UNIVERSIDADE CATÓLICA PORTUGUESA

BREAKING PRESCRIPTIVE STEREOTYPES OR FACING BACKLASH? AGEISM AND THE IMPACT OF TECHNOLOGY USE BY OLDER WORKERS IN THE MODERN WORKPLACE

Dissertation presented to Universidade Católica Portuguesa to obtain a Master's Degree in Psychology in Business and Economics

By

Katharina Christina Hörmann

Faculty of Human Sciences

September 2024

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Abstract

Age-related prescriptive stereotypes in the workplace often shape expectations about older workers' abilities, particularly concerning technology. When individuals violate these stereotypes, they may face negative social and economic consequences for deviating from societal norms, also referred to as backlash (Rudman, 1988). This dissertation explored how older workers who violate technology-based age stereotypes are perceived by people of different ages. Factors influencing these perceptions, and the role of benevolent and hostile ageism in this relationship were examined. Through a factorial vignette experiment (n = 169), participants evaluated profiles depicting either middle-aged or older workers, female or male workers, and workers who adhere to or violate technology-based age stereotypes. The findings revealed that older workers perceived as less technologically adept (thus adhering to stereotypes) were rated higher in warmth and likability, whereas middle-aged workers showed the opposite trend. Both groups, however, were perceived as more competent and respected when they behaved counter-stereotypically by demonstrating technological proficiency. Contrary to expectations, hostile ageism, participant age, and the gender of the evaluated individual did not significantly influence perceptions but were instead linked to different emotional responses such as irritation and annoyance. This study partially supports existing literature while offering new insights into the relationship between age stereotype violations and perceptions of older workers. It also underscores the need for further research on the factors shaping perceptions of counter-stereotypical behavior in older individuals. Practical recommendations are provided to help mitigate the potential negative consequences for older workers displaying high levels of technological competence and adaptability in the workplace.

Keywords: age stereotype, workplace ageism, counter-stereotypical behavior, technology competence

Resumo

Estereótipos prescritivos relacionados com a idade no local de trabalho muitas vezes moldam as expectativas sobre as competências dos trabalhadores mais velhos, especialmente no que diz respeito à tecnologia. Quando os indivíduos violam estes estereótipos, podem enfrentar consequências sociais e económicas negativas por se desviarem das normas sociais, também conhecidas como retaliação (Rudman, 1988). Esta dissertação explorou como os trabalhadores mais velhos que violam estereótipos de idade relacionados com a tecnologia são percecionados por pessoas de diferentes idades. Foram examinados os fatores que influenciam estas perceções, bem como o papel do idadismo benevolente e hostil nesta relação. Através de uma experiência com vinhetas fatoriais (n = 169), os participantes avaliaram perfis que retratavam trabalhadores de meia-idade ou mais velhos, trabalhadores do sexo feminino ou masculino, e trabalhadores que seguiam ou violavam estereótipos de idade relacionados com a tecnologia. Os resultados revelaram que os trabalhadores mais velhos, percecionados como menos habilidosos tecnologicamente (e, portanto, a aderirem aos estereótipos), foram avaliados de forma mais positiva em termos de simpatia e afabilidade, enquanto os trabalhadores de meia-idade apresentaram a tendência oposta. No entanto, ambos os grupos foram vistos como mais competentes e respeitados quando se comportavam de forma contra-estereotípica, demonstrando proficiência tecnológica. Contrariamente às expectativas, o idadismo hostil, a idade dos participantes e o género dos indivíduos avaliados não influenciaram significativamente as percepções, mas foram, em vez disso, associados a respostas emocionais diferentes, como irritação e aborrecimento. Este estudo apoia parcialmente a literatura existente, oferecendo novas perspetivas sobre a relação entre a violação de estereótipos etários e as perceções sobre os trabalhadores mais velhos. Também sublinha a necessidade de mais investigação sobre os fatores que moldam as perceções de comportamentos contra-estereotípicos em indivíduos mais velhos. São fornecidas recomendações práticas para ajudar a mitigar potenciais consequências negativas para os trabalhadores mais velhos que demonstram elevados níveis de competência tecnológica e adaptabilidade no local de trabalho.

Palavras-chave: estereótipo de idade, idadismono local de trabalho, comportamento contra-estereotípico, competência tecnológica

Table of Contents

List of Abbreviations

B	Unstandardized regression coefficient
Beta	Standardized regression coefficient
M	Mean
MANCOVA	Multivariate analysis of covariance
n	Sample size
SD	Standard deviation
SE	Standard error

List of Figures

List of Tables

Introduction

The futurist Alvin Toffler coined the phrase: “The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn” (Toffler, 1970, p. 214). Already decades ago, he emphasized the vital importance of lifelong learning and adaptation to remain engaged in society, particularly in the workforce. In today’s rapidly changing world, adaptability and flexibility have become essential for both young and old to keep pace with technological advancements and other evolving challenges. However, for many older adults, adapting to new technologies remains a significant challenge (Czaja & Lee, 2007). This is compounded by deeply ingrained and widespread stereotypes that depict older individuals as lacking technological competence (AARP, 2000; Kroon et al., 2016; McGregor & Gray, 2002; van Dalen et al., 2009; Vines et al., 2015), being less adaptable to technology (AARP, 2000; Hayward et al., 1997; Kroon et al., 2016; Lyon & Pollard, 1997; McCann & Keaton, 2013; Redman & Snape, 2002; Warr & Pennington, 1993), and feeling uncomfortable, as well as fearful with technology (Hayward et al., 1997, McCann & Keaton, 2013), which Burn et al. (2020) summarized in their literature review (see Appendix A).

To meet the demands of the modern workplace and society, it is essential to support older individuals in developing their technological skills and adaptability, while also addressing and reducing the fear of technology that often persists (Burn et al., 2020). Alongside cognitive skills, technical abilities are required for enhancing overall digital literacy among older adults (American Library Association, 2012). Digital literacy refers to “the ability to use information and communication technologies to find, understand, evaluate, create and communicate digital information” (American Library Association, 2012, p. 1) and is a key success factor in addressing digital transformation (Nikou et al., 2022). Yet how does the environment of older people, where stereotypes of technological ineptitude are so prevalent, respond when older adults violate these expectations and become highly skilled in technology? Existing literature suggests that such individuals may be viewed more negatively than those who remain technologically unskilled (Hanrahan et al., 2023; North & Fiske, 2013). Especially amid demographic change, when promoting digital literacy is imperative for society and the economy, this negative perception of older adults could potentially discourage them from breaking free from these stereotypes and embracing the continuous cycle of learning, unlearning, and relearning.

