TECHNOLOGICAL CHANGE AND AN AGING WORKFORCE: INVESTIGATING THE CAREER EXPERIENCES OF OLDER WORKERS

By

© Judah I. Adeniyi

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Abstract

This dissertation examines the intersection between two significant economic and societal challenges: an aging workforce and rapid technological change. The aging workforce is a growing concern, particularly in Canada, where the population of older workers (55 years and older) surpasses that of younger entrants (15 to 24 years). This demographic shift, already contributing to labour shortages in key sectors like manufacturing and healthcare, poses risks to labour participation rates and the stability of healthcare and pension systems (Acemoglu & Restrepo, 2017; Maestas et al., 2016). Given the projected exodus of older workers and limited incoming replacements, scholars and practitioners advocate for delayed or phased retirements to mitigate talent shortages. Simultaneously, technological change reshapes work, presenting opportunities and challenges, especially for older workers who may find adapting to new technologies daunting. This environment makes it critical to understand how technology affects older workers' experiences, including their retirement intentions. I conducted two studies to better understand the impact of technology and technological changes on older workers' work experiences.

In Study One, I conducted a systematic literature review to synthesize existing research on technology's impact on older workers, with a comprehensive analysis of 121 articles, including both peer-reviewed (n=82) and grey literature sources (n=39). Thematic analysis revealed key areas in the current literature, such as socio-demographic factors, training and development, and retirement planning. The results of this study also included descriptive insights on journals, methodologies, regions, and publication dates,

highlighting 14 important research gaps. These gaps guided recommendations for future studies, which aim to address the implications of technological innovations on an aging workforce.

In the second study, I empirically examined the relationship between technological change and older workers' retirement intentions using a sample of 361 participants. Testing a moderated mediation model grounded in the Job Demand-Resources (JD-R) theory, I analyzed burnout and perceived work ability as serial mediators alongside moderating factors of computer self-efficacy, technological training, and organizational justice. Findings accentuate the complex interplay of burnout, work ability, and retirement intentions, emphasizing that burnout negatively impacts work ability, which in turn influences retirement intentions. Notably, technological training significantly moderated the relationship between burnout and work ability, reinforcing its role as an important factor shaping older workers' capacity to adapt within technologically evolving work environments. Ultimately, this dissertation provides valuable implications for both theory and practice. The findings from both studies provide important directions for the successful integration and retention of older employees in the rapidly changing technological work environment, as well as for creating a supportive work environment for them.

Keywords: Older workers, aging workforce, retirement intentions, technological change, Job Demand-Resources (JD-R) theory

General Summary

As people live and work longer, workplaces must adapt to an aging workforce. At the same time, rapid technological change is reshaping jobs and industries. In Canada, the number of older workers (aged 55 and above) now exceeds that of younger entrants (aged 15 to 24). This shift contributes to labour shortages, particularly in industries like healthcare and manufacturing. Many experts suggest that encouraging older workers to delay retirement could help address these shortages. However, technology presents both opportunities and challenges, as older workers may struggle to keep up with new tools and systems or may thrive due to intrinsic interests in technology. My research explores how technological change affects older workers' experiences at work, including their decisions about when to retire.

The first part of my study reviewed 121 research papers on this topic. It identified key themes such as the role of training, job demands, and retirement planning, while also highlighting research gaps. The second part involved a survey of 361 older workers to examine how technological change influences burnout, job satisfaction, and retirement intentions. The findings show that workplace burnout reduces older workers' ability to perform their jobs, which can push them toward early retirement. Interestingly, the study also found that technological training significantly influenced this relationship, indicating that the impact of training may depend on the broader context in which it is delivered, including the worker's level of strain or burnout. These insights offer practical guidance for organizations looking to support older workers in adapting to technology, reducing burnout, and extending their careers. By fostering supportive work environments and providing the

right resources, employers can better retain experienced employees and navigate the challenges of an aging workforce in a technology-driven world.

Definition of Key Terms

Burnout	Burnout is a psychological syndrome of emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment that can occur in any job (Bakker & Demerouti, 2017; Demerouti et al., 2001; Maslach et al., 2001).
Computer Self-Efficacy	An individual's perception of their ability to use computers in the accomplishment of a task (Compeau & Higgins, 1995).
Job Demands	Job demands are those physical, psychological, social, or organizational aspects of the job that require sustained physical, cognitive, and/or emotional effort and are therefore associated with certain physiological and/or psychological costs (Demerouti et al., 2001).
Job Resources	Job resources are defined as the physical, psychological, social, or organizational aspects of the job that have motivating potential, are helpful in achieving work goals, regulate the impact of job demands, and stimulate learning and personal growth (Demerouti et al., 2001).
Job Demand-Resources Theory	The theory explains how job demands and resources influence job performance through employee well-being (including burnout and work engagement) and how employees use proactive as well as

	reactive work behaviors to influence job demands and resources (Bakker & Demerouti, 2017).
Older workers	Refers to individuals aged 55 and older (Statistics Canada, 2021).
Organizational Justice	Individuals' perception of fairness in the workplace (Colquitt et al., 2001; Greenberg & Colquitt, 2013).
Perceived Work Ability	Refers to an individual's subjective perception of their ability to perform their job effectively, taking into account their physical, cognitive, and emotional capacities (Ilmarinen, 2009; McGonagle et al., 2015).
Retirement	The exit from an organizational position or career path of considerable duration, taken by individuals after middle age, and taken with the intention of reduced psychological commitment to work thereafter (Feldman, 1994).
Retirement Intentions	Refers to individuals' willingness to decrease or withdraw their mental, psychological, and behavioral involvement in their existing jobs, careers, or the workforce (von Bonsdorff et al., 2010; Jiang et al., 2021; Solem et al., 2016).
Technology	Defined as computer technologies, encompassing a wide range of technologies, including computer hardware (central processing units, graphics processing units, memory, and storage devices), operating systems, application software, networking infrastructure, and internet technologies.

Technological Change	This is the process of implementing new methods or techniques of production and the diffusion of new inventions or technology throughout the workplace (Godin, 2015).
Technology Training	Technology training encompasses a wide range of educational programs and activities designed to enhance individuals' knowledge, skills, and competencies related to the use of technology, particularly computer hardware, software, and digital tools (Dawson & Rakes, 2003; Lee et al., 2008).

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Chapter One: Introduction and Thesis Overview

1.1 INTRODUCTION

The percentage of seniors in the Canadian population is rapidly growing, projected to reach 9.3 million, or 23 percent, by 2030 (Statistics Canada, 2022). These changes are not unique to Canada; many nations, particularly in the developed world, are experiencing similar trends (Alcover, Guglielmi, Depolo & Mazzetti, 2021). The most recent census results reveal that individuals aged 56 to 75, known as baby boomers[1], constitute the largest cohort in Canada, comprising 24.9 percent of the total population (Statistics Canada, 2022). This shift towards a predominantly aging population presents significant socio-economic challenges. For instance, the increasing number of retirees can strain economic growth as the workforce shrinks (Acemoglu & Restrepo, 2017; Maestas, Mullen, & Powell, 2016). Additionally, the pressure on social welfare systems intensifies as more people rely on pensions and healthcare services (Acemoglu & Restrepo, 2017). The changing demographics also reshape patterns of work and retirement, necessitating adjustments in workplace policies and retirement planning (Alcover et al., 2021; Fraccaroli & Deller, 2015). Headlines dominating the media such as "Aging is the real population bomb" (Bloom & Zucker, 2023), "Population aging is one of our most urgent challenges" (Mihailidis & Muscedere, 2023) highlight the severity of these trends and the need for urgency in addressing these issues.

[1] These demographics reflect the trend as of the most recent census (2021). However, as of February 2024, Millennials / Generation Y are the largest cohort in Canada (largely in part due to immigration) (Statistics Canada, 2024).

Workforce aging is a significant consequence of an aging population. With Canada's birth rate at 1.40 births per woman and life expectancy at 82.05 years (Statistics Canada, 2021), fewer young individuals are entering the labour market to replace the growing number of older workers retiring (Schwab, 2017; Statistics Canada, 2022). The change in worker ratios further illustrates this demographic shift: in 1996, there were 2.7 Canadian workers aged 25 to 34 for every older worker; by 2018, this ratio had plummeted to 1.0 (Statistics Canada, 2022).

The definition of older workers varies globally, but in Canada, it often refers to individuals aged 55 and older (Statistics Canada, 2021). The decline in labour force participation through the loss of older workers to retirement is a concern of many economies (Acemoglu & Restrepo, 2017; Alcover et al., 2021). More specifically, the retirement of a large cohort of baby boomers (i.e., individuals born between 1945 and 1965) is expected to be a major catalyst of labour shortages (Zacher & Griffin, 2015). Additionally, as baby boomers retire en masse, they will increasingly exert pressure on the health and home care system, as well as pension plans (Carrière, Legare & Purenne, 2016). They will depend more on governmental support such as Old Age Security (OAS), Guaranteed Income Supplement (GIS), etc.), putting further tension on the economy (Messe et al., 2014).

Currently, there are more individuals over the age of 65 than those under the age of 15 in Canada (Employment and Social Development Canada, 2018). With the standard retirement age in Canada being 65 years (Employment and Social Development Canada, 2015; 2017), the workforce is experiencing a significant drain as more individuals retire

than enter. The severity of this issue is accentuated by reports from the most recent census, which indicate that the number of people close to retirement is at an all-time high, with one in five (21.8%) persons of working age being between the ages of 55 and 64 years (Statistics Canada, 2022).

An aging workforce will create challenges for employers and firms, such as labour shortages and declining productivity (Acemoglu & Restrepo, 2017). As a larger proportion of the workforce reaches retirement age, without an adequate number of younger workers available to fill the gaps left behind, this will strain the availability of skilled labour. This can also lead to declining productivity as older workers may face physical and cognitive limitations that affect their performance (Dalecki et al., 2017).

Workers aged 55 and older account for 36 percent of the Canadian workforce and are expected to reach 40 percent by 2026 (Statistics Canada, 2017). The increase in the share of older workers predicts a reduction in the overall labour participation rates (Employment and Social Development Canada, 2018; Statistics Canada, 2022). In light of this, several scholars and socio-economic commentators have expressed the need to increase the labour force participation of older workers to boost growth in productivity, support businesses, and reduce pressures on the social welfare system (Employment and Social Development Canada, 2018; Schwab, 2017; Zacher & Griffin, 2015). In addition to demographic trends, technological change is significantly impacting the labour force participation of older workers (Hudomiet & Willis, 2022; Schwab, 2017).

The most recent technological changes have also influenced work systems and processes (Beer & Mulder, 2020), along with job designs and requirements (Gibbs, 2022).

The way certain tasks are executed has evolved in the last decade and continues to evolve. As one example, integrating technology into financial services has catalyzed a significant transformation, prompting numerous financial institutions to embrace E-banking. This paradigm shift has not only streamlined operations but also reduced the reliance on manual processing. By leveraging electronic platforms, financial institutions allocate resources more efficiently, enabling quicker transactions and enhanced customer service. Technology has also revolutionized many industries and disrupted the status quo in different sectors. For instance, the advent of Uber and similar ride-sharing companies completely disrupted the traditional transport industry (Jalloh, 2023). These companies have introduced a new business model that leverages mobile technology to connect drivers with passengers, offering greater convenience and often lower costs than traditional taxi services (Jalloh, 2023). Although these changes have led to traditional taxi companies losing employees to ride-sharing companies such as Uber and Lyft (Jalloh, 2023), this disruption has forced traditional transport providers to innovate and adapt, leading to increased competition and changes in regulatory frameworks.

Myriad speculations about what the "fourth industrial revolution" (Schwab, 2017) means for the future of work and workers have dominated both academic and industry literature in recent years (Brynjolfsson & McAfee, 2014; Gibbs, 2017; Schwab, 2017), a significant focus in the literature has been the job security of workers (Harbert, 2021; Schwab, 2017). Many workers worry that the rapidly changing technological environment will make their jobs redundant and displace them in the future (Brynjolfsson & McAfee, 2011a, 2011b, 2014). Scholars widely agree on the necessity for workers to continually

upskill or reskill to maintain competitiveness and employability in the evolving labour market (Alcover et al., 2021; Brynjolfsson & McAfee, 2011a, 2011b, 2014).

Advancements in communication technologies, in some cases, accelerated by the COVID-19 pandemic, have transformed how organizations operate, with many organizations shifting to remote or hybrid work arrangements (Conger, 2020; Holmes, Coburn & Francis, 2020; Sneader & Sternfels, 2020). There are conflicting arguments regarding the implications of this shift on older workers. One argument is that remote or hybrid work offers older workers the flexibility that many of them crave at the later stages of their careers (AARP, 2023). It enables them to pick up interests outside of work or spend more time with family while maintaining their level of productivity (AARP, 2021). Moreover, working from home will enable older workers, especially those with disabilities or health challenges, to stay in the workforce longer (Chen & Munnell, 2020; Coombs, McLeod & Storey, 2021; Quinby, Rutledge & Wettstein, 2021). A survey conducted by the UK Office for National Statistics (ONS) found that 10.9 percent of older workers with long-term illness and disabilities who work remotely reported that they plan to retire later compared to their colleagues (5.9 percent) who are not working remotely (Coombs et al., 2021). This suggests that remote work may help older workers better manage their health conditions, making it more feasible for them to remain in the workforce longer.

On the other hand, the shift to remote/hybrid work arrangements could be detrimental to older workers (Pit et al., 2021). Older workers are more likely to struggle with technology compared to younger workers (Lee, Czaja, & Sharit, 2008). Therefore,

given that remote work often entails a heavy reliance on technology, older workers may face greater challenges in adapting to these new environments. This situation heightens the risk of discrimination in the workplace, as older employees might be perceived as less capable of handling technological tools and platforms (Lee et al., 2008; Taylor, 2011). Consequently, these workers could be marginalized or overlooked for opportunities that increasingly prioritize digital skills. For example, a recent survey conducted in the UK found that people thought that workers 55 years or older were the group least likely to work from home and did not expect this to change in the future (Gardiner & Slaughter, 2020).

The implications of the changing technological environment are particularly significant for older workers. First, the changing technological environment might influence the retirement decisions of older workers. Older workers who are close to retirement might need to decide if the effort and time required to reskill or upskill is a valuable investment (Ahituv & Zeira, 2011; Bartel & Sicherman, 1990; Friedberg, 2003). This decision hinges on their assessment of whether such investments will enhance their employability and job security. Ultimately, their evaluations will significantly influence whether they opt for early retirement or choose to extend their careers. Second, older workers are susceptible to age discrimination due to stereotypes that characterize them as slow, unamenable, and untrainable (Employment and Social Development Canada, 2018; Urwin, 2006). Older workers stand the risk of being labeled as old dogs who can no longer learn new tricks (Garfein, Schaie & Willis, 1988; Lee et al., 2008; Yashiro et al., 2022). They might be disadvantaged in the allocation of training and development

opportunities; employers might favor younger workers for promotion and pay increases over older workers, and they also face a higher risk of retrenchment compared to their younger colleagues (Lee et al., 2008; Taylor, 2011; Weiss & Maurer, 2004).

There are established laws, such as the Canadian Human Rights Act and the Age Discrimination in Employment Act of the United States (ADEA), in the United States, which prohibit age discrimination practices against workers who are 40 years or older. However, research shows that older workers are still victims of discrimination in the workplace, and incidences of ageism continue to worsen (AARP, 2021; Gomez & Gunderson, 2004). One study conducted by the American Association of Retired Persons (AARP) reported that nearly 80 percent of older workers claimed to have witnessed or experienced age discrimination in the workplace (AARP, 2021).

Several scholars and practitioners agree that encouraging older workers to delay retirement could benefit the economy, employers, and the workers themselves (Alcover et al., 2021; Messe et al., 2014; Yashiro et al., 2022). First, delayed retirement would help workers maintain their standard of living by providing continued income and financial stability (Alcover et al., 2021). This extension of their careers would also offer a sense of purpose and fulfillment in the later stages of their lives (Hill & Weston, 2019). Staying in the workforce longer can keep older workers engaged and active, contributing to their overall well-being and mental health (Hill & Weston, 2019). Moreover, their extended participation in the labour market allows them to continue sharing their expertise and experience, which can be valuable for mentoring younger employees and sustaining organizational knowledge (Alcover et al., 2021).

Second, the idea of delayed retirement aligns with the growing recognition of the value of older workers in the modern workforce (Heisler & Bandow, 2018). In today's rapidly evolving technological landscape, older workers' expertise and institutional knowledge are invaluable assets that can contribute significantly to organizational success (Heisler & Bandow, 2018). By retaining older workers, employers can benefit from a diverse range of perspectives, enhanced mentorship opportunities, and smoother knowledge transfer processes, all of which are crucial for navigating complex business challenges in a digital age (Heisler & Bandow, 2018; Loretto & Vickerstaff, 2013).

Additionally, delaying retirement has broader economic implications. By extending the working lives of older adults, there could be a potential increase in overall productivity and GDP growth (Messe et al., 2014). Technological advancements can create new job opportunities and enhance productivity, thus providing a conducive environment for older workers to continue contributing meaningfully to the economy (Acemoglu & Restrepo, 2017). Furthermore, as industries undergo digital transformation, older workers may play a pivotal role in bridging the skills gap by leveraging their experience and adaptability to navigate new technologies (Shultz & Adams, 2007).

Several factors make delaying retirement difficult for older workers. As discussed, the rapidly changing technological work environment poses significant challenges in this regard. Hence, scholars such as Maestas et al. (2023) highlight the importance of upskilling and reskilling programs tailored to older workers to ensure their continued relevance in the labour market amidst technological disruptions. Additionally, the pandemic-induced economic downturn has underscored the financial vulnerability of

older adults, making delayed retirement strategies even more pertinent in safeguarding their retirement savings and social security benefits (Lusardi & Mitchell, 2011).

Furthermore, the interplay between health and well-being considerations and retirement decisions among older workers warrants attention. The COVID-19 crisis has underscored the importance of health and well-being, particularly for vulnerable populations such as older adults. Therefore, policies and workplace interventions aimed at promoting health and work-life balance can facilitate prolonged labour force participation among older workers (van Dalen, Henkens & Wang, 2015).

Although several studies have examined the factors influencing the retirement decisions of older workers (Bartel & Sicherman, 1993; Czaja, 2001; Friedberg, 2003), only a few studies investigate how the changing technological environment could influence the retirement intentions of older workers. Given the previously noted trends concerning the aging workforce, technological change, and workplace changes associated with COVID, this is an important research gap for investigation. Emerging research suggests that while technological change can pose challenges for older workers in terms of skill obsolescence and adaptation (Czaja, Sharit, Charness & Schmidt, 2015), it also presents opportunities for continued engagement and reintegration into the workforce through upskilling initiatives, flexible work arrangements, and the adoption of age-friendly technologies (Allen et al., 2021). Therefore, investigating the interplay between technological change and retirement decisions among older workers is not only timely but also imperative for informing policy interventions and organizational strategies aimed at

promoting extended labour force participation and ensuring the well-being of aging populations in the digital era.

1.2 THESIS OVERVIEW

Technology, particularly Information Communication Technologies (ICT), has become increasingly prevalent in every sector of the economy (Alcover et al., 2021; de Koning & Gelderbloom, 2006; Song, 2009). Throughout history, the world has undergone several phases of technological change (Schwab, 2017). These phases are commonly referred to as industrial revolutions. The first industrial revolution (between 1760 and 1830) was characterized by developments such as the construction of rail systems and the invention of steam engines (Deane, 1979). The second industrial revolution (between 1870 and 1914) was marked by technological developments such as the telephone and the electric light bulb (Engelman et al., 2020). The third industrial revolution, also known as the digital revolution, occurred in the late 20th century and was characterized by the invention and widespread use of the computer and the internet (Rifkin, 2011).

The most recent wave of technological change has been termed the 'fourth industrial revolution' in both academic and industry spheres (Schwab, 2017). Compared to previous industrial revolutions, the fourth industrial revolution is characterized by greater interconnectedness of smart, automated systems (Schwab, 2017; Xu, David & Kim, 2018). Indeed, the pervasiveness of technological systems in every fiber of society is one of the hallmarks of the fourth industrial revolution (Xu et al., 2018). Innovative technology, such as artificial intelligence (AI), is increasingly changing the way individuals experience the world around them (Acemoglu & Restrepo, 2018). AI-driven

applications are enhancing everyday activities, from Large Language Models (LLM) such as ChatGPT[2] to advanced navigation systems in smart cars. These technologies are also transforming industries by optimizing processes, improving decision-making, and creating new opportunities for innovation (Xu et al., 2018). For example, in healthcare, AI is being used for diagnostic accuracy and personalized treatment plans (Rajpurkar et al., 2022), while in finance, it is streamlining operations and enhancing fraud detection (Geddes & Schmidt, 2020). The pervasive influence of AI is reshaping not only how individuals interact with technology but also how businesses operate and compete in the modern economy.

Technological advancements can impact different populations in diverse ways (Halford et al., 2015; McCausland et al., 2015). As one example, Halford et al. (2015) discovered in their case studies of the Norwegian health sector that female nurses had different reactions to the introduction of new technologies to their work compared to their male colleagues. Their thematic analysis demonstrated that compared to their male counterparts, the introduction of new technologies made some female nurses feel powerless in the face of change. Additionally, some of the female nurses interviewed reported feeling a loss of professional identity in their roles.

Turning attention to the older population, such findings beg the question, 'How does technological change impact older workers?' Scholars and practitioners highlight the aging workforce as one of the biggest challenges that threaten the future of work (Alcover

[2] Details regarding the use of AI tools to support non-analytical aspects of the research process (e.g., proofreading, idea refinement) are provided in Appendix F.

et al., 2021; Acemoglu & Restrepo, 2018; Maestas et al., 2016). Indeed, several scholars advocate delaying retirement as one of the solutions to labour shortages and declining labour participation rates (Kadefors, Wikstrom & Arman, 2020; Zacher & Griffin, 2015). Consequently, it is necessary to make the work environment conducive for older workers to benefit from a prolonged stay in the workforce (Wargo-Sugleris et al., 2018).

With the increase in the pervasiveness of technology in the workplace (Alcover et al., 2021; de Koning & Gelderbloom, 2006; Song, 2009), there is a pressing need to understand the impact of the rapidly changing technological work environment on older workers. Older workers are disproportionately affected by technological change in the workplace (de Koning & Gelderbloom, 2006; Mothe & Nguyen-Thi, 2021; Turek & Henkens, 2020). For example, studies have shown that older workers are victims of age-related stereotypes (Borle et al., 2021; Turek & Henkens, 2020) that negatively affect their employability (Alcover et al., 2021), and training opportunities (Gist, Rosen & Schwoerer, 1988; McCausland et at., 2015) within the changing technological work environment. These stereotypes may lead to a self-reinforcing cycle where older employees are denied opportunities to update their skills, further entrenching the perception that they cannot keep up with technological changes (Lee et al., 2008). Consequently, this can hinder their professional growth and reduce their overall contributions to the workforce.

The retirement intentions of older workers have received significant interest from researchers (Adams & Beehr, 1998; Bartel & Sicherman, 1990; Feldman, 1994; Jiang, Zhang, Hu & Liu, 2021; Oakman & Wells, 2016). The examination of factors influencing

older workers' retirement intentions has been examined through various lenses. Some existing studies have taken an economic perspective to examine the retirement decision-making process of older workers (Feldman & Beehr, 2011; Mitchell & Fields, 1984). From an economic perspective, the availability of financial resources heavily influences workers' retirement intentions, with decisions often predicated on whether they have accumulated sufficient financial resources to sustain their standard of living during retirement (Coile, 2015; Hatcher, 2003; Hurd, 1990). For instance, in Canada, opting for early retirement could significantly reduce a worker's pension package, impacting their long-term financial security (Canada Revenue Agency, 2024). Economic considerations such as pension benefits, savings, healthcare costs, and social security play a critical role in determining when individuals choose to retire.

Other studies have focused on how individual and socioeconomic factors such as educational status (Bound, Schoenbaum & Waidmann, 1995; von Bonsdorff et al., 2010), health (McGarry, 2004), and psychological well-being (Shultz & Wang, 2011; Wang & Shi, 2014) impact retirement intentions. For example, higher educational status is often associated with better job opportunities and higher income, which can lead to more substantial retirement savings and the ability to retire earlier (Bound et al., 1995; von Bonsdorff et al., 2010). Health is another factor that workers consider; individuals in poor health may be forced to retire earlier than planned due to physical limitations or medical needs (McGarry, 2004; Shultz et al., 1998). Conversely, those in good health may choose to work longer, enjoying continued professional engagement and income. Psychological well-being could also play a significant role, as individuals with higher levels of life

satisfaction and mental health may be more inclined to remain in the workforce, finding purpose and fulfillment in their careers (Wang & Shi, 2014).

Some scholars have also studied the retirement decision-making process as a step in the lifespan and career development of workers (Carstensen et al., 1999; Carstensen et al., 2003). The desire to shift their attention to other activities and prioritize other aspects of their lives motivates them to retire (Lytle et al., 2015). For example, the desire to spend more time with family or travel might influence a worker to retire (Matthews & Fisher, 2013; Shultz & Olson, 2013). This perspective views retirement not merely as an economic decision but as a natural progression in one's life, where personal fulfillment and quality of life take precedence (Lytle et al., 2015). As workers age, their values and priorities may evolve, leading them to seek a balance between work and other life domains (Carstensen & Reynolds, 2023).

Researchers have also examined work-related factors that play a role in the retirement decision-making of older workers, such as HRM practices (Armstrong-Stassen & Schlosser, 2011; Jiang et al., 2021; Solinge & Henkens, 2014), job characteristics (de Wind et al., 2014; Hurd & McGarry, 1993), and organizational climate (Bal et al., 2012). HRM practices, including high involvement work practices, flexible working arrangements, career development opportunities, and retirement planning support, can significantly influence an employee's decision to retire or continue working (Armstrong-Stassen & Schlosser, 2008; Chen & Gardiner, 2019; Jiang et al., 2021; Solinge & Henkens, 2014). Positive job characteristics, such as meaningful work, job autonomy, and manageable workload, can encourage older workers to remain in the workforce longer

(Van Fossen et al., 2022). Conversely, physically demanding or monotonous jobs may hasten retirement decisions (Roossien, 2021). The organizational climate, encompassing the overall work environment and culture, also plays a critical role. A supportive and inclusive climate that values older workers and promotes work-life balance can enhance job satisfaction and delay retirement (Bal et al., 2012).

Research examining the relationship between technological change and the retirement intentions of older workers is scant. Although the different perspectives discussed above are important in understanding older workers' retirement decision-making process, they are still inadequate in providing sufficient insight into how the changing technological environment influences the retirement intentions of workers. Hence, this dissertation aims to fill this gap by empirically examining the relationship that exists between technological change and the retirement intentions of older workers.

Moreover, scholars and practitioners agree that if adequate efforts are not made to extend the working lives of older workers, it will adversely affect the psychological and mental well-being of workers who choose to retire early due to workplace technological changes (Dave et al., 2008; Mosca & Barrett, 2016; Osborne, 2012). For example, one study involving an Irish sample of older workers found that workers who retired early due to factors such as redundancy were more likely to experience depressive symptoms (Mosca & Barrett, 2016). Additionally, early retirement could also result in adverse socio-economic implications for society (Acemoglu & Restrepo, 2017; Maestas et al., 2016). Consequently, addressing this gap will provide valuable insights into how the changing technological environment influences the retirement intentions of older workers.

This dissertation encompasses two studies designed to address the aforementioned gaps in the literature regarding the impact of technology and technological change on older workers. Recognizing a lack of studies that systematically synthesize existing research in this area, the first study adopts a systematic literature review approach (Snyder, 2019). This comprehensive review delves into the existing body of literature examining the effects of technology on older workers. By analyzing and synthesizing findings from various studies, this systematic review not only provides a comprehensive overview of the current state of knowledge but also lays the groundwork for the subsequent quantitative study.

Building upon the insights gleaned from the literature review, the second study aims to empirically investigate the impact of the changing technological environment on the retirement intentions of older workers. The quantitative study primarily utilizes the Job-Demand Resources (JD-R) theoretical framework to investigate the relationship between technological change and the retirement intentions of older workers.

Through this two-study approach, this dissertation not only contributes to bridging the gap in the literature but also offers valuable insights that can inform policy interventions, organizational practices, and future research aimed at promoting the successful integration and retention of older workers in an increasingly technology-driven workplace.

In chapters two and three, the two studies are presented in detail. In chapter four, I synthesize the findings of both studies, highlighting major takeaways and overarching themes that emerge from the research. This chapter offers a holistic overview of the

research outcomes, drawing connections between the two studies and offering insights into their combined implications for theory and practice.

Chapter Two: Study One

A Systematic Review of Factors Impacting Older Workers' Experiences with Technology in the Workplace

A growing number of studies have examined the impact of the changing technological work environment on the work experiences of older workers (Birdi, Pennington & Zapf, 1997; McCausland et at., 2015; Van Yperen & Wortler, 2017; Virokannas et al., 2000). However, through a preliminary review of the existing literature, it was evident that studies that systematically review the impact of technology on older workers are scarce. This is problematic as, according to Gubbins and Rousseau (2015), single studies are insufficient in establishing scientific facts**.** Thus, a synthetization of individual studies is now necessary to establish credible evidence and reach broad conclusions and implications concerning the impact of technology on older workers, with systematic literature reviews advocated as one way to synthesize individual studies (Gubbins & Rousseau, 2015; Rousseau & Gunia, 2016; Rousseau, Manning & Denyer, 2008).

A systematic literature review represents a review of a clearly defined question(s) that uses rigorous, systematic, and replicable processes to identify and select relevant research articles on a specific topic and critically analyze the data from the studies included in the review (Rousseau et al., 2008; Siddaway, Wood & Hedges, 2019). Such reviews involve methodically locating all the relevant published and unpublished articles that focus on specific research questions and systematically analyzing and presenting results (Gubbins & Rousseau, 2015; Siddaway et al., 2019).

The search process of a systematic literature review is one of the most important steps in the review process. The researcher's goal is to ensure that the search strategy is replicable and has minimal bias (Callahan, 2014; Siddaway et al., 2019). The inclusion and exclusion criteria must be explicit and transparent so that other researchers can make similar decisions and obtain similar results. The rationale for exclusion and inclusion, search strategy, and results should be well documented to enable other researchers to develop and extend the review in the future (Callahan, 2014; Rousseau et al., 2008; Siddaway et al., 2019).

Systematic literature reviews play an important role in evidence-based management. Several scholars argue that evidence-based management (defined by Rousseau and Gunia (2016) as a "disciplined approach to decision making and action, the hallmark of which is attention to evidence quality and the use of the best available evidence" (p.668)) is one of the most effective ways to bridge the research-practice gap (Gubbins & Rousseau, 2015; Rousseau & Gunia, 2016). Because systematic literature reviews are deemed to be at the pinnacle of the hierarchy of evidence (Gubbins & Rousseau, 2015), they are considered one of the most effective methods for implementing an evidence-based approach.

Additionally, systematic reviews help to (a) identify the current state of the literature being examined and (b) identify research gaps for future research (Brown et al., 2019; Siddaway et al., 2019). Therefore, the main objectives of study one are to identify (1) the state of the existing literature examining the impact of technological change on the work experiences of older workers and (2) the research gaps for future investigation.

Siddaway et al. (2019) urge researchers to consider several factors before conducting a systematic literature review: (a) the last systematic review on the topic should be at least ten years old, and the current literature must have rapidly progressed before embarking on a new one; (b) the last review has some methodological flaws that the new review intends to address, and (c) the previous review has a different theoretical or empirical focus from the new review. To ascertain if the current review met the criteria outlined above, I conducted a preliminary search of the existing literature that examined the impact of technology on older workers. I conducted the search within the Business Source Complete and ABI INFORM databases, using the keywords "technology," "technological change," and "older workers." Because the search was intended to get a preliminary overview of the extant literature, I only excluded articles that were not published in the English language or were not peer-reviewed. The search yielded 62 articles that were related to the topic of technology and older workers.

Following this search, I discovered that, first, there are no systematic literature reviews that have comprehensively examined this topic with the same breadth and depth of focus in the last ten years. Despite the proliferation of studies in related areas, none have addressed the unique aspects and specific scope of this subject. Specifically, I did not find any studies that explored the individual-level or organizational-level factors and outcomes of older workers' interactions with technology.

