ethical duty of an AI companion designed to alleviate loneliness should be to work toward its own obsolescence. These systems should be explicitly designed as bridges, not destinations. This means incorporating features that actively scaffold and encourage users toward real-world social engagement. This could include modules for practicing difficult conversations, tools for identifying and connecting with local community groups, or gentle prompts that encourage reaching out to human friends and family. The system's

success should be measured not by user retention, but by the user's improved real-world social health.

### **Practice Implications**

So far, the recurring theme on this paper has been the dual role that technology plays in our lives. Since technological advancements are not settling down and is in fact increasing as years go by, it would be wise for counsellors in the field to figure out strategies to understand the use of technology by their clients, and also figure out ways in which technology can be used for a positive outcome.

### ***Assessment of Technology's Role in Loneliness***

Counsellors could develop a set of questions to explore clients' technology use patterns, the quality of their online vs. offline interactions, and the perceived impact on their loneliness. These questions could be, for instance, "Can you walk me through a typical day of your technology use? Which online interactions leave you feeling more connected, and which leave you feeling more isolated or inadequate? How does your use of [specific platform] align with the values of connection you described earlier?"

We can also draw on the Cognitive Discrepancy Model, Social Needs Approach, or Evolutionary Model described in Chapter One to frame assessment questions about technology use, such as "How does your experience on social media affect the gap between your desired and actual social connections?" Other questions could include, "How does seeing others' posts about their social activities (FOMO) affect your mood or your feelings about your own social life? When you have an ambiguous interaction online (e.g., a short reply, no 'like' on a post), what's your typical assumption about what the other person is thinking or feeling?" or "Does your use

of technology (e.g., passive scrolling vs. active engagement) tend to make you feel more or less motivated to seek out face-to-face connections?”

### ***Behavioral and Cognitive-Behavioral Interventions***

Exercises and strategies can be developed to help clients engage with technology more intentionally or in a more mindful manner. For instance, Radtke et al. (2021) suggested setting time limits through a device’s internal settings or with aid of apps to access to certain apps and website for a specified amount of time. The authors noted that exploring ideas such as digital detox periods, which are time-outs for using electrical devices, have been helpful for reducing negative outcomes of digital devices like smartphones. Counsellors can also help clients challenge negative cognitions by identifying and restructuring unhelpful thought patterns related to online social comparison, fear of negative evaluation online, or catastrophizing based on digital interactions. Counsellors can also use concepts of behavioral activation by using technology as a tool to facilitate offline social engagement, for instance, by finding local groups online, coordinating activities with friends and building skills to extend the virtual relationships that clients may have maintained into real life interactions.

### ***Leveraging Technology for Positive Connection***

Counsellors can help clients identify supportive online communities and guide clients to find and vet online groups or platforms that align with their interests and values and offer genuine peer support. They can also explore apps or online resources that teach social skills, communication, or mindfulness skills. Counsellors can also suggest using the algorithm to the client’s advantage. Since algorithms work by showing similar contents that the user generally interacts with, it could be helpful for clients to engage with media and contents that are helpful and motivating in some way towards their healing journey. This could look like engaging with

more contents that talk about breathing techniques, mindfulness activities, social skills etc.

Sometimes it could also be as simple as choosing a quote of the week with the client and setting it as their wallpaper, which would be a reminder every time they are on their phone or other electronic devices.

### **Future Directions for Research and Practice**

The complex interplay between technology, loneliness, ethics, stigma, and culture highlights several critical areas for future investigation and development in practice. Addressing the gaps in current knowledge is essential for harnessing technology's potential benefits while mitigating its risks.

#### ***Need for Longitudinal and Diverse Population Studies***

A significant limitation of the current research landscape is the preponderance of cross-sectional studies, which makes it difficult to establish causality or understand the long-term effects of technology use on loneliness and vice versa (Smith & Alheneidi, 2023). Future research must prioritize longitudinal designs, as observed by Smith and Alheneidi, to track changes over time and clarify the directionality of observed relationships (e.g., does social media use lead to loneliness, or do lonely individuals turn to social media?). Furthermore, many studies have relied on limited or homogenous samples, such as college students or specific Western countries. There is a pressing need to expand research to include more diverse populations, encompassing variations in age (children, adolescents, middle-aged adults, oldest-old), gender identity (including transgender and non-binary individuals), culture (beyond simple individualism/collectivism dichotomies), socioeconomic status, ethnicity, migration status (including refugees and different generations of immigrants), disability status, and geographic location (urban vs. rural) (Barreto et al., 2022).