The scale of the challenge associated with demographic change is underscored by the Eurobarometer survey, conducted by the European Commission (2023a). Across the European population, 70% view demographic change as a risk, with the aging population (42%) and shrinking working-age groups coupled with labor shortages (40%) identified as the most pressing concerns (European Commission, 2023a). If unaddressed, these trends could exacerbate labor shortages, strain public budgets, and impact investments and the productivity of the European economy (European Commission, 2023b). In June 2023, the European Council urged the Commission to create tools to help member states tackle these challenges and their effects on Europe's competitiveness, emphasizing the need to address socio-economic inequalities (European Commission, 2023b). A key element of the proposed toolbox includes supporting older populations in maintaining their well-being through policy reforms, suitable employment, and workplace strategies (European Commission, 2023b).
In order to improve the well-being of older workers and implement appropriate workplace strategies which promote technological inclusion and thereby contribute to the increased digital literacy of older workers, this study examines the specific impact of violations of age-related stereotypical behavior – also known as age-related counter-stereotypical behavior – on perceptions of these individuals in Germany and Austria.

By examining counter-stereotypical behaviors and their potential social and economic repercussions – commonly known as backlash – this study not only provides practical insights for developing workplace strategies but also potentially offers theoretical implications that contribute to the application of backlash theory (Rudman, 1998), role congruity theory (Eagly & Karau, 2002) and stereotype content model (Fiske et al., 2002). A distinction is made between descriptive stereotypes (how individuals are perceived to be) and prescriptive stereotypes (how individuals are expected to behave) (North & Fiske, 2013). Research has shown that older individuals who violate prescriptive age stereotypes are often viewed as less warm and competent compared to their younger counterparts (Hanrahan et al., 2023; North & Fiske, 2013). Furthermore, Cary et al. (2017) discovered that individuals are more likely to view older persons as incompetent and distant if they exhibit higher levels of hostile ageism. Conversely, those with high levels of benevolent ageism tend to exhibit the opposite effect. However, it remains unclear how these dynamics play out when technology-based age stereotypes are violated, how they influence not only warmth and

competence, but also other perceptions like likability, trust, and respect, and how factors like the perceiver's age and the target's gender may impact these relationships.

Using a factorial vignette experiment, participants are randomly assigned to profiles of older individuals, with variations in age, gender, and stereotypical behavior. This approach enables the study to assess how these factors, especially stereotype violations, relate to benevolent and hostile ageism and influence perceptions of warmth, competence, likability, trust, and respect. Additionally, the study explores the impact of the participant's age and the profile subject's gender, focusing on a target population aged 18 and above in Germany and Austria.

This dissertation is structured into two main parts: The first part delves into the theoretical framework, while the second part is dedicated to the empirical study. The theoretical background explores the concepts of benevolent and hostile ageism, alongside the concept of age stereotypes, with a particular focus on the distinction between descriptive and prescriptive stereotypes, the occurrence of backlash effects, and the moderators of age stereotype effects. Building on this theoretical foundation, the current study is introduced, outlining the specific hypotheses under investigation. In the empirical study section, the methodology is detailed, covering participants, materials, design, procedure, and data analysis. Following this, the results of the hypothesis testing, and exploratory analyses are presented. The discussion then connects these findings with the existing literature, explores the practical implications, suggests areas for future research, and highlights the study's limitations.

Chapter I – Theoretical Background

1.1 Benevolent and Hostile Ageism

In 1969, Butler defined ageism as a "prejudice by one age group toward other age groups" (Butler, 1969, p. 243). Over time, the concept of ageism has evolved into a nuanced phenomenon, characterized by its multidimensionality. Iversen et al. (2009) conducted a comprehensive review of the existing literature to provide conceptual clarity on ageism. They identified three dimensions of ageism: how we think (stereotypes), feel (prejudice), and act (discrimination) towards others based on age. According to this framework, ageism can be summarized as "cognitive stereotypes, affective prejudice, and behavioral discrimination" based on age (Iversen et al., 2009, p. 15). Ageism can also manifest either

consciously (explicitly), referring to deliberately adopted ageist beliefs, feelings, and behaviors, or unconsciously (implicitly), where these beliefs, feelings, and behaviors occur without conscious awareness (Iversen et al., 2009). Ageism can also occur on different levels: at the individual (micro level), within social networks (meso level), and in institutional or cultural contexts (macro level). Furthermore, Iversen et al. (2009) differentiates between positive and negative stereotypes, prejudice, and discrimination against (or in favor of) older adults based on age. Another distinction is made between other-directed ageism, which targets other individuals, and self-directed ageism, which involves ageism directed toward oneself (Ayalon & Tesch-Römer, 2017; Iversen et al., 2009). This comprehensive understanding of ageism has not only been supported by several studies (Ayalon & Tesch-Römer, 2017; Marques et al., 2020; São José et al., 2019) but has also been adopted by the World Health Organization (2021).

Ageism can also manifest in benevolent and hostile forms, as explained by the stereotype content model (Fiske et al., 2002) and research on ambivalent sexism (Glick & Fiske, 1996). This stereotype content model categorizes social groups in two dimensions: warmth (e.g., friendliness) and competence (e.g., intelligence). Groups are typically perceived as high in one dimension and low in the other, or low in both (Fiske et al., 2002). The concept of ambivalent sexism distinguishes between benevolent and hostile sexism, which can also be applied to ageism. According to Glick and Fiske (1996) and Fiske et al. (2002), hostile ageism views older individuals as neither warm nor competent, whereas benevolent ageism views them as warm but incompetent. This classification of older individuals is explained by their perceived low power within society and lack of competitiveness with other groups for resources (Fiske et al., 2002). Cary et al. (2017) created the first ageism scale that distinguishes between hostile and benevolent ageism.