Second, any existing reviews I found were conceptual and not systematic in their approach. Hence, they had some methodological limitations that I intend to address in my review. For example, the conceptual review by Taylor and Bisson (2022), which

examined the impact of aging and age stereotypes in the technology-based training of older workers, did not report parameters that would make a review systematic and replicable, such as the keywords, search string, and databases used, etc.

Third, past reviews had a different focus from the current review (see Dropkin et al., 2016; Sharit & Czaja, 1994). For example, Dropkin et al. (2016) review focused on blended work as a bridge between traditional workplace employment and bridge employment, a narrower scope compared to the broader scope of this review, which examines the factors influencing older workers' experiences with technology in the workplace.

This paper is the first systematic literature review on this topic, and it addresses methodological gaps in existing reviews, and is different in focus of past reviews. As such, it is consistent with Siddaway et al.'s (2019) criteria for conducting a systematic literature review. Hence, the current study aims to fill these gaps and contribute to the existing literature by systematically reviewing previous studies examining the factors impacting older workers' experiences within the changing technological work environment.

2.1 METHODS

I followed the guidance of Siddaway et al. (2019) on how to conduct a systematic literature review. Specifically, they highlight four important steps researchers should follow when conducting a systematic review: scoping, planning, identification/searching of relevant literature, and screening. Siddaway et al. (2019) propose that "a clear, specific, and answerable research question is the starting point of a clear and comprehensive

review" (p.756). Hence, the first step (scoping) involved clearly delineating the scope of the review. Following this, the current review sought to answer the following research questions:

1. What individual-level factors impact older workers' experiences within the changing technological work environment?

2. What organizational-level factors impact older workers' experiences within the changing technological work environment?

3. What are the outcomes associated with older workers' experiences within the changing technological work environment?

The next step (planning) involved identifying and formulating clear search terms that accurately operationalized the research questions (Siddaway et al., 2019). To formulate search terms that clearly captured the scope of the review, I examined extant studies to capture the terms that authors have often used in the literature. I also consulted a subject librarian for further assistance regarding how to curate search terms correctly. On the librarian's advice, I utilized the thesaurus function in databases such as Business Source Complete to expand my search terms. The thesaurus function helped me establish search terms that were likely to appear frequently in the searches. As an example, I included "digital*" as one of the search terms because the thesaurus function suggested that it would include many other research areas, such as the sharing economy, gig economy, and digital platforms. This function helped me narrow the search terms to a few words while broadening the searches. The specific keywords I used in the search included

technolog*, computer*, automation, digital*, work*, occupation, employ*, job, older workers, bridge employment, aging, and retire*[3].

According to Siddaway et al. (2019), sufficient consideration must be given to the inclusion and exclusion criteria used in a systematic literature review to ensure that the boundaries of the review are clearly defined. Following this guidance, the search was conducted between November 2021 and December 2022. The inclusion criteria were focused on peer-reviewed scholarly articles and grey literature[4] written in English. This comprehensive review encompasses both conceptual and empirical articles, ensuring a broad perspective on the topic. I specifically included peer-reviewed articles that are ranked in the Academic Journal Guide (AJG) 2021 list of journals. I decided to include journals from the AJG because it is highly regarded as a repository of reputable journals, providing a reliable benchmark for academic research (Morris, Harvey & Kelly, 2009). AJG also provides wide and extensive journal coverage, has high levels of internal and external reliability, and is generally accepted as a fair means of ranking journals within the academic community (Morris et al., 2009).

The current review examined the disciplines most likely to focus on the topic at hand, namely, Human Resource Management (HRM) and Employment Studies[5]; Information Management, Organization Studies; General Management, Ethics, Gender, and Social Responsibility[6]; Psychology (Organizational); Psychology (General); and

[3] The inclusion of the asterisks in search words such as retire* meant that the search would pick up all words with the "retire" root, such as retirement, retiree, etc.
[4] Grey literature refers to book chapters, conference papers and dissertations.
[5] Note that I refer to this discipline by the shortened name of HRM throughout the rest of the paper.
[6] Note that I refer to this discipline as General Management throughout the rest of the paper.

Social Sciences. Indeed, other researchers have used similar criteria related to AJG journal discipline and/or AJG journal Guide list of journals (see Brown, O'Kane, Mazumdar, & McCracken, 2019; Kutzschbach, Tanikulova, & Lueg, 2021; Rajagopal, Prasanna Venkatesan, & Goh, 2017).

The next stage (identification/searching of relevant literature) in the current review involved identifying databases to conduct the literature search (Siddaway et al., 2019). Several scholars assert that to ensure that all relevant articles are found and to reduce the risk of bias, the searches for a systematic review should be done in at least two databases (Bramer et al., 2017; Harris et al., 2014; Siddaway et al., 2019). Hence, I conducted the searches in the SCOPUS and Web of Science databases. I chose these databases because they are well-recognized and contain the world's largest repository of high-impact journals (Bramer et al., 2017). For instance, SCOPUS covers nearly 36377 titles from about 11678 publishers (Burnham, 2006). These databases have also been used by other researchers, such as Bhimani, Mention, and Barlatier (2019), Huang et al. (2019), and Martín-Martín et al. (2021), in their reviews.

I searched for articles that contained the search terms in their title, abstracts, or keywords. Specifically, I believed that if a term were central to the article (and not just a mere mention or reference within the body of the text), the term would be included in the title, abstract, and/or keywords. This decision was also consistent with other reviews (e.g., Bentley et al., 2023; Kutzschbach et al., 2021). Finally, I screened the articles to ensure that the articles included in the dataset met the inclusion and exclusion criteria. The initial search yielded 679 journal articles from SCOPUS and 648 from the Web of Science.

However, after combining results from both databases, removing duplicates, and limiting articles to those published in English and in journals on our list, 233 articles were left. After excluding articles based on the scope of the study, the total number was 82 journal articles.

Publication bias is a significant threat to the validity and reliability of the results from a systematic review (Siddaway et al., 2019). Due to the focus on statistically significant results in published articles, there is a tendency for a review to present a biased view of the literature if it only contains published articles. Hence, it was necessary to include grey literature in the current review to mitigate potential biases (Paez, 2017; Siddaway et al., 2019). I searched within Business Source Complete, SCOPUS, and EBSCO open dissertations. The initial search yielded 399 articles from the three databases. However, after I manually checked the abstracts of all the articles to ensure they met the inclusion criteria and were within the scope of the current review, 39 articles remained.

Additionally, to ensure inter-rater reliability, I engaged a Ph.D. student in human resource management to check a sub-sample of the data to ensure the inclusion and exclusion decisions were consistent. I reached a 90 percent agreement with the Ph.D. student, and we were in full agreement after meeting to resolve any discrepancies. After excluding irrelevant articles, the dataset comprised 121 papers[7] (82 journal articles and 39 grey literature articles[8]).

[7] Note that papers will refer to both journal and grey literature articles from here forward.
[8] Grey literature comprised 17 book chapters, 14 conference papers, and 8 dissertations.

2.1.1. Data Analysis

I conducted a thematic analysis of the data, primarily following an inductive approach. An inductive approach involves collecting data and then deriving patterns, themes, or theories from that data (Creswell, 2014). Unlike a deductive approach, which starts with a hypothesis and then tests it against data, an inductive approach begins with observations and moves toward the development of broader generalizations and theories (Azungah, 2018; Creswell, 2014). I employed this approach to ensure that the range of themes and concepts identified in the review were representative of the current literature and not just a reflection of a predetermined expectation of the literature.

To guide the analysis, I followed Nowell, Norris, White, and Moule's (2017) suggestions for best practices in conducting a rigorous and relevant thematic analysis, which involve familiarization with data, generating initial codes, searching, reviewing and naming themes. Hence, the first step was familiarization with the data. This involved examining the abstracts and keywords and skimming the full text of each paper to gain some initial insights into the dataset. The goal was to find meaning and patterns within the data before coding began (Nowell et al., 2017). This initial familiarization step was crucial for setting the stage for the subsequent coding and thematic development, ensuring that I had a solid grasp of the data's overall landscape and potential areas of interest.

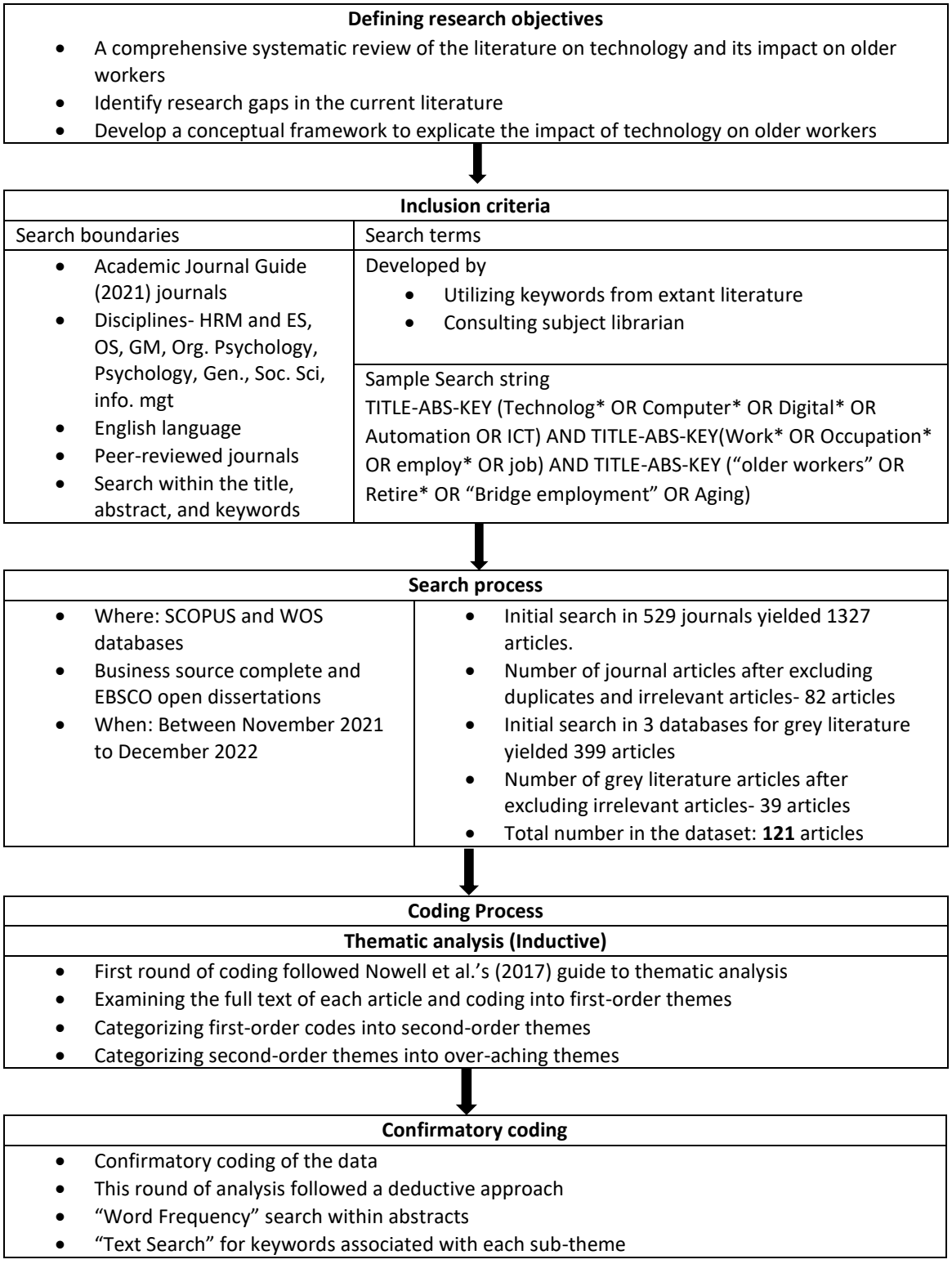

Figure 2.1: Schematic Diagram of Methodology and Data Analysis

The next phase of the analysis involved generating codes from the data. The first round of coding required a thorough reading of each paper to identify the main ideas or concepts discussed. This process included assigning labels to segments of the data based on their primary, descriptive content (Creswell, 2014; Nowell et al., 2017). I then compiled an Excel spreadsheet of first-order codes derived from the dataset. Subsequently, I categorized these first-order codes into second-order codes. In the second-order coding, my aim was to refine the first-order codes into broader categories to uncover patterns and relationships within the data (Creswell, 2014). For example, first-order codes such as "digitally literacy" and "proficient in computer-based tasks" were grouped into the second-order category "digital skills."

The next stage involved examining the codes and searching for overarching themes. This process required a detailed review of the first-order and second-order codes to identify broader patterns and relationships that could unify the data into coherent themes (Nowell et al., 2017). By analyzing the connections between different codes, I aimed to discover the underlying themes that captured the essence of the data and provided deeper insights into the research questions. Some of the broader themes include "socio-demographic factors," "cognition," and "training and development."

The next stage in the thematic analysis involved reviewing and revising the themes to ensure they were reflective of the dataset. Following this, the next round of analysis involved establishing the confirmability of the themes derived from the dataset. Confirmability is "concerned with establishing that the researcher's interpretations and findings are clearly derived from the data" (Nowell et al., 2017, p.3). One of the ways I

sought to establish confirmability was to ascertain that the themes I devised reflected the main topics and concepts in the raw dataset. To do this, I imported an Excel spreadsheet that contained the abstracts and keywords of the papers into NVivo. It is important to note that because initial themes had already been developed, this round of analysis followed a deductive approach, which involved testing already developed themes against the data (Azungah, 2018).

I conducted a word frequency search in NVivo, and I was able to identify the 100 most frequently occurring words in the dataset. I used the stemmed search (which finds words with the same beginning; for example, technology would also capture technological, technologies, technologically, etc.). I excluded words such as "effects" and "studies," which did not have meaning within the research context, and reorganized the remaining words to reflect topics that took precedence in the dataset. Table 2.1 presents a summary of the 12 most frequently occurring words in the raw dataset. An examination reveals some correlation with the overarching themes. For example, the appearance of 'training' and 'development' as one of the most frequently occurring words in the raw dataset gives credence to the inclusion of 'training and development' as one of the overarching themes.

Additionally, to support the validity of the coded themes, I conducted a "text search" of the overarching themes in NVivo. Text search queries help to find all occurrences of a word, phrase, or concept in the dataset. The aim was to see if searching for keywords associated with a particular theme would capture the relevant papers. It was also a way to make sure that each theme had sufficient data to support it (Nowell et al.,

2017). In most cases, the search results captured the correct papers. However, in a few instances, I found that some themes substantially overlapped with others. In these cases, I merged the overlapping themes to create more coherent and comprehensive categories. As one example, 'job security' and 'employability' were initially distinct themes but were merged as there were significant overlaps between both themes.

To improve the systematicity, communicability, and transparency of the coding process, a PhD student in human resource management reviewed a subset of the coding frame to ascertain inter-coder reliability (O'Connor & Joffe, 2020). I reached a 95 percent agreement with the student, and we were in total agreement after meeting to resolve our discrepancies. Once the themes were validated and finalized, the next step was to identify gaps and areas for further investigation. This involved a thorough examination of the coding structure, themes, and research methodology derived from the dataset. By critically analyzing the existing themes, I aimed to identify aspects that were underrepresented or not fully explored. This process included reviewing the literature for any emerging trends or unanswered questions that could point to areas needing further research. A schematic representation of the methods is presented in Figure 2.1.

Table 2.1: Word Frequency Search

Word	Count	Similar Words
older	164	older
work	156	work, worked, working
workers	149	worker, workers, workers', workers’
technology	135	technological, technologically, technologies, technology
employment	85	employ, employability, employed, employer, employers, employers', employers’, employment
training	70	train, trained, training
aging	69	age', aged, ageing, ages, aging
computers	65	computer, computers, computing
differently	61	differ, difference, differences, different, differently, differing
change	56	change, changed, changes, changing
employees	54	employee, employees, employees', employees’
development	51	develop, developed, developing, development, developments, develops

2.2 RESULTS

The results of the analysis are structured as follows. First, I present the results of the thematic analysis of the data. The themes were categorized according to the research questions I sought to answer in this review. As noted earlier, these themes were inductively developed from the 121 papers included in the dataset. Table 2.2 presents a summary of the thematic analysis of the data. I also propose a conceptual framework that shows the relationship between individual and organizational factors and the outcomes associated with older workers' experiences with technology (see Figure 2.2). Secondly, I

present the results of a descriptive analysis of the data (see Tables 2.3 and 2.4), which includes summarizing the data based on journals, publication dates, data type, country of origin, and research methodology. Finally, I identify gaps in the literature (See Table 2.5 for a summary of research gaps) and provide suggestions for future research.

Table 2.2: Thematic Analysis

Themes	**Sub-themes**	**Total (out of 121 papers)**
INDIVIDUAL-LEVEL FACTORS		
Socio-demographic factors	*Age differences*	54
	Gender differences	
	Socioeconomic status differences	
Cognition	*Cognitive abilities*	20
	Cognitive dexterity	
	Cognitive impairments	
Psychosocial factors	*Individual and personality traits*	15
	Motivation	
	Self-efficacy	
ORGANIZATIONAL-LEVEL FACTORS		
Training and development	*ICT training*	53
	Training design	
	Training transfer	
	Training effectiveness	
	Inter-generational learning	
	Training motivation	
	Computer-based training	
Organizational fairness	*Age discrimination*	28
	Age diversity	
	Skill diversity	
	Digital divide	
	Age stereotypes	
Job design and work characteristics	*Work autonomy*	28
	Socio-technical systems	
	Computer-supported cooperative work	
	Computer-based tasks	
	Digital work intensification	
	Workplace safety	26

Themes	Sub-themes	Total (out of 121 papers)
Workplace safety and ergonomics	*Workplace accommodations*	
	Ergonomics	
Work arrangements	*Remote work*	18
	Blended work	
	Gig work	
Job demands	*Physical demands*	16
	Mental demands	
	Technology-mediated interruptions	
OUTCOMES		
Employability and job security	*Employability*	55
	Labour and skill shortages	
	Job vulnerability	
	Job elimination/replacement	
Attitudes to technology	*Technology acceptance*	44
	Technology use	
	Resistance to technology	
Health and wellbeing	*Technostress*	26
	Telepressure	
	Perceived work ability	
	Physical and mental health	
Performance	*Job performance*	22
	Task competency	
Retirement	*Retirement timing*	20
	Retirement decisions	
	Retirement transitions	

2.2.1 Thematic Analysis

2.2.1.1 Individual-Level Factors Impacting the Experiences of Older Workers Within the Changing Technological Work Environment

In this review, I sought to examine and highlight the key individual-level factors impacting older workers' experiences with technology and technological change. I discuss these factors below.

Socio-demographic factors. The review of the data showed that 54 of the 121 papers (~45%) examined issues related to how different socio-demographic factors such as age, gender, and socio-economic status influence the work experiences of older workers with technology. More specifically, analysis of the data revealed that a significant number of studies (n= 43) have examined how age differences impacted workers' interactions with technology. As one example, Czaja and Sharit (1994) investigated differences between three age groups (younger, middle-aged, and older) in the performance of a computer-based task and the extent to which task experience influenced this relationship.

The prevalence of such studies in the literature is not surprising given that debates persist around whether perceived differences between older and younger workers' interaction with technology emanate from biases or are based on empirical evidence (Wandke, Sengpiel, & Sonksen, 2012). In my review of the literature, I noticed inconsistencies in what age groups are deemed older workers. In some studies, older workers were classified either as individuals 45 years or older (Marquie et al., 1994), 50 years or older (Turek & Henkens, 2020), or between 60-75 years (Czaja & Sharit, 1998). A lack of consistency in the population samples might inhibit the possibility of drawing generalizations or conclusions across different studies (Shadish et al., 2002). Hence, the field would benefit from a consistent definition. Therefore, this presents the first research gap:

Research Gap #1: A need for consistent definitions of older workers across different studies.

Apart from age differences, the analysis revealed that researchers have examined other demographic factors. However, they represent a smaller sample than those investigating age differences. As an example, a smaller proportion of scholars studied the impact of gender (n=5) and socioeconomic differences (n=6) on older workers' experiences with technology in the workplace. Others have examined whether socioeconomic status or the gender of older employees influences their experiences within the changing technological environment (Angrisani et al., 2017; Melchers & Basch, 2022; Smeaton & White, 2018; White & Smeaton, 2016). However, the analysis reveals that these factors have not received the same level of attention in the literature. I identify this as research gap 2.

Research Gap #2: The need for more examinations of the different socio-demographic factors that influence older workers' experiences with technology.

Furthermore, the results of the review showed that not only has age-related demographics dominated the literature, but the impact of other socio-demographic factors, such as race and socioeconomic status, have been examined in isolation. A siloed examination of these different socio-demographic factors is insufficient to understand the nuanced experiences of older workers with technology in the workplace (Umeh, Cornelius & Wallace, 2023). Future studies should examine the interplay between the different socio-demographic factors that influence older workers' unique experiences. Doing this can also offer insights into equity, diversity, and inclusion issues that older workers face in their interactions with technology (Ma, 2017).

Scholars can achieve this by adopting an intersectional perspective to studying older workers. Intersectionality recognizes that individuals' experiences are shaped by the intersection of various social categories such as race, ethnicity, socioeconomic status, and sexual orientation (Weil, 2023). Therefore, using this lens can provide researchers with a deeper understanding of the unique experiences of older workers as they navigate the rapidly changing technological work environment. For example, future research could investigate the impact of factors such as educational background, race, ethnicity, and financial status on older workers' interactions with technology. By exploring these dimensions, researchers can uncover how these intersecting factors influence the adaptability and experiences of older workers in the context of technological advancements. This approach can help identify specific challenges and opportunities for different demographic groups, thereby informing more inclusive policies and practices in the workplace. Following this, I propose research gap 3.

Research Gap #3: More studies that adopt an intersectional approach to examining older workers' experiences with technology in the workplace are needed.

Cognition. The analysis of data in the sample showed that differences in cognitive abilities had a role in influencing older workers' experiences with technology. Twenty of the 121 papers in the data set (or ~17%) examined cognitive-related factors that influence older workers' interaction with technology. These factors include psychomotor skills (refers to the ability to execute movement tasks that require both cognitive and motor processes), visuomotor skills (refers to the ability to translate a visual image, or a visual plan, into an accurate motor action), and memory (Czaja & Sharit,1998). The results of

the analysis revealed that these factors influence older workers' task performance, training performance, and ability to successfully transfer training (Birdi et al., 1997; Czaja & Sharit, 1998; Dalecki et al., 2017). The review also revealed that age is positively related to cognitive decline. Therefore, as older workers age, they are more predisposed to suffer declines in cognitive function that could affect their interactions with technology.

Psychosocial factors. The analysis suggests that certain psychosocial factors impact the experiences of older workers with technology in the workplace. The review of the data highlighted motivation (n=7), self-efficacy (or an individual's belief in their ability to perform a specific task (Bandura et al., 2012)) (n=6), and personality traits (n=2) as some of the psychosocial factors that play a pivotal role in shaping how older workers engage with, and adapt to, the changing technological work environment. In my review, I found that motivation, both intrinsic and extrinsic, significantly influences older workers' attitudes to technology (Fasbender, 2022), intention to train or retrain (Charness, 2019), and digital skills development (Kase, Saksida & Mihelic, 2019). Additionally, the review supports that general self-efficacy, which is a person's perception of their ability to perform tasks across various contexts (Taylor & Bisson, 2022), significantly influences older workers' performance and creativity. Additionally, other forms of self-efficacy, such as computer self-efficacy, defined as individuals' beliefs about their ability to use computers to solve tasks successfully (Artis, 2005), and internet self-efficacy, which refers to the belief in one's capabilities to organize and execute internet-related actions to achieve specific outcomes (Schuster & Cotten, 2022), influenced older workers' performance and creativity (Tams & Dulipovici, 2022).

Although fewer papers (n=2) examined the impact of personality traits on older workers' experiences, they found that individual and personality traits contribute to the diverse ways older workers approach technology (Angrisani et al., 2017). For instance, older workers with higher levels of openness to experience may be more likely to embrace new technologies and integrate them into their work routines compared to those with lower levels of openness. Indeed, an understanding of the role personality traits play in older workers' attitudes and reactions to technology might be beneficial in aiding employers design and implementing strategies to effectively integrate older workers into rapidly digitalized workplaces. Pursuant to this, I present research gap 4.

Research Gap #4: The *need for future studies to investigate the role of personality differences in older workers' experiences with technology.*

2.2.1.2 Organizational-Level Factors Impacting the Experiences of Older Workers Within the Changing Technological Work Environment

This section presents and discusses the key organizational-level factors impacting older workers' experiences with technology and technological change.

Training and development. Analysis of the data revealed that 53 papers (or ~44%) examined issues related to training older workers to use technology. Given the pervasiveness of ICT in the workplace and the need to acquire digital skills, it is not surprising that this was a prevalent theme. Among the topics investigated include skill development initiatives (Ford & Orel, 2005), training design (Charness & Czaja, 2018), safety training (Wallen & Mulloy, 2006), and inter-generational learning initiatives (Kase et al., 2019). Most studies examined training in relation to the use of new technology in

the workplace (McCausland et al., 2015; Weathersby-Holman, 2021). However, some studies also examined the use of computer-based methods in training older workers. For example, Wallen and Mulloy (2006) examined the effectiveness of using a computer-based approach in occupational health and safety training for older workers. Furthermore, my analysis of the literature revealed that organizational support for training and development can mitigate age-related stereotypes and biases, promoting a more inclusive workplace (Van Yperen & Wortler, 2017).

In my review of the literature, an important gap related to the technological training of older workers emerged. The results of the review revealed that only four of the 53 papers examining topics around training studied older workers' transfer of technological training. Transfer of training refers to the extent to which employees use the acquired knowledge, skills, and abilities (KSAs) from a training program back to their jobs (Baldwin & Ford, 1988; Newstrom, 1986). Given the pivotal role of training transfer in training effectiveness and job performance (Taylor & Bisson, 2022; Wolfson, Cavanagh & Kraiger, 2014), this is a significant gap in the literature. The rapid increase in workplace automation also requires older workers to undergo training regularly; hence, it is imperative that employers are aware of the best approaches to improve the transfer of training for older workers. Therefore, I propose research gap 5.

Research Gap #5: More studies that investigate factors that can influence and improve older workers' transfer of technological training are needed.

Organizational fairness. Organizational fairness is one of the predominant factors affecting older workers' experiences with technology in the workplace. I found 28 papers

examining the importance of organizations providing a fair and equitable workplace for older workers. Age discrimination founded by ageist biases and stereotypes remains a critical issue facing older workers in relation to their experiences with workplace automation (Thomas & Biermeier-Hanson, 2021). In this sample, 18 articles examined issues related to the impact of technology on the discrimination of older workers.

The review revealed that although there are laws that should protect older workers from discrimination, such as the Canadian Human Rights Act and the Age Discrimination in Employment Act (ADEA) of the United States, older workers still suffer from systemic biases and age-typing (McDermott & Goldberg, 2018; Perry & Finkelstein, 1999). Research has shown that age discrimination has negative effects on older workers' psychological attachment (Venz & Woehrmann, 2022) and employability (Turek & Henkens, 2020). The review suggests that organizations need to create a work environment that thrives on diversity. Creating this equitable, diverse, and inclusive work environment encompasses different dimensions of diversity, including age and skill diversity (Mothe & Nguyen-Thi, 2021).

Workplace safety and ergonomics. My review of the literature suggests that as the workforce continues to age, the impact of workplace safety, accommodations, and ergonomics on older workers' experiences with technology becomes increasingly crucial. Indeed, 26 papers examined topics related to workplace safety and ergonomics and their impact on older workers' interactions with technology in the workplace. This highlights the importance of organizations paying attention to the diverse needs of their employees, which include the provision of ergonomic workspaces (Bartha et al., 2015; Gonzalez &

Morer, 2016) and the implementation of safety measures (Aleksandrowicz et al., 2014; Wallen & Mulloy, 2006). My review of the literature also suggests that accommodations for older workers must go beyond mere physical safety and should also address cognitive and sensory needs (Thompson & Mayhorn, 2012). Furthermore, organizations need to prioritize making workplace technologies accessible by making digital interfaces and communication tools more accessible through features like adjustable font sizes, screen readers, and closed captioning (Schneider et al., 2008; Williams, Sabata & Zolna, 2006). Potential changes in manual dexterity can be addressed through the use of alternative end-user interfaces. Multiple options, such as keyboard input, mouse manipulation, touchscreen use, adjustable sensitivity settings, or voice commands, can accommodate diverse user needs. As technology becomes increasingly ubiquitous, these interface options may help reduce the physical and cognitive demands of technology use and facilitate broader adoption.

Job design and work characteristics. In total, 28 papers (or ~23%) highlighted job design and work characteristics as critical aspects of ensuring a positive and productive work environment for aging workers (Beier, Torres & Beal, 2020). Several factors significantly influence older workers' experiences within the changing technological landscape. These include socio-technical systems, which emphasize the interaction and interconnectedness between people and technology in workplaces (Popkin et al., 2008); computer-supported cooperative work, which focuses on how computer systems can support collaborative activity and coordination in organizations (Convertino et al., 2007); work autonomy (Van Fossen et al., 2022); and digital work intensification

(Borle et al., 2021).The review showed that increased automation has changed the way older workers carry out different tasks (White & Smeaton, 2016). The papers reviewed showed that changes in job content or task design due to technological changes can be challenging for older workers, as they often constitute additional workload or demands (Blank, Laflamme & Diderichsen, 1996; Van Fosse et al., 2022). The review also revealed that the additional job demands from changes in job design often emanate from the need to undergo skill upgrades (Hamlin & Leslie, 2019).

Job demands. The review of the literature (n=16) indicates that while technology has its benefits, it can pose some challenges to older workers. As an example, the potential increase in workload associated with the integration of technology into various job roles can make employees feel overwhelmed (Tams et al., 2022; White & Smeaton, 2016). Technology can introduce new physical demands on older workers. Prolonged use of computers or other digital devices may contribute to ergonomic challenges, potentially leading to musculoskeletal issues (Roossien, 2021). Additionally, technology often requires quick adaptation to changing interfaces, software updates, and evolving digital landscapes. Older workers may encounter challenges in keeping pace with these rapid changes, leading to increased mental and cognitive demands (Sharit, 2019). My review suggests that to decrease some of the additional demands that accompany technology use in the workplace, organizations must foster a work environment that promotes the successful integration of technology for employees of all ages (Sharit & Czaja, 2012).

Work arrangements. As organizations increasingly embrace flexible work models, such as remote work or hybrid work, my analysis revealed from (n=18) papers

that these developments present unique opportunities and challenges for older employees navigating a technologically driven work environment. On the one hand, these arrangements allow older employees to customize their work schedules, potentially easing the physical and cognitive demands associated with traditional work structures (Kristjuhan, 2009). On the other, the introduction of flexible work arrangements also presents technological challenges. Remote work, in particular, requires a strong reliance on digital communication tools, virtual collaboration platforms, and efficient internet connectivity (Sharit et al., 2009). Older workers may face a learning curve in adapting to these technologies, especially if they have not been accustomed to such tools in their earlier career stages (Van der Wal, 2021).

The proliferation of the gig economy and gig work (work that involves short-term or project-based jobs, often for multiple clients at once) also presents older workers with an avenue to flexibly leverage their skills and expertise (Nakayama et al., 2013). A 2023 World Bank report found that workers 55 years and older represent around 3.8% of the global online gig workforce (Datta et al., 2023). Technology platforms that connect gig workers with opportunities have become prevalent, allowing older individuals to engage in meaningful work while maintaining control over their schedules (Arita et al., 2017). For example, platforms like Upwork and Fiverr allow older professionals to offer freelance services such as writing, graphic design, and consulting. These platforms enable them to choose projects that match their skills and interests, set their own rates, and work from home or any location of their choice, thus maintaining a flexible work-life balance.

The emergence of blended and remote work arrangements as a mainstay in numerous organizations, catalyzed by the critical event of the COVID-19 pandemic (Foss, 2021), underscores a paradigm shift in contemporary work practices. Despite the widespread adoption of these arrangements, there remains a notable gap in the literature concerning their nuanced implications and long-term effects on older workers. Pursuant to this, I suggest research gap 6.

Research Gap #6: There is a need for future studies to investigate the adjustment of older workers to evolving work arrangements and the role technology plays in situating them within the new world of work.