### *Developing Ethical Frameworks for Emerging Technologies*

The rapid advancement of technologies like AI, VR/AR, social robotics, and passive sensing necessitates the development of more specific and robust ethical frameworks and guidelines (Yang et al., 2025). Future work should focus on developing clear guidelines for data governance by establishing transparent protocols for data collection, especially passive/ambient data, the storage of the data, the sharing, security, and de-identification, addressing risks of third-party access and misuse (Deutrom et al., 2021). There should also be a focus on developing clear guidelines for informed consent where the emphasis is on creating dynamic and accessible consent processes suitable for complex technologies and diverse user capacities, including alternatives to traditional written consent for vulnerable populations (CPA, 2017). Furthermore, guidelines regarding algorithmic transparency and fairness should also be considered when developing methods for auditing AI systems for bias, ensuring fairness across demographic groups, and increasing the transparency of algorithmic decision-making (Kapur et al., 2025). Similarly, guidelines on autonomy and dignity would be necessary by setting boundaries on the use of technology to replace human care, preventing infantilization or deception, and ensuring technologies empower rather than control the users (Probst et al., 2024). Lastly, guidelines on human-centered design should be regulated to mandate the integration of ethical considerations and user involvement, especially from target populations like older adults, throughout the technology design, development, and evaluation life cycle (Yang et al., 2025).

To maintain further fairness, the intensely personal data generated through interaction with an AI companion must belong to and be controlled by the user. This principle demands robust, user-centric data governance. Users must be provided with simple, intuitive tools for data access, portability to other services, and complete, permanent deletion.

For individuals, promoting mindful and balanced technology use is crucial, encouraging the cultivation of meaningful relationships both online and offline. Awareness of the potential for social comparison on social media and its impact on self-esteem should be heightened, and individuals experiencing loneliness should be encouraged to seek support and resources. Technology developers should prioritize designing platforms and technologies that foster genuine connection and well-being over superficial engagement metrics, incorporating ethical considerations into the design process, particularly for vulnerable populations, and promoting digital literacy and responsible technology use. Future regulations must also be informed by psychological research to specifically address the harms that have been discussed in this chapter with the use of the evolutionary model, social needs model and cognitive discrepancy model of loneliness.

The complexity of these issues could require a new model of governance. Regulatory bodies and standards committees must be interdisciplinary, including not just technologists, business leaders, and lawyers, but also clinical psychologists, sociologists, ethicists, and representatives from vulnerable user groups. This ensures that policy is shaped by a holistic understanding of the human experience of connection and the potential societal impacts of these technologies.

### ***Investigating Specific Intervention Effectiveness***

While many technological interventions show promise, Yang et al. (2025) argued that rigorous evidence of their effectiveness in reducing loneliness is often lacking or mixed. Future research should employ robust methodologies, particularly randomized controlled trials (RCTs) with larger sample sizes and longer intervention and follow-up periods, to evaluate specific interventions. Future research should also be moving beyond simple effectiveness studies to

understand how interventions work (or don't work) by examining mediating factors, such as changes in social cognition, self-efficacy, quality vs. quantity of interaction. Yang et al. also suggested that future studies should compare digital interventions against traditional face-to-face interventions (e.g., group activities, befriending) to understand their relative strengths and weaknesses.

### *Addressing the Digital Divide and Ensuring Equitable Access*

The potential benefits of technology for alleviating loneliness cannot be realized if significant portions of the population are excluded due to the digital divide (Umoh et al., 2022). Future efforts must move beyond simply providing devices or internet access such as investigating the multifaceted barriers to technology adoption and use among specific groups for instance, older adults, low-income individuals, immigrants, Indigenous peoples, people with disabilities etc., including factors beyond cost and infrastructure, such as motivation, trust, perceived usefulness, digital literacy, fear of scams, privacy concerns, and lack of culturally relevant content or design. Advocating for policies that ensure affordable internet access, provide funding for devices and training, and address the structural factors that contribute to both loneliness and digital exclusion goes hand in hand. Designing and evaluating digital literacy programs that are tailored, flexible, culturally appropriate, language-sensitive, and foster peer support, particularly for older immigrants and other marginalized groups (Au et al., 2024).

### **Conclusion**

The exploration undertaken within this chapter has navigated the intricate and rapidly evolving landscape where technology, the human experience of loneliness, and the ethical responsibilities of the counselling profession converge. It has become evident that the integration of technology into strategies for assessing and mitigating loneliness is not merely a

methodological adjunct but represents a fundamental shift in how such challenges must be understood and addressed. The very focus on these intersections, from privacy and informed consent to algorithmic bias and the application of ethical codes—in particular the CPA’s (2017) *Code of Ethics for Psychologists*—underscores a critical realization: loneliness in the 21st century is increasingly a socio-technical phenomenon. Consequently, traditional counselling paradigms, while foundational, may prove insufficient without a robust and nuanced integration of the client’s digital life and the pervasive technological environment. This necessitates an expansion of therapeutic frameworks to acknowledge technology not just as a potential tool, but as an influential force shaping the contours of human connection and isolation.

This chapter has provided an integrated discussion of the central theme emerging from the preceding discussion is the profound duality of technology in relation to loneliness. Technology is not a monolithic entity with a singular impact; rather, it acts as a multifaceted force, simultaneously offering unprecedented avenues for connection and support while also harboring risks of increased isolation, superficial engagement, and the potential erosion of genuine human interaction. The capacity for technology to bridge geographical distances and foster communities of shared interest is undeniable, yet so too is its potential to create echo chambers, fuel social comparison, or replace substantive relationships with fleeting digital encounters. This inherent duality means that the impact of technology is heavily moderated by the specific type of technology, patterns of use, individual psychological predispositions, and broader socio-cultural factors.