Benevolent ageism often appears as unwanted help for older individuals, characterized by negative communication like overaccommodation and baby talk. Overaccommodation involves dismissing the serious thoughts, concerns, and emotions of older adults (Grainger et al., 1990) and speaking to them overly politely, loudly, slowly, and in simple terms (Giles et al., 1994). The latter is mostly based on stereotypes about poor hearing and slower cognitive functioning (Kite & Wagner, 2002). However, these stereotypes are often inaccurate, as shown by Veríssimo et al. (2022), who found that older adults can outperform middle-aged adults in orienting their attention and ignoring

distractions. Baby talk, characterized by simplified speech with high pitch and exaggerated intonation, can be perceived positively by older adults with lower functional abilities, but negatively by those with higher cognitive abilities, as it can feel disrespectful and condescending (Caporael & Culbertson, 1986; Ryan et al., 1994). Much like overaccommodation, baby talk is based on the stereotype that all older adults have cognitive deficits and therefore require simplified language (Nelson, 2005). Benevolent ageist behavior is often perceived as harmless or even helpful, but research shows it can lead to negative outcomes like lower self-esteem and reduced communication competence (Nussbaum et al., 2005; Ryan et al., 1994). Despite these negative effects, it tends to be viewed as more socially acceptable than hostile ageism (Gans et al., 2023).

In contrast, hostile ageism is much more aggressive and involves more extreme attitudes and behaviors (Chen & Zhang, 2022), including passive harm such as exclusion or other forms of disregard (Pasupathi & Löckenhoff, 2002). In the workplace, this is particularly apparent in the greater difficulty older job seekers, particularly women, face in securing employment (Neumark et al., 2017). As people age, they encounter both benevolent and hostile ageism more frequently in the workplace (Marchiondo et al., 2019).

In a study by Takeuchi and Katagiri (2024), 75% of participants reported experiencing some form of age discrimination at work, with women in full-time employment facing more severe ageism compared to men. Tahmaseb-McConatha et al. (2023) confirm that women are disproportionately affected by ageism. Conversely, ageism directed toward older white men is more widely accepted, meaning that when they face ageist attitudes or behaviors, it is perceived less negatively compared to black men, white women, or black women (Gans et al., 2023). The need for further research is highlighted by the evidence that ageism is linked to lower subjective well-being, negative self-perceptions of aging (Takeuchi & Katagiri, 2024), and increased anxiety and depression (Marchiondo et al., 2019). Furthermore, experiencing ageism at work leads to declines in overall self-rated health and job satisfaction (Marchiondo et al., 2019).

Explanations for other-directed ageism can be found at both the intrapersonal and intergroup level. On the intrapersonal level, ageism can arise from negative attitudes toward older adults, which, according to Nelson's (2005) functional perspective, helps younger individuals view old age as less threatening and maintain a positive self-image. This ego-protective function allows them to mentally and emotionally distance themselves from the

future in-group, reducing anxiety about their own aging and mortality (Marques et al., 2020; Nelson, 2005; O'Connor & McFadden, 2012; Snyder & Miene, 1994). On the intergroup level, ageism is driven by the need to maintain psychological distance from older adults to preserve group self-esteem (Nelson, 2005; North & Fiske, 2013). Terror management theory (Becker, 1973) suggests that existential threat of mortality is projected onto others, with older adults seen as an outgroup embodying future mortality (Bodner, 2009). This fear has been linked to ageism among young adults (Bodner, 2009; Martens et al., 2004; O'Connor & McFadden, 2012), with studies showing that fear of aging correlates with a greater fear of death and less optimism (Barnett & Adams, 2018). Culture and religion offer structure that lessens the fear of mortality (Greenberg et al., 1986; Solomon et al., 1991), while self-esteem acts as a buffer, helping individuals deny their mortality (Nelson, 2005). Younger people develop ageist attitudes to protect their self-esteem and distance themselves from the realities of aging, often blaming older adults for their condition to deny their own aging process (Nelson, 2005; North & Fiske, 2013). In their literature review, Marques et al. (2020) found that factors such as age, gender and religiosity, but also other factors such as years of education, cultural background, ethnicity, socioeconomic status, urban vs. rural residence, and marital status have all been reported as intrapersonal determinants of ageism. However, the literature lacks a clear consensus (Marques et al., 2020), underscoring the need for further research into the determinants of ageism.

Considering the perspective that ageist beliefs can be seen as a mitigation measure to cope with the fear of one's own mortality (Greenberg et al., 1986; Solomon et al., 1991), it raises the question of how individuals react to older adults who act counter-stereotypical to their age. Younger people may better distance themselves from their future in-group by rejecting older people's characteristics (Nelson, 2005). Maintaining the psychological distance from the older age group may become more difficult when older adults violate age stereotypes, such as being exceptionally tech-savvy. Moreover, descriptive age stereotypes tend to foster benevolent ageism, while prescriptive age stereotypes lead to hostile ageism (Chasteen & Cary, 2015), prompting questions about how these forms of ageism interact with violations of age stereotypes. Given that age stereotypes are deeply embedded in the concept of ageism for both men and women, reactions to counter-stereotypical behavior may be particularly strong, highlighting the need for further research.

1.2 Age Stereotypes

Age stereotypes refer to overgeneralized expectations and beliefs about various characteristics and traits of members of a social outgroup solely based on an individual's age (Fiske, 1998; Toomey & Rudolph, 2017). In the workplace, where age stereotypes are frequently untrue, these preconceptions are especially persistent (Posthuma & Campion, 2009; Toomey & Rudolph, 2017). For instance, compared to younger workers, older workers are thought to be less capable, productive, motivated, and competent, giving the impression that their average job performance is lower (Posthuma & Campion, 2009). On the other hand, there is no empirical evidence indicating a link between age and job performance. Instead, coping strategies and general health or well-being are predictors of work performance (Posthuma & Campion, 2009). Stereotyping primarily leads to biases in information processing, although stereotypes cognitively help to quickly categorize environmental stimuli and prevent cognitive overload (Greifeneder et al., 2018). Age discrimination can emerge quickly because of these biased decision-making processes, which also impact training identification, personnel selection, and promotion decisions (Bal et al., 2011). According to Rothermund et al. (2021), there are three strategies to stop or lessen age discrimination: raising awareness of the issue, challenging age norms and stereotypes, and altering societal and institutional practices that discriminate against older people. They propose that age stereotypes need to be addressed, either directly or indirectly, by providing counterexamples that disprove the stereotype (Rothermund et al., 2021). However, numerous studies (e.g., Hanrahan et al., 2023; North & Fiske, 2013) suggest that individuals who behave counter-stereotypically, as proposed by Rothermund et al. (2021), may encounter opposite effects and even face more negative reactions.