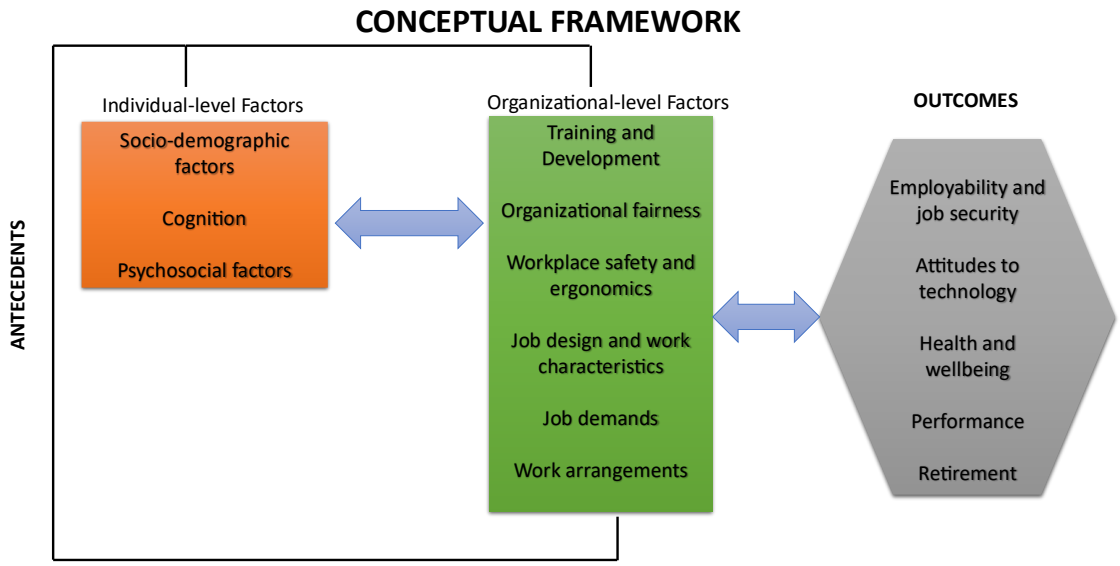

Figure 2.2: Conceptual Framework Explicating the Factors Impacting Older Workers' Experiences with Technology in the Workplace

2.2.1.3 Outcomes Associated with Older Workers' Experiences Within the Changing Technological Work Environment

This section discusses the outcomes associated with older workers' experiences with technology and technological changes in the workplace.

Employability and job security. One of the predominant outcomes I found related to the impact of automation and digitalization on the employability and job security of older workers (Alcover et al., 2021; Savrina & Martisune, 2021). Papers (n=55) that examined these issues comprised 45.45% of the sample. The review showed that job vulnerability or insecurity is a major concern for older workers. Routine tasks that humans once performed are increasingly being automated, leading to a shift in job requirements (Alcover et al., 2021). Older workers who have spent years mastering specific tasks may find themselves at risk of redundancy if their skills become obsolete (Shaw, 2016; Song, 2009). However, several studies focused on exploring various policies and strategies to increase the employability of older workers and combat potential labour market shortages due to a rapidly aging population (Alcover et al., 2021; Henkens, Remery, & Schippers, 2008; Savrina & Martisune, 2021). For example, Van Yperen and Wortler (2017) advocate blended working (a combination of on-site and off-site working, enabled by the utilization of information and communications technologies (ICTs) that provides workers with almost constant access to job-relevant information and coworkers) as a strategy that can help older workers remain in the workforce longer by accommodating their changing needs and preferences.

Attitudes to technology. Studies examining older workers' attitudes towards technology within the evolving technological work environment (n=44) reflect a complex interplay of individual and organizational factors (Elias, Smith & Barney, 2012; Marquie, Thon, & Baracat, 1994). At the individual level, the experiences and backgrounds of older workers significantly influence their attitudes toward technology (Rizzuto, 2011). Those who have had exposure to technological advancements throughout their careers may exhibit greater comfort and adaptability. However, individuals who have not been consistently exposed to evolving technologies might display resistance due to a perceived lack of relevance or unfamiliarity with digital tools (Schuster & Cotten, 2022). As an example, Schuster and Cotten (2022), in their survey of 1142 older adults, found that employed older workers, compared to retired older adults, had higher online self-efficacy, more positive attitudes towards new technology, spent more time online, and were more likely to use more ICTs.

Organizational factors also play a crucial role in shaping older workers' technology acceptance, adoption, and use (Fasbender, 2022; Taylor & Bisson, 2022). The accessibility and quality of training programs, for instance, impact the ease with which older employees can acquire new skills (Soja & Soja, 2020). My review of the literature suggests that resistance to technology among older workers can be a result of concerns about job security, fear of obsolescence, or a perceived threat to established work routines (Hampel, 2022; Laukkanen et al., 2007).

In my review of organizational factors that influence older workers' attitudes to technology, I discovered a lack of studies that examined the impact of industry-related

differences on the attitudes of older workers to technological change. Different industries or job types experience varying levels of technological change. For instance, trade occupations such as construction might experience low levels of technological change compared to technology-intensive occupations such as software programming (Bartel & Sicherman, 1993). Hence, older workers who are employed in technology-intensive industries where there is an expectation of constant innovation might demonstrate more positive attitudes to technology compared to those in less technology-intensive sectors. Furthermore, older workers employed in industries with high unionization rates might have different attitudes to technological change compared to those in industries with lower levels of unionization. In highly unionized industries, where collective bargaining agreements and strong labour representation shape workplace dynamics, the interplay between older workers and technology may manifest in distinct ways compared to relatively non-unionized industries (Kostol & Svarstad, 2023). Considering this, I present research gap 7.

Research Gap #7: A need for future research to examine industry or job type differences in older workers' interactions with and attitudes to technology.

Health and wellbeing. My data analysis indicated that the changing technological work environment has both positive and negative implications for the health and well-being of older workers. Papers (n=26) showed that one significant concern is technostress, a term coined to describe the negative psychological and physiological impacts of technology use (Van Fossen et al., 2022). Older workers, who may not have grown up in a digital era, can experience higher levels of technostress as they grapple

with learning and adapting to new technologies (Tams, 2017). The review also revealed that working with technology has the potential to impact the physical, and psychological well-being of older workers (Sharit et al.,1998; Tams, 2017; Tams & Hill, 2017). For example, Borle et al. (2021), in a study examining the relationship between digital work intensification and older workers' physical health, mental health, and work ability, found that digital work intensification may be associated with worse mental health and work ability. Work ability[9] refers to an individual's subjective perception of their ability to perform their job effectively, taking into account their physical, cognitive, and emotional capacities (Ilmarinen, 2009). Although, workers' perceptions of their work ability are a significant predictor of work-related outcomes such as employee engagement and turnover intentions (Tomietto et al., 2019), a review of the literature revealed that studies that examined the impact of technology on the work ability of older workers are scant. Therefore, I suggest research gap 8.

Research Gap #8: Research examining the relationship between technology and older workers' work ability warrants attention.

Performance. Papers (n=22) that examined the impact of technology on the performance of older workers made up ~18% of the sample. Some of the topics examined around performance include competency (Birdi et al., 1997), performance evaluation (Czaja & Sharit, 1998), and task performance (de Koning & Gelderblom, 2006). The review revealed that a substantial number of studies (n=15) examined issues around the

[9] Unless otherwise stated, all references to "work ability" in this thesis refer to participants' perceived work ability—i.e., their self-assessed capacity to meet the cognitive, emotional, and physical demands of their job.

competence of older workers in using new workplace technologies. The analysis also showed that technology has the tendency to either positively or negatively impact the job performance of older workers, depending on explanatory variables such as ICT exposure (Borle et al., 2021), technology design (Virokannas et al., 2000), and job type (de Koning & Gelderblom, 2006).

Retirement. The analysis of the data showed that technology in the workplace has myriad effects on the career transitions of older workers, specifically regarding their retirement decisions. In the sample, 20 papers (or ~17%) examined the impact of technology on the retirement of older workers. Some of the issues investigated include retirement timing (Mertens & Romeu-Gordo, 2021), retirement transitions (Hesketh, Griffin, & Loh, 2011), and bridge employment (which refers to labour participation pattern of retirees, whereby they engage in full or part-time work after regular full-time employment and before complete withdrawal from the workforce (Van Yperen & Wortler, 2017). Given the rapidly aging population and labour shortages, there is a growing need to extend the labour participation of older workers (Haas & Höflmayr, 2019; Burke & Ng, 2006). My review revealed that the technological work environment has varying effects on the labour participation of older workers. However, the review of the literature showed that knowledge gaps still exist in understanding the underlying factors at play in this relationship, especially regarding older workers' decisions to continue working. In view of this, I propose research gap 9.

Research Gap #9: Further research examining the factors and mechanisms that impact the relationship between the changing technological environment and the retirement decisions of older workers is needed.

2.2.2 Descriptive Analysis

As mentioned earlier, I also analyzed the data according to journals, geographical regions, research methodology, and publication dates. I present the result of this analysis in the following sections.

Table 2.3: Articles by Journals and Discipline

Journal	**n**	**AJG Rankings (2021)**
Organizational Psychology		
Personnel Psychology	2	4*
Journal of Vocational Behavior	2	4
Journal of Occupational and Organizational Psychology	1	4
Work and Stress	1	4
Applied Ergonomics	3	3
Ergonomics	2	3
Journal of Business and Psychology	1	3
Accident Analysis and Prevention	1	3
Occupational and Environmental Medicine	1	3
Applied Psychology	1	3
International Journal of Selection and Assessment	2	2
International Archives of Occupational and Environmental Health	2	2
International Journal of Industrial Ergonomics	2	2
Organizational Psychological Review	1	2
Journal of Safety Research	1	2
Work	6	1
International Journal of Occupational Safety and Ergonomics	3	1
Journal of Rehabilitation	1	1
Human Factors and Ergonomics in Manufacturing	1	1
Gedrag en Organisatie	1	1
Journal of Career Development	1	1
Occupational medicine	1	1
Journal of Employment Counseling	1	1
Subtotal	38	

Journal	n	AJG Rankings (2021)
HRM and Employment Studies		
Work, Employment and Society	2	4
Human Resource Management	1	4
Human Resource Management review	3	3
International Labour Review	1	3
International Journal of Human Resource Management	1	3
Work, Aging and Retirement	6	2
International Journal of Manpower	2	2
Journal of Labour Research	1	2
International Journal of Management Reviews	1	3
Gender, Work and Organization	1	3
European Management Journal	1	2
Labour	3	1
Subtotal	20	
Information Management		
Journal of the Association for Information Systems	1	4*
European Journal of Information Systems	1	4
Information Systems Frontiers	1	3
Behaviour and Information Technology	6	2
Computers in Human Behavior	3	2
Journal of Enterprise Information Management	2	2
Journal of Enterprise Information Management	1	2
Australasian Journal of Information Systems	1	1
Subtotal	16	
General Management		
International Journal of Management Reviews	1	3
European Management Journal	1	2
Gender Work and Organization	1	3
Subtotal	3	
General Psychology		
Journal of Experimental Psychology- Applied	1	4
Subtotal	1	
Organizational Studies		
Human Relations	1	4
International Journal of Organization Theory and Behavior	1	1
Subtotal	2	
Social Sciences		
British Journal of Sociology	1	3
International Journal of Sociology and Social Policy	1	1
Subtotal	2	
TOTAL	**82**	

Journals. One of the inclusion criteria of this review was that the articles that were published should be published in journals listed on the AJG 2021 journal rankings. Table 2.3 presents a summary of peer-reviewed articles by journal and discipline. The results of the analysis showed that the journals with the most publications on the current topic were "Work, Aging, and Retirement," "Behavior and Information Technology," and "Work," with six publications each (two times more publications than the next closest journal).

Regarding discipline, as shown in Table 2.3, this topic has received the most attention in Organizational Psychology (n=38), HRM (n=20), and Information Management (n=16) journals. Together, these disciplines represent 90.2% of the sample. These results suggest that (1) HRM, Organizational Psychology, and Information Management have clearly provided the most contribution to the topic of technology and older workers, and (2) there is a need for increased examination of this topic in other fields/disciplines. From this analysis, I examine the dominance of these disciplines through a dual lens. On the one hand, I consider these disciplines to be fertile ground for topics on technology and older workers. On the other hand, this demonstrates the need for increased coverage of the topic across journals and disciplines. The results of the review showed that while publications in Information Management, HRM, and Organizational Psychology journals made up 90% of the sample, disciplines like General Psychology made up just less than one percent of the sample. I recognize that the current topic might lend itself to the narrow focus of some of the HRM or Organizational Psychology

journals. However, the topic of technology and older workers can benefit from a wide range of disciplinary perspectives. Hence, I propose research gap 10.

Research Gap #10: The necessity to widen the coverage of the current literature to include more interdisciplinary perspectives.

In terms of the ranking of the AJG 2021 journals, 13 (~16%) of the articles were published in journals ranked 4*, or 4, 17 (~21%) in journals ranked 3, 31 (~38%) in journals ranked 2, and 21 (~26%) in journals ranked 1. These results show that research on the topic of technology and older workers has received the least attention in journals ranked 4* or 4. This shows that although these journals might be the most preferred outlet for many scholars, journals ranked 2 or 1 (~63%) have been more prolific in publishing research on this topic. Therefore, I identify research gap 11.

Research Gap #11: *That there is a need for increased coverage of this important topic in higher-rated journals on the AJG 2021 list.*

Geographical region. Table 2.4 summarizes the different geographical contexts in which the topic of technology and older workers has been explored. The data revealed that of the 81 papers where I could code the country, 33 (~41%) were examined in the North American context (specifically USA and Canada), 33 (~41%) were within European contexts, 5 (~6%) within Asian contexts, and 2 (~3%) in Australia. I could not find a single study that examined the topic of technology and older workers within the South American and African contexts. Furthermore, relative to North American and European contexts, Asia and Australian contexts have received little attention.

Admittedly, the limited representation of other contexts could emanate from the fact that most journals reviewed in this study are published in English. Nonetheless, while remaining cognizant of this bias, these findings still indicate that research on technology and older workers in English language journals has been skewed toward Western, Educated, Industrialized, Rich, and Democratic (WEIRD) countries. Evidently, the current literature does not present a globalized view of the topic. Following this, I pinpoint research gap 12.

Research Gap #12: The need for future studies to examine this topic within a wider array of geographical and cultural contexts.

Table 2.4: Descriptive Analysis

	Total number (out of 121 papers)	**Journals (out of 82 articles)**	**Grey literature (out of 39 articles)**
Geographical region (n=81)			
North America	33	24	9
Europe	33	26	7
Asia	5	–	5
Australia	2	–	2
Publication dates (n=121)			
1953-1962	1	1	–
1963-1972	–	–	–
1973-1982	-	-	–
1983-1992	2	2	
1993-2002	18	18	-
2003-2012	36	28	8
2013-2022	64	33	31
Research Methodology (n=81)			
Quantitative	60	51	9
Qualitative	12	6	6

	Total number (out of 121 papers)	Journals (out of 82 articles)	Grey literature (out of 39 articles)
Mixed methods	9	1	8
Cross-sectional data	32	26	6
Longitudinal data	6	5	1
Laboratory experiments	15	13	2
Field experiments	3	3	–
Vignette experiments	1	1	–
Experience sampling	1	1	–
Observational field study	1	1	–
Case studies	5	3	2
Interviews	6	2	4
Focus groups	1	1	–

Research methodology. Analysis of the data revealed that the methodology used in the studies was dominantly quantitative in nature (with 60 of the 121 papers, compared to 40 conceptual papers and 12 qualitative papers). The summary of the specific methodologies showed that 32 studies were cross-sectional, 19 were experimental, 9 were mixed-methods, and 6 were longitudinal. These results present some research gaps. First, I see that quantitative studies have dominated the current literature on technology and older workers, and this could be because of the heavy quantitative focus of HRM, Organizational Psychology, and Information Management journals, as noted earlier. Employing more qualitative studies will help researchers gain more in-depth insights into the lived experiences of older workers with technology (Gubbins & Rousseau, 2015).

Second, research on this topic has heavily relied on single-time cross-sectional data compared to longitudinal data (n=6). Employing more longitudinal or experimental designs can improve the causal inferences derived from these studies. Additionally, longitudinal and time-lagged studies will also help increase internal validity and methodological rigor and combat measurement error issues such as common method and self-report biases (Aguinis & Bradley, 2014; Gubbins & Rousseau, 2015). Consequently, the analysis of the research methodologies employed in the extant literature presents research gaps 13 and 14.

Research Gap #13: The need to increase the use of qualitative methods in this research area.

Research Gap #14: *The need for future research to use more longitudinal, time-lagged, or experimental studies in examining this topic.*

Publication dates. A summary of the articles by publication dates (see Table 2.4) reveals a notable evolution in research interest over time. While only one journal article was published between 1953 and 1962 (Tannenbaum & Grenholm, 1962), the field remained largely dormant in the subsequent two decades, with no recorded publications from 1963 to 1982. However, scholarly interest began to emerge in the late 1980s and early 1990s, with two journal articles published between 1983 and 1992 and a more significant jump to 18 journal publications between 1993 and 2002. This upward trend continued into the 2000s and 2010s, with a marked expansion in both journal and grey literature sources. Notably, the last decade (2013–2022) shows the highest publication volume across both sources, signaling increased scholarly and practical attention to this

topic. The pattern suggests a growing recognition of the complex relationship between technology and older workers, reflecting both academic momentum and broader societal relevance.

Table 2.5: Summary of Research Gaps

Research Gaps	**Summary**
Research Gap #1	The need for a consistent definition of older workers across different studies in the literature.
Research Gap #2	The need for a consistent definition of older workers across different studies in the literature.
Research Gap #3	The need for more examinations of the diverse socio-demographic factors that influence older workers' experiences with technology.
Research Gap #4	More studies that adopt an intersectional approach to examining older workers' experiences with technology in the workplace are needed.
Research Gap #5	A need for future studies to investigate the role of personality differences in older workers' experiences with technology.
Research Gap #6	More research that investigates factors that can influence and improve older workers' transfer of technological training is needed.
Research Gap #7	There is a need for future studies to investigate the adjustment of older workers to evolving work arrangements and the role technology plays in situating them within the new world of work.
Research Gap #8	A need for future research to examine industry or job type differences in older workers' interactions with and attitudes to technology.

Research Gaps	Summary
Research Gap #9	Research examining the relationship between technology and older workers' workability warrants attention.
Research Gap #10	The need for future studies to examine the factors and mechanisms that impact the relationship between technological change and the retirement decisions of older workers.
Research Gap #11	The necessity to widen the coverage of the current literature to include more interdisciplinary perspectives.
Research Gap #12	Increased coverage of the current topic in higher-rated journals on the AJG journal ranking list.
Research Gap #13	The need for future studies to examine this topic within a wider array of geographical and cultural contexts.
Research Gap #14	A need for increased use of qualitative methods.

2.3 STUDY IMPLICATIONS

The current review offers several implications for scholarship and practice. First, to my knowledge, this study is the first to systematically review the factors impacting older workers' experiences with technology in the workplace. Although scholars (such as Dropkin et al., 2016; Sharit & Czaja, 1994; Taylor & Bisson, 2022) have conducted literature reviews that examine the experiences of older workers with technology, none of them took a systematic approach. This study provides a synthesized picture of the current literature and reveals knowledge gaps that exist in the literature. In this review, I highlighted the prominent themes from previous studies and integrated them to provide a

comprehensive understanding of the current literature. As such, this study provides fertile ground for scholars and practitioners alike.

The current review answers the calls made by researchers (such as Gubbins & Rousseau, 2015; Rousseau & Gunia, 2016) for more evidence-based practice in the management disciplines. Several scholars agree that evidence-based practice is one of the most effective ways of bridging the research-practice divide (Gubbins & Rousseau, 2015; Rousseau et al., 2008; Rousseau & Gunia, 2016). Furthermore, the current study helps address one of the gaps (Research Gap #10) I highlighted in the review by examining the literature through a multidisciplinary lens. Several scholars agree that interdisciplinary research is crucial in broadening and developing our understanding of any area of study, as it transcends some of the limitations of individual disciplines and allows for a deeper and more nuanced understanding of research conclusions (Porter et al., 2006; Siedlok & Hibbert, 2014). Pursuant to this, I integrated perspectives across various management disciplines, specifically Human Resources, Organizational Psychology, Information Management, General Management, General Psychology, and Social Sciences literature.

Another contribution of the current review lies in its broader and more inclusive scope compared to many past studies. Notably, this review includes articles published in journals ranked 1 to 4* on the Academic Journal Guide (AJG) list, whereas previous reviews (e.g., Kutzschbach et al., 2021; Rajagopal et al., 2017) often limited inclusion to journals ranked 2 and above. By expanding the inclusion criteria, the current review addresses a key limitation and mitigates the publication bias that constrained earlier syntheses. Furthermore, in line with best practices for systematic literature reviews

(Siddaway et al., 2019), this study also incorporates grey literature, thereby capturing additional perspectives that might have been excluded from more traditional academic sources.

Researchers suggest that it is not sufficient for a systematic review only to summarize the existing literature; it also needs to synthesize and build on the extant body of knowledge (Siddaway et al., 2019; Snyder, 2019). I contribute to the existing literature by synthesizing existing studies and developing a conceptual framework (see Figure 2.2) that encapsulates the relationship between the individual and organizational factors that influence older workers' experiences with technology and the outcomes of older workers' interactions with technology. I believe scholars can use this framework as a guide in tackling research questions in the future.

Collectively, the factors identified in this review—such as self-efficacy, training, job autonomy, and perceptions of organizational fairness- do not operate in isolation. Instead, they interact in ways that shape how older workers perceive and respond to technological change, ultimately influencing their adjustment outcomes, including their employability, retirement intentions, attitudes to technology, and well-being. As illustrated in the conceptual framework presented in Figure 2.2, these factors can be understood to influence older workers' ability to navigate technological change. For example, the availability of targeted training may enhance self-efficacy, which in turn reduces feelings of inadequacy and fosters continued engagement. Similarly, organizational fairness and autonomy may increase motivation and perceived control, helping older workers approach change with a greater sense of agency.

These patterns suggest the need for a more integrative perspective, one that theorizes how factors across individual, job, and organizational levels dynamically interact to support or hinder technology-related adjustment. While current research often isolates these factors, future studies should explore how they operate in combination. For example, computer self-efficacy may only translate into positive adjustment outcomes when supported by meaningful training opportunities and a psychologically safe work environment. Conversely, high job demands or perceived ageism may undermine even highly motivated older workers. Future research could use moderated or mediated models to investigate these interactions empirically, to identify distinct adjustment trajectories among older workers.

The current study also presents relevant practical implications, especially ensuring that the changing technological work environment is conducive for older workers to thrive. The current review highlights training and development as one of the key organizational-level factors impacting older workers' experiences within the changing technological work environment. Therefore, I suggest that organizations should design and implement training programs that cater to the specific needs and learning preferences of older workers. Organizations need to consider older workers' diverse socio-demographic backgrounds (Melchers & Basch, 2022) and cognitive abilities (Dalecki et al., 2017) to create personalized training initiatives that can enhance their technological competencies and reduce technostress (Tams, 2017; Van Fossen et al., 2022).

The review suggests that fostering a fair and inclusive work environment is crucial for the well-being of older workers. Organizations should regularly assess and promote

fairness in policies, procedures, and resource distribution (Armstrong-Stassen & Schlosser, 2011). Transparent communication about technological changes and opportunities for skill development can enhance perceived fairness, reducing job insecurity and promoting a positive work environment (Turek & Henkens, 2020). From my review, I found that technological changes significantly impact the career trajectory of older workers, especially regarding their retirement timing (Mertens & Romeu-Gordo, 2021). Older workers' experiences with technology and technological changes often inform their decisions to retire early or later (Hesketh et al., 2011). For some, it is also crucial in deciding whether to transition to bridge employment (Van Yperen & Wortler, 2017). Due to issues affecting an aging population, such as labour market shortages, loss of expertise, etc. (Kadefors et al., 2020). It is important that organizations strategize on how to extend the working lives of older workers (Haas & Höflmayr, 2019). I suggest that organizations develop phased retirement programs and flexible work arrangements that allow older workers to transition out of the workforce gradually. This will not only help retain valuable expertise but will also provide a structured pathway for older workers to explore new roles or engage in mentorship activities.

Importantly, the insights from this review provide older workers with a clearer understanding of the multifaceted nature of the challenges and opportunities they face in the evolving technological work environment. Rather than internalizing negative stereotypes or attributing difficulties solely to age, older workers can begin to view their experiences through a broader lens, one that recognizes the impact of organizational practices, access to training, socio-demographic factors, and job design (Van Fossen et al.,

2022; Turek & Henkens, 2020). For example, the review highlights how disparities in digital skills, training access, and age-inclusive policies can shape the experience of technological adaptation. This empowers older workers to advocate not only for training, but for training that is appropriately designed, paced, accessible, and relevant to their actual work tasks. It also points to the importance of seeking out or co-creating learning environments that incorporate intergenerational collaboration, feedback loops, and ergonomic considerations that support sustained engagement.

Finally, the review draws attention to systemic inequities, such as age-based stereotypes, digital divides, and underrepresentation in training, that older workers can collectively challenge (Thomas & Biermeier-Hanson, 2021). By becoming more aware of the broader forces that shape their experiences, they can partner with coworkers, unions, and managers to help shape more inclusive organizational practices and cultures. In this sense, the review supports older workers not just as individual learners, but as change agents who can influence how technology is introduced, taught, and integrated into their workspaces.

2.4 LIMITATIONS AND CONCLUSION

Like all studies, the current review has some potential limitations that future research can further address. First, the review only included papers that were written in the English language. While this is consistent with many reviews in the HR field (Alerasoul et al., 2022; Brown et al., 2019), it does mean that important research published in non-English outlets can be missed. Unfortunately, I am not fluent in other languages. Therefore, I suggest that future studies would benefit from broad, diverse

research teams with the ability to include, and understand, papers written in languages in addition to English.

The second relates to the search strategy, whereby I only searched for key terms within the title and abstracts of articles. This approach is consistent with past research (Bentley et al., 2023; Kutzschbach et al., 2021). While I believe it unlikely that major themes would emerge from an analysis of the full text that was not contained in the abstract and/or title, I cannot rule out this possibility.

Third, some may question why I did not conduct a meta-analysis as a way to examine statistical relationships. However, this was intentional, as I wanted to present a full review of the literature, including conceptual and qualitative papers lacking statistical results. Nonetheless, future studies may wish to conduct a meta-analysis in an attempt to better understand statistical effects.

Another limitation of the systematic literature review concerns the scope of keywords used in the search strategy. While the review followed Siddaway et al.'s (2019) structured approach to maximize transparency and replicability, the reliance on domain-specific terminology (e.g., “older workers”) may have inadvertently constrained the breadth of the literature captured, particularly given the interdisciplinary nature of the topic. In fields such as Information Systems, related concepts are often discussed using alternative terms like “older adults,” rather than “older workers.” This points to a risk of epistemic siloism (Kruglanski, 2001), whereby field-specific conceptual boundaries can obscure overlapping knowledge across domains. While the current review contributes meaningfully to scholarship on aging and technology, future systematic reviews should

adopt an even more interdisciplinary keyword strategy to ensure more inclusive coverage of the existing literature.

In conclusion, the goal of the current review was to systematically synthesize the literature on technology and its impact on the work experiences of older workers. In doing so, I reviewed 121 papers which included peer-reviewed journal articles (n=82) and grey literature articles (n=39). I conducted a thematic analysis in the review and identified some key themes in the current literature. Drawing from the key findings of my review I developed a conceptual model delineating the antecedents and outcomes of older workers' experiences with technology in the workplace. I also summarized the data according to journals, research methodology, geographical region, and publication dates. This provided a descriptive analysis of the literature. Stemming from the thematic and descriptive analysis, I identified 14 gaps in the literature, which helped ground my suggestions for future research. Given the previously noted societal and workplace implications of an aging population, I believe this review offers substantial implications for scholarship and practice and will help advance the research on technology and older workers.

Chapter Three: Study Two

An Examination of the Relationship Between Perceived Technological Change and Older Workers' Retirement Intentions

3.1 LITERATURE REVIEW

3.1.1. Perceived Technological Change and Retirement Intentions

Feldman (1994) defines retirement as "the exit from an organizational position or career path of considerable duration, taken by individuals after middle age, and taken with the intention of reduced psychological commitment to work thereafter" (p.287). Retirement is characterized not only by a physical departure from the workforce but also by a psychological transition, it involves a significant shift in an individual's mental and emotional investment in their work life (Feldman, 1994). While retirement is focused on the actual departure, older workers' retirement intentions refer to their willingness to decrease or withdraw their mental, psychological, and behavioral involvement in their existing jobs, careers, or the workforce (von Bonsdorff et al., 2010; Jiang et al., 2021; Solem et al., 2016).

Although retirement intentions could share some similarities with other forms of employee withdrawal intentions, they should not be confused with other forms of employee withdrawal intentions, such as turnover intentions (Adams & Beehr, 1998). More specifically, while both retirement and turnover intentions involve leaving a job, the underlying motivations and outcomes differ. Retirement intentions reflect a desire for a more concrete disengagement from the work environment, whereas, turnover intentions

imply a shift to a different employment situation, often with the expectation of continuing to engage in work-related activities (Adams & Beehr, 1998; Feldman, 1994).

In the current study, I examine retirement intentions in the context of perceived technological change. Technological change refers to the process of implementing new methods or techniques of production and the diffusion of new inventions or technology throughout the workplace (Godin, 2015). The current study focuses on computer technologies, encompassing a wide range of technologies, including computer hardware (central processing units, graphics processing units, memory, and storage devices), operating systems, application software, networking infrastructure, and internet technologies. Specifically, I focus on employees' perceptions of technological change to reflect employees' subjective evaluations of the frequency of technological advancements in their work environment.

Many jobs require extensive use of technology (Cortellazzo, Bruni & Zampieri, 2019). Hence, the ability to effectively utilize technology to accomplish work-related tasks has become a core requirement for employment (Cortellazzo et al., 2019; Gibbs, 2022), and the resulting knowledge, skills, and abilities (KSAs) requirements for workers have changed, and continue to change (Lee et al., 2008). As one example, it is becoming commonplace for restaurants to utilize technology such as iPads and tablets to take orders and point-of-sale (POS) machines to accept payments (Halvorson, 2023**)**. As such, servers must be comfortable using these technologies to be employable in these restaurants.

Existing studies have examined the relationship between technology and the retirement intentions of older workers from an economic viewpoint (Bartel & Sicherman,

1993; Messe et al., 2014). Some of these studies have highlighted a decline in productivity due to older workers' inability to keep up with technological change as a factor influencing their retirement intentions (Friedberg, 2003; Hudomiet & Willis, 2021; Messe et al., 2014). For instance, Friedberg (2003) notes that rapid technological advancements can render older skills obsolete, leading to a mismatch between the workers' existing competencies and the new demands of their roles. Moreover, one study conducted by Messe et al. (2014) found that older workers who could easily adapt to changes in technology and maintain a high level of productivity were likely to delay retirement. These findings suggest that the ability to stay productive in the face of technological change can be a crucial determinant in extending the working life of older employees.

Other studies have cited labour market and government policies as factors influencing older workers' response to technological change (Coile & Levine, 2007; Lumsdaine & Mitchell, 1999; Yashiro et al., 2022). Pension policies and the availability of social benefits can impact older workers' retirement decision-making in response to technological change (Feldman, 1994). Loose criteria to qualify for unemployment benefits or pension plans that do not reward workers who stay in the workforce longer might incentivize older workers for early retirement. In such cases, there is no incentive to acquire the necessary skills to adapt to technological change (Friedberg, 2003; Yashiro et al., 2022). In comparison, policies that reward workers who delay retirement encourage a positive response to technological change (Yashiro et al., 2022).

Looking at the Canadian context and Canada Pension Plan (CPP), a person can start receiving CPP before the age of 65; however, the monthly amounts received will decrease by up to 36 percent compared to retiring at 70 (Employment and Social Development Canada, 2015). This could encourage workers to delay retirement in the event of technological changes. In contrast, a study by Yashiro et al. (2022), using data samples from Finland, found that older workers who were more exposed to technology were more likely to exit the workforce when they were eligible and able to extend their unemployment benefits until the earliest age for receiving an old age pension.

Some researchers argue that the type of industry or job determines the impact of technological changes on the retirement intentions of older workers (Bartel & Sicherman, 1993; Lee et al., 2008; Messe et al., 2014). A possible explanation for this is that different industries experience varying levels of technological change. Trade occupations such as plumbing or carpentry might experience low levels of technological change compared to technologically intensive occupations such as software programming (Bartel & Sicherman, 1993). Hence, some scholars opine that the expectation of updating knowledge and skills might differ by industry (Lee et al., 2008; Messe et al., 2014). Indeed, Bartel and Sicherman (1993) found a positive correlation between technological change and on-the-job training in industries that experience high levels of technological change. They also found that workers in industries that experience high levels of technological change will find the effort required to retrain and update their skills an attractive career investment and are likely to retire later than their contemporaries in industries with lower levels of technological change.