This chapter also highlighted the evolving landscape of loneliness in a technologically forward world and the significant ethical quandary for counsellors, particularly concerning their involvement in the development and deployment of technologies, including artificial intelligence

(AI), aimed at alleviating loneliness. There exists a palpable tension between the professional responsibility to contribute expertise for societal benefit, potentially shaping technologies to be more human-centered and effective, and the ethical mandate to “do no harm.” Concerns are valid that AI and robotic interactions, however sophisticated, may inherently lack genuine human empathy, potentially fostering emotional dependency or proving ineffective or even detrimental to vulnerable individuals. As highlighted, the prospect of AI offering non-human, instruction-based interactions that may not align with the complex, nuanced needs of individuals presents a direct challenge to core counselling principles. Yet, the alternative, a lack of professional guidance in the development of such technologies, carries its own risks, potentially leading to the creation of tools that inadvertently exacerbate harm or complicate the mental health field. This “critical ethical tightrope” is not merely an individual concern but poses a systemic challenge. It signals a pressing need for professional bodies to develop more specific ethical guidelines, robust training, and supportive structures for counsellors engaging in interdisciplinary collaborations with technology developers. The potential negative consequences of allowing unguided technological development in sensitive areas like mental health may be as significant as the risks associated with carefully considered, ethically informed engagement.

Recognizing the unrelenting speed of technological advancement is also essential. These developments are a continuous and accelerating current in modern society, as stressed throughout this chapter, rather than a passing phase. It is inevitable that technologies like virtual reality, AI-driven analytics, passive sensing, and advanced social platforms will develop further, influencing clients’ social interactions, loneliness experiences, and overall lives. Because of this continuous development, adaptation in the counselling profession must become a continuous professional competency rather than a one-time occurrence. The definition of professional

competence in the digital age, continuing education, and the core curriculum of counsellor training programs are all significantly impacted by this reality. A sustained commitment to developing “digital literacy” and “techno-ethical reasoning” must become woven into the fabric of counsellor identity and practice.

Future directions could involve the establishment of interdisciplinary regulatory bodies to guarantee that technological advancement improves human connection, longitudinal research into the long-term effects of relationships mediated by technology, and the development of strong ethical guidelines for AI in mental health. This role extends beyond adapting clinical practice to include advocating for human-centered values in technological innovation and contributing to the creation of a digital ecosystem that supports, rather than undermines, mental well-being and authentic social connection. By embracing this challenge, the profession can help shape a future where technology and humanity progress in mutually enriching ways.

The findings will be disseminated through a 20-minute virtual presentation. Given the time constraints, the presentation will be concise and focused on the most critical takeaways. The presentation will be organized with a clear structure: an introduction to the problem, an overview of the methodology, a summary of key findings and their implications, and a concluding call to action. The virtual presentation will be hosted on Zoom, a platform that supports large audiences and allows attendees to join from any location. The dissemination strategy will target a diverse audience composed of three key groups: students, technology developers, and counselling professionals. The dissemination of this capstone project will occur upon its completion, at the end of the final semester. This timing allows for the presentation of a complete and finalized body of work to peers, faculty, and community members. To enhance engagement and to clarify certain points, questions will be encouraged at the end of the presentation.

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## Appendix

**Table 1: Comparative Overview of the UCLA Loneliness Scale (Version 3) and the De Jong Gierveld Loneliness Scale (11-Item)**

<b>Feature</b>	<b>UCLA Loneliness Scale (Version 3)</b>	<b>De Jong Gierveld Loneliness Scale (DJGLS-11)</b>
Theoretical Basis	General, unidimensional concept of loneliness (Pollet et al., 2022)	Weiss's (1973) theory of social and emotional loneliness (De Jong Gierveld & Van Tilburg, 2010)
Primary Purpose	To measure a global, overall level of loneliness	To differentiate between social and emotional loneliness
Number of Items	20 items (11 negative, 9 positive) (Russell, 1996)	11 items (6 negative, 5 positive) (Alsubheen et al., 2023)
Response Format	4-point Likert scale ("Never" to "Often"/"Always") (Pollet et al., 2022)	3-point categorical ("Yes" / "More or less" / "No")
Intended Structure	Unidimensional (Keskin & Lajunen, 2024)	Two-dimensional (social and emotional) (De Jong Gierveld & Van Tilburg, 2010)
Empirical Structure	Often shows artifactual factors based on item wording; best fit is a bifactor model with method	Also shows method effects, but the theoretical two-factor structure is more robust and frequently

	factors (Penning et al., 2013)	recovered (Penning et al., 2013)
Key Strength	High internal consistency; historical precedent with a vast comparative literature (Russell, 1996)	Strong theoretical grounding; superior measurement invariance across time and age groups (De Jong Gierveld & Van Tilburg, 2010)
Key Weakness	Questionable structural and construct validity; poor measurement invariance across time and age groups (Penning et al., 2013)	Weaker evidence base for content and construct validity in systematic reviews (Alsubheen et al., 2023)