1.2.1 Descriptive and Prescriptive Age Stereotypes

Age stereotypes are classified as either descriptive or prescriptive (North & Fiske, 2013). Descriptive age stereotypes refer to characteristics of how older workers are perceived to be, including perceptions of illness, incapacity, invisibility, and irrelevance (Fiske et al., 2002; Kornadt & Rothermund, 2011; North & Fiske, 2013; Rothermund & Brandtstädter, 2003). Older people are also frequently viewed as pathetic, low-status, and nonreciprocating (Cuddy et al., 2005). Prescriptive age stereotypes, on the other hand, center on beliefs and expectations regarding how older adults should be and how they should

behave, including how they should use their social resources (Ludwig et al., 2024; North & Fiske, 2013). While research has traditionally focused on descriptive age stereotypes (Fiske et al., 2002; Kornadt & Rothermund, 2011; North & Fiske, 2013; Rothermund & Brandtstädter, 2003), there is increasing attention on prescriptive age stereotypes (de Paula Couto et al., 2022; Hanrahan et al., 2023; Ludwig et al., 2024).

According to the stereotype embodiment theory, age stereotypes are internalized throughout our lives, happening unconsciously and becoming more salient due to self-relevance (Kornadt & Rothermund, 2011). Psychologically, age stereotypes function by creating expectations about the future, which then develop into self-fulfilling prophecies (Levy & Leifheit-Limson, 2009). The term "possible selves" refers to these hopes and anxieties about the future (Markus & Nurius, 1986). Possible selves are "images of the self in the future that serve to organize and energize action and behavior" (Frazier et al., 2000, p. 237). Meanwhile, possible selves serve as reference standards by which the experiences of the present are measured (Hoyle & Sherrill, 2006; Markus & Nurius, 1986). When an individual begins to see themselves as an "older person", their possible future self is influenced by age stereotypes. Both benevolent and hostile ageist beliefs can influence this process, as they help maintain psychological distance from the future older self, reducing the fear of aging and supporting a positive self-image and group self-esteem (Hoyle & Sherrill, 2006; Nelson, 2005; North & Fiske, 2013; Snyder & Miene, 1994). Descriptive stereotypes are generally held across all age groups, while prescriptive stereotypes tend to be more unevenly distributed among different groups.

According to North and Fiske (2013), this can be explained by the interdependence of groups, as prescriptive stereotypes are more common in groups that rely on each other. For instance, men, who hold higher societal status, benefit from maintaining controlling stereotypes that keep women in lower-status roles, protecting their privilege (Pratto et al., 1997). A common prescriptive belief is that women should show warmth, and when women act agentic, they face repercussions, which helps uphold men's privileged status (Carli & Eagly, 1999; Eagly & Karau, 2002; Rudman & Glick, 2001). Studies have also revealed situations in which men are the targets of repercussions to maintain the status of women. For example, Chaney et al. (2019) found that men who engage in housework are not stigmatized if they also earn an income and are viewed more positively when they perform a moderate share (30-50%) of housework, compared to the majority (70%). This suggests that men can

retain their status by conforming to the male prescriptive norm of income earning, despite participating in communal, stereotypically female-associated tasks (Chaney et al., 2019). The examples from Carli and Eagly (1999) and Chaney et al. (2019) clearly demonstrate that men and women are interdependent in maintaining a certain degree of social control.

Younger and older individuals, much like men and women, share a relationship of interdependence (North & Fiske, 2013). Middle-aged individuals are perceived to hold the highest status, compared to younger and older individuals, and are viewed as the most entitled to societal resources (Abrams & Swift, 2008; Garstka et al., 2005). Young individuals benefit most from resource transfers from older individuals, as they are seen as lacking resources, while older individuals are viewed as having already "had their turn" (North & Fiske, 2013). As a result, older workers, like agentic women, are more likely to face backlash. Instead of gender-based status threats, intergenerational tensions over resources seem to be the primary reason for competition for resources across age. North and Fiske (2013) identify three main prescriptive age stereotypes held by younger workers about the behavior of older workers. The first prescriptive age stereotype is "succession", which states that older people should step down from their roles to make room for the younger generation. The second one is "consumption", which argues that older people ought to share and use public and private resources sparingly, especially when it comes to pensions and health care. "Identity" is the third prescriptive age stereotype that suggests older people should act in a way appropriate to their age instead of attempting to act younger. Additionally, the prescriptive stereotype of "activation" suggests that older individuals should remain physically and cognitively fit, competent, and engaged both socially and economically, with activation now being considered a variation of the succession stereotype (de Paula Couto et al., 2022; Havighurst, 1961; North & Fiske, 2013).

Based on the description of prescriptive age stereotypes by North and Fiske (2013), technology-related age stereotypes could be linked to the succession and identity stereotypes, as explored in this study. On the one hand, a particularly tech-savvy older individual might retain their role in the workplace longer due to their technology skills, thereby not making way for the next generation as quickly, which would violate the prescriptive stereotype of succession (North & Fiske, 2013). On the other hand, older individuals are often perceived as being poor at handling technology (AARP, 2000; Kroon et al., 2016; McGregor & Gray, 2002; van Dalen et al., 2009; Vines et al., 2015), and

technological proficiency is generally associated with younger people. Since older individuals are expected to behave in an age-appropriate manner and not act like younger people (North & Fiske, 2013), tech-savvy older workers could also violate the prescriptive stereotype of identity. Additionally, the activity theory (Havighurst, 1961) suggests that aging well depends on preserving all middle-aged activities and attitudes for as long as possible, while the disengagement theory (Havighurst, 1961) proposes that aging well depends on accepting and desiring a process of disengaging from an active life. This raises the question of what kind of backlash older people face when they seem to 1) not make way for the next generation as quickly by staying longer in the workplace due to their advanced technology skills (violation of succession stereotype) or 2) act like a young person due to adopting a tech-savvy identity (violation of identity stereotype). Such behavior would also deviate from the disengagement theory (Havinghurst, 1961), which suggests older individuals should gradually withdraw from active roles in the workplace.

1.2.2 Violation of Prescriptive Age Stereotypes and Backlash

As previously introduced, the repercussions for women and men who violate prescriptive gender stereotypes by behaving counter-stereotypically are known as backlash (Carli & Eagly, 1999; Chaney et al., 2019). Backlash theory defines backlash as the negative social and economic consequences individuals face when violating prescriptive gender stereotypes (Rudman, 1998). More recent research (e.g., Lee, 2023) has confirmed the continued relevance of Rudman's (1998) initial definition of backlash. Therefore, this definition is adopted in the present study and applied to age stereotypes. These social and economic consequences can manifest as age-discriminatory behaviors such as criticism, sanctions, and exclusion, affecting individuals of different genders and ages (Lee, 2023; Rothermund et al., 2021).