Previous studies have used theories from economics, such as human capital theory (Ahituv & Zeira, 2011; Bartel & Sicherman, 1993; Hægeland et al., 2007) and the overlapping generations model (Messe et al., 2014) to explain the relationship between technological change and the retirement intentions of older workers. Human capital theory posits that individuals invest in their own education and skills development to increase their productivity and earning potential over their lifetime (Ahituv & Zeira, 2011; Bartel & Sicherman, 1993; Hægeland et al., 2007). According to this theory, older workers may face diminishing returns on investments in new skills due to the shorter time horizon until retirement. Scholars such as Ahituv and Zeira (2011) suggest that the cost of learning new technologies may outweigh the benefits for older employees, leading them to consider early retirement a more viable option.

The overlapping generations model provides another perspective by examining the interactions between different age cohorts within the labour market (Messe et al., 2014). This model suggests that technological advancements can create a competitive environment where more technologically adept workers replace older employees who struggle to adapt. However, Messe et al. (2014) also state that older workers who benefit from skill upgrades and are able to integrate new technologies into their skill set successfully can maintain their competitive edge and postpone retirement. While these theories offer valuable insights into older workers' retirement decision-making from an economic perspective, they do not adequately examine technological change's psychological and physiological impacts on older workers' retirement intentions. To address this gap, I employ the Job Demand-Resources (JD-R) theory (Bakker &

Demerouti, 2017) to explain the relationship between technological change and older workers' retirement intentions.

3.1.2 Job Demand-Resources Theory

The JD-R model was introduced into the literature over 20 years ago (Demerouti et al., 2001). The JD-R model builds on and synthesizes knowledge from several stress and motivation theories, such as the two-factor theory (Herzberg, 1966), job characteristics theory (Hackman & Oldham, 1976), the job demands–control model (Karasek, 1979), the effort-reward imbalance model (Siegrist, 1996), and conservation of resources theory (Hobfoll et al., 2018). However, while previous models have claimed a limited set of job characteristics as crucial predictors of job stress and/or work motivation, the JD-R model is flexible and able to integrate a wide variety of job characteristics (Bakker, Demerouti & Sanz-Vergel, 2023). For example, the job characteristics theory (Hackman & Oldham, 1976) proposes that five core job characteristics (skill variety, task identity, task significance, autonomy, and feedback) have a positive impact on work outcomes through critical psychological states (experienced meaningfulness, experienced responsibility, and knowledge of results), the JD-R model extends this idea and argues that burnout and work engagement may be the result of various job characteristics that include but are not limited to these five characteristics.

Although the JD-R model started out as a relatively simple heuristic, it has matured and evolved into the JD-R theory (Bakker & Demerouti, 2017; Bakker et al.,

2023), which includes specific premises[10] regarding the relationship between job demands and resources, employee work behaviours, and outcomes (e.g., job performance, absenteeism, turnover intentions). The first premise of the JD-R theory is that job characteristics can be divided into two main categories, namely job demands and job resources (Demerouti et al., 2001). Job demands are those physical, psychological, social, or organizational aspects of the job that require sustained physical, cognitive, and/or emotional effort and are therefore associated with certain physiological and/or psychological costs (Demerouti et al., 2001). In contrast, job resources are defined as the physical, psychological, social, or organizational aspects of the job that have motivating potential, are helpful in achieving work goals, regulate the impact of job demands, and stimulate learning and personal growth (Bakker & Demerouti, 2017). While some job demands and resources (e.g., workload, social support) are common among occupations, others are more unique. For example, while emotional and physical demands are more prevalent for nurses, cognitive demands are much more relevant for software developers and scientists.

The second premise is that job demands and resources initiate two distinct processes: a health impairment process and a motivational process (Bakker & Demerouti, 2017). In the health-impairment process, the frequency and intensity of job demands (e.g., work overload, digital interruptions) lead to increased effort, which depletes employees' resources and may lead to burnout, exhaustion, and health problems (Demerouti et al.,

[10] I must note that while I briefly discuss the premises of the JD-R theory, my intention is not to test them but rather to provide some background to the theory.

2001). On the other hand, the motivational process occurs as job resources (e.g., training, social support) satisfy basic psychological needs and promote employee work engagement (Bakker, Demerouti & Sanz-Vergel, 2014).

The third premise is that job demands and resources have multiplicative effects on employee wellbeing and outcomes (Bakker et al., 2023). In essence, job resources can buffer the impact of job demands on strain. Job resources can influence how individuals perceive and think about job demands, potentially moderating their responses during the appraisal process or lessening the harmful health impacts associated with those responses (Bakker, Demerouti & Euwema, 2005). Additionally, job demands enhance the impact of job resources on work engagement; when employees frequently encounter challenging job demands (e.g., work complexity), they can benefit from resources, such as training, to cope with these challenges (Bakker et al., 2023).

The fourth premise suggests that personal resources, such as optimism and self-efficacy, can function similarly to job resources (Bakker & Demerouti, 2017). Personal resources encompass individuals' beliefs about their level of control over their surroundings (Bakker & Demerouti, 2017). For instance, those with high levels of optimism and self-efficacy tend to expect positive outcomes and feel confident in their ability to manage unexpected situations.

The fifth premise suggests that, similar to job resources, personal resources can also moderate the impact of job demands on employee well-being (Bakker et al., 2023). Employees who perceive that they can control their environment tend to have positive self-evaluations about their ability to surmount the challenges of job demands.

Premise six of the JD-R theory is that while job demands and resources influence employee well-being, behaviors, and performance, employees may also proactively optimize their own job demands and resources through job crafting (Bakker et al., 2023). Job crafting refers to employees' discretion to modify their job demands and resources to better align the job design with their abilities and preferences (Tims & Bakker, 2010). When employees are able to make minor adjustments to their daily job demands and resources (e.g., acquiring support and feedback or choosing their workspace), their work engagement and performance improve (Petrou, Demerouti & Schaufeli, 2015).

Premise seven dictates that work engagement can instigate a gain cycle of proactive work behaviours (such as job crafting), job and personal resources, and optimal job demands (Bakker et al., 2023). Specifically, when employees experience work engagement, they are intrinsically motivated to stay engaged and, therefore, start to proactively optimize their jobs (increase resources and optimize demands). Over time, this job-crafting behaviour generates job and personal resources that help employees handle job demands and increase work engagement (Bakker et al., 2023). In other words, work engagement is both an outcome and a predictor of proactive behaviour and job and personal resources (Hobfoll et al., 2018).

Whereas job resources and work engagement can encourage employees to adopt proactive behaviours, premise eight posits that high job demands and strain may lead to maladaptive self-regulation cognitions and behaviours (Bakker & de Vries 2021). Increased job strain can make it harder for employees to concentrate, leading to more

errors (Linden et al., 2005). Additionally, the negative emotions that stress provokes (e.g., anger, irritation) limit employees' thought-action repertoires (Fredrickson, 2001).

Consequently, under consistently high job demands, employees may resort to harmful strategies like self-undermining, creating new obstacles that hinder their performance (Bakker & Costa, 2014; Bakker &Wang, 2020). Over time, employees may enter a loss cycle (Premise nine) (Bakker et al., 2023). Specifically, when job strain manifests as burnout, exhaustion, anxiety, or depression, employees drain their energy resources and resort to dysfunctional coping strategies (Hobfoll et al., 2018). Gradually (over days, weeks, months, or even years), this self-undermining behaviour generates additional job demands, further intensifying job strain. Thus, job strain can be seen as both an outcome and a predictor of dysfunctional behaviours and increasing job demands.

The Job-Demand Resources (JD-R) theory offers a comprehensive lens to understand how the interplay between job demands and resources influences employees' well-being and outcomes (Bakker & Demerouti, 2017). However, I must note that while the theory includes a broad set of mechanisms, such as the dual pathways of strain and motivation, as well as feedback loops like job crafting and self-undermining (Bakker & Demerouti, 2017), the current study draws specifically on the core premise that job demands contribute to strain (e.g., burnout) and that resources can buffer these effects or sustain key outcomes. Indeed, this focused application is consistent with prior research that has adapted the JD-R model to specific contexts or outcomes (Chowhan & Pike, 2023; Lesener, Gusy & Wolter, 2019). Given the study's emphasis on older workers' adjustment to technological change, the model was streamlined to emphasize those

components most relevant to technology-related strain and support mechanisms, allowing for a more targeted examination of the research questions.

In an era of rapid technological advancements, older workers may view the continual need to update skills and adapt to new systems as a considerable job demand (Ragu-Nathan et al., 2008). This sustained pressure can heighten their strain levels, which, in turn, may impact their retirement intentions by encouraging early exit from the workforce. Building on this, I argue that technological changes introduce new job demands that can significantly shape older workers' decisions regarding retirement.

3.1.3 Hypothesis Development

3.1.3.1 Perceived Technological Change and Retirement Intentions: The Mediating Effects of Burnout and Older Workers' Perceived Work Ability

Perceived technological change can constitute additional job demands because it often requires employees to learn new skills, adapt to new work processes, and adjust to new work environments (Carlson et al., 2017; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Ragu-Nathan et al., 2008). Drawing from the Job Demand-Resources (JD-R) theory, technological change can be considered to create additional job demands because it requires sustained effort and can result in physiological and psychological costs for employees (Bakker et al., 2023).

The JD-R theory suggests that job demands can adversely impact employees' well-being and motivation, while job resources can buffer the negative effects of demands and promote positive outcomes (Bakker et al., 2023; Carlson et al., 2017). Several studies

have investigated the impact of technology on employee health and well-being (Borle et al., 2021; Carlson et al., 2017; Chesley et al, 2014; Johnson et al., 2020; Nixon & Spector, 2013). Carlson et al. (2017) found that the increased demands of technology-based job overload and job monitoring were positively related to increased job tension in a sample of 326 full-time employees. Another study conducted by Chesley et al. 2014 on a nationally representative sample of US employees reported that technology use was linked to higher levels of workplace strain and distress through increased work pace, multitasking, and work interruptions. These findings suggest that perceived technological change can increase job demands, leading to negative employee outcomes.

Burnout is one of the most prevailing consequences of increased job demands, and a psychological syndrome of emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment that can occur in any job (Bakker & Demerouti, 2017; Demerouti et al., 2001; Maslach, Schaufeli, & Leiter, 2001). Both contextual and individual factors contribute to burnout. Given that people vary in how they perceive and handle their environments (Lazarus & Folkman, 1984), burnout experiences can differ even among employees facing similar working conditions. For example, Swider and Zimmerman (2010) suggest that neurotic individuals, who tend to focus on the negative aspects of situations and retain negative memories, may be more susceptible to burnout. Conversely, extraverted, agreeable, and conscientious individuals, who are generally open, warm, supportive, and resilient, may be better equipped to manage job demands and, therefore, less likely to experience burnout.

Reviews and meta-analyses reinforce the role of specific situational or organizational factors in contributing to burnout (Alarcon, 2011; Lee & Ashforth, 1996). For instance, Lee and Ashforth's (1996) meta-analysis found that job demands such as role ambiguity, role conflict, role stress, challenging events, workload, and work pressure were significant predictors of exhaustion and depersonalization. In the current study, I argue that perceived technological change is an antecedent of burnout.

In today's work environment, competitive demands to stay updated with the latest hardware, software, and applications have intensified. New applications can take months or longer to learn. Research shows that users may develop technophobia (Nimrod, 2018) or experience aversion, fear, or anxiety when required to use technology they find complex (Ragu-Nathan et al., 2008). The expanded scope and skills required for these technologies can increase task difficulty and lead to ambiguity in performance expectations (Johnson et al., 2020). While some employees may initially approach new applications with enthusiasm, the ongoing need to refresh and update their skills can ultimately contribute to burnout and exhaustion.

Indeed, I expect that the increased job demands arising from perceived technological change will exacerbate older workers' burnout symptoms. Older workers may encounter more difficult learning curves when adapting to new technologies compared to their younger co-workers (Charness & Boot, 2016), and the increased job demands associated with technological change can lead to higher levels of emotional exhaustion and feelings of burnout (Johnson et al., 2020). Perceived technological changes may also introduce ambiguity regarding job roles and expectations, contributing

to burnout by increasing feelings of depersonalization (Berg-Beckhoff, Nielsen, & Ladekjær Larsen, 2017; Ragu-Nathan et al., 2008). Older workers may experience heightened feelings of stress and a reduced sense of personal accomplishment due to the perception that their skills are becoming obsolete in the rapidly evolving digital landscape (Mauno et al., 2019). Maier, Laumer, and Eckhardt (2015), in their survey of over 300 employees, found that technology contributes to work exhaustion and burnout significantly. Another study surveying over 9000 Argentine teachers' responses to changes during the pandemic found that teachers who experienced technological changes that substantially modified their way of working also reported higher levels of stress and burnout (Vargas Rubilar & Oros, 2021). These studies give credence to the JD-R theory's proposition that job demands can instigate a health-impairment process. Extending this idea, I propose that the job demands associated with technological changes may activate a similar health impairment process in older workers, potentially resulting in burnout. Therefore, I hypothesize that:

Hypothesis 1: Perceived technological change will be positively related to feelings of burnout for older workers.

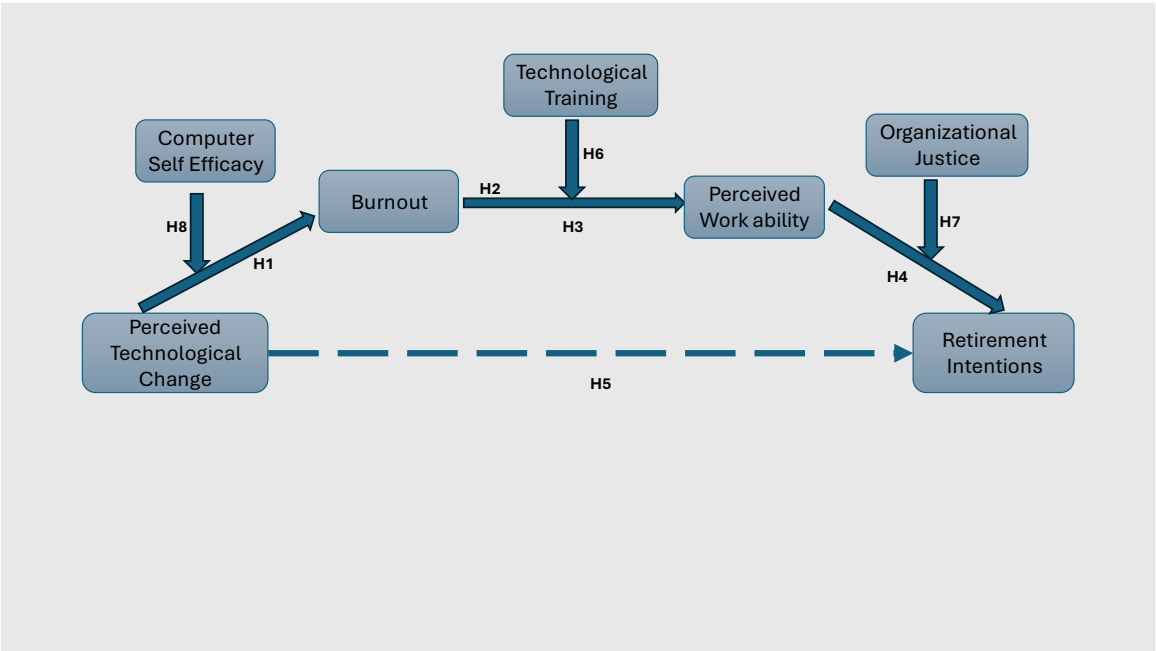

Figure 3.1 is a schematic representation of the hypothesized relationships. Each arrow labeled H1-H8 refers to a specific hypothesis. The broken arrow labeled H5 shows the indirect relationship between perceived technological change and retirement intentions.

Figure 3.1. Figure showing hypothesized relationships

According to JD-R theory, the experience of burnout holds negative consequences for employees (Bakker & Demerouti, 2017). Burnout is linked to health problems and adverse job-related outcomes (e.g. absenteeism, depression). As an example, chronic fatigue is a symptom of burnout; hence, it can be expected that burned-out individuals might exhibit reduced levels of energy and will only invest limited effort in their work. Burnout can alter not only individuals' physical states but also their mental states (Bakker et al., 2023; Tams, 2017; Van Fossen et al., 2022). One of the prescriptions of the JD-R theory is that job strain, such as burnout, can lead to negative cognitive states where

employees internalize self-undermining and self-defeating evaluations of themselves (Bakker et al., 2023). For instance, a burned-out individual making more errors might start to believe that they are not good enough to do their job. Pursuant to this, I opine that burnout will negatively shape older workers' self-evaluations of their ability to excel at their jobs. Specifically, I propose that burnout adversely relates to older workers' perceived work ability.

Perceived work ability refers to an individual's subjective perception of their ability to perform their job effectively, taking into account their physical, cognitive, and emotional capacities (Ilmarinen, 2009; McGonagle, Fisher, Barnes-Farrell, & Grosch, 2015). While it shares some conceptual similarities with constructs such as self-efficacy, work ability is broader, encompassing the individual's health status, skills, and motivation relative to job demands (McGonagle et al., 2015). Although several factors can influence an individual's perceived work ability, one important factor is age. As individuals age, they may experience declines in physical and cognitive function, which can impact their perceived work ability (Tuomi, Ilmarinen, Jahkola, Katajarinne, & Tulkki, 1998). Ilmarinen et al. (1997) conducted a study that examined the changes in the work ability of more than 800 Finnish employees over 11 years and observed that perceived work ability typically declines with age, particularly after 50, a trend attributed to the physiological and psychological changes accompanying the aging process.

However, work ability is not solely influenced by age; job conditions play a significant role as well. According to the Job Demands-Resources (JD-R) theory, job strain arises when job demands outweigh available job resources, and this imbalance can

contribute to diminished work ability (Bakker & Demerouti, 2017). McGonagle et al. (2015) found that high levels of job demands, such as workload, time pressure, and role conflict, can exacerbate strain, leading to lower perceived work ability. While job resources like support, autonomy, and training opportunities can serve as protective factors that help maintain or even improve work ability, especially in demanding work environments (Van den Broeck et al., 2010).

In this current study, I posit that perceived technological change presents additional job demands that can lead to burnout, which could then negatively influence older workers' perceived work ability. Technological change may lead to changes in job tasks and requirements, and workers who cannot adapt to these changes may find their work ability reduced. Although technology can enhance productivity, it can also increase workload and time pressure for older workers (White & Smeaton, 2016). Technology-related job demands such as email overload, constant connectivity, and multitasking expectations can be particularly overwhelming for older employees who may prefer a more structured and focused work approach (Blank et al., 1996; Van Fossen et al., 2022).

According to the JD-R theory, these technology-related demands can trigger a health impairment process in the form of burnout (Bakker et al., 2023). Depersonalization, a key component of burnout, can lead to a reduced sense of personal accomplishment and motivation (Bakker & Demerouti, 2017), causing older workers to question their competence and effectiveness, further eroding their perceived work ability (Hatch et al., 2018; Van den Berg et al., 2009). Van den Berg et al. (2009), in their review of 20 empirical studies that examined the impact of work-related and individual factors

on employees' health and perceived work ability, found that job demands such as physical workload, high mental work demands, and lack of autonomy were negatively related to perceived work ability.

Technological change in the workplace exacerbates these challenges by introducing additional layers of complexity and demands (Borle et al., 2021). Extant studies show that technological change in the workplace poses significant, negative issues for older workers especially regarding their ability to adapt to and engage with new technologies (Birdi et al., 1997; Turek & Henkens, 2020), task performance (de Koning & Gelderblom, 2006) and can lead to increases in feelings of burnout (Sharit et al.,1998; Tams, 2017; Tams & Hill, 2017). These stressors can significantly diminish older workers' perceived work ability, leading them to question their value and effectiveness in the workplace.

Building on the JD-R theory, I propose that older workers' perceptions of their work ability are directly influenced by their burnout experiences (Bakker & Demerouti, 2017). Burnout, as a state of physical and emotional exhaustion, depletes self-confidence and reduces an individual's sense of personal effectiveness—two key elements in assessing work ability (McGonagle et al., 2015). For older workers, who may already feel pressured by the demands of rapid technological changes, the experience of burnout likely exacerbates doubts about their capability to perform effectively. This means that the more burned out an individual feels, the more negatively they evaluate their capacity to meet job demands. Over time, this negative assessment may not only undermine their motivation but also contribute to early retirement considerations, as they may feel less

able to keep up with ongoing workplace requirements. This is consistent with the health-impairment process in JD-R theory, where prolonged job demands strain personal and job resources, leading to a diminished perception of work ability. Consequently, I hypothesize that:

Hypothesis 2: Burnout will be negatively related to older workers' perceived work ability.

Hypothesis 3: Burnout will mediate the relationship between perceived technological change and older workers' perceived work ability.

Research has shown that perceived work ability is an important predictor of several employee outcomes, such as job satisfaction (Lindfors et al., 2007), employee engagement (Tomietto et al., 2019), and turnover intentions (Derycke et al., 2012). Individuals who perceive their work ability to be high are more likely to intend to stay in their job, while those who perceive their work ability to be low are more likely to intend to leave their job (Ilmarinen et al., 1997). Derycke et al. (2012), in a longitudinal study, investigated the relationship between nurses' perceived work ability and their intention to leave their ward, profession, and organization. They found that poor work ability at baseline increased the risk of high intent to leave the ward and organization a year later. Similarly, Oakman and Wells' (2016) study examined the factors influencing Australian public servants' intention to retire and found self-rated work ability to be a strong predictor of retirement intentions. Their results showed that participants who reported higher levels of self-rated work ability were also less likely to intend to retire within five years than those with low levels.

In the current study, I expect that older workers with higher perceived work ability will show a lower intention to retire. Research on retirement suggests that workers may decide to leave their jobs due to “push” or “pull” factors—or a combination of both (Oakman & Wells, 2013; Shultz et al., 1998). Push factors are negative aspects of the work environment that encourage individuals to exit the workforce, such as a stressful workplace or lack of training opportunities. In contrast, "pull" factors are positive attributes associated with retirement, attracting workers away from employment (e.g. desire to spend time with grandchildren). I posit that feelings of burnout, as a result of technological change, is a push factor that may lead to reduced perceived work ability, prompting workers to consider retirement. Ultimately, I suggest that workforce exit decisions stem from an evaluative process in which individuals assess both personal and job characteristics to gauge their work ability, influencing whether they are pushed out of the workforce. Therefore, I hypothesize that:

Hypothesis 4: Older workers’ perceived work ability will be negatively related to their retirement intentions.

Drawing on the JD-R theory, I propose that older workers’ feelings of burnout and perceived work ability act as serial mediators in the relationship between perceived technological change and retirement intentions. According to the JD-R theory, high job demands, such as those imposed by rapid technological advancements, can trigger a health impairment process, leading to burnout as personal and job resources are depleted (Bakker & Demerouti, 2017; Bakker et al., 2023). For older workers, navigating continuous technological updates often intensifies job demands, contributing to feelings

of burnout (Carlson et al., 2017). This burnout may lead to self-undermining cognitive states, diminishing their perceived work ability as they doubt their capacity to meet these evolving demands (Bakker et al., 2023; de Koning & Gelderblom, 2006). As perceived work ability declines, employees assess their capacity to remain effective in their roles, a cognitive evaluation that could ultimately push them out of the workforce (Shultz et al., 1998). When employees perceive their work ability as insufficient to meet the job demands, especially in the face of technological change, they may be 'pushed' toward early retirement as a way to escape the chronic strain (von Bonsdorff et al., 2010; Shultz et al., 1998). Thus, burnout and perceived work ability operate in sequence to mediate the influence of technological change on older workers' retirement intentions. Hence, the current study hypothesizes that:

Hypothesis 5: Older workers' feelings of burnout and perceived work ability will serially mediate the relationship between perceived technological change and their retirement intentions.

3.1.3.2 Perceived Technological Change and Retirement Intentions: The Moderating Role of Technology Training

Technology training encompasses a wide range of educational programs and activities designed to enhance individuals' knowledge, skills, and competencies related to the use of technology, particularly computer hardware, software, and digital tools (Dawson & Rakes, 2003; Lee et al., 2008). Such training aims to equip individuals with the technical proficiency required to effectively utilize technology for various purposes, whether in the workplace, education, or daily life (Dawson & Rakes, 2003; Hsu et al.,

2013; Lee et al., 2008). I propose that technology training is a job resource that can moderate the indirect relationship between technological change and older workers' retirement intentions. Specifically, I propose that technology training can act as a buffer, mitigating the adverse relationship of burnout on older workers' perceived work ability.

According to the buffering hypothesis within the JD-R theory, job resources can alleviate the effects of job strain on employees' well-being and behaviour by moderating the stressor-outcome relationship (Bakker & Demerouti, 2017; Bakker et al., 2023). By providing supportive resources like technology training, organizations can help older workers reframe their response to burnout, lessening its impact on their perceptions of work ability. As previously noted, burnout often results in diminished perceived work ability, particularly among older workers who may feel less capable of adapting to technological demands. Here, technology training serves as a crucial job resource, counteracting the negative self-assessment that burnout triggers and preserving their sense of efficacy and competence in the workplace.

Adequate technology training can not only reduce the perception of technological change as a daunting job demand but also work to maintain or improve older workers' work ability (Beer & Mulder, 2020; McGonagle et al., 2015). Training equips older workers with the skills and confidence needed to navigate new technologies more effectively, thereby reducing burnout (Thomas Craig et al., 2021). One of the ways burnout negatively impacts older workers is by reducing their sense of personal efficacy, which in turn negatively impacts their perceived work ability (Bakker & Demerouti, 2017).

Technology training can boost older workers' perceived work ability by increasing their confidence to perform tasks involving technology (Hsu et al., 2013; Thomas Craig et al., 2021). One of the primary ways technology training can buffer the relationship between burnout and perceived work ability is by providing older workers with the skills and knowledge needed to perform their job tasks efficiently. One experimental study conducted by Cohen and Gagin (2005) on social workers found that workers who underwent skill development training, reported increased levels of personal accomplishment and reduced levels of depersonalization compared to their pre-training levels. Therefore, when older workers receive training, they gain confidence in their technical skills, which reduces the likelihood of negative self-evaluations of their work ability stemming from feelings of burnout (Cohen & Gagin, 2005; Lee et al., 2008).

Technology training empowers older workers to take control of their work processes, reducing feelings of helplessness and exhaustion. They are better equipped to manage their workload and navigate digital tools, which can ease the emotional exhaustion component of burnout (Awa, Plaumann & Walter, 2010; Rowe, 2000). Technology training encourages adaptability among older workers. They learn to embrace change and view technological advancements as opportunities rather than threats (Rainie, 2017). This shift in mindset can positively influence their perceived work ability and reduce feelings of depersonalization and burnout (McGonagle et al., 2015).

Additionally, adequate technology training can align job requirements with employees' capabilities, creating a better sense of personal accomplishments. When older workers feel proud of themselves and abilities, they are more likely to perceive their work

ability as high (Illmarinen, 2002). Technology training can be a powerful factor in encouraging older workers to remain in the workforce (McGonagle et al., 2015). Improved perceived work ability and reduced burnout, facilitated by technology training, may lead older workers to reconsider retirement plans (Xie et al., 2023). Analyzing data collected from 285 older workers, Xie et al. (2023) found that when digital technology training was deemed to be useful for work, digital technology training availability indirectly facilitated older workers' intention to continue working. By enhancing their ability to adapt to technological change, training can extend their work lives (Li et al., 2023; Messe et al., 2014; Xie et al., 2023). Hence, I hypothesize that:

Hypothesis 6: Technology training will moderate the relationship between burnout and perceived work ability, such that the mediated relationship will be weaker under high levels of technology training and stronger under low levels of technology training.

3.1.3.3. Perceived Technological Change and Retirement Intentions: The Moderating Role of Organizational Justice

Organizational justice refers to individuals' perception of fairness in the workplace (Colquitt et al., 2001; Greenberg & Colquitt, 2013). In the current study, I argue that older workers' overall perception of organizational justice will moderate the indirect relationship between technological change and their retirement intentions. Consistent with the JD-R theory, organizational justice can be seen as a critical job resource that supports employees' well-being by fostering a fair and supportive work environment. I suggest that organizational justice will act as a buffer in the relationship between perceived work ability and retirement intentions, particularly among older

workers who may face challenges adapting to new technologies. When older employees perceive high levels of fairness and support from their organization, they are likely to feel more valued and confident in their roles, which can strengthen their perceived work ability. This positive perception of work ability may, in turn, reduce the likelihood of early retirement, as they feel more equipped and motivated to continue contributing within a supportive environment. Conversely, when organizational justice is low, older workers may feel marginalized or undervalued, potentially intensifying the negative effects of low perceived work ability and increasing retirement intentions. Studies have studied justice under three main dimensions: distributive (employee's perception of fairness in outcome allocations), procedural (employee's perceptions of fairness in procedures and processes leading to outcome allocations), and interactional justice (employee's perception of fairness in how decisions on outcome allocations are communicated) (Cohen- Charash & Spector, 2001; Colquitt et al., 2001; Greenberg & Colquitt, 2013; Rupp, 2011).

Previous studies have shown that distributive, procedural, and interactional justice strongly influence organizational-level and individual-level outcome variables, such as organizational commitment (Armstrong-Stassen & Schlosser, 2011; Minibas-Poussard, Le Roy, & Erkmen, 2017), and employee well-being (Lawson, Noblet & Rodwell, 2009). Numerous studies have also shown that distributive, procedural, and interactional justice communicates to employees that they are valued and respected within their organizations and work groups (Armstrong-Stassen & Schlosser, 2011; Eib et al., 2021; Skarlicki & Folger, 1997; Tyler & Blader, 2003).

However, in the current study, I examine individuals' overall justice perceptions rather than a specific dimension of their justice perceptions. This is consistent with other scholars (Ambrose et al., 2015; Ambrose & Schminke, 2009; Bobocel, 2021). Indeed, several researchers have queried the benefits of focusing on specific types of justice, recommending a shift to overall justice judgments for several reasons (Ambrose & Arnaud, 2013; Ambrose & Schminke, 2009; Colquitt et al., 2013; Nicklin et al., 2014). One argument for the shift to examining overall justice perceptions is that although individuals can differentiate between different justice dimensions when asked, they make and base their justice judgments on a holistic assessment of their experience (Ambrose & Schminke, 2009; Greenberg, 1986; Shapiro, 2001). A second argument is that individuals' perceptions of the different dimensions of justice are only meaningful in the context of their overall perceived fairness of the referent situation (Tornblom & Vermunt, 1999). Finally, researchers often hypothesize the same predictions for the different dimensions of justice (Lance Frazier et al., 2010; Holtz & Harold, 2013; Sulander et al., 2016), suggesting that they are likely more interested in a higher-order level of justice perceptions rather than specific dimensions (Ambrose et al., 2015).

Recent studies continue exploring the impacts of overall justice perceptions on employee and organizational outcomes (Arneguy, Ohana & Stinglhamber, 2020; Koay & Lim, 2023; Linlin, Lirong & Yong, 2021). As an example, Linlin et al. (2021), in their study of 204 employees from 25 different industries, found that perceptions of overall organizational justice moderate the indirect relationship between newcomers' idiosyncratic deals (individualized working arrangements negotiated between employees

and their employers) and self-improvement and ostracism. Another study by Arneguy et al. (2020) using data collected from 230 employees facing organizational change, found that overall justice fostered employees' readiness for change. Overall, I find an increase in the prevalence of overall justice in the current literature, but there is a lack of studies examining the role of overall justice perceptions on retirement intentions. Hence, the current study fills this gap by focusing on older workers' overall perceptions of organizational justice.