An explanation for this phenomenon is offered by status incongruity theory, which posits that individuals experience backlash when their behavior conflicts with their expected social status (Lenski, 1966; Karpowitz & Mendelberg, 2014). These negative reactions aim to enforce social norms and maintain the status quo (Lee, 2023). As a result, individuals often conform to societal expectations and adjust their behavior to avoid sanctions for counter-stereotypical actions (Rudman, 1998; Rudman et al., 2012).

Similarly, role congruity theory (Eagly & Karau, 2002) explains that gender stereotypes influence how individuals are evaluated in the workplace when they behave contrary to their prescribed gender roles. This theory is closely tied to social role theory (Eagly, 1987), which views gender-based behavioral differences and the division of labor in society as products of societal expectations based on gender roles. In industrialized economies, men are typically seen as primary breadwinners, while women are viewed as caregivers (Eagly, 1987; Eagly, 2007). Because of these stereotypical roles, the expectation arises that men should display agentic traits, while women are expected to exhibit communal traits. Agency involves competence, individuality, and suppression of emotions, whereas communion emphasizes relationships, community and harmony (Bakan, 1966). Non-compliance with these roles often results in backlash (Carlsson et al., 2014; Chaney et al., 2019). This raises the question of whether prescriptive stereotypes in the workplace are not only influenced by gender but also shaped by age-related expectations.

Counter-stereotypical behavior can impact perceptions of warmth and competence, as shown by the stereotype content model (Cuddy et al., 2008; Fiske et al., 2002). This model identifies warmth and competence as key characteristics that influence social perception more than other attributes (Cuddy et al., 2008; Fiske et al., 2002). Warmth includes traits such as being friendly, well-intentioned, trustworthy, warm, good-natured and sincere, while competence includes traits such as being competent, confident, capable, efficient, intelligent and skillful (Fiske et al., 2002). Individuals or groups can be positioned on these two dimensions, with their placement having consequences such as emotional responses (e.g., admiration, contempt, envy, pity) or behavioral tendencies (e.g., active/passive facilitation, active/passive harm). For most groups, these two dimensions are ambivalently related. For example, older people are often perceived as warm but incompetent (Cuddy et al., 2008).

North and Fiske (2013), Hanrahan (2016) and Hanrahan et al. (2023) extend the theoretical frameworks of prescriptive stereotypes by examining the backlash effects of violating age stereotypes in the workplace. These are the only studies to specifically explore backlash theory in relation to age stereotypes, serving as the foundation for this research. North and Fiske (2013) found that younger individuals view older adults who violate consumption, succession, and identity stereotypes as less competent and warm. Hanrahan (2016) and Hanrahan et al. (2023) further supported this by demonstrating that older adults who violate identity stereotypes are perceived as not only less competent and warm but also

less liked, respected, trusted, stable, and motivated. They also found that these individuals are less likely to participate in coworking activities or be invited to lunch. All these studies agree that younger individuals tend to show more backlash toward older adults who violate stereotypes but become more forgiving as they themselves age, highlighting the significance of the perceiver's age in evaluating counter-stereotypical behavior. However, it remains unclear how the gender of the individual violating age stereotypes affects perceptions. While previous research has not fully addressed this, both backlash theory (Rudman, 1998) and role congruity theory (Eagly & Karau, 2002) emphasize the important role gender plays in these evaluations.

Hanrahan et al. (2023) showed that middle-aged and older individuals adhering to age stereotypes were perceived as less surprising for struggling with technology than those who violated age stereotypes. This highlights a potential connection between stereotype violation and perceptions of technological competence. However, it remains unclear how technology-savvy workers are viewed in the workplace, and whether these perceptions vary by the perceiver's age or the target's gender. The importance of considering age and gender in the evaluation of employees aged over 50 is also emphasized by Cleveland et al. (2017).

1.3 The Current Study

The study aims to explore the dynamics of ageism and prescriptive age stereotype violation in the workplace, focusing on older male and female workers' relationship with technology. Age-related stereotypes set expectations for older workers' technological abilities (Burn et al., 2023; McGregor & Gray, 2002; Vines et al., 2015). Previous studies suggest that violations of not only gender stereotypes but also age stereotypes can trigger backlash, leading to negative social and economic consequences (Hanrahan et al., 2023; North & Fiske, 2013). Therefore, the main research question is: "Are older male and female individuals subjected to backlash in their workplace when they violate age-related prescriptive stereotypes regarding technological proficiency?".

Individuals high in hostile ageism view older adults as incompetent and cold, even if they hold some positive benevolent ageist views. In contrast, those low in hostile ageism but high in benevolent ageism see older adults as warm but lacking competence (Cary et al., 2017). The stereotype content model (Fiske et al., 2002) supports this link between ageism, warmth, and competence perceptions. Additionally, people with high benevolent ageism

scores often view older job candidates as incompetent, regardless of context (Chasteen & Cary, 2015). However, how counter-stereotypical behavior impacts these perceptions remains underexplored. It can be hypothesized that demonstrating technological proficiency, which contradicts the stereotype of older adults' technological ineptitude (Burn et al., 2020), could result in reduced perceptions of warmth (as it contradicts the expectation of needing assistance) and competence (if technology proficiency is perceived as counter-stereotypical). In the workplace, individuals perceived as warm tend to elicit positive engagement from others, such as offers of help, while those not seen as warm often provoke negative responses, including aggression (Becker & Asbrock, 2012; Cuddy et al., 2011). Similarly, those viewed as competent typically receive passive support, such as smooth cooperation or required collaboration, whereas individuals perceived as incompetent are more likely to face passive negative reactions, such as being ignored or overlooked (Becker & Asbrock, 2012; Cuddy et al., 2007; Cuddy et al., 2011). Given the challenges older adults and especially women already encounter in the workplace, understanding the interaction between benevolent and hostile ageism, counter-stereotypical behavior, and perceptions of warmth and competence is essential.