Research shows that older workers experience age-related discrimination in the workplace, especially concerning technological changes (Adams & Neumark, 2006; Gomez & Gunderson, 2004). The results of an AARP survey of 1000 workers revealed that one-third of workers aged 50 years or older had either experienced or knew someone who had experienced age discrimination in the workplace (AARP, 2012; Hannon, 2012; McIntosh, 2020). Existing studies further reveal that older workers have limited training opportunities compared to their younger counterparts (Lee et al., 2008; Truxillo et al., 2015). One study that examined the impact of ageism on older workers also reported that older workers felt underappreciated and isolated when they were overlooked for promotion or training opportunities in the workplace (Ayalon, 2013). Indeed, extant research has shown that older workers who experience such discrimination also perceive their organizations as unfair (Eib et al., 2021). Eib et al. (2021) argue that perceptions of organizational injustice, fueled by discriminatory practices, can significantly impact older workers' job satisfaction, commitment, and overall well-being. Hence, I suggest that when older employees perceive that their contributions are undervalued and that they are not

treated equitably, their motivation to remain in the workforce diminishes, increasing their intentions to retire early.

There is ample evidence in the existing literature that organizational justice is an important determinant of employee psychological and mental well-being (Cassar & Buttigieg, 2015; Moliner et al., 2008; Wood, Braeken & Niven, 2013). As one example related to retirement intentions, Heponiemi et al. (2008), using survey data from a random sample of Finnish physicians between the ages of 45 and 65, found that organizational injustice strengthened the relationship between poor health and retirement intentions. Hence, in the current study, I argue that the degree to which older workers perceive their organizations to be fair will influence the indirect relationship between technological change and their retirement intentions.

More specifically, I conceptualize organizational justice as a job resource that can help older workers cope with the additional demands of technological change (Proost, Verboon & Ruysseveldt, 2015). Drawing from the JD-R model, job resources are physical, psychological, social, or organizational aspects of the job that help individuals to achieve work goals, reduce job demands, and facilitate personal growth and development (Bakker & Demerouti, 2017; Van den Broeck, De Cuyper, De Witte, & Vansteenkiste, 2010). Research has shown that perceptions of organizational justice can act as a buffer against the negative effects of job demands on employee well-being (Proost et al., 2015). Older workers may feel apprehensive about their technological skills and their ability to adapt to new technologies (Alcover et al., 2021). However, conscious efforts to mitigate age-related stereotypes and discrimination in decision-making

processes could help improve their perception of fairness, reduce resistance, and enable them to navigate the challenges associated with technological advancements more effectively. Proost et al. (2015), in their study, which examined the role of organizational justice in helping employees cope with job demands, found that organizational justice buffered for the positive effect of job demands on turnover intentions and the negative effect of job demands on job satisfaction.

Drawing on the JD-R theory (Demerouti et al., 2001), I argue that perceptions of organizational justice will moderate the relationship between perceived work ability and retirement intentions, influencing how older workers respond to perceived declines in their capacity to meet job demands. When older workers perceive high levels of organizational justice, where they are treated fairly, respected, and supported during workplace transitions, they may be less likely to interpret diminished work ability as a signal to retire early. Instead, they may feel more confident that their organization will accommodate their needs and provide the necessary support to sustain their contribution, thereby weakening the negative link between perceived work ability and retirement intentions (Bakker & Demerouti, 2017; Eib et al., 2021).

This aligns with the JD-R framework, which posits that job resources such as organizational justice can buffer the adverse effects of reduced personal resources (e.g., perceived work ability) by enhancing motivation and reinforcing commitment (Bakker et al., 2023). Existing research supports this buffering function; for example, Sulander et al. (2016) found that organizational justice moderated the relationship between job involvement and retirement intentions among older nurses.

Accordingly, I propose that organizational justice moderates the second stage of the indirect effect between perceived technological change and retirement intentions, such that the negative association between perceived work ability and retirement intentions is weaker when organizational justice is high and stronger when organizational justice is low. Following this, I hypothesize that:

Hypothesis 7: Perceptions of organizational justice will moderate the relationship between perceived work ability and retirement intentions, such that the mediated relationship will be weaker under higher perceptions of organizational justice and stronger under lower perceptions of organizational justice.

3.1.3.4 Perceived Technological Change and Retirement Intentions: The Moderating Role of Computer Self-Efficacy

Social Cognitive Theory states that individuals acquire knowledge through social interactions and personal experiences (Bandura, 1977; Bandura, 2001). A key variable of this theory is self-efficacy (Bandura, 1977; Bandura, 2012), or an individual's belief in their ability to perform a specific task (Bandura, 1977; Bandura, 2012). Over 35 years ago, in a seminal paper, Gist (1987) highlighted the importance of self-efficacy for human resources. Since that time, scholars have shown that self-efficacy is positively correlated to numerous outcomes: task performance (Brown et al., 2016; Gist, 1989; Mitchell, Hopper, Daniels, George-Falvy, & James, 1994), training motivation (Machida & Schaubroeck, 2011; Tannenbaum, Mathieu, Salas, & Cannon-Bowers, 1991), openness to new experiences (Wanberg & Banas, 2000) and willingness to adopt new technology (Hill, Smith & Mann, 1987; Zhao, Mattila, & Tao, 2008).

Several scholars have extended the research on social cognitive theory by examining specific aspects of self-efficacy, such as leader efficacy (i.e., one's belief about their ability to exhibit leadership behaviors and carry out leadership tasks) (Hannah, Avolio, Luthans & Harms, 2008), physical activity efficacy (i.e., one's belief in their ability to complete physically demanding tasks) (Ryan & Dzewaltowski, 2002), recovery self-efficacy (i.e., one's belief about their ability to resume an activity after a lapse) (Luszczynska & Sutton, 2006) and computer self-efficacy (Compeau & Higgins, 1995; Hasan, 2003; Thatcher & Perrewe, 2002). The latter is important given that the most recent wave of technological changes (the fourth industrial revolution) in workplaces is characterized by advances in computing technologies and the automation of organizational and workplace processes (Cascio & Montealegre, 2016; Schwab, 2017).

Compeau and Higgins (1995) define computer self-efficacy as "an individual's perception in their ability to use computers in the accomplishment of a task" (p.191). Specifically, computer self-efficacy examines the applied rather than the rudimentary use of computers (Compeau & Higgins, 1995). For example, this involves using computer software to deliver a lecture rather than knowing how to 'type' on a computer. The current study joins previous studies in extending the construct of computer self-efficacy to include other forms of computer-aided information technology (Correia, Compeau & Thatcher, 2016; Thatcher et al., 2008). Previous studies have shown that computer self-efficacy can influence an individual's acquisition of new technological skills (Ertmer et al., 1994; Reed, Doty & May, 2005) as well as the willingness to adopt new technologies

(Henry & Stone, 1997; Luse, Mennecke, & Triplett, 2013; Yesilyurt, Ulas, & Akan, 2016).

Age plays a part in an individual's perception of computer self-efficacy (Reed et al., 2005). Age-related factors such as a decline in cognitive capability or memory function and learning techniques might also impact older workers' computer self-efficacy (Garfein et al., 1988; Westerman et al., 1995). In their quasi-experimental study, Reed et al. (2005) examined the impact of age on computer self-efficacy and found a negative relationship between age and computer self-efficacy. They reported that older workers had negative beliefs about their ability to operate technology compared to younger workers, despite positive measures of their ability (Reed et al., 2005). Existing studies have also shown positive correlations between computer self-efficacy and work outcomes such as organizational commitment (Stone & Henry, 2003) and training effectiveness (Chien, 2012).

JD-R theory proposes that personal resources have a reciprocal relationship with job resources and, similar to job resources, can also moderate the impact of job demands on employee well-being (Bakker et al., 2023). Hence, the current study conceptualizes computer self-efficacy as a personal resource that can mitigate the effects of technological changes on older workers' feelings of burnout. As an example, consider the case of a banking institution transitioning from traditional brick-and-mortar operations to digital banking. This technological change introduces new job demands, such as employees needing to learn digital banking platforms, handle online transactions, and troubleshoot technical issues. Older workers, who may have limited prior experience with digital

technologies, may perceive these demands as overwhelming and exhausting. However, those who are more comfortable with digital technologies will be more accepting of these changes and consequently adapt to these changes better.

Drawing from the JD-R theory, I argue that older workers' computer self-efficacy will shape the degree to which perceived technological change will influence their feelings of burnout. High levels of computer self-efficacy may help older workers feel more confident and capable when using new technologies, reducing the negative relationship of technological change on their well-being. High computer self-efficacy can reduce anxiety associated with technological change. When older workers believe they can successfully handle the demands of new technologies, they are less likely to experience stress and emotional exhaustion. Computer self-efficacy is associated with improved problem-solving skills related to technology use. Older workers with high computer self-efficacy are better equipped to overcome challenges and navigate new digital tools, reducing the sense of helplessness contributing to burnout (Compeau & Higgins, 1995). High computer self-efficacy fosters adaptability to technological changes. Older workers are more likely to view these changes as opportunities for growth and development rather than as threats to their job security, reducing feelings of depersonalization associated with burnout (Salanova et al., 2000). Thus, I hypothesize that:

Hypothesis 8: Computer self-efficacy will moderate the relationship between perceived technological change and the feelings of burnout of older workers, such that the mediated

relationship will be weaker with higher levels of computer self-efficacy and stronger under lower levels of computer self-efficacy.

3.2. METHODS

3.2.1 Procedures and Participants

I administered an online survey, collecting responses from a sample of older workers. I adopted the Statistics Canada definition and included only workers aged 55 or older (Statistics Canada, 2022). Another rationale for including only workers 55 years or older is that it is also around this age that many people start to think about retirement and begin to face certain age-related challenges in the workforce (AARP, 2023). Additionally, in many countries, workers can start receiving retirement benefits at this age (Chomik & Whitehouse, 2010; Turner, 2007).

Participants were recruited through the Prolific platform. Prolific is an online recruitment service platform specifically designed to help researchers recruit participants for participation in research. Prolific carefully vets its participant pool to ensure data quality and has detailed rules regarding the treatment of subjects on the platform to ensure ethical research practices are upheld (Palan & Schitter, 2018). In a study that compared data quality between online recruitment platforms, Douglas, Ewell, and Brauer (2023) found that compared to MTurk, Qualtrics, or an undergraduate student sample (i.e., SONA), participants on Prolific and CloudResearch were more likely to pass various attention checks, provide meaningful answers, follow instructions, have a unique IP address, and work slowly enough to be able to read all the items. The survey was hosted

and administered through Qualtrics. The Survey items were also presented in a consistent order for all respondents.

I conducted a two-wave study where participants were invited to complete two online surveys (see Appendices C and D) approximately two weeks apart. One of the reasons for a two-week lag is that extant research in social sciences suggests that effect sizes decline as time lags become longer (Cohen et al., 2003; Dormann & Griffin, 2015; Griffeth, Hom, & Gaertner, 2000). Another reason is that using a two-week lag also helps reduce the attrition rate that is common in panel studies (Dormann & Griffin, 2015; Podsakoff et al., 2003). Indeed, this decision is consistent with other researchers (such as Dawson, O'Brien, & Beehr, 2016; Raja, Javed & Abbas, 2018) who have also used a two-week time lag in their studies.

Prior to data collection, ethics approval was obtained from the Interdisciplinary Committee on Ethics in Human Research (ICEHR) at Memorial University (Appendix A). Participants were pre-screened to ensure they met the eligibility criteria, including that they were 55 years or older, worked in the United States or Canada, and used computer or computer-assisted technologies in their jobs. Individuals were required to read and accept the terms of the informed consent form (Appendix B) to participate in the study. Any persons who declined consent were automatically excluded from participation. Each participant received a full honorarium of $6.34[11] (CAD) for participation in the study ($2.54 CAD for the first part of the study and $3.80 CAD for the second part of the

[11] Prolific is a UK-based platform; hence, participant compensation was converted from British pounds to Canadian dollars.

study). Prolific strongly endorses the principle of ethical rewards. Therefore, participant compensation was determined by Prolific's compensation calculator, which determined a fair wage based on survey length. I recruited a total of 400 participants at Time 1 and invited them to participate in Time 2 (see Appendix B for more details on recruitment). Only 361 participants responded at Time 2 (90.25% response rate).

The age range of the participants was as follows: 38.8% were 55 to 59 years, 36.5% were 60 to 64 years, 15% were 65 to 69 years, 6.6% were 70 to 74 years, 2.8% were 75 to 79 years, and 0.3% were 80 years or older. Women comprised 51% of the sample, 48.8% were men, and one person did not identify their gender. A large proportion of the sample (60.4%) obtained a university degree, diploma, or certificate at the bachelor's level or above, 11.8% obtained a high diploma or equivalent, 9.4% had a college or other non-university certificate or diploma, 8.8% obtained a university certificate or diploma below the bachelor level, 8.5% received an apprenticeship or trades diploma or certificate, and 0.8 did not have any certificate, diploma or degree. Most of the sample (83.4%) identified as White, 8.6% as Black, 4% as multi-racial, and 2.1% as Asian.

3.2.2 Addressing Common Method Bias

Common method bias is a type of measurement bias that occurs when respondents use the same response style or scale across multiple measures, potentially leading to spurious correlations among the variables (Conway & Lance, 2010; Podsakoff et al., 2003; Podsakoff et al., 2012). This bias can be introduced by various factors, including the use of self-report measures, the same survey format, and common items or wording

across scales (Podsakoff et al, 2003; Podsakoff et al 2012). The current study relied on self-reported measures; thus, as I outline in more detail below, I took several preventative measures to mitigate against the threat of common method bias. Scholars such as Conway and Lance (2010) acquiesce that the assumption that self-reports are inherently biased and inferior to other kinds of reports is not always accurate. Following their suggestions, I provide the rationale for using self-report measures and the steps I took to abate the impact of common method bias below.

3.2.2.1. Steps to Mitigate Common Method Bias

The rationale for using self-report measures. The current study sought to examine the retirement intentions of older workers; hence, it was imperative that I obtained self-reports from older workers to understand better the experiences that inform their intentions. Also, most of the variables in the study, such as computer self-efficacy and work ability, require an assessment of participants' perceptions, attitudes, and reactions. Hence, it would be inappropriate to use other sources.

Time-lagged study design. Using a time-lagged two-wave study design helped mitigate the effects of common method bias by introducing a time delay between the measurement of the variables. This means any biases or errors associated with a particular measurement were less likely to influence the study results, as they would be spread out over time (Conway & Lance, 2010; Podsakoff et al., 2003; Podsakoff et al., 2012).

Using different question formats and eliminating ambiguity in the questionnaire. To mitigate the threat of common method bias, I used different question formats, such as matrix designs, multiple choice, etc., to ensure that the respondents

remained engaged (Podsakoff et al., 2012). Vague question items tend to increase participants' reliance on their systematic response predispositions (e.g., extreme or midpoint response styles) as they cannot rely on the content of the ambiguous item (De Vries & Cho, 2015). Therefore, I reduced ambiguity by keeping questions as simple and specific as possible. I also defined terms that may be unfamiliar to respondents or could be open to multiple interpretations (De Vries & Cho, 2015; Podsakoff et al., 2012). As one example, I defined retirement in the questions asking respondents about their retirement intentions.

Absence of overlap in items for different constructs. I ran a Harman single-factor test to ensure that there were no overlaps between the items of the different constructs (Conway & Lance, 2010; Podsakoff et al., 2012). The analysis yielded 13 factors with eigenvalues greater than 1.0 that accounted for a cumulative variance of 72.9%. The first factor accounted for only a 24.24% variance. This suggests that there is no problem with common method bias in my data since the total variance extracted by one factor is less than the recommended threshold of 50% (Podsakoff & Organ, 1986).

3.2.3. Addressing Data Quality and Data Checking

I am cognizant of the effect low-quality data has on the validity and reliability of the results obtained from this study (Shadish et al., 2002; DeSimone & Harms, 2017). To identify potential issues with the survey design, wording, and formatting, I piloted the survey with a small sample of individuals prior to the main data collection. This helped identify and address issues with question ambiguity, response fatigue, and other issues impacting data quality (Podsakoff et al., 2012).

To mitigate the effects of low-quality data on the results, I also employed data screening techniques to detect low-quality data in the sample. One of the ways I screened the data was to insert attention checks (e.g., select 'strongly agree' for this question) into the survey. I did this to evaluate the respondents' attention while completing the survey (DeSimone & Harms, 2017). Participants (n=36) who failed the attention checks were automatically excluded from the study and replaced with more attentive respondents; hence, low-quality data was not an issue.

I ran several tests to ensure that my data met the assumptions necessary for regression analysis. First, I checked that my data met the assumption of normality by inspecting the normal probability plot (P-P) and histogram of the regression standardized residuals (Flatt & Jacobs, 2019; Meuleman et al., 2014). I also examined the scatter plot of the residuals and noticed that the points were equally distributed above and below zero on the X-axis and to the left and right of zero on the Y-axis, signifying homoscedasticity (Flatt & Jacobs, 2019; Meuleman et al., 2014). I also checked that there was no multicollinearity. The Variance Inflation Factor (VIF) values were less than 10, indicating the absence of multicollinearity (Yoo et al., 2014). The results of these tests showed that the data set met the required criteria for regression analysis.

3.2.4 Measures

Key measures used in the study included the following. In Appendix E, I present the surveys containing all of the measures used.

Retirement Intentions. I collected data on this variable at Time 2 of the study. It was measured using the retirement intentions scale constructed by De Vos and Segers

(2013). The scale contains four items assessed on a five-point Likert scale ranging from 1= totally disagree to 5= totally agree. A sample item from the scale is "I intend to stop working before my official retirement age." The Cronbach's Alpha reliability coefficient was acceptable (α= 0.80).

Computer Self-Efficacy. This was collected at Time 2 and measured using the computer efficacy scale developed by Henry and Stone (1997). The scale contains four items, each assessed on a five-point Likert scale ranging from 1= strongly disagree to 5= strongly agree. A sample item from the scale is "At work, I feel more competent with the computer system than most other people." The scale demonstrated acceptable reliability with a Cronbach's Alpha of 0.79.

Perceptions of Organizational Justice. This was collected at Time 1 and measured using the perceived overall justice scale developed by Ambrose and Schminke (2009). The measure consists of a total of six items, with three items measuring personal perceptions of justice in the organization and three items assessing perceptions of fairness of the organization generally. All items were assessed on a seven-point Likert scale ranging from 1= strongly disagree to 7= strongly agree. A sample item from the scale is "For the most part, this organization treats its employees fairly." The Cronbach's Alpha coefficient was 0.92.

Burnout. This was collected at Time 1 and measured using the Maslach Burnout Inventory- General Survey (MBI-GS) developed by Schaufeli et al. (2002). The measure consists of a total of 16 items, with five items measuring emotional exhaustion, five items measuring cynicism/depersonalization, and seven items measuring personal efficacy. All

items were assessed on a seven-point Likert scale ranging from 0=never to 6=every day. A sample item from the scale is "I feel emotionally drained from my work." The reliability was acceptable (α= 0.91).

Technology training. This was collected at Time 1 and assessed using a measure adapted from the Workers and Employee Survey (WES) measure developed by Statistics Canada. This is a single-item self-reported measure that asks respondents, "Have you received any formal or informal training related to the changes in technology in your workplace?" The original measure was assessed dichotomously with a yes/no option. I adapted the question to be assessed on a five-point Likert scale ranging from 1=not at all to 5=very much so. I adapted this question because I intended technology training to be a continuous variable rather than a categorical variable.

Perceived Technological Change. This was collected at Time 1 and measured using the techno-uncertainty scale developed by Ragu-Nathan et al. (2008). The scale contains four items assessed on a five-point Likert scale ranging from 1= strongly disagree to 5=strongly agree. A sample item from the measure is "there are always new developments in the technologies we use in our organization." Cronbach's Alpha was 0.82.

Perceived Work ability. This was collected on the Time 2 survey and measured using the four-item perceived work ability scale developed by McGonagle et al. (2015). A sample item was "Thinking about the mental demands of your job, how do you rate your current ability to meet those demands?" The response scale ranges from 0= cannot currently work at all to 10= work ability at its lifetime best. Cronbach's Alpha (α= 0.86).

Control Variables

Extant studies have examined various factors that influence the retirement intentions of older workers (Barnes-Farrell, 2003; McGarry, 2004; Warren & Kelloway, 2010). Indeed, previous studies have offered alternative explanations for the retirement intentions of older workers, such as age, educational status (Bound, Schoenbaum & Waidmann, 1995; von Bonsdorff et al., 2010), life satisfaction (Beehr, 1986; Heybroek, Haynes & Baxter, 2015), financial wellbeing (Chan & Stevens, 2008; Salignac et al., 2020), physical health (McGarry, 2004) and psychological wellbeing (Shultz & Wang, 2011; Wang & Shi, 2014). Hence, I controlled for these variables to ensure that those factors do not confound the influence of technological change on the retirement intentions of older workers.

Age. Participants' years of birth were used as a proxy for age. I collected participants' years of birth on the Time 1 survey by asking them to choose their birth year from 10 categories (e.g., 1969- 1965, 1954-1950, etc.), ranging from "After 2005" to "1944 or before."

Educational status. This was collected at Time 1 using the educational status measure from the Statistics Canada Labour Force Survey (LFS). The scale contains a single item that asks respondents, "What is your highest level of education?" This comprised six categories ranging from no certificate or diploma to a university certificate, diploma, or degree at the bachelor's level or above.

Life satisfaction. This was collected at Time 2 and measured using the Satisfaction with Life scale developed by Diener et al. (1985). The scale contains five items assessed on a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree. A sample item from the scale is "In most ways, my life is close to my ideal." The scale demonstrated strong reliability (α= 0.90).

Financial wellbeing. This was collected on the Time 2 survey using the financial satisfaction scale by Mugenda, Hira, and Fanslow (1990). The scale contains six items assessed on a five-point Likert scale ranging from 1=very dissatisfied to 5=very satisfied. A sample item from the scale is "How satisfied are you with your level of living." The Cronbach's Alpha reliability coefficient was 0.93.

Personal income. I also collected data on the personal income of participants at Time 2 as an objective measure of their financial well-being. I used a single-item question obtained from the Statistics Canada Canadian income survey. The question asks respondents, "What is your best estimate of your total personal income, before taxes and deductions, from all sources during the last year?" The 14 answer options ranged from $5000 or less to $100000 or more.

Physical health and psychological wellbeing. This was collected on the Time 2 survey; it was assessed using the subjective health measure used in the University of Michigan Health and Retirement Study (HRS) (McGarry, 2004). Two questions were used: "In general, how would you rate your physical health?" and "In general, how would you rate your emotional health? (i.e., how good, stressed, or depressed you feel)." Their responses were assessed on a five-point scale ranging from 1= poor to 5=excellent.

3.3. ANALYSIS AND RESULTS

Table 3.1 reports the descriptive statistics and inter-correlations between key variables. A review of Table 3.1 reveals that multicollinearity was not a significant concern in this study as the independent variables were low to moderately correlated (with a maximum coefficient of 0.57) (Yoo et al., 2014).

3.3.1. Hypothesis Testing

I conducted the analysis using IBM SPSS Amos (version 29), which supports path analysis and structural equation modeling (SEM). This study used observed composite variables based on averaged scale scores rather than modeling each construct as a latent factor. While this approach allows for an efficient estimation of direct and indirect effects between constructs, it does not constitute a confirmatory factor analysis (CFA) of the measurement model. As such, factor loadings, average variance extracted (AVE), and formal assessments of discriminant and convergent validity are not reported. However, scale reliability was assessed and reported using Cronbach's alpha, and correlations between composite variables were examined to evaluate potential multicollinearity or redundancy concerns.

Given the sample size and study objectives, path analysis in Amos was an appropriate and parsimonious choice to examine mediation and moderated mediation effects. Mediation analyses were conducted to assess the indirect effects of perceived technological change on retirement intentions through burnout and perceived work ability. Moderated mediation analyses tested whether these indirect effects varied depending on levels of technological training, computer self-efficacy, and organizational

justice. Following standard recommendations, bootstrapping with 5,000 samples was used to generate bias-corrected confidence intervals for all indirect and conditional effects. This approach aligns with similar applications in recent literature (e.g., Bhargava et al., 2024; Osei et al., 2022) and provided a robust means of testing the hypothesized relationships in a theoretically grounded manner.

Table 3.1: Descriptive Statistics and Pearson Correlations

		Mean	S.D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	RI	2.42	0.99	(0.80)														
2	WA	9.53	1.36	-.32**	(0.86)													
3	CSE	4.02	0.72	-0.04	.17**	(0.79)												
4	Income	9.71	3.55	0.08	.18**	0.06	--											
5	FinSat	3.48	1.06	0.07	.25**	0.05	.37**	(0.93)										
6	Phy Health	3.49	0.91	-.19**	.48**	0.06	.22**	.43**	--									
7	Psy Health	3.82	1.04	-.12*	.40**	.18**	.10*	.48**	.47**	--								
8	LifeSat	3.36	0.96	-0.04	.32**	.17**	.29**	.69**	.42**	.59**	(0.90)							
9	P. Tech Change	3.47	0.82	0.01	-0.02	0.02	.18**	0.08	-0.05	-0.01	0.09	(0.82)						
10	OJ	5.61	1.17	-.20**	.33**	.22**	0.09	.28**	.27**	.31**	.31**	-0.02	(0.92)					
11	Burnout	2.69	1.13	.33**	-.44**	-.17**	-0.07	-.32**	-.40**	-.49**	-.40**	0.02	-.57**	(0.91)				
12	Tech. Train	2.97	0.99	-0.08	0.02	0.08	.16**	.12*	-0.01	0.06	.20**	.38**	.12*	-.21**	--			
13	Gender	1.52	0.50	-0.08	0.06	-0.10	-.25**	-.14**	-0.03	0.01	-0.03	-0.04	-0.00	-0.02	0.02	--		
14	Age	5.99	1.05	-.22**	0.07	-0.04	0.02	0.09	.13*	.19**	.12*	-0.06	0.04	-.21**	0.04	0.02	--	
15	Educ.	4.95	1.50	0.08	-0.02	0.06	.34**	.16**	0.06	-0.10	0.06	0.05	0.01	-0.04	0.09	-.11*	-0.00	--
	N			**360**	**360**	**361**	**356**	**361**	**361**	**361**	**361**	**361**	**361**	**361**	**360**	**361**	**360**	**361**

Note: *p ≤ .05 , ** p ≤ .01, Cronbach Alphas are in parentheses on the diagonal. RI= Retirement Intentions, WA= Work ability, CSE= Computer Self-Efficacy, FinSat= Financial Satisfaction, Phy Health = Physical Health, Psy Health= Psychological Health, LifeSat = Life Satisfaction, P.Tech Change = Perceived Technological Change, OJ = Organizational Justice, Tech Train = Technological Training, Educ = Educational status.

My sample contained some missing data (~1.4%), and SPSS Amos cannot run bootstrapping on datasets with missing values. However, SPSS Amos has a built-in data imputation function that replaces each missing value in the dataset with an estimate called an imputed value. The missing values are replaced with values obtained from regression imputation (Zhang, 2016). In regression imputation, the model is first fitted using maximum likelihood. After that, model parameters are set equal to their maximum likelihood estimates and linear regression is used to predict the unobserved values for each case as a linear combination of the observed values for that same case. Predicted values are then plugged in for the missing values (IBM SPSS AMOS Reference Guide, n.d; Zhang, 2016). Zhang (2016), in their study examining the best techniques for handling missing data, argued that compared to methods such as complete case analysis and central tendency (i.e., mean, median, and mode) imputation, regression imputation is the most effective at eliminating biases and preserving the relationships between missing values and other variables. The statistical significance of the indirect effects was evaluated using bias-corrected 95% confidence intervals (CI), with each analysis based on 5,000 bootstrapped samples. I included the control variables as covariates in all the analyses.

Table 3.2: Direct and Indirect Effects Model Coefficients for the Effects of Perceived Technological Change on Retirement Intentions

	Burnout (M1)					Work ability (M2)					Retirement Intentions (Y)				
	B	SE	*p*	LLCI	ULCI	B	SE	*p*	LLCI	ULCI	B	SE	*p*	LLCI	ULCI
P. Tech Change (X)	.002	.07	.96	-.13	.13	-.33	.08	<.01	-.49	-.17	-.05	.06	.42	-.17	.07
Burnout (M1)	-	-	-	-	-	-	-	-	-	-	-.23	.04	<.01	-.32	-.16
Work ability (M2)	-	-	-	-	-	-	-	-	-	-	-.13	.07	.06	-.27	.01
Physical Health	-.23	.07	<.01	-.37	-.11	.48	.11	<.01	.29	.71	.02	.07	.80	-.11	.14
Psychological Health	-.34	.07	<.01	-.47	-.21	.18	.10	.07	-.01	.36	.20	.07	<.01	.07	.33
Financial Satisfaction	-.003	.07	.99	-.14	.14	-.13	.08	.10	-.28	.03	-.05	.09	.49	-.23	.11
Life Satisfaction	-.16	.09	.06	-.33	.00	.06	.10	.54	-.13	.25	.01	.03	.71	-.05	.07
Education	-.06	.04	.10	-.13	.01	-.07	.04	.15	-.15	.02	-.20	.04	<.01	-.28	-.12
Age	-.12	.05	.01	-.21	-.03	-.07	.05	.19	-.17	.03	.03	.02	.06	-.00	.06
Income	.02	.02	.18	-.01	.06	.05	.02	.02	.01	.09					
Indirect Effect of X on M2						-.00	.02	.96	-.05	.04					
Indirect Effect of X on Y	-	-	-	-	-	-	-	-	-	-	.00	.01	.95	-.01	.01

Note: X= Independent variable, Y= Outcome Variable, M1 = Mediator variable, M2= Mediator variable, ULCI= Upper Limit Confidence Interval, LLCI= Lower Limit Confidence Interval,

When I tested the relationship between perceived technological change and burnout (hypothesis 1), I found that although perceived technological change had a direct positive relationship with burnout, the relationship was not significant (B= .002, *p*=.96). Hence hypothesis 1 was not supported. Hypothesis 2 was supported as burnout was negatively related to work ability (B= -.33, *p*<.01). Hypothesis 3 stated that burnout will mediate the relationship between perceived technological change and older workers' work ability. However, the proposed indirect relationship was not supported (B= -.00, LLCI= -.05, ULCI=.04 |see Table 3.2). The results of the analysis showed that older workers' perceived work ability was negatively related to their retirement intentions, supporting hypothesis 4 (B= -.23, *p*<.01). I tested the indirect relationship between perceived technological change and the retirement intentions of older workers. The results indicated that burnout and work ability did not serially mediate the relationship (B= .00, LLCI= -.01, ULCI=.01). Hence, hypothesis 5 was not supported. In the mediation model, the predictors accounted for 30.7% of the variance in burnout (R^2 = .31), 34.3% in perceived work ability (R^2 = .34), and 20.3% in retirement intentions (R^2 = .20). These values indicate that the model offers moderate explanatory power, particularly for the mediating and outcome variables. Model fit indices for the mediation model were mixed. The chi-square statistic was significant, $\chi^2(75) = 19.864$, $p < .001$, and the chi-square/df ratio (CMIN/DF = 9.932) exceeded the recommended cutoff of 3. The Root Mean Square Error of Approximation (RMSEA) value was .158 (90% CI = [.099, .224]), exceeding the conventional threshold of .08 (Browne & Cudeck, 1993). However, the Comparative Fit Index (CFI = .982) and Incremental Fit Index (IFI = .983) suggested good fit, both above

the .90 threshold (Hu & Bentler, 1999). Despite the elevated RMSEA, the model was retained given acceptable comparative indices and theoretical grounding.

Table 3.3 presents the results of the moderated mediation analysis of the model. Hypothesis 6 proposed that technological training will moderate the relationship between burnout and work ability. The interaction effect (Burnout x Technological training) was significant as the 95% confidence interval, based on 5000 samples, did not contain zero (B= -.14, p <.05, LLCI= -.26, ULCI= -.03). However, the direction of the effect was contrary to the hypothesis. Rather than mitigating the negative relationship between burnout and work ability, higher levels of technological training exacerbated this relationship. As shown in Figure 3.2, the negative association between burnout and work ability was stronger among those who reported higher levels of technological training. Therefore, Hypothesis 6 was not supported.. I also found that the conditional indirect effects of technological training on the serial-mediated relationship between technological change and retirement intentions were not significant (low technological training: B= .003, LLCI= -.015, ULCI= .022; average technological training: B= .002, LLCI= -.019, ULCI= .027; high technological training: B= .003, LLCI= -.022, ULCI= .032 |see Table 3.4).