Previous research suggests that counter-stereotypical behavior by older individuals not only affects perceptions of warmth and competence but also diminishes likability, trust, and respect (Hanrahan, 2016). For example, women displaying high agency in professional settings face hiring and promotion discrimination for leadership roles due to gender stereotype violations (Rudman & Glick, 2001). This reflects findings on both hostile and benevolent ageism, where violating gender norms negatively impacts likability (Warren et al., 2020). Conversely, women conforming to traditional gender roles and showing low agency receive less respect (Eagly & Carli, 2007; Rudman & Glick, 2001). Understanding this paradox is essential, as respect is a key predictor of job resilience, satisfaction, retention, and engagement (LaGree et al., 2023). Alongside respect, trust is crucial in the workplace, influencing teamwork (Fulmer & Gelfand, 2012), work engagement (Håvold et al., 2021), job satisfaction (Håvold et al., 2021), and team satisfaction (Chou et al., 2008). Spector and Jones (2004) found that stereotypes and trust are closely intertwined, with new male team members often perceived as more trustworthy than their female counterparts. Understanding how violations of age stereotypes affect likability, trust, and respect in the workplace is key to grasping the complexities of age and gender dynamics.

Considering both the target's gender and the perceiver's age could offer valuable insights as well. Women often face more critical evaluations than men when violating stereotypes, leading to greater sanctions (Carlsson et al., 2014; Chaney et al., 2019; Eagly & Karau, 2002), as explained by social role theory (Eagly, 2007) and Bakan's (1966) distinction between agency and communion. Women tend to rate older adults lower in warmth and competence but are more likely to recognize age discrimination as a problem, while men believe older individuals should make way for the younger generation (Kessler & Warner, 2023). In visual media, technology is often illustrated as male-dominated, with older men more frequently shown using it, while older women are underrepresented in such depictions (Christensen, 2019; Kowalewska & Grodzki, 2019; Persaud et al., 2018). Younger individuals tend to hold more negative views about older adults' use of technology (Brina & Zlata, 2024), exhibit stronger prescriptive and ageist biases compared to older participants (Bae & Choi, 2023; North & Fiske, 2013; Officer et al., 2020), and are more accepting of hostile ageism (Gans et al., 2023). North and Fiske (2013) also showed that while younger participants are most likely to exhibit backlash when individuals behave counter-stereotypically, they tend to become more forgiving as they grow older. Many studies focus on younger and older individuals, often overlooking middle-aged groups (de Paula Couto et al., 2022). This study fills the gap by comparing middle-aged and older individuals while examining whether participants, particularly older ones, will sanction peers who violate technology-related stereotypes, offering insights into age-related self-stereotypes.

This leads to the following hypotheses, which will be investigated in this study to determine if older male and female workers who violate technology-based prescriptive stereotypes face backlash at work:

- Hypothesis 1: Hostile and benevolent ageism are significant predictors of perceptions regarding warmth, competence, likability, trust, and respect in individuals who violate technology-related age stereotypes.
- Hypothesis 2: Older workers violating technology-related prescriptive stereotypes face lower warmth ratings and lower competence ratings in comparison to their adhering and younger counterparts.

- Hypothesis 3: Older workers violating technology-related prescriptive stereotypes face lower likeability, trust and respect ratings in comparison to their adhering and younger counterparts.
- Hypothesis 4: The target's gender moderates the relationship between older workers violating technology-related prescriptive stereotypes and the ratings of the target.
- Hypothesis 5: Younger study participants show stronger backlash towards older workers who violate technology-related prescriptive stereotypes.

Chapter II – Method

2.1 Participants

The data collection for the pretest and main study was conducted online using the Qualtrics platform (https://www.qualtrics.com). The opportunity to participate in the study was communicated through professional and personal networks via email, as well as through various social media platforms such as WhatsApp, LinkedIn, and Instagram. Many of the personal contacts have forwarded it to their own personal and professional contacts. Participation in the study did not involve any form of compensation (e.g., money, prize draw, etc.). Participants in the study had to be employed in organizations where the primary tasks did not involve physical or manual labor. To exclude any potential cultural influence, only individuals living in Germany or Austria were included in the analysis, as these two countries are linguistically and culturally closely connected (Muhr, 2008). Eligible participants for the study sample were required to be at least 18 years of age. It was crucial to enlist individuals from diverse age cohorts, especially to test self-stereotypes in Hypothesis 5.

During the pretest, which took place from March 8 to March 15, 2024, a total of n = 24 participants took part, none of whom had to be excluded due to factors such as missing data or occupation. The majority of the participants were female (58%) compared to male (17%). The remaining participants (25%) declined to disclose their gender. The proportion of participants residing in Austria was 67%, while the proportion residing in Germany was 33%. Among the participants, 38% reported being between 18 and 25 years old, 17% between 26 and 35 years old, 4% between 46 and 55 years old, 24% between 56 and 65 years old, and 17% chose not to reveal their age.

The recommended sample size for the main study was calculated using G*Power 3.1 (Faul et al., 2009). A priori Multivariate Analysis of Covariance (MANCOVA), with a desired power of 95% and a small to medium effect size of Cohen's f^2 of 0.06, indicated a total sample size of $n = 163$. To reach a minimum of $n = 163$ participants, this study aimed for a sample size of 200 individuals. The main study accessed a total of $n = 255$ times between April 26 and June 6, 2024. Participants who did not complete the survey at all ($n = 70$) or only partially ($n = 16$) were excluded from further analysis. Those who did not fully complete the study often had unusually short participation times or provided inattentive responses. Failure to correctly answer the attention check question, "Please check answer option 2 "*unlikely*" in this line to show that you are paying attention", was also considered grounds for exclusion. Consequently, the study's final participant count was $n = 169$, which was more than the suggested sample size. Of this sample, 59.8% of participants identified as female, 39.6% as male, and one person selected the "Other" option (0.6%) without providing further details on their gender. The age range of the participants was 20 to 64 years old, with a mean age of 35. Specifically, 48 participants were under 25 years old, 63 were between 26 and 35 years old, 17 were between 36 and 45 years old, 20 were between 46 and 55 years old, and 21 were over 56 years old. Among the participants, 37% held a master's degree, 28% had a bachelor's degree, 15% were high school graduates, 10% had completed an apprenticeship or vocational degree, 7% had a doctorate degree or higher, 1% had some high school education but no diploma, and 2% did not identify with any of these categories. Thus, individuals with higher education degrees (72%) were overrepresented in the sample. Additionally, 70% of the participants resided in Austria and 30% in Germany. The distribution of participants across the experimental conditions was relatively equal, with each condition having a similar number of participants, as seen in Table 1.