Table 3.3: Moderated Mediation Models

	Burnout (M1)					**Work ability (M2)**					**Retirement Intentions (Y)**				
	B	SE	p	LLCI	ULCI	B	SE	p	LLCI	ULCI	B	SE	p	LLCI	ULCI
P. Tech Change (X)	.02	.07	.77	-.12	.15						-.06	.06	.32	-.18	.06
Physical Health	-.24	.07	<.01	-.37	-.11	.45	.10	<.01	.26	.67	-.12	.07	.08	-.26	.02
Financial Satisfaction	-.03	.07	.72	-.16	.12	-.14	.08	.07	-.29	.01	.22	.06	<.01	.10	.35
Income	.02	.02	.21	-.01	.06	.05	.02	.01	.01	.09	.03	.02	.05	.00	.06
Psychological health	-.32	.07	<.01	-.45	-.19	.19	.09	.05	.00	.37	.02	.06	.69	-.10	.15
Life Satisfaction	-.13	.09	.13	-.30	.04	.06	.10	.59	-.14	.24	-.04	.08	.61	-.21	.13
Education	-.05	.04	.14	-.13	.02	-.06	.04	.20	-.14	.03	.01	.03	.69	-.05	.07
Age	-.13	.05	<.01	-.22	-.04	-.04	.05	.41	-.15	.05	-.20	.04	<.01	-.29	-.12
Burnout (M1)	-	-	-	-	-	-.36	.08	<.01	-.52	-.20	-	-	-	-	-
Work ability (M2)	-	-	-	-	-	-	-	-	-	-	-.20	.04	<.01	-.29	-.13
CSE (W1)	-.12	.07	.10	-.27	.02										
Tech Change X CSE (INT1)	-.16	.10	.12	-.35	.04										
Tech Train (W2)						-.08	.06	.16	-.20	.03					

	Burnout (M1)					Work ability (M2)					Retirement Intentions (Y)				
	B	SE	p	LLCI	ULCI	B	SE	p	LLCI	ULCI	B	SE	p	LLCI	ULCI
Tech Train X Burnout (INT2)						-.14	.06	.02	-.26	-.03					
Org. Justice (W3)											-.12	.04	<.01	-.20	-.04
Work ability X Org. Justice (INT3)											.02	.03	.58	-.03	.09

Note: X= Independent variable, Y= Outcome Variable, M1 and M2= Mediator variables, ULCI= Upper Limit Confidence Interval, LLCI= Lower Limit Confidence Interval, W1, W2 and W3= Moderator variables, INT1, INT2, and INT3= Interaction terms

. Hypothesis 7, which proposed that organizational justice will moderate the relationship between work ability and retirement intentions, was not supported. The interaction effect (work ability x organizational justice) was not significant as the 95% confidence interval, based on 5000 samples, contained zero (B= .02, LLCI= -.03, ULCI= .09).

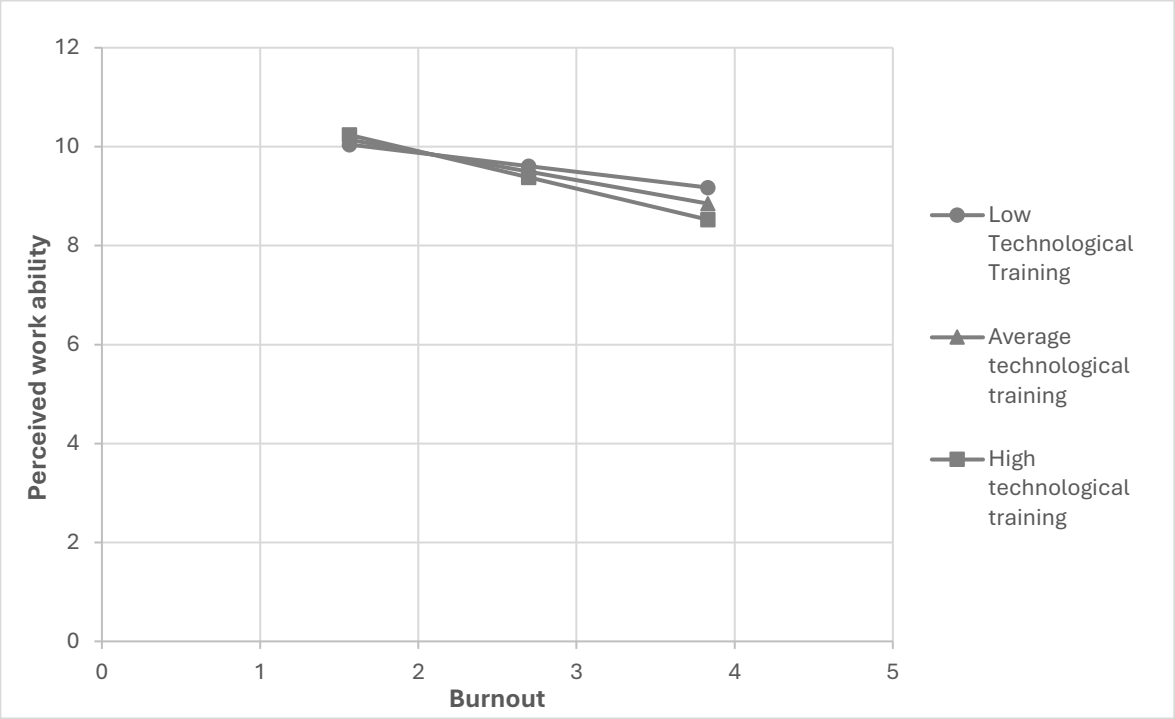

Figure 3.2: This figure is a graphical representation of the interaction effects of burnout and technological training on work ability. The Y-axis depicts work ability levels (0= cannot currently work at all to 10= work ability at its lifetime best), and the X-axis depicts burnout levels (0=never to 6=every day). The chart shows the older workers' work ability and burnout levels at different levels of technology training (high, average, and low).

Figure 3.2: Interaction Effects of Burnout and Technological Training on Work Ability

Consequently, I also found that the serial-mediated relationship's conditional indirect effects at different organizational justice levels were insignificant (see Table 3.5).

Furthermore, the results demonstrated that computer self-efficacy did not moderate the relationship between perceived technological change and burnout. The interaction effect (perceived technological change x computer self-efficacy) was not significant as the 95% confidence interval, based on 5000 bootstrap samples, contained zero (B= -.16, LLCI= -.35, ULCI= .04). Hence, hypothesis 8 was not supported. The conditional indirect effects of the serial-mediated relationship at different levels of computer self-efficacy were also insignificant (see Table 3.6). In the moderated mediation model, the predictors accounted for 31.9% of the variance in burnout ($R^2 = .32$), 36.4% in perceived work ability ($R^2 = .36$), and 20.9% in retirement intentions ($R^2 = .21$). These values suggest that the model demonstrates moderate explanatory power, particularly for the mediating and outcome variables. The fit indices for the moderated mediation model indicated less than ideal model fit, $\chi^2(df = 14) = 158.38$, $p < .001$; CMIN/DF = 11.13; CFI = .896; RMSEA = .169, 90% CI [.146, .193]; CFI = .896 and IFI = .904. These values suggest that while the hypothesized model captures some of the relationships in the data, there may be omitted paths or model complexity affecting overall fit.

Table 3.4: Conditional Indirect Effects of Perceived Technological Change on Retirement Intentions (at different levels of Tech Train)

	B	SE	LLCI	ULCI
Low Tech Train	.002	.009	-.015	.022
Average Tech Train	.003	.011	-.019	.027
High Tech Train	.003	.013	-.022	.032

Note: Tech Train= Technological Training, ULCI= Upper Limit Confidence Interval, LLCI= Lower Limit Confidence Interval

Table 3.5: Conditional Indirect Effects of Perceived Technological Change on Retirement Intentions (at different levels of Org. Justice)

	B	SE	LLCI	ULCI
Low Org. Justice	.001	.005	-.005	.018
Average Org. Justice	.001	.005	-.006	.019
High Org. Justice	.001	.006	-.008	.019

Note: Org. Justice= Organizational Justice, ULCI= Upper Limit Confidence Interval, LLCI= Lower Limit Confidence Interval

Table 3.6: Conditional Indirect Effects of Perceived Technological Change on Retirement Intentions (at different levels of CSE)

	B	SE	LLCI	ULCI
Low CSE	-.036	.027	-.110	.002
Average CSE	-.044	.033	-.133	.002
High CSE	-.052	.038	-.157	.003

Note: CSE= Computer Self-Efficacy, ULCI= Upper Limit Confidence Interval, LLCI= Lower Limit Confidence Interval

3.4. DISCUSSION

The current work climate, characterized by an aging workforce and rapid technological innovations, demands that organizations leverage the expertise of older workers to address concerns about labour shortages and talent drain in the workforce (Maltby, 2011). As populations age and birth rates decline in many parts of the world, the proportion of older workers within the labour force is increasing (Alcover et al., 2021).

This demographic shift poses significant challenges and opportunities for organizations seeking to maintain a competitive edge in a rapidly evolving economic landscape.

The expertise and experience of older workers are invaluable assets that can help organizations navigate complex challenges, drive innovation, and maintain institutional knowledge (Heisler & Bandow, 2018). However, past research suggests that the rapid pace of technological change can create barriers for older employees, leading to feelings of inadequacy and burnout (Tams et al., 2022; von Bonsdorff et al., 2010). When older workers struggle to keep up with new technologies, their perceived work ability may decline, prompting them to consider early retirement (von Bonsdorff et al., 2010). This trend not only exacerbates labour shortages but also results in a loss of critical skills and knowledge that are essential for organizational success. Therefore, understanding the role of perceived technological change on the retirement intentions of older workers is crucial for several reasons.

Firstly, it enables organizations to develop targeted interventions that support the continuous professional development of older employees. By providing tailored training programs, fostering an inclusive learning environment, and recognizing the unique contributions of older workers, organizations can enhance their ability to adapt to technological advancements and retain valuable talent (Xie et al., 2023).

Secondly, addressing the challenges older workers face in adapting to new technologies can help mitigate the negative effects of age-related discrimination and promote a more equitable and inclusive workplace. By understanding these challenges,

organizations can foster a culture of fairness and inclusion and encourage older workers to extend their workforce participation (Truxillo et al., 2015).

Thirdly, the relevance of this research extends beyond organizational boundaries to broader societal and economic implications. As governments and policymakers grapple with the implications of an aging population, understanding the factors that influence older workers' retirement intentions is vital for designing effective labour market policies. Encouraging the active participation of older workers in the labour force can alleviate pressure on social security systems, reduce the economic burden of an aging population, and contribute to overall economic growth (Acemoglu & Restrepo, 2018).

Nonetheless, one of the gaps identified in the first study of this thesis was the lack of studies that examine the factors and mechanisms that shape the relationship between the changing technological work environment and older workers' retirement intentions. Hence, in the second study of this thesis, I sought to probe the relationship between perceived technological change and the retirement intentions of older workers. This study was grounded in the Job Demand-Resources (JD-R) theory, which proposes that employee job outcomes reflect the interplay between job demands and available job resources (Bakker & Demerouti, 2017). Expanding beyond the tenets of this theory, I hypothesized a moderated mediation model (see Figure 3.1) to explicate the relationship between perceived technological change and older workers' retirement intentions. I theorized that this relationship would be serially mediated by burnout and older workers' perceived work ability, with computer self-efficacy, technological training, and

organizational justice intervening in this model as moderators. I discuss the findings of this study in the sections that follow.

In this study, the first five hypotheses (i.e., H1-H5) suggested that the serial mediating effects of burnout and work ability facilitated the indirect relationship between perceived technological change and older workers' retirement intentions. The hypothesized relationships were founded on the premise that technological change creates additional job demands for older workers. This notion was grounded in the Job-Demand Resources theory and was supported by existing studies (such as Barley et al., 2011; Chesley et al., 2014; Maier et al., 2015). Consequently, I proposed that perceived technological change will be positively associated with burnout (H1). Although the results confirmed the hypothesized direction, the relationship between the variables was not significant. However, the results supported the direct relationships between burnout and work ability (H2) and work ability and retirement intentions (H4). Ultimately, the results did not support the hypothesized indirect relationship between perceived technological change and the retirement intentions of older workers (H5). Furthermore, contrary to expectations, technological training amplified the negative relationship between burnout and work ability (H6), indicating that higher levels of training were associated with a stronger adverse effect of burnout on perceived work ability. Similar to the other moderators, which included organizational justice (H7) and computer self-efficacy (H8), technological training did not have conditional indirect effects (moderated mediation) on the hypothesized serial-mediated relationship.

There are a few possible explanations for why this study's findings were inconsistent with the proposed hypotheses. First, even though technological change might create additional job demands, older workers might possess a higher adaptive capacity than anticipated. Accumulated knowledge and the ability to leverage past experiences are resources that older workers can use to confront the challenges associated with technological change. Previous research has suggested that older employees can exhibit significant resilience when faced with technological changes, utilizing their extensive work experience to adapt effectively (Truxillo et al., 2015). One such study by Ragu-Nathan et al. (2008) reported that older workers experience less technostress than younger coworkers; the authors argued that this result might indicate that older workers compensate for techno-stressors by using their greater organization-specific experience.

Moreover, the COVID-19 pandemic catalyzed many work-related changes, including the massive shift to remote and hybrid work arrangements (Conger, 2020; Sneader & Sternfels, 2020). These changes meant an accelerated and increased adoption of different forms of technology, such as information communication technologies (De' et al., 2020; Mulder, 2021). Evidently, the gravity of a critical event like the pandemic forces everyone, including older workers, to adjust and adapt to changes (Mulder, 2021). Therefore, it is possible that greater levels of adaptability and resilience are markers of a post-COVID world. Consequently, this increased level of adaptability may supersede any adverse effects that perceived technological change could have on older workers' retirement intentions.

Second, psychosocial factors such as strong professional networks and social support might contribute to older workers' ability to cope with technological advancements without feeling compelled to retire prematurely (Schellaert & Derous, 2024; Zaniboni, Sarchielli & Fraccaroli, 2010). A strong support system at work, such as supportive co-workers or supervisors, might stimulate older workers' workforce participation. In organizations with robust support mechanisms, older workers may feel more confident in their ability to manage technological changes, thus diminishing any impact on their retirement intentions (Schellaert & Derous, 2024).

Third, the worker's job role or industry might explain their retirement intentions in the face of technological change. Scholars (such as Lee et al., 2008; Messe et al., 2014) have argued that the extent to which technological change affects retirement intentions might vary significantly across different job types. Older workers in job roles heavily reliant on technology may not experience the same pressures as those in less technology-dependent positions (Nazareno & Schiff, 2021). In other words, technological changes might not elicit the same reactions from those more familiar and comfortable with technology than those who are not. A case in point is the sample of workers surveyed in this study. The participants surveyed were recruited through Prolific, a digital crowdsourcing platform, where users are expected to be familiar with and comfortable working with digital technology. Hence, this could explain why the effects of perceived technological change were not strong enough to influence the retirement intentions of the workers sampled in this study.

Fourth, retirement policies could also explain the insignificant results in this study. The economics of retirement and retirement policies, such as pension and social security systems, could also influence older workers' retirement intentions despite technological change. In contexts where there are strong incentives to remain in the workforce longer, the association between perceived technological change and retirement intentions might be less pronounced (Yashiro et al., 2022).

The participants in this study were individuals working in the USA or Canada. The pension and social security systems in both countries are designed to reward workers who stay longer in the workforce (Employment and Social Development Canada, 2015; Social Security Administration, n.d.). In the United States, workers can receive their Social Security retirement benefits as early as age 62. However, they are only entitled to full benefits when they reach their full retirement age. For workers who delay taking their benefits till age 70, their benefit amount will increase (Social Security Administration, n.d). In Canada, workers can start receiving a pension before the age of 65; however, if they start receiving Social Security benefits at age 67, the amount will be 30 percent more than the amount received if they started at age 62. If they wait until age 70, they will get an additional 24 percent bump in income between ages 67 and 70 (Employment and Social Development Canada, 2015).

Given that 75 percent of the participants in the sample were between the ages of 55 and 64 years old, it is possible that the desire to accumulate the maximum amount of retirement benefits was a stronger determinant of their retirement intentions compared to technological change. The salience of retirement policies on retirement intentions is

further bolstered by the study's results that showed financial satisfaction to be positively related to retirement intentions. That is, the more financially stable individuals feel, the more likely they are to consider withdrawing from their careers. These results, along with sample characteristics, suggest that future research should delve deeper into the relative importance of retirement benefits compared to technological change in shaping retirement intentions.

3.5. STUDY IMPLICATIONS

While the current study did not reveal a significant relationship between perceived technological change and retirement intentions, it did highlight significant direct effects among other variables in the model, particularly the detrimental influence of burnout on perceived work ability. Notably, the study also uncovered a significant moderating effect of technological training, whereby higher levels of training intensified the negative relationship between burnout and work ability, contrary to initial expectations. Additionally, the findings confirmed the hypothesized inverse relationship between perceived work ability and retirement intentions, suggesting that when employees feel competent and capable in their roles, they are more likely to delay retirement. The findings from this study present several practical and scholarly implications.

In this study, perceived technological change was conceptualized and measured using the four-item techno-uncertainty scale developed by Ragu-Nathan et al. (2008) as part of the broader technostress framework. This scale captures employees' subjective perceptions of the frequency of technological changes within their work environment. As such, it reflects a personal-level cognitive appraisal rather than an objective account of

structural or industry-wide change. This framing is consistent with prior studies that emphasize the importance of individual interpretation in shaping strain responses to technology (Tarafdar et al., 2019).

However, it is important to note that this operationalization primarily captures the volume and recurrence of change, rather than other potentially relevant dimensions such as the complexity of new technologies, their fit with existing skillsets, or the extent of role disruption they generate. As a result, the findings should be interpreted as reflecting how older workers experience and make sense of technological change, rather than the objective nature or content of that change. Future research may benefit from a more multidimensional measurement approach, one that distinguishes between the pace, novelty, skill demands, and structural impact of technological changes. Such distinctions could enhance theoretical framing and help clarify under what conditions technological change is perceived as a challenge versus a hindrance demand, particularly among aging workers.

The theoretical underpinning of this study was the Job-Demands-Resources theory. The current study makes some significant contributions to the JD-R model. This study examines the JD-R model within the context of perceived technological change, contributing to the literature by broadening the model's application. The JD-R model has often been used to explore job demands and resources in more static or traditionally evolving work contexts (Bakker & Demerouti, 2017), but the rapidly changing technological landscape introduces new and distinct types of demands and resources that older workers must navigate (Carlson et al., 2017). By examining the JD-R model within

the context of perceived technological change, this study expands the understanding of how modern work environments shape employee experiences, particularly for older workers who may have distinct challenges adapting to new technologies.

Furthermore, the study highlights that technological advancement, typically seen as constituting additional job demands in the JD-R framework (Barley et al., 2011; Ragu-Nathan et al., 2008), may not uniformly act as a stressor leading to burnout, especially for older workers. This finding challenges one of the assumptions in the JD-R model—that job demands ultimately result in strain. While existing studies have found that technology can indeed create additional work demands and, consequently, burnout (Barley et al., 2011), by showing that the relationship between perceived technological change and burnout is more complex, this study invites a re-examination of the model's core assumptions and suggests that individual characteristics, such as adaptability, resilience, and previous technological experience, might moderate the impact of these demands. This adds depth to the JD-R model, encouraging future research to investigate how specific techno-related demands interact with individual factors like resilience and experience.

Further to the current study's finding that strays from the demand-strain premise of the JD-R theory (Bakker et al., 2023), the non-significant direct relationship between perceived technological change and burnout invites a reconsideration of how such demands are conceptualized and experienced. While the JD-R model posits that job demands generally deplete energy and lead to strain (Bakker & Demerouti, 2007; 2017), emerging scholarship suggests that the nature of the demand, along with how it is appraised by the individual, matters significantly. Specifically, job demands can function

either as hindrance stressors that obstruct personal growth and goal attainment or as challenge stressors that, while taxing, are perceived as opportunities for learning, mastery, or advancement (Cavanaugh et al., 2000; LePine, Podsakoff, & LePine, 2005).

In the context of technological change, this distinction is particularly relevant. For some older workers, technology may be viewed as a threat, triggering uncertainty, skill obsolescence concerns, or a loss of professional identity (Choi & DiNitto, 2013; Czaja et al., 2006). For others, however, it may represent a chance to stay relevant, acquire new skills, and extend their career longevity (Ng & Feldman, 2012). This subjective appraisal process may explain why perceived technological change was not directly related to burnout in this study. The diversity of interpretations across participants likely diluted any consistent strain effect, highlighting a gap in the JD-R model's assumption of uniform demand effects.

Moreover, older workers' interpretations may be especially shaped by contextual and resource-related factors, including past learning experiences, industry-specific contexts, organizational support, and perceived age inclusivity (Hertel et al., 2015; Zacher et al., 2018). In this light, the findings support recent calls to integrate appraisal theory into the JD-R model (Tuckey et al., 2015), where the same demand may have divergent effects based on how it is cognitively evaluated. Future research should explore this boundary condition more explicitly, potentially incorporating challenge–hindrance frameworks to distinguish between different types of demands and their emotional and behavioral consequences for older employees (Bakker & Sanz-Vergel, 2013).

Ultimately, this study contributes to theoretical refinement by illustrating that not all job demands operate uniformly, particularly in dynamic and interpretive contexts like digital transformation. The JD-R theory would benefit from accounting for demand ambiguity and perceptual variability, especially when applied to aging populations navigating rapid workplace change.

Burnout is often viewed as an extreme outcome stemming from a prolonged build-up of work-related stressors, marked by emotional exhaustion, cynicism, and reduced personal efficacy (Maslach & Leiter, 2016; Schaufeli et al., 2009). However, the lack of a significant direct relationship in this study suggests that participants may not necessarily reach clinically defined levels of burnout due to technological changes. Instead, they might experience a more moderate form of well-being depletion, characterized by stress, fatigue, or diminished engagement—which could still contribute to increased retirement intentions (Schaufeli & Taris, 2014). This is consistent with research indicating that even subclinical symptoms of stress and exhaustion can shape employees' career decisions, including intentions to leave the workforce (Hobfoll, 2011; Tetrick & Winslow, 2015).

This finding also raises broader theoretical questions about the suitability of using traditional burnout constructs to capture the nuanced strain responses that may arise from technology-related demands. While the JD-R model typically assumes that excessive demands lead to generalized burnout, it may not fully account for stressors that are domain-specific or appraised as challenges rather than threats. As such, future research might benefit from considering alternative constructs—such as technostress (Ragu-Nathan et al., 2008; Tarafdar et al., 2019) and digital fatigue (Bennett et al., 2021), which

may better reflect the types of chronic, low-grade strain that older workers experience in response to ongoing technological change. Additionally, future research could investigate whether these technology-specific forms of strain (e.g., technostress or digital fatigue) mediate the relationship between perceived technological change and work outcomes more robustly than general burnout constructs. Additionally, qualitative studies could explore how older workers themselves describe the emotional and cognitive toll of adapting to technology, potentially uncovering novel indicators of strain that are overlooked in current models.

The findings of this study suggest that the transmission mechanism from perceived technological change to burnout is intricate and contests the assumption that older workers are universally more susceptible to the potential negative impacts of technological change. While the prevailing narrative often paints older workers as a homogeneous group particularly vulnerable to technological advancements (Alcover et al., 2021), the results from this study reveal a more nuanced picture. These findings align with extant studies in the aging and retirement literature that caution against lumping older workers into a single category without accounting for individual and group differences (Kooij et al., 2008; Truxillo et al., 2015). Such oversimplification can lead to erroneous conclusions about their experiences and needs. By acknowledging the diversity within the older workforce, this study underscores the importance of a differentiated approach when examining the role of technological change. For example, older workers with extensive experience in technologically intensive roles may exhibit greater adaptability and lower burnout levels compared to their peers in less technology-driven

positions. Hence, the current study calls for an updated perspective on the intersection of aging and technology in the workplace and suggests that future research should delve deeper into identifying and understanding the specific factors contributing to these individual differences. For example, future studies could examine the role of socio-demographic and cognitive differences based on the conceptual framework developed in the first study of this thesis.

The unexpected finding that technological training exacerbated, rather than buffered, the negative relationship between burnout and perceived work ability contributes a novel insight to JD-R theory and highlights the complexity of job resources in the context of technological change. While training is typically considered a resource that mitigates strain, this result suggests that not all training interventions are experienced as helpful by older workers, especially when they are already experiencing high levels of burnout. This aligns with emerging perspectives from the challenge–hindrance stressor framework, which posits that certain demands or resources may be perceived as either developmental or obstructive depending on individual context and appraisal (Cavanaugh et al., 2000; LePine et al., 2005). For some older workers, technological training may be viewed as a hindrance rather than a challenge, particularly if the training is poorly designed, overly technical, or lacking relevance, thus exacerbating strain and diminishing perceived work ability.

Additionally, this finding draws attention to the individual differences in how technology-related resources are perceived and processed. For example, workers with higher computer playfulness or confidence may experience technological training as

engaging and empowering; whereas, those with lower digital efficacy may experience it as overwhelming or demotivating (Agarwal & Karahanna, 2000). Moreover, the degree of end-user involvement in the design and delivery of training programs can shape these outcomes. Extant literature suggests that when users are actively involved in systems development and training design, their acceptance and efficacy increase (Markus & Mao, 2004). The absence of such involvement may lead to misalignment between training content and learner needs, thus undermining the very support such training is meant to offer.

These findings suggest that theoretical models like JD-R may benefit from more nuanced conceptualizations of job resources, ones that consider the conditional nature of their impact based on individual, contextual, and design-related factors. Future studies should continue to explore the boundary conditions under which traditionally beneficial resources, such as training, may inadvertently heighten strain or reduce perceived capacity, particularly among vulnerable worker groups navigating technological change.

Furthermore, the non-significant relationship between perceived technological change and older workers' retirement intentions suggests the need for future studies to consider contextual factors not included in this study. These could include organizational-level factors such as job type, co-worker or supervisor support, and organizational culture (Schellaert & Derous, 2024; Zaniboni et al., 2010). For example, the type of job and the nature of technological demands can vary widely across different sectors and roles (Bartel & Sicherman, 1993). Workers in more dynamic and technology-intensive industries might experience different stressors and support compared to those in less technology-driven

fields (Nazareno & Schiff, 2021). Investigating how specific job characteristics and organizational practices influence older workers' responses to technological change could provide a more comprehensive understanding of their retirement intentions. Beyond the organizational context, socioeconomic factors such as retirement policies could also play a role in shaping retirement intentions (Jiang et al., 2022; Messe et al., 2014; Taylor et al., 2014). Future research should explore how these external factors interact with workplace dynamics to influence older workers' retirement intentions.

The results showing that burnout negatively relates to perceived work ability, which in turn affects retirement intentions, have important theoretical implications. These results align with the tenets of the JD-R model on the adverse effects of burnout on employee performance and behaviour (Bakker & Demerouti, 2017). Therefore, the finding reiterates the importance of addressing burnout to maintain high levels of work ability among older workers. Interventions aimed at reducing job demands and enhancing job resources, such as providing ergonomic support, mental health resources, and opportunities for social support, can be crucial in mitigating burnout and its subsequent influence on work ability and retirement intentions (Bartha et al., 2015; Gonzalez & Morer, 2016).

The importance of addressing burnout is particularly salient in the context of an aging workforce. As older workers continue to contribute to the labour market, organizations must prioritize creating supportive work environments that can accommodate their unique needs. By doing so, organizations can help mitigate the risk of burnout and enhance the overall work ability of older employees, thereby extending their

productive engagement in the workforce (Borle et al., 2021). Future theoretical models examining older workers' retirement intentions should remain cognizant of and emphasize how burnout and exhaustion diminish employees' perceived capacity to perform their jobs effectively. Integrating insights from the JD-R model with theories of aging and resilience can provide a more informed understanding of how older workers cope with job demands and maintain their work ability. Incorporating concepts such as psychological capital (Luthans et al., 2010) and successful aging (Rowe & Kahn, 1997) could enrich our understanding of the protective factors that help older workers manage burnout.

This study also offers important practical implications. Contrary to expectations, the results revealed that technological training exacerbated, rather than buffered, the negative relationship between burnout and perceived work ability. This suggests that while training is often assumed to be a helpful resource, it may place additional cognitive or emotional strain on already exhausted older workers, particularly if it is poorly timed, overly complex, or misaligned with their needs. Therefore, organizations should approach technological training not as a one-size-fits-all solution, but as an intervention that requires thoughtful design and delivery. Creating a culture that values supportive, inclusive, and user-informed training is essential.

Re-echoing the insights from the first study that stressed the importance of considering older workers' individual differences, training programs should be tailored to the learning preferences, digital comfort levels, and energy capacity of older employees, especially those experiencing elevated levels of burnout. This may include offering self-

paced modules, using peer support models, embedding hands-on guidance, and actively involving older workers in the co-design of training content (Van Yperen & Wortler, 2017; Kase et al., 2019; Xie et al., 2023). By recognizing that training can inadvertently become a hindrance rather than a resource in high-strain contexts, organizations can better align their learning initiatives with employee well-being and retention goals.

The current study also highlights older workers' work ability as a crucial factor that influences their retirement intentions. Consequently, organizations looking to extend the working lives of older workers and leverage their wealth of expertise need to pay special attention to their work ability. Work ability refers to workers' perception of their ability to cope with the physical, mental, and interpersonal demands of their jobs (McGonagle et al., 2015). Investing in health and wellness programs focusing on physical and mental health can significantly improve older workers' perceived work ability (Cloostermans et al., 2014). For instance, providing ergonomic assessments and adjustments, offering fitness programs tailored to various physical capabilities, and ensuring access to mental health resources can help older workers maintain their health and productivity (Borle et al., 2021; Tams, 2017; Thompson & Mayhorn, 2012).

Additionally, providing ongoing career development opportunities can help older workers feel valued and capable, thus improving their perceived work ability (Maltby, 2011). Organizations should also consider implementing flexible work arrangements, such as part-time roles, job-sharing, and remote work options, which can help older workers manage their workloads more effectively, reduce the risk of burnout, and extend their workforce participation (Vanajan et al., 2020).

The results from this study also have salient implications for aging workers, particularly as they navigate rapid technological change. By empirically demonstrating the pathway through which burnout diminishes work ability and, in turn, shapes retirement intentions, this study highlights the importance of psychological and functional well-being in sustaining career longevity. For aging workers, this means that monitoring and managing burnout is not just a matter of well-being—it is directly tied to one's ability to remain active and effective in the workforce (Borle et al., 2021; Tams, 2017). Understanding this relationship empowers older employees to prioritize stress management, work-life balance, and restorative practices that support long-term functioning. It also encourages them to engage in conversations with supervisors or HR professionals about modifying workloads, introducing flexibility, or redesigning roles in ways that reduce chronic strain.

For aging workers, the counterintuitive finding that technological training can intensify the negative effects of burnout on perceived work ability signals a need for caution and self-awareness when engaging with skill development opportunities. While training is often promoted as a pathway to staying current and employable in tech-driven environments (Xie et al., 2023), it may become overwhelming if pursued under conditions of psychological strain. This highlights the importance of recognizing personal limits and seeking training that aligns not only with one's professional goals but also with one's cognitive and emotional capacity at a given time.

Older workers may be best served by choosing training programs that are flexible, self-paced, and designed with practical application in mind. Additionally, cultivating

digital confidence and seeking environments that support user involvement in training design can enhance their sense of control (Markus & Mao, 2004). Rather than internalizing stress related to technological demands, aging employees can advocate for learning experiences that empower rather than exhaust, helping them maintain a sense of competence and agency in the face of change.

3.6. LIMITATIONS AND FUTURE RESEARCH

The findings from this study should be interpreted within the context of its limitations. First, the study used a North American sample, specifically participants from the USA and Canada. While restricting the sample to these countries may constrain the generalizability of the findings (Roberts et al., 2020), the rationale was to maintain a level of consistency in socioeconomic and political contexts. Expanding the sample to other countries or regions with different characteristics would have introduced additional variables that could complicate the interpretation of results. For example, countries like Brazil and China still enforce mandatory retirement ages, which could significantly influence older workers' retirement intentions (World Bank, 2022). Additionally, while the USA and Canada face similar challenges related to an aging population, other regions, such as Africa, do not share the same demographic trends. In 2020, only 5.6% of Africa’s population was 60 years or older, compared to 23.4% in North America (US Census Bureau, 2022). Therefore, the findings of this study might not be applicable in contexts with different retirement policies or demographic compositions.

Similarly, the predominance of research examining older workers' interactions with technology within Western, Educated, Industrialized, Rich, and Developed (WEIRD)

countries, as identified in the first study, underscores the need for a more diverse examination of this topic. Future studies would benefit from exploring these issues in a broader array of socioeconomic and cultural contexts. Conducting comparative studies across different countries could also reveal how varying retirement policies, economic conditions, and cultural attitudes toward aging influence older workers' experiences with technological change and their retirement intentions (Cooke, Veen & Wood, 2017).

Moreover, the recruitment method used in this study (i.e., Prolific) suggests that most participants are likely comfortable using digital technology. This could have impacted the results, as participants who are more technologically adept may have different experiences and perceptions compared to those who are not. To address this limitation, future research should aim to include a wider cross-section of older workers, including those who may not be as technologically savvy. Employing diverse recruitment methods such as telephone surveys, traditional pen-and-paper surveys, and in-person interviews can help capture a more representative sample of the older workforce.

An additional contextual factor that warrants consideration is the digital divide, which refers not only to disparities in access to technology but also in the capacity to use it effectively (Van Deursen & Van Dijk, 2014). While this study focused primarily on age-related experiences, other dimensions such as socioeconomic status (SES), occupational background, and prior technological exposure likely intersect with workers' adjustment to technological change. For example, older employees in low-SES occupations or historically low-tech roles may face disadvantages, such as limited access to digital resources outside of work or fewer opportunities for digital upskilling. A more nuanced

understanding of the digital divide could enrich both research and policy efforts by highlighting intersectional vulnerabilities beyond chronological age. Future research would benefit from examining how technological change interacts with digital inequality, especially across lines of class, ethnicity, and organizational context (Hacker & Mason, 2003).

Additionally, while the focus of this research was intentionally limited to older workers to better understand how technological change intersects with aging workforce dynamics, this focus also presents a boundary to the study's explanatory power. By not including younger workers as a point of comparison, it remains unclear whether the observed outcomes (e.g., burnout, diminished work ability, retirement intentions) are truly age-related or instead driven by other factors, such as psychological strain, technological complexity, or insufficient organizational support. This ambiguity raises the possibility that age-based assumptions in the literature may sometimes obscure deeper structural or contextual causes of technology-related strain. Future research should examine these phenomena across different age cohorts to clarify whether age itself or the conditions surrounding technology use is the primary driver of differential outcomes. Doing so could also help illuminate potential age-related biases in organizational practice and scholarship.

The participants in this study were also highly educated, with about 60 percent having a university degree or higher. This could mean that most of the participants work in knowledge-based industries where technology use is commonplace and frequent changes do not cause as much strain (Beckstead & Gellatly, 2004). Consequently, the lack

of significant findings regarding the influence of technological change on retirement intentions may be due to the variations in how technology affects different job roles. Future studies should analyze the impact of technological change across different job types and industries to determine if the effects vary based on the nature of the work and the technological demands associated with it.

Another limitation of this study is its partial application of the Job-Demand Resources (JD-R) model. While the JD-R theory includes important feedback mechanisms such as job crafting and self-undermining behaviors (Bakker & Demerouti, 2017), the present research focused primarily on the strain pathway, examining how burnout, as a function of demands, impacts work ability, and how resources such as technological training and self-efficacy may buffer or enhance outcomes. This narrowed focus allowed for a more manageable and context-specific model; however, it does not capture the full dynamic complexity of JD-R processes. Future research could build on this work by incorporating feedback loops like job crafting, which may be particularly relevant for understanding how older workers actively shape their roles to extend employability. Similarly, exploring self-undermining behaviors could offer deeper insights into how coping strategies or maladaptive responses contribute to burnout and retirement decisions over time.

Additionally, while this study provides valuable insights, and used several safeguards in the method given the use of self-report data, I must acknowledge the potential biases introduced by the usage of self-reported data. Participants' responses may be influenced by social desirability bias or inaccurate self-assessment of their

technological skills and burnout levels (Caputo, 2017; Creswell, 2014). Future research could consider incorporating objective measures of technological proficiency and burnout, such as performance assessments and physiological indicators, to complement self-reported data and provide a more comprehensive understanding of the issues at hand.

By employing a two-wave time-lagged design, I increased the methodological rigor of this study. However, I recognize that the data is still cross-sectional, and thus, I can not infer causality from my findings. Additionally, despite the several measures I have taken to minimize the impact of common method bias, the presence of such bias cannot be completely ruled out. Consequently, to probe causal relationships between the variables and mitigate against potential common method bias, future studies may wish to examine this topic using longitudinal data. Longitudinal studies that track changes over time would also be beneficial in understanding the dynamic relationship between perceived technological change, burnout, work ability, and retirement intentions. Such studies could reveal how these relationships evolve over time and identify critical intervention points to support older workers in adapting to technological advancements and maintaining their work ability.

This study relied on composite variables derived from averaged scale scores and, therefore, did not model constructs as latent variables. Future research could extend this work by conducting confirmatory factor analysis (CFA) to assess the psychometric properties of the measurement model, including construct validity and item-level performance.

Finally, while the hypothesized mediation and moderated mediation models yielded significant and theoretically meaningful results, some of the fit indices, particularly for the moderated mediation model, fell below conventional benchmarks (e.g., RMSEA = .169, CFI = .896). Although such values are not uncommon in applied settings with complex constructs and real-world data (Marsh, Hau, & Wen, 2004), they indicate room for improving the model's explanatory power.

One possible reason for the less-than-optimal fit is the inherent complexity of modeling conditional indirect effects, which can introduce measurement error and reduce parsimony. Additionally, factors such as cross-sectional data, unmeasured variables, or potential model misspecification may have contributed to the suboptimal fit. Future research could consider alternative model specifications, explore additional mediators or moderators, or use longitudinal or experimental designs to enhance the robustness and fit of structural models examining this model. Moreover, expanding the sample or using multi-group SEM to compare subpopulations (e.g., by age or industry) could provide more nuanced insights and potentially improve model performance.

3.7. CONCLUSION

The second study of this thesis explored the relationship between perceived technological change and older workers' retirement intentions. Drawing from the Job Demand-Resources (JD-R) theory, I focused on burnout and perceived work ability as serial mediators, and the moderating roles of computer self-efficacy, technological training, and organizational justice. Although the primary hypothesis of a significant indirect relationship between perceived technological change and retirement intentions

was not supported, several key findings emerged that offer valuable practical and theoretical insights.

In terms of scholarship, the findings highlight the complex nature of the relationship between perceived technological change and retirement intentions. The findings challenge assumptions about older workers' interactions and experiences with technological change. The significant negative relationships between burnout and work ability, and between work ability and retirement intentions, emphasize the critical roles these factors play in older workers' retirement decisions.

The moderating effect of technological training on the burnout–work ability relationship suggests that, contrary to expectations, training may worsen the adverse effects of burnout rather than mitigate them. This unexpected finding highlights the importance of incorporating context-sensitive moderators like training into future theoretical models, especially when examining aging workers' adaptation to technological change. From a practical perspective, the results caution against assuming that training is always a protective factor. Instead, they highlight the need for thoughtfully designed, well-paced, and learner-centered training programs that account for the emotional and cognitive state of participants.

Particularly for older workers experiencing burnout, a supportive learning culture that involves workers in training design and delivery may prevent training from becoming an additional source of strain. These findings advocate for more nuanced workplace interventions that address not only skill development but also the conditions under which training is delivered, in order to better support older employees' perceived work ability in

the face of ongoing technological change.. Additionally, comprehensive health and wellness programs, coupled with career development opportunities, can significantly enhance older workers' perceived work ability (Borle et al., 2021).

Nevertheless, while the anticipated indirect relationship between perceived technological change and retirement intentions was not found to be statistically significant, the study provides important insights into how burnout, work ability, and training influence older workers' retirement intentions. Future research should continue to explore these relationships, incorporating additional individual and contextual factors to develop a more comprehensive understanding of the impact of technological change on the aging workforce.

Chapter Four: Summary and Conclusion

This dissertation sought to investigate the intersection between two pressing issues of interest to many economies– an aging workforce and rapid technological change. A rapidly aging workforce is of concern to many nations, including Canada, because of the threat it poses to labour participation rates and the projected disruption of healthcare and pension systems (Acemoglu & Restrepo, 2017; Maestas et al., 2016). Recent data from Statistics Canada reported that older workers dominated the Canadian labour force, with more than 4.4 million people aged 55 years and older compared to approximately 2.7 million Canadians aged 15 to 24 (Statistics Canada, 2022). These statistics suggest that there are potentially more workers prepared to exit the workforce than there are entering. In fact, Canada is already experiencing labour shortages in several sectors, such as manufacturing and health care, due to the aging workforce (Statistics Canada, 2023). A mass exodus of workers from the labour market without adequate replacements for them holds negative consequences for the future of work (Acemoglu & Restrepo, 2017). It is not surprising that scholars, practitioners, and relevant stakeholders advocate delayed or phased retirements as a solution to talent shortages (Employment and Social Development Canada, 2018; Schwab, 2017; Zacher & Griffin, 2015).

Technological change is the other piece of the puzzle, and it presents both opportunities and challenges for the future of work. On one hand, technological change offers benefits such as increased connectivity and access to information (Mulder, 2021). For example, the recent proliferation of big data has greatly impacted human resources management, as many organizations now rely on HR analytics to make informed

decisions and develop strategies around their workforce (Marler & Boudreau, 2017). On the other hand, technological change is often met with some trepidation as many workers become worried about the security of their jobs and efficacy in adapting to new technologies (Schuster & Cotten, 2022). Indeed, there is ample evidence in the literature that workers who struggle to adapt to the demands of new technologies sometimes consider exit from their organization, jobs, or the labour market as a viable alternative (Carlson et al., 2017; Schellaert & Derous, 2024). Given the discussion about the necessity of keeping older workers in the labour force, I considered it crucial to examine the role of the changing technological work environment on the work experiences of older workers, conducting two studies to investigate this line of inquiry.

The first of these studies was a systematic literature review of the factors impacting older workers' experiences with technology in the workplace. In a bid to fill existing knowledge gaps in the literature, I examined the individual and organizational level factors impacting older workers' experiences with technology and the outcomes of these interactions. In my examination of extant literature, I identified 14 research gaps and outlined suggestions for future research. I also developed a conceptual framework to explicate the interaction between older workers and technology.

In the second study, I analyzed data from 361 older workers. In that study, I investigated the relationship between perceived technological change and older workers' retirement intentions. Grounded in the JD-R theory, I constructed a moderated mediation theoretical model to explain this relationship. According to my findings, and contrary to my initial predictions, perceived technological change does not have any significant

relationship with the retirement intentions of older workers. Although my primary hypothesis was not supported, I put forward several explanations for the contrarian findings. In accordance with my expectations, I found burnout to be significantly related to older workers' work ability, and work ability to be significantly related to their retirement intentions. Importantly, the results from this study revealed that technological training, rather than buffering the negative relationship between burnout and older workers' perceived work ability, actually amplified it. This suggests that training may not always function as a universally beneficial resource and may, under certain conditions, contribute to added strain. Nevertheless, both studies were instrumental in fostering a deeper understanding of older workers' experiences within the rapidly changing technological work environment and the complex interplay of factors that influence these experiences. In the following section, I elucidate the contributions of this dissertation.

4.1. THESIS CONTRIBUTIONS

As I previously mentioned in the second chapter, study one of this thesis stands out as the first to systematically review the antecedents and outcomes of older workers' experiences with technology. More specifically, through the synthesis of previous studies, I contribute to the extant literature on this topic by developing a comprehensive conceptual framework that integrates both individual-level and organizational-level factors influencing older workers' interactions with technology. This framework not only identifies the critical elements at play but also highlights the outcomes of the interplay between these factors, offering a holistic view of how technology impacts older workers.

This framework serves as a guide for future studies to develop models and theories aimed at expounding on the relationship between technology and older workers' work behaviors and outcomes. The value of this framework has been demonstrated as it was instrumental in developing the moderated mediation model, which I proposed in study two of this thesis. An example of this is the inclusion of technological training as a moderating variable in the model proposed in the second study because it was identified as an important organizational-level factor influencing older workers' relationships with technology. By incorporating technological training, the model addressed a key intervention point that can enhance older workers' adaptability and proficiency with new technologies.

Furthermore, this framework has practical implications for organizations aiming to support their aging workforce. As technological advancements continue to redesign workplaces, it is crucial for organizations to adapt their practices to support older employees proactively. The review emphasizes the importance of training and development as a key organizational factor influencing older workers' experiences in the evolving work environment. Therefore, organizations should invest in targeted training programs tailored to the specific needs and learning styles of older workers. Personalized training that accounts for diverse socio-demographic backgrounds (Melchers & Basch, 2022) and varying cognitive abilities (Dalecki et al., 2017) can enhance technological competencies while reducing technostress (Tams, 2017; Van Fossen et al., 2022). These initiatives will not only facilitate skill development but also foster a sense of empowerment among older employees, encouraging continuous learning and adaptation.

Additionally, creating a fair and inclusive work environment is critical for the well-being and retention of older workers. The review highlights that perceived fairness, both in policy implementation and resource distribution, can mitigate feelings of job insecurity and promote a more positive work climate (Turek & Henkens, 2020). Organizations should prioritize transparent communication about technological changes, career development opportunities, and access to resources. This transparency can foster trust, alleviate concerns over obsolescence, and encourage older employees to engage with new technology.

Given the challenges associated with an aging workforce, such as labour shortages and the loss of expertise (Kadefors et al., 2020), the insights from the first study stress the importance of implementing strategies to extend older workers' stay in the workforce in the face of technological change (Mertens & Romeu-Gordo, 2021). Older workers' experiences with technology often influence whether they choose to retire early, continue working, or transition to bridge employment (Van Yperen & Wortler, 2017). Therefore, implementing phased retirement programs and flexible work arrangements can facilitate a gradual transition from full-time employment to retirement, helping retain institutional knowledge while supporting older workers' needs. Such measures not only provide structure but also open opportunities for mentoring roles, allowing experienced employees to pass on their knowledge to younger colleagues.

Beyond training and retirement planning, organizations should also consider implementing health and wellness programs specifically designed for older workers, recognizing the importance of maintaining physical and mental well-being. Programs

focused on stress management, ergonomic adjustments, and wellness coaching can contribute to sustaining productivity and reducing the physical demands associated with technology use in the workplace (Borle et al., 2021).

Furthermore, leveraging older workers' strengths, such as their accumulated experience, problem-solving skills, and deep organizational knowledge, can benefit technology adoption (Fasbender, 2022; Taylor & Bisson, 2022). Encouraging older employees to take on mentoring, advisory, or knowledge-sharing roles can increase their sense of value and contribution while also easing the integration of new technologies within teams (Popkin et al., 2008). This not only benefits the organization by preserving critical knowledge but also enhances older workers' engagement and job satisfaction.

Collaboration with older workers in technology design and implementation can be a valuable strategy. By involving them in the decision-making processes regarding new technology, organizations can ensure that technological tools are user-friendly and that any barriers to adoption are minimized (Beier, 2022; Beier et al., 2020). This participatory approach can boost acceptance of technology and reduce resistance, making technological transitions smoother and more effective.

Turning to study two, my thesis contributes to the literature examining older workers' retirement intentions by investigating the role of perceived technological change through a job-demand resources perspective. Previous studies have examined technology use at work through the JD-R lens. For instance, Carlson et al.'s (2017) study applied the JD-R model to understand technology use as a predictor of turnover intentions in a sample with an average age of 35.9 years. Hence, although other studies have tested

different aspects of the JD-R model, the second study of this thesis broadened the scope by applying the model within the context of how perceived technological change influences older workers' retirement intentions. This approach fills a critical gap in the literature by shifting the focus to the older population, which is increasingly relevant given the aging workforce. This theoretical grounding enabled me to hypothesize and test the relationships put forward in the moderated mediated model.

Moreover, based on the tenets of the JD-R theory, I theorized that perceived technological change creates job demands that lead to burnout for older workers. However, the findings from my analysis challenged this notion, questioning preconceived assertions about the effects of technological change on older workers. The results from the second study suggest that technological change might not be a direct source of burnout for older workers. While there is evidence that techno-related factors such as digital work intensification (Barley et al., 2011; Borle et al., 2021) can have negative consequences on the health of older workers, my findings suggest that technological change alone might not be the problem.

Indeed, other scholars have reached similar conclusions. For example, Borle et al.'s (2021) study, which examined the social and health implications of technology on older workers, surmised that technology use by itself did not negatively impact older workers. Instead, it was the specific conditions under which technology was applied and the context in which older workers engaged with technology that determined its effects. These findings align with my results, indicating that the mere presence of technological change is not inherently detrimental.

Therefore, this thesis contributes to the literature by highlighting the need for future research to seek alternative ways of conceptualizing technological change, especially regarding the different aspects or patterns of technological change that might cause burnout or stress for older workers. For instance, future studies could explore how the pace of technological change, the adequacy of training and support, and the relevance of new technologies to job roles impact older workers' experiences. Additionally, understanding the role of individual differences, such as adaptability and prior technological experience, could provide deeper insights into how technological changes affect older workers differently (Ragu-Nathan et al., 2008; Truxillo et al., 2015).

Furthermore, in the second study, I hypothesized an indirect relationship between perceived technological change and older workers' retirement intentions, proposing that technological change might be a catalyst for older workers' decision to exit the workforce. However, the results of the study did not subscribe to my propositions. Instead, the findings of study two call for a re-examination of our understanding of how older workers view and react to technological change. Some empirical studies report that older workers make less use of digital technologies in their jobs, use fewer complex applications, and have more difficulties using ICTs compared to younger workers (de Koning & Gelderblom, 2006). Seemingly, such findings support stereotypes that label older workers as 'technophobes' who are often resistant and unwilling to use new technologies (Thompson & Mayhorn, 2012). My findings refute such arguments and suggest that the idea that 'flight' is the response of older workers to technological change might be erroneous. Instead of viewing technological change as a direct catalyst for

retirement, my findings indicate that older workers might not necessarily react to technological advancements with a desire to exit the workforce. This suggests that older workers may possess a greater degree of adaptability and may be more willing to 'fight' than previously assumed (Ragu-Nathan et al., 2008). Therefore, future studies need to investigate other underlying factors to better understand the relationship between technological change and retirement intentions among older workers.

By challenging the stereotype that older workers are inherently resistant to technology and prone to retiring as a result, this thesis contributes to a more nuanced understanding of the factors influencing retirement decisions. It encourages a broader investigation into the conditions and contexts that shape older workers' interactions with technology, moving beyond simplistic notions of resistance and withdrawal.

The results obtained from the second study of this thesis showed that technological training significantly moderated the relationship between burnout and older workers' perceived work ability. However, contrary to expectations, the effect was in the negative direction, indicating that higher levels of technological training intensified the adverse impact of burnout on perceived work ability. This surprising finding offers a critical counterpoint to the prevailing view that training is always beneficial and underscores the importance of examining contextual and psychological factors when implementing training initiatives.

Still, the significant interaction reinforces the insight from the first study, which identified technological training as an important organizational-level factor shaping older workers' experiences with technology. While prior research has shown that training can

enhance positive attitudes toward technology and facilitate continued workforce participation (Xie et al., 2023), and reduce computer anxiety over time (Charness & Bosman, 1992), this thesis contributes to the literature by suggesting that these benefits may not extend uniformly to workers under high psychological strain. In such cases, training may inadvertently increase feelings of inadequacy or overwhelm. These findings highlight the need to design more responsive and adaptive training approaches that account for burnout and other well-being indicators to genuinely support older workers' functional capacity in an evolving technological landscape. Furthermore, findings from this thesis challenge the misconception that older workers are inherently resistant to technology. Instead, they show that with appropriate support and training, older workers can adapt to and thrive in technologically advanced work environments. Hence, the significance of technological training holds broad implications for organizational policies and practices, especially within the context of retaining older workers in the workforce. Employers and managers need to prioritize ongoing and tailored training programs that address the specific needs and challenges faced by older employees. By focusing on tailored training programs, organizations can create a more inclusive environment that leverages the experience and capabilities of older employees.

Across both studies, a central insight is that older workers are not simply passive recipients of technological change; they are active agents whose experiences are shaped by the alignment (or misalignment) of job demands and resources. The thesis highlights that when older workers are provided with appropriate supports, such as well-designed technological training, fair workplace practices, and inclusive learning environments, they

are more than capable of adapting to change and sustaining meaningful work. Rather than framing aging as a liability, this research emphasizes the importance of equipping older workers with the tools, confidence, and autonomy to navigate evolving work environments. By doing so, organizations can enable older employees to manage stress, maintain work ability, and extend their careers in ways that are both productive and personally fulfilling.

It is also important to situate the findings of this thesis within the broader demographic landscape. While this research was conducted during a period when older workers represented a growing share of the Canadian workforce, recent data indicate that Millennials (Generation Y) have since become the largest cohort, largely due to immigration-driven growth (Statistics Canada, 2024). Nevertheless, the challenges and opportunities surrounding older workers' adjustment to technological change remain relevant. As many older employees continue to delay retirement or re-enter the workforce, understanding how they engage with technological demands remains crucial for fostering inclusive, age-diverse workplaces. Moreover, the insights generated here offer a foundational lens for anticipating how future cohorts, who will themselves age into later stages of their careers, might navigate similar technological transitions.

4.2. THESIS LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

The contributions of any thesis should be examined within the confines of its limitations. One important limitation relates to the sample used in the second study, which may not be fully representative of the broader population of older workers. One factor

potentially impacting the sample's representativeness is how they were recruited. The cross-section of older workers surveyed in this research were recruited from Prolific, an online crowdsourcing platform. While the advantages of a Prolific sample were identified earlier in Chapter Three, the participants of this research may have a higher degree of familiarity with digital technologies compared to the general population of older workers, given their participation in the online platform. This inherent bias towards more technologically-savvy individuals means that the findings might overestimate older workers' comfort and competence with technology. Therefore, any inferences regarding their attitudes or reactions to technology should be considered cautiously. The overrepresentation of digitally literate older workers could skew the results, making it appear as though older workers are generally more adaptable and less resistant to technological changes than they might be in reality. This limitation highlights the need for caution when generalizing the findings to the broader population of older workers, who may have varying levels of technological proficiency and different experiences with digital tools.

To address this limitation, future research should strive to include a more diverse and representative sample of older workers. This could involve recruiting participants through various channels beyond online platforms, such as through community centers, retirement organizations, and workplaces that employ a significant number of older workers. Additionally, stratified sampling techniques could be employed to ensure a more balanced representation of older workers with different levels of technological experience and from various socio-economic backgrounds (Lynn, 2019).

Another factor potentially impacting the representativeness of the sample is that the sample is comprised predominantly of older workers from the United States or Canada. These two countries share many social, economic, and political similarities. For instance, both countries have policies that incentivize workers to delay retirement, such as the Canada Pension Plan and Social Security benefits in the United States (Employment and Social Development Canada, 2015; Social Security Administration, n.d.). Consequently, the findings from this research might not be easily generalized to countries or regions with different socio-political and economic landscapes.

For example, while mandatory retirement has been abolished in the United States and Canada, it still exists in many other countries, such as Brazil, China, and South Korea (World Bank, 2022). In these countries, the dynamics of older workers' interactions with technology may differ significantly due to these enforced retirement ages and different cultural attitudes towards aging and work. These socio-political and economic differences could affect how older workers perceive and adapt to technological changes. For instance, in countries with mandatory retirement, older workers might have less motivation to engage with new technologies as they approach retirement age compared to those in the U.S. and Canada, where continued employment beyond the traditional retirement age is more common.

Due to the difficulties and complexities involved in accounting for all the variabilities and contextual variables at play within different population samples, I chose not to expand my sample to include other countries or regions with different socioeconomic or political characteristics (Creswell, 2014). Expanding the sample in such

a way could potentially introduce additional confounding variables, making it challenging to draw clear conclusions from the results. However, this limitation underlines the need for caution when generalizing the findings to older workers in other regions with distinct socio-economic and political environments.

Despite these constraints, this thesis provides a foundational understanding of older workers' interactions with technology in the North American context. I encourage other researchers to conduct studies on this topic within different contexts to determine if the findings from this study hold true across various socio-political and economic landscapes. Comparative studies involving multiple countries with diverse retirement policies and economic conditions could provide a more global perspective on older workers' experiences with technology. Such research could offer valuable insights into how different environmental factors influence older workers' technological adaptation and retirement intentions, thereby enriching the global discourse on aging, technology, and workforce participation.

Another avenue for future research relates to one of the gaps identified in the systematic literature review, which was the deficiency of qualitative studies examining the experiences of older workers with technology. While quantitative studies offer the advantage of statistical generalizability and the ability to analyze patterns across large samples, they are not without limitations (Almalki, 2016; Verhoef & Casebeer, 1997; Zaborek, 2009). Quantitative methods often fail to capture the nuanced, lived experiences and the subjective perspectives of individuals (Toomela, 2010). In contrast, qualitative studies provide an opportunity to delve deeper into the personal experiences, attitudes,

and perceptions of older workers as they interact with technology (Almalki, 2016; Verhoef & Casebeer, 1997). Qualitative research methods, such as interviews, focus groups, and ethnographic studies, can yield rich, detailed data that illuminate the complexities and contextual factors influencing older workers' technological experiences (Creswell, 2014). These methods allow researchers to explore the reasons behind older workers' attitudes toward technology, the specific challenges they face, and the strategies they employ to adapt to technological changes.

Incorporating more qualitative studies could help address several unanswered questions and provide a more holistic understanding of older workers' interactions with technology. For example, qualitative research could explore how older workers perceive technological training programs and their emotional responses to technology-induced changes in the workplace. Furthermore, qualitative research can capture the diversity of experiences among older workers (Creswell, 2014), highlighting variations based on factors such as industry, job role, prior technology experience, and individual differences in learning styles. This approach can help identify the unique needs of different subgroups within the older worker population, enabling more tailored and effective interventions. Therefore, future research should include qualitative studies to complement the quantitative findings and provide a more comprehensive understanding of older workers' experiences with technology. By integrating both qualitative and quantitative approaches, researchers can develop a richer, more nuanced understanding of how older workers engage with technology and how organizational practices can better support their technological adaptation (Almalki, 2016; Verhoef & Casebeer, 1997).

In conclusion, this thesis makes significant contributions to the understanding of older workers' interactions with technology and their retirement intentions, addressing critical gaps in the existing literature. In so doing, this dissertation tackles the ‘dual threat’ of an aging workforce and rapid technological changes. The implications of this work are far-reaching, offering actionable recommendations for organizations and policymakers to support the aging workforce and create more inclusive, adaptive work environments. As the workforce continues to age and technology evolves, the insights from this thesis will remain crucial for fostering an equitable and productive workplace for all employees.

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APPENDICES

Appendix A: Letter of Approval from ICEHR Committee

MEMORIAL UNIVERSITY

Interdisciplinary Committee on
Ethics in Human Research (ICEHR)

St. John's, NL Canada A1C 5S7
Tel: 709 864-2561 icehr@mun.ca
www.mun.ca/research/ethics/humans/icehr

ICEHR Number:	**20230545-BA**
Approval Period:	July 25, 2022 – July 31, 2024
Funding Source:	CIHR [RIS# 20200593]
Responsible Faculty:	Dr. Travor Brown Faculty of Business Administration
Title of Project:	***Technological Change and its Impact on Older Workers***
Amendment #:	***01***

December 11, 2023

Mr. Adeniyi Judah
Faculty of Business Administration
Memorial University

Dear Mr. Judah:

The Interdisciplinary Committee on Ethics in Human Research (ICEHR) has reviewed the proposed additions for the above referenced project, as outlined in your amendment request dated November 16, 2023. We are pleased to give approval to the Prolific study protocols, as described in your request and subsequent communication, provided all other previously approved protocols are followed.

The *TCPS2* **requires that you strictly adhere to the protocol and documents as last reviewed** by ICEHR. If you need to make any other additions and/or modifications during the conduct of the research, you must submit an Amendment Request with a description of these changes, for the Committee's review of potential ethical issues, before they may be implemented. Submit a Personnel Change Form to add or remove project team members and/or research staff. Also, to inform ICEHR of any unanticipated occurrences, an Adverse Event Report must be submitted with an indication of how the unexpected event may affect the continuation of the project.

Your ethics clearance for this project expires **July 31, 2024**, before which time you must submit an Annual Update to ICEHR, as required by the *TCPS2*. If you plan to continue the project, you need to request renewal of your ethics clearance, and include a brief summary on the progress of your research. When the project no longer requires contact with human participants, is completed and/or terminated, you need to provide an annual update with a brief final summary, and your file will be closed.

All post-approval ICEHR event forms noted above must be submitted by selecting the *Applications: Post-Review* link on your Researcher Portal homepage.

The Committee would like to thank you for the update on your proposal and we wish you well with your research.

Yours sincerely,

James Drover, Ph.D.
Chair, Interdisciplinary Committee on
Ethics in Human Research

JD/bc

cc: Supervisor – Dr. Travor Brown, Faculty of Business Administration

Appendix B: Informed Consent Form for Study Two

Informed Consent Form

Title:	Technological change and retirement intentions
Researcher(s):	Judah Adeniyi, Faculty of Business Administration, Memorial University jiadeniyi@mun.ca.
Thesis Committee:	Dr. Travor Brown (Supervisor): Faculty of Business Administration, Memorial University, travorb@mun.ca.
	Dr. Alyson Byrne: Faculty of Business Administration, Memorial University, alyson.byrne@mun.ca.
	Dr. Bui Petersen: Sobey School of Business, Saint Mary's University, bui.petersen@smu.ca.
	Dr. Ray Gosine: Faculty of Engineering and Applied Sciences, Memorial University, rgosine@mun.ca.

You are invited to take part in a research project entitled *"Technological Change and Retirement Intentions."*

This form is part of the process of informed consent. It should give you a basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. This is the informed consent process. Take time to read this carefully and to understand the information given to you. Please contact the researcher, **Judah Adeniyi**, if you have any questions about the study or would like more information before you consent.

It is entirely up to you to decide whether to take part in this research. If you choose not to take part in this research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future.

Introduction:
My name is Judah Adeniyi, I am a PhD candidate in the Faculty of Business Administration at Memorial University. I am conducting this study as part of the requirement for my PhD thesis under the supervision of Dr. Travor Brown.

Purpose of Study:
The purpose of this study is to examine the impact of technology change(s) on the retirement intentions of older workers.

What You Will Do in this Study:
To participate in this study, you will need to meet the selection criteria of being 55 years of age or older, employed in a job where you use computer and computer-aided technology in your work, and live and work in either Canada or the USA. This study has two parts, and you will be required to complete the two parts for your participation to be considered complete. You will be contacted 14 days after the first part of the study to complete the second part of the study. You will be required to provide your Prolific ID, as it will be used to link your responses from the two parts of the study.

If you agree to participate and meet the selection criteria, you will be presented with survey questions to which you will respond based on your experience using technology in your work. You will also be asked to provide some demographic information. Please note that you are free to skip or not answer any question you do not wish to answer. However, if you complete less than 75% of the survey, your data will not be used, and you will not receive full compensation (see compensation details below).

Length of Time:
Each part of the study should take between ten (10) - fifteen (15) minutes to complete.

Compensation:
As a participant, you will receive a full honorarium of $6.34 (CAD) for participation in the study ($2.54 CAD for the first part of the study and $3.80 CAD for the second part of the study). However, as ***we need participants willing to take part in both parts of the study*** and ***not just one***, we would ask you to **only sign up for the study** if you are prepared to take part **in both parts of the study**. Please note that full compensation will be delayed until after the completion of the second part of the study. You will receive payment for each part **if you provide your Prolific ID number to the researcher and if you respond to at least 75% of the survey and answer questions with earnest effort.**
To check your response quality, we have embedded some attention checks questions in our survey. If you do not answer these questions correctly, your responses may be rejected, and you will not receive any payment. Please note that, if you *do not provide your Prolific ID* and submit your survey, even if your data is good quality, your data will not be used, and you *will not receive any payment* as there is no way to trace your participation and/or to match your responses from part one and two.
Overall, only submitted surveys with a minimum of 75% completion and identifiable Prolific ID will be used.

Withdrawal from the Study:
Your participation in this study is voluntary. You may end your participation in this study at any time. You can withdraw from the study simply by closing your browser, and any data entered will be destroyed. However, once you complete this survey and click submit, your data cannot be removed.

Possible Benefits:
Your participation in this study will help inform research on the impact of technology and technological changes on the careers of older workers, specifically how it impacts their retirement decisions. Insights from this study will also be useful for developing future employment and labour market policies.