Table 1

Distribution of Participants Across the Experimental Conditions

Gender	Stereotype behavior	Age	*n*
Female	Adhering to stereotypes	Middle-aged	18
Female	Adhering to stereotypes	Old	21
Female	Violating stereotypes	Middle-aged	22
Female	Violating stereotypes	Old	24
Male	Adhering to stereotypes	Middle-aged	22
Male	Adhering to stereotypes	Old	20
Male	Violating stereotypes	Middle-aged	21
Male	Violating stereotypes	Old	21

2.2 Materials

The fundamental materials of this study consisted of vignettes (see Appendix B) and measurements in terms of the scales (see Appendix C) used. The different vignettes served as the foundation of the factorial vignette experiment, in which the independent variables of the target's age (levels: 44 years old and 62 years old), target's gender (levels: male and female), and target's stereotype behavior (levels: adhering to stereotypes and violating stereotypes) were varied. Whenever this dissertation mentions the three conditions, it specifically refers to the individual depicted in the vignette and evaluated by the participants, called "target". If the participants' age is being referenced, it will be explicitly stated, and their perspective is often referred to as the perceiver's perspective. To provide context, the vignette mentions that the target works in a consulting firm, as this is a job that is not associated with any specific age group or gender (Goldberg et al., 2004). The vignette described a person working in a company who uses technology in their daily tasks, detailing their skills and habits related to its use. The narrative of the vignette was presented in form of a continuous text, with varying elements across vignettes highlighted by being written in bold, as recommended by Dülmer (2014).

Each participant was randomly assigned to evaluate only one vignette (between-subject design) to prevent learning effects and order effects (Auspurg & Hinz, 2015; Auspurg & Jäckle, 2017; Dülmer, 2014). The combination of all possible attributes depicted in the vignette results in a "full factorial" (Auspurg & Hinz, 2015; Liebe et al., 2020), and the number of vignettes in the population is a Cartesian product of all levels and dimensions (Atzmüller & Steiner, 2010). The full factorial for this study included eight vignettes. To avoid cognitive burden (Sudman et al., 1996), fatigue effects (Krosnick, 1991), and satisficing (Simon, 1955) a small set of eight vignettes was used, providing sufficient data for evaluation while considering the hypotheses. A fractional factorial design was not needed due to the low number of factors and levels. It was assumed that no key variables were omitted (omitted variable bias; Greene, 2012), that the vignette values were broad enough to reflect real-world importance (range effects; Steiner & Atzmüller, 2006), and that the variables had an adequate number of levels (number-of-levels effect; Steiner & Atzmüller, 2006). Before testing the vignettes in the main study, a pretest was conducted. Participants assessed the vignettes for perceived typicality, surprisingness, and emotions elicited. After

each vignette, participants answered questions used to infer constructs such as warmth, competence, likability, trust, respect, and both hostile and benevolent ageism.

This study used the Ambivalent Ageism Scale (Cary et al., 2017) to measure both benevolent (9 items) and hostile (4 items) ageism. The scale had excellent reliability, with an overall alpha coefficient of .91 (Cary et al., 2017), and strong internal consistency for both benevolent (α = .89) and hostile ageism (α = .84). It also showed good test-retest reliability (r = .80) and correlated significantly with the Fraboni Scale of Ageism, confirming its discriminant validity (Cary et al., 2017). A 6-point Likert scale (from 1 = *strongly disagree* to 6 = *strongly agree*) was used to measure the 13-item ambivalent ageism scale. Items 1-9 measured benevolent ageism, and items 10-13 assessed hostile ageism. Following the recommendation of Cary et al. (2017), the scale scores were calculated by computing the mean of the items for each scale. Cronbach's alpha in this study was .84 for the overall scale, .81 for benevolent ageism, and .69 for hostile ageism. Despite the lower reliability for hostile ageism, the scale was used while acknowledging its limitations.

To measure the constructs of warmth and competence, this study used the scale of Fiske et al. (2002) as part of the stereotype content model. Each construct was operationalized through six distinct attributes. Warmth was assessed through attributes like friendliness, good intentions, trustworthiness, warmth, good-naturedness, and sincerity, while competence was assessed through attributes such as competence, confidence, capability, efficiency, intelligence, and skillfulness (Fiske et al., 2002). Both constructs were rated on a 5-point Likert scale (from 1 = *not at all* to 5 = *extremely*), and the mean score of the six items represented each construct. The scales have been validated in multiple studies (Fiske et al., 2002; Hanrahan et al., 2023), and this study confirmed their reliability with Cronbach's alphas of .88 for warmth and .95 for competence.

To operationalize the constructs of likability, trust, and respect, this study adopted scales introduced by Harnish et al. (1990), Dunn and Schweitzer (2005), and Hanrahan (2016). Likability was based on Harnish et al. (1990) and was assessed with a five-item scale (kind, considerate, polite, sincere, warm) rated on a 5-point Likert scale (from 1 = *not at all* to 5 = *extremely*). Trust was based on Dunn and Schweitzer's (2005) 7-point Likert scale (from 1 = *not at all likely* to 7 = *very likely*), which demonstrated strong reliability (α = 0.86). Respect was measured using Hanrahan's (2016) scale, adapted from Cerrentano and Finkelstein (2009), with a 7-point Likert scale (from 1 = *disagree strongly* to 7 = *agree*

strongly) and a strong reliability (α = 0.92). To fit the vignette, the described individual's name was replaced in the trust and respect scales, following the procedure by North and Fiske (2002), which was also adopted by Hanrahan (2016) and Hanrahan et al. (2023). In this study, the high and robust reliabilities of the original studies were confirmed. The likability scale achieved a Cronbach's alpha of 0.86, the trust scale a Cronbach's alpha of 0.87, and the respect scale a Cronbach's alpha of 0.91.

2.3 Design

To explore prescriptive age stereotypes, a factorial vignette experiment was conducted, as it allowed for the simulation of complex judgment and decision-making problems through the crossing of a variety of realistic objects or situational characteristics (Auspurg et al., 2009). This method captured the complex structure of attitudes more holistically and minimized the influence of social desirability (Liebig & Mau, 2002). Evaluating a single person profile helped avoid presenting a skewed picture of personal attitudes (Hechter et al., 1999), while the orthogonal arrangement of factors in the experimental design ensured an unbiased assessment of their effects (Auspurg et al., 2009). As shown in Table 2, the experiment resulted in a 2 (age: middle-age vs. old) x 2 (gender: female vs. male) x 2 (stereotype behavior: adhere vs. violate) between-subject design.