Possible Risks:
There is minimal risk to you from participating in this study as you will not be asked any questions of sensitive or intimate nature. You are also free to decline to answer any questions that make you uncomfortable. However, questions related to future employment could trigger stress and anxieties and thereby pose a small emotional/psychological risk. If you do not have access to either professional consultation or an employee assistance program at your company of employment, the following may be of use;

In Canada: Canadian Mental Health Association: https://cmha.ca/find-your-cmha. Toll-free (1-833-456-4566; for those in Quebec: 1-866-277-3553) OR Canadian Human Rights Commission: www.chrc-ccdp.gc.ca.
In the USA: Mental Health America: https://mhanational.org/finding-help OR The United States Commission on Civil Rights: www.usccr.gov

Confidentiality and Anonymity:
This survey is anonymous, and the only identifier collected is your prolific ID number for compensation purposes and to link your responses from the two parts of the study. All information gathered will be kept completely confidential, and no answer can be directly attributed to you.
Furthermore, the data collected will only be analyzed at an aggregate (not individual) level, which minimizes the risk of any individual participant being identified due to a possible unique combination of descriptors (such as age, occupation, and geographic location). Participants requiring assistance from other individuals in reviewing this form or for completing this survey should be aware that this may limit confidentiality and anonymity. All data will be kept confidential by the researcher and his supervisory committee.

Use, Access, Ownership, and Storage of Data:

The survey is hosted on Qualtrics. For information on the security and privacy policy of the company, you may visit https://www.qualtrics.com/privacy-statement/

Once the data has been collected, it will be transferred to the researcher and removed from the Survey Company's website. Data will be stored electronically on password-protected servers and encoded computers (i.e., the researcher's laptop and desktop computers). No identifying information will be collected or linked to the data files in any way (e.g., similar file names).

The Memorial University policy on Integrity in Scholarly Research requires data retention for a minimum of five years. The data will not be used for archival purposes; rather it will be maintained in case the research is "audited" by another researcher or future analyses are required for revision purposes in the publication process.

Third-Party Data Collection and/or Storage:
Anonymized data may be stored on Microsoft's OneDrive servers (located in Canada) for backup purposes and is subject to their privacy policy (https://www.microsoft.com/en-ca/trust-center/privacy). However, any data stored on such servers will be password protected. Data may also be temporarily stored on the Canadian servers of Qualtrics, whose service we will use to host the survey and is subject to their privacy policy (https://www.qualtrics.com/support/survey-platform/getting-started/data-protection-privacy/).

Reporting and Sharing of Results:
The results of this research will be presented at research conferences and will be published in academic and practitioner journals. All results will be reported in the aggregate. Again, no single individual's responses will be illustrated in the papers/presentations.

The published PhD thesis will be available through ***Memorial's QEII thesis library*** *and accessible via this link:*
https://research.library.mun.ca/view/theses_dept/BusinessAdministration.html

Questions:
You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact Judah Adeniyi, jiadeniyi@mun.ca. You may also contact Dr. Travor Brown: travorb@mun.ca

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Consent:
By clicking on "Accept" below and signifying willingness to participate, you agree that:

- You have read the information about the research.
- You have been able to ask questions about this study.
- You are satisfied with the answers to all your questions.
- You understand what the study is about and what you will be doing.
- You understand that you are free to withdraw from the study, without having to give a reason, and that doing so will not affect you now or in the future.

You can withdraw from this research or choose not to participate by not accepting this consent form or by simply closing your browser. However, once you complete this survey and click submit, your data cannot be removed.

By consenting to this online survey, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Please retain a copy of this consent information for your records.

Clicking accept below and submitting this survey constitutes consent and implies your agreement to the above stipulations.

Appendix C: Survey Questionnaire for Study Two: Wave One

Technology and older workers part 1

Start of Block: Landing Page

Q1
Survey on the impact of technology on older workers' retirement decisions
Welcome!
My name is Judah Adeniyi, a PhD candidate in the Faculty of Business Administration at

Memorial University. I am conducting this study as part of the requirement for my Ph.D. thesis under the supervision of Dr. Travor Brown. This study aims to examine the impact of technology change(s) on the retirement intentions of older workers.

To participate in this study, you must meet the selection criteria of being 55 years of age or older, employed in a job where you use computer and computer-aided technology in your work, and live and work in Canada or the USA.

This study has two parts, and you will be required to complete the two parts for your participation to be considered complete. You will be contacted 14 days after the first part of the study to complete the second part. Each part should take 10-15 minutes to complete.

Please note that no personal identifier will be required. Your response will be anonymous. In addition, this exercise is exclusively for research purposes and not a university/employment requirement.

As a participant, you will receive a full honorarium of $6.34 (CAD) for participation in the study ($2.54 CAD for the first part of the study and $3.80 CAD for the second part of the study), provided you provide your ProlificID number and meet the performance criteria noted in the letter of informed consent.

You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact Judah Adeniyi, jiadeniyi@mun.ca. You may also contact Dr. Travor Brown: travorb@mun.ca

Please proceed to read the letter of informed consent

Best regards,
Judah Adeniyi

End of Block: Landing Page

Start of Block: Informed Consent

Q2
Informed Consent Form

Title: Technological change and retirement intentions

Researcher(s): Judah Adeniyi, Faculty of Business Administration, Memorial University jiadeniyi@mun.ca.

Thesis Committee: Dr. Travor Brown (Supervisor): Faculty of Business Administration, Memorial University, travorb@mun.ca.

Dr. Alyson Byrne: Faculty of Business Administration, Memorial University, alyson.byrne@mun.ca.

Dr. Bui Petersen: Sobey School of Business, Saint Mary's University, bui.petersen@smu.ca.

Dr. Ray Gosine: Faculty of Engineering and Applied Sciences, Memorial University, rgosine@mun.ca.

You are invited to take part in a research project entitled *"Technological Change and Retirement Intentions."*

This form is part of the process of informed consent. It should give you a basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. Please contact the researcher, **Judah Adeniyi**, if you have any questions about the study or would like more information before you consent.

Introduction:

My name is Judah Adeniyi, I am a PhD candidate in the Faculty of Business Administration at Memorial University. I am conducting this study as part of the requirement for my PhD thesis under the supervision of Dr. Travor Brown.

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Length of Time:

Each part of the study should take ten (10) - fifteen (15) minutes to complete.

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Your participation in this study will help inform research on the impact of technology and technological changes on the careers of older workers, specifically how it impacts their retirement decisions. Insights from this study will also be useful for developing future employment and labour market policies.

Possible Risks:

There is minimal risk to you from participating in this study as you will not be asked any questions of sensitive or intimate nature. You are also free to decline to answer any questions that make you uncomfortable. However, questions related to future employment could trigger stress and anxieties and thereby pose a small emotional/psychological risk. If you do not have access to either professional consultation or an employee assistance program at your company of employment, the following may be of use;

In Canada: Canadian Mental Health Association: https://cmha.ca/find-your-cmha. Toll-free (1-833-456-4566; for those in Quebec: 1-866-277-3553) OR Canadian Human Rights Commission: www.chrc-ccdp.gc.ca.

In the USA: Mental Health America: https://mhanational.org/finding-help OR The United States Commission on Civil Rights: www.usccr.gov

Confidentiality and Anonymity:

This survey is anonymous, and the only identifier collected is your prolific ID number for compensation purposes and to link your responses from the two parts of the study. All information gathered will be kept completely confidential, and no answer can be directly attributed to you. Furthermore, the data collected will only be analyzed at an aggregate (not individual) level, which minimizes the risk of any individual participant being identified due to a possible unique combination of descriptors (such as age, occupation, and geographic location). Participants requiring assistance from other individuals in reviewing this form or for completing this survey should be aware that this may limit confidentiality and anonymity. All data will be kept confidential by the researcher and his supervisory committee.

Use, Access, Ownership, and Storage of Data:

The survey is hosted on Qualtrics. For information on the security and privacy policy of the company, you may visit https://www.qualtrics.com/privacy-statement/

Once the data has been collected, it will be transferred to the researcher and removed from the Survey Company's website. Data will be stored electronically on password-protected servers and encoded computers (i.e., the researcher's laptop and desktop computers). No identifying information will be collected or linked to the data files in any way (e.g., similar file names). The Memorial University policy on Integrity in Scholarly Research requires data retention for a minimum of five years. The data will not be used for archival purposes; rather it will be maintained in case the research is "audited" by another researcher or future analyses are required for revision purposes in the publication process.

Third-Party Data Collection and/or Storage:

Anonymized data may be stored on Microsoft's OneDrive servers (located in Canada) for backup purposes and is subject to their privacy policy (https://www.microsoft.com/en-ca/trust-center/privacy). However, any data stored on such servers will be password protected. Data may also be temporarily stored on the Canadian servers of Qualtrics, whose service we will use to host the survey and is subject to their privacy policy (https://www.qualtrics.com/support/survey-platform/getting-started/data-protection-privacy/).

Reporting and Sharing of Results:

The results of this research will be presented at research conferences and will be published in academic and practitioner journals. All results will be reported in the aggregate. Again, no single individual's responses will be illustrated in the papers/presentations. The published PhD thesis will be available through ***Memorial's QEII thesis library*** *and accessible via this link:*
https://research.library.mun.ca/view/theses_dept/BusinessAdministration.html

Questions:

You are welcome to ask questions at any time during your participation in this

research. If you would like more information about this study, please contact Judah Adeniyi, jiadeniyi@mun.ca. You may also contact Dr. Travor Brown: travorb@mun.ca

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Consent:

By clicking on "Accept" below and signifying willingness to participate, you agree that:

You have read the information about the research. You have been able to ask questions about this study. You are satisfied with the answers to all your questions.

You understand what the study is about and what you will be doing. You understand that you are free to withdraw from the study, without having to give a reason, and that doing so will not affect you now or in the future. You can withdraw from this research or choose not to participate by not accepting this consent form or by simply closing your browser. However, once you complete this survey and click submit, your data cannot be removed.

By consenting to this online survey, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Please retain a copy of this consent information for your records.

Q3 **Clicking accept below and submitting this survey constitutes consent and implies your agreement to the above stipulations.**

- ○ I accept
- ○ I do not accept

End of Block: Informed Consent

Start of Block: Prolific ID

Q4 Please enter your Prolific ID below

_____

End of Block: Prolific ID

Start of Block: Technological change

Q5 Thinking about your job, to what extent do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
There are always new developments in the technologies we use in my work.	○	○	○	○	○
There are constant changes in computer software in my work.	○	○	○	○	○
There are constant changes in computer hardware in my work	○	○	○	○	○
There are frequent upgrades in computer networks in my work	○	○	○	○	○

End of Block: Technological change

Start of Block: Organizational justice

Q6 To what extent do you agree or disagree with the following?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Overall, I'm treated fairly by my organization.	○	○	○	○	○	○	○
In general, I can count on my organization to be fair.	○	○	○	○	○	○	○
In general, the treatment I receive in my organization is fair.	○	○	○	○	○	○	○
Usually, the way things work in my organization are not fair.	○	○	○	○	○	○	○
For the most part, my organization treats its employees fairly.	○	○	○	○	○	○	○

Most of the people who work in my organization would say they are often treated unfairly.	○	○	○	○	○	○	○

End of Block: Organizational justice

Start of Block: Burnout

Q7 Please read each statement carefully and decide how often you feel this way about your job.

	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Everyday
I feel emotionally drained from work	○	○	○	○	○	○	○
I feel used up at the end of the workday	○	○	○	○	○	○	○
I feel tired when I get up in the morning and have to face another day on the job.	○	○	○	○	○	○	○
Working all day is really a strain for me.	○	○	○	○	○	○	○
Please select 'a few times a week' to show you are paying attention	○	○	○	○	○	○	○
I can effectively solve the problems that arise in my work.	○	○	○	○	○	○	○

I feel burned out from my work.	○	○	○	○	○	○	○
I feel I am making an effective contribution to what this organization does.	○	○	○	○	○	○	○
I've become less interested in my work since I started this job.	○	○	○	○	○	○	○

Q8 Please read each statement carefully and decide how often you feel this way about your job.

	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Everyday
I have become less enthusiastic about my work.	○	○	○	○	○	○	○
In my opinion, I am good at my job.	○	○	○	○	○	○	○
I feel exhilarated when I accomplish something at work.	○	○	○	○	○	○	○
I have accomplished many worthwhile things in this job.	○	○	○	○	○	○	○
I just want to do my job and not be bothered.	○	○	○	○	○	○	○
I have become more cynical about whether my work contributes anything.	○	○	○	○	○	○	○
I doubt the significance of my work.	○	○	○	○	○	○	○

At my work, I feel confident that I am effective at getting things done.	○	○	○	○	○	○	○

End of Block: Burnout

Start of Block: Technology Training

Q9 Have you received any formal or informal training related to the changes in technology in your workplace?

- ○ Great deal of training
- ○ Quite a bit of training
- ○ Some amount of training
- ○ Very little training
- ○ No training at all

Q10 Select 'often' as your answer to this question

- ○ Strongly agree
- ○ Agree
- ○ Neither agree nor disagree
- ○ Often
- ○ Strongly disagree

End of Block: Technology Training

Start of Block: Demographics

Q11 What is your gender?

- ○ Male
- ○ Female
- ○ I identify my gender as _____
- ○ I prefer not to identify

Q12 What year were you born?

- ○ 2006-2000
- ○ 1999-1990
- ○ 1989-1980
- ○ 1979-1970
- ○ 1969-1965
- ○ 1964-1960
- ○ 1959-1955
- ○ 1954-1950
- ○ 1949- 1945
- ○ 1944 or before

Q13 Which of the following best describes your ethnicity? [Select all that apply]

- ☐ White
- ☐ South Asian (e.g., East Indian, Pakistani, Sri Lankan)
- ☐ Chinese
- ☐ Black
- ☐ Filipino
- ☐ Arab
- ☐ Latin American
- ☐ Southeast Asian (e.g., Vietnamese, Cambodian, Laotian, Thai)
- ☐ West Asian (e.g., Iranian, Afghan)
- ☐ Korean
- ☐ First Nations, Inuit, and Metis
- ☐ Japanese
- ☐ Other group- please specify

_____

End of Block: Demographics

Start of Block: Demographics

Q14 What is your highest level of education?

- ○ University certificate, diploma or degree at bachelor level or above
- ○ University certificate or diploma below bachelor level
- ○ College, CEGEP or other non-university certificate or diploma
- ○ Apprenticeship or trades certificate or diploma
- ○ Secondary (high) school diploma or equivalency certificate
- ○ No certificate, diploma or degree

End of Block: Demographics

Appendix D: Survey Questionnaire for Study Two: Wave Two

Technology and older workers part 2

Start of Block: Landing Page

Q1
Survey on the impact of technology on older workers' retirement decisions Welcome! My name is Judah Adeniyi, a PhD candidate in the Faculty of Business Administration at Memorial University. I am conducting this study as part of the requirement for my Ph.D. thesis under the supervision of Dr. Travor Brown. This study aims to examine the impact of technology change(s) on the retirement intentions of older workers.

Thanks again for completing the first part of our study. This survey is the final part of the

two-part study.

Please note that no personal identifier will be required. Your response will be anonymous. In addition, this exercise is exclusively for research purposes and not a university/employment requirement.

As a participant, you will receive a full honorarium of $3.80 CAD for participation in this second part of the study, provided you provide your ProlificID number and meet the performance criteria noted in the letter of informed consent.

You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact Judah Adeniyi, jiadeniyi@mun.ca. You may also contact Dr. Travor Brown: travorb@mun.ca

Please proceed to read the letter of informed consent

Best regards,
Judah Adeniyi

End of Block: Landing Page

Start of Block: Informed Consent

Q2
Informed Consent Form

Title: Technological change and retirement intentions

Researcher(s): Judah Adeniyi, Faculty of Business Administration, Memorial University jiadeniyi@mun.ca.

Thesis Committee: Dr. Travor Brown (Supervisor): Faculty of Business Administration, Memorial University, travorb@mun.ca.

Dr. Alyson Byrne: Faculty of Business Administration, Memorial University, alyson.byrne@mun.ca.

Dr. Bui Petersen: Sobey School of Business, Saint Mary's University, bui.petersen@smu.ca.

Dr. Ray Gosine: Faculty of Engineering and Applied Sciences, Memorial University, rgosine@mun.ca.

You are invited to take part in a research project entitled *"Technological Change and Retirement Intentions."*

This form is part of the process of informed consent. It should give you a basic idea of what the research is about and what your participation will involve. It also describes your right to withdraw from the study. In order to decide whether you wish to participate in this research study, you should understand enough about its risks and benefits to be able to make an informed decision. Please contact the researcher, **Judah Adeniyi**, if you have any questions about the study or would like more information before you consent.

Introduction:

My name is Judah Adeniyi, I am a PhD candidate in the Faculty of Business Administration at Memorial University. I am conducting this study as part of the requirement for my PhD thesis under the supervision of Dr. Travor Brown.

Purpose of Study:

The purpose of this study is to examine the impact of technology change(s) on the retirement intentions of older workers.

What You Will Do in this Study:

To participate in this study, you will need to meet the selection criteria of being 55 years of age or older, employed in a job where you use computer and computer-aided technology in your work, and live and work in either Canada or the USA. This study has two parts, and you will be required to complete the two parts for your participation to be considered complete. You will be contacted 14 days after the first part of the study to complete the second part of the study. You will be required to provide your Prolific ID, as it will be used to link your responses from the two parts of the study. If you agree to participate and meet the selection criteria, you will be presented with survey questions to which you will respond based on your experience using technology in your work. You will also be asked to provide some demographic information.

Length of Time:

Each part of the study should take ten (10) - fifteen (15) minutes to complete.

Compensation:

As a participant, you will receive a full honorarium of $6.34 (CAD) for participation in the study ($2.54 CAD for the first part of the study and $3.80 CAD for the second part of the study). However, as ***we need participants willing to take part in both parts of the study*** and ***not just one***, we would ask you to **only sign up for the study** if you are prepared to take part **in both parts of the study**. Please note that full compensation will be delayed until after the completion of the second part of the study. You will receive payment for each part **if you provide your Prolific ID number to the researcher and if you respond to at least 75% of the survey and answer questions with earnest effort.** To check your response quality, we have embedded some attention checks questions in

our survey. If you do not answer these questions correctly, your responses may be rejected, and you will not receive any payment. Please note that, if you *do not provide your Prolific ID* and submit your survey, even if your data is good quality, your data will not be used, and you *will not receive any payment* as there is no way to trace your participation and/or to match your responses from part one and two.

Withdrawal from the Study:

Your participation in this study is voluntary. You may end your participation in this study at any time. You can withdraw from the study simply by closing your browser, and any data entered will be destroyed. However, once you complete this survey and click submit, your data cannot be removed.

Possible Benefits:

Your participation in this study will help inform research on the impact of technology and technological changes on the careers of older workers, specifically how it impacts their retirement decisions. Insights from this study will also be useful for developing future employment and labour market policies.

Possible Risks:

There is minimal risk to you from participating in this study as you will not be asked any questions of sensitive or intimate nature. You are also free to decline to answer any questions that make you uncomfortable. However, questions related to future employment could trigger stress and anxieties and thereby pose a small emotional/psychological risk. If you do not have access to either professional consultation or an employee assistance program at your company of employment, the following may be of use;

In Canada: Canadian Mental Health Association: https://cmha.ca/find-your-cmha. Toll-free (1-833-456-4566; for those in Quebec: 1-866-277-3553) OR Canadian Human Rights Commission: www.chrc-ccdp.gc.ca.

In the USA: Mental Health America: https://mhanational.org/finding-help OR The United States Commission on Civil Rights: www.usccr.gov

Confidentiality and Anonymity:

This survey is anonymous, and the only identifier collected is your prolific ID number for compensation purposes and to link your responses from the two parts of the study. All information gathered will be kept completely confidential, and no answer can be directly attributed to you. Furthermore, the data collected will only be analyzed at an aggregate (not individual) level, which minimizes the risk of any individual participant being identified due to a possible unique combination of descriptors (such as age, occupation, and geographic location). Participants requiring assistance from other individuals in reviewing this form or for completing this survey should be aware that this may limit confidentiality and anonymity. All data will be kept confidential by the researcher and his supervisory committee.

Use, Access, Ownership, and Storage of Data:

The survey is hosted on Qualtrics. For information on the security and privacy policy of the company, you may visit https://www.qualtrics.com/privacy-statement/

Once the data has been collected, it will be transferred to the researcher and removed from the Survey Company's website. Data will be stored electronically on password-protected servers and encoded computers (i.e., the researcher's laptop and desktop computers). No identifying information will be collected or linked to the data files in any way (e.g., similar file names). The Memorial University policy on Integrity in Scholarly Research requires data retention for a minimum of five years. The data will not be used for archival purposes; rather it will be maintained in case the research is "audited" by another researcher or future analyses are required for revision purposes in the publication process.

Third-Party Data Collection and/or Storage:

Anonymized data may be stored on Microsoft's OneDrive servers (located in Canada) for backup purposes and is subject to their privacy policy (https://www.microsoft.com/en-ca/trust-center/privacy). However, any data stored on such servers will be password protected. Data may also be temporarily stored on the Canadian servers of Qualtrics, whose service we will use to host the survey and is subject to their privacy policy (https://www.qualtrics.com/support/survey-platform/getting-started/data-protection-privacy/).

Reporting and Sharing of Results:

The results of this research will be presented at research conferences and will be published in academic and practitioner journals. All results will be reported in the aggregate. Again, no single individual's responses will be illustrated in the papers/presentations. The published PhD thesis will be available through ***Memorial's QEII thesis library*** *and accessible via this link:*
https://research.library.mun.ca/view/theses_dept/BusinessAdministration.html

Questions:

You are welcome to ask questions at any time during your participation in this research. If you would like more information about this study, please contact Judah Adeniyi, jiadeniyi@mun.ca. You may also contact Dr. Travor Brown: travorb@mun.ca

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial University's ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Consent:

By clicking on "Accept" below and signifying willingness to participate, you agree that:

You have read the information about the research. You have been able to ask

questions about this study. You are satisfied with the answers to all your questions.

You understand what the study is about and what you will be doing. You understand that you are free to withdraw from the study, without having to give a reason, and that doing so will not affect you now or in the future. You can withdraw from this research or choose not to participate by not accepting this consent form or by simply closing your browser. However, once you complete this survey and click submit, your data cannot be removed.

By consenting to this online survey, you do not give up your legal rights and do not release the researchers from their professional responsibilities.

Please retain a copy of this consent information for your records.

Q3 **Clicking accept below and submitting this survey constitutes consent and implies your agreement to the above stipulations.**

- ○ I accept
- ○ I do not accept

End of Block: Informed Consent

Start of Block: Prolific ID

Q4 Please provide your Prolific ID below

_____

End of Block: Prolific ID

Start of Block: Retirement Intentions

Q5 To what extent do you agree or disagree with the following statements?
[Retirement refers to the exit from an organizational position or career path of considerable duration, taken by individuals after middle age and taken with the intention of reduced psychological commitment to work thereafter].

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I intend to stop working before my official retirement age	○	○	○	○	○
I can easily continue working until my official retirement age	○	○	○	○	○
It is my intention to work as long as possible	○	○	○	○	○
I plan to stop working as soon as I can	○	○	○	○	○

End of Block: Retirement Intentions

Start of Block: Perceived work ability

Q6 Assume that your work ability at its best has a value of 10 points. How many points would you give your current work ability?

- ○ 10 (means your work ability is at its best)
- ○ 9
- ○ 8
- ○ 7
- ○ 6
- ○ 5
- ○ 4
- ○ 3
- ○ 2
- ○ 1
- ○ 0 (means you currently cannot work at all)

X→

Q7 Thinking about the mental demands of your job, how do you rate your current ability to meet those demands?

- ○ 10 (means your work ability is at its best)
- ○ 9
- ○ 8
- ○ 7
- ○ 6
- ○ 5
- ○ 4
- ○ 3
- ○ 2
- ○ 1
- ○ 0 (means you currently cannot work at all)

Q8 Thinking about the interpersonal demands of your job, how do you rate your current ability to meet those demands?

- ○ 10 (means your work ability is at its best)
- ○ 9
- ○ 8
- ○ 7
- ○ 6
- ○ 5
- ○ 4
- ○ 3
- ○ 2
- ○ 1
- ○ 0 (means you currently cannot work at all)

Q9 Thinking about the physical demands of your job, how do you rate your current ability to meet those demands?

- ○ 10 (means your work ability is at its best)
- ○ 9
- ○ 8
- ○ 7
- ○ 6
- ○ 5
- ○ 4
- ○ 3
- ○ 2
- ○ 1
- ○ 0 (means you currently cannot work at all)

Q10 Please select 'sometimes' as your answer to this question

- ○ Always
- ○ Often
- ○ Sometimes
- ○ Rarely
- ○ Never

End of Block: Perceived work ability

Start of Block: Computer Self-Efficacy

Q11 Thinking about your day-to-day interactions with technology in your job, to what extent do you agree or disagree with the following statements?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
At work, I feel more competent with the computer system than most other people	○	○	○	○	○
I know enough about the computer system to get my job done	○	○	○	○	○
Compared to other people at work, I know a lot about computers.	○	○	○	○	○
I use computers as much as possible in my work	○	○	○	○	○

End of Block: Computer Self-Efficacy

Start of Block: Control variables

Q12
What is your best estimate of your total personal income, before taxes and deductions, from all sources during the last year?

- ○ $5000 or less
- ○ $5001 to $10000
- ○ $10001 to $15000
- ○ $15001 to $20000
- ○ $20001 to $25000
- ○ $25001 to $30000
- ○ $30001 to $40000
- ○ $40001 to $50000
- ○ $50001 to $60000
- ○ $60001 to $70000
- ○ $70001 to $80000
- ○ $80001 to $90000
- ○ $90001 to $100000
- ○ $100001 or more

Q13 How satisfied are you with your...

	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
Level of living	○	○	○	○	○
Current level of savings	○	○	○	○	○
Ability to stay out of debt	○	○	○	○	○
Level of assets	○	○	○	○	○
Ability to pay back what you owe	○	○	○	○	○
Ability to meet large emergency expenses	○	○	○	○	○

Q14 In general, how would you rate your physical health?

- Excellent
- Very good
- Good
- Fair
- Poor

Q15 In general, how would you rate your emotional health?

- Excellent
- Very good
- Good
- Fair
- Poor

End of Block: Control variables

Start of Block: Control variables

Q16 To what degree do you agree or disagree with the following statements

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
In most ways, my life is close to my ideal.	○	○	○	○	○
The conditions of my life are excellent.	○	○	○	○	○
Please select 'agree' to show you are paying attention	○	○	○	○	○
I am satisfied with my life.	○	○	○	○	○
So far, I have gotten the important things I want in life	○	○	○	○	○
If I could live my life over, I would change almost nothing.	○	○	○	○	○

End of Block: Control variables

Appendix E: List of Measurement Scales, Sources, and Scale Items

Variable	Scale item(s) with sources
Technological Change	(Ragu-Nathan et al., 2008) To what extent do you agree or disagree with the following statements? • There are always new developments in the technologies we use in our organization. • There are constant changes in computer software in our organization. • There are constant changes in computer hardware in our organization. • There are frequent upgrades in computer networks in our organization. (Answer scale: 1=strongly disagree to 5=strongly agree)
Retirement Intentions	(De Vos & Segers, 2013) To what extent do you agree or disagree with the following statements? • I intend to stop working before my official retirement age • I can easily continue working until my official retirement age • I plan to stop working as soon as I can • It is my intention to work as long as possible (Answer scale: 1=strongly disagree to 5=strongly agree)
Computer Self-Efficacy	(Henry & Stone, 1997) Thinking about your day-to-day interactions with technology in your job, to what extent do you agree or disagree with the following statements? • At work, I feel more competent with the computer system than most other people. • I know enough about the computer system to get my job done. • Compared to other people at work, I know a lot about the computer system. • I use the computer system as much as possible. (Answer scale: 1=strongly disagree to 5=strongly agree)
Perceptions of Overall Justice	(Ambrose & Schminke, 2009) To what extent do you agree or disagree with the following statements? • Overall, I'm treated fairly by my organization. • In general, I can count on my organization to be fair. • In general, the treatment I receive in my organization is fair. • Usually, the way things work in my organization are not fair. • For the most part, my organization treats its employees fairly. • Most of the people who work in my organization would say they are often treated unfairly.

	(Answer scale: 1=strongly disagree to 7=strongly agree)
Perceived Work Ability	(McGonagle et al., 2015) 1. How many points would you give your current work ability? 2. Thinking about the physical demands of your job, how do you rate your current ability to meet those demands? 3. Thinking about the mental demands of your job, how do you rate your current ability to meet those demands? 4. Thinking about the interpersonal demands of your job, how do you rate your current ability to meet those demands? (Answer scale: 0= currently cannot work at all to 10= work ability at its best)
Technology Training	(WES, Statistics Canada) Question: Have you received any informal or formal training related to the changes in technology in your workplace? (Answer scale: 1=not at all to 5=very much so)
Burnout	(Schaufeli et al. (1996) 1. I feel emotionally drained from my work. 2. _____ I feel used up at the end of the workday. 3. _____ I feel tired when I get up in the morning and have to face another day on the job. 4. _____ Working all day is really a strain for me. 5. _____ I can effectively solve the problems that arise in my work. 6. _____ I feel burned out from my work. 7. _____ I feel I am making an effective contribution to what this organization does. 8. _____ I've become less interested in my work since I started this job. 9. _____ I have become less enthusiastic about my work. 10. _____ In my opinion, I am good at my job. 11. _____ I feel exhilarated when I accomplish something at work. 12. _____ I have accomplished many worthwhile things in this job. 13. _____ I just want to do my job and not be bothered. 14. _____ I have become more cynical about whether my work contributes anything. 15. _____ I doubt the significance of my work. 16. _____ At my work, I feel confident that I am effective at getting things done. (Answer scale: 0= never to 6=everyday)
Financial Satisfaction	(Mugenda et al., 1990) How satisfied are you with your

	o Level of living o Current level of savings o Ability to stay out of debt o Level of assets o Ability to pay back what you owe o Ability to meet large emergency expenses (Answer scale: 1= very dissatisfied to 5= very satisfied)
Physical Health	University of Michigan Health and Retirement Study (HRS) In general, how would you rate your physical health? (Answer scale: 1= poor to 5=excellent)
Psychological Health	University of Michigan Health and Retirement Study (HRS) In general, how would you rate your emotional health? (i.e., how good, stressed, anxious or depressed you feel) (Answer scale: 1= poor to 5=excellent)
Life Satisfaction	(Diener et al., 1985) • In most ways, my life is close to my ideal. • The conditions of my life are excellent. • I am satisfied with my life. • So far, I have gotten the important things I want in life. • If I could live my life over, I would change almost nothing. (Answer scale: 1= strongly disagree to 5= strongly agree)
Educational Status	(LFS, Statistics Canada) What is your highest level of education? o No certificate, diploma or degree o Secondary (high) school diploma or equivalency certificate o Apprenticeship or trades certificate or diploma o College, CEGEP or other non-university certificate or diploma o University certificate or diploma below bachelor level o University certificate, diploma or degree at bachelor level or above
Income	(WES, Statistics Canada) What is your best estimate of your total personal income, before taxes and deductions, from all sources during the last year? o $5000 or less o $5001 to $10000 o $10001 to $15000 o $15001 to $20000 o $20001 to $25000 o $25001 to $30000 o $30001 to $40000 o $40001 to $50000

	o $50001 to $60000 o $60001 to $70000 o $70001 to $80000 o $80001 to $90000 o $90001 to $100000 o $100001 or more
Gender	What is your gender? • Male • Female • I identify my gender as: _____ • I prefer not to identify.
Age	What year were you born? o 2006-2000 o 1999-1990 o 1989-1980 o 1979-1970 o 1969-1965 o 1964-1960 o 1959-1955 o 1954-1950 o 1949- 1945 o 1944 or before

Appendix F: Use of AI Tools

Artificial Intelligence (AI) tools were not used for conducting the literature review, data collection, or data analysis in this thesis. All aspects of the research, from identifying and synthesizing relevant literature to analyzing the quantitative data, were completed manually using academic databases (e.g., Scopus, Web of Science, EBSCO) and established statistical software (e.g., SPSS). AI writing tools (e.g., ChatGPT) were occasionally used in the revision process to brainstorm ideas, rephrase complex sentences, or check for flow and clarity in sections such as the abstract and discussion. However, any content generated using such tools was critically evaluated, edited, and integrated by the researcher to maintain academic integrity and originality.

The decision not to use AI for core research tasks (e.g., systematic review coding, statistical modeling) was intentional. This ensured that the analysis remained grounded in established scholarly practices and that methodological rigour was preserved. It also allowed me to remain closely engaged with the data and findings, which was particularly important given the interpretive nature of the theoretical framework employed.