Table 2

Dimensions and Levels of the Independent Variables

	Dimensions	Levels
1	Age	middle-aged (44 years old)/old (62 years old) targets
2	Gender	female/male targets
3	Stereotype behavior	Adhering to/violating stereotypes targets

The 44-year-olds represented the group of "middle-aged workers" and the 62-year-olds referred to the group of "older workers", as this categorization has proven to be significant in the previous studies by Hanrahan et al. (2023). To focus on differences between these two groups, younger workers were excluded to keep the study within scope. Gender differentiation of the targets was essential for testing Hypothesis 4 and was operationalized using the categories "female" and "male". This excluded nonbinary, genderfluid, or transgender identities to reduce complexity and confounding variables. In the vignettes, male participants were referred to as James and female participants as Mary,

as these have been the most popular names in the United States over the past 100 years (Social Security Administration, 2023), symbolizing individuals of all ages in a Western context. Stereotypical behavior was categorized as either adhering to or violating stereotypes. Those adhering to stereotypes were described as "having very poor technological skills", "struggling with using new technology", "lacking technological adaptability", "having poor ability to adapt to change, learn and be trained, and accept new technology", "being deeply uncomfortable with technology" and "being too cautious and afraid to use new technology". In contrast, those violating stereotypes were described as "having exceptional technological skills", "being very good at using new technology", "being known for his/her technological adaptability", "having high ability to adapt to change, learn and be trained, and accept new technology", "being deeply comfortable with technology", "being not too cautious nor too afraid to use new technology". These descriptions were based on technology-related age stereotypes from Burn et al. (2020), as seen in Appendix A.

It's important to acknowledge potential drawbacks of factorial vignette studies, such as low validity due to wording choices or participants' interpretations (Auspurg & Jäckle, 2017). To address this, a pretest was conducted. Furthermore, measurement errors, like participants skimming or not paying attention (satisficing), can also occur (Auspurg & Jäckle, 2017). To minimize halo, consistency, and change effects, each participant evaluated only one vignette and confirmed their attention by recalling details from it at the beginning of the experiment, reducing learning effects and cognitive burden (Aguinis & Bradley, 2014). Vignettes were randomly assigned, and confounding variables, such as remote work or lack of coworker interaction, were controlled. This approach followed the guidelines of North and Fiske (2013) and Hanrahan et al. (2023), who successfully used this method to study prescriptive age stereotypes.

2.4 Procedure

Before data collection began, ethical approval was granted by the Ethics Committee for Technology, Social Sciences, and Humanities at Universidade Católica Portuguesa on March 21, 2024 (approval number: CETCH2024-75, see Appendix D). This ensured compliance with ethical standards for research involving human participants. The factorial vignette experiment was then conducted online via Qualtrics, consisting of a pretest and

main study to evaluate vignette effectiveness. Participants were randomly assigned to different conditions to minimize potential learning effects. Both phases followed a similar structure, starting with outlining the research objectives, assurances of participant anonymity, and an emphasis on honest responses. Participants were informed of the study's duration (3 minutes for the pretest, 10 minutes for the main study) and asked to accept or decline participation after reviewing the conditions of participation, general information about the purpose of the research and data protection (see Appendix E). Participants who agreed could continue to fill out the survey, while those who declined were sent to the end. After viewing the vignette, participants had to recall details about the person described. Up to this point, the procedures were identical for both the pretest and the main study.

During the pretest, participants rated the target's typicality and surprisingness on a 4-point Likert scale (from 1 = *not at all typical/surprising* to 4 = *very typical/surprising*), and emotions on a 6-point Likert scale (from 1 = *not at all* to 6 = *very much so*). An open-ended question asked for observations on age-related technology behaviors in the workplace of the participant. The pretest ended with demographic data collection (see Appendix F). Results showed counter-stereotypical targets were seen as more surprising and less typical, evoking different emotions, confirming the successful manipulation of the vignettes. Responses to the open-ended question validated stereotypes that older individuals are less enthusiastic about technology, however some participants noted interest, not age, as the key factor.

The successful manipulation of the vignettes in the pretest led to the initiation of the main study. After asking participants to recall the information they remembered from the displayed vignette, they rated the items of the warmth, competence, likeability, trust and respect scales. As in the pretest, participants rated the typicality of the behavior described in the vignette to assess the effectiveness of the independent variable manipulation. Exploratory questions about the emotions associated with the person depicted in the vignette were also asked, like the pretest, followed by items from the Ambivalent Ageism Scale. Finally, demographic data of participants were collected (see Appendix F). Before concluding, participants received a detailed explanation of the study's actual purpose. The survey was available in both German and English, with scales translated by another rater and me to increase accuracy, identify ambiguities, and enhance reliability, following Forsyth et al. (2007) recommendations.

2.5 Data Analysis

A MANCOVA was performed with a significance level set at $p < .05$ to test the hypotheses using IBM SPSS Statistics Version 28. Assumptions for MANCOVA – including homogeneity of covariance, homogeneity of variances, and multicollinearity – were examined and generally satisfied. The covariates included in the analysis were participant's education, gender, age, technology use at work, and working with others. However, the assumption of homogeneity of covariance was violated for warmth and competence ($p = .041$) as well as for positive and negative emotions ($p = .022$), which represents a limitation of the study (see Chapter 4.2). For likability, trust, respect, benevolent, and hostile ageism, the assumption of homogeneity of covariance was met ($p > .05$). Levene's Test for homogeneity of variances showed no significant differences between groups ($p > .05$). Results for homogeneity of covariance and homogeneity of variances are illustrated in Table 3.

Table 3

Box's Test and Levene's Test Results for Equality of Covariances and Error Variances

Dependent variables	Homogeneity of covariance					Homogeneity of variance		
	Box's M	*F*	*df*1	*df*2	*p*	*F*	*df*	*p*
Warmth	34.93	1.60	21	87196.63	.041	0.61	7, 161	.748
Competence	34.93	1.60	21	87196.63	.041	0.95	7, 161	.470
Likability	61.11	1.37	42	41026.88	.058	0.25	7, 161	.971
Trust	61.11	1.37	42	41026.88	.058	1.22	7, 161	.295
Respect	61.11	1.37	42	41026.88	.058	0.85	7, 161	.546
Benevolent ageism	10.78	0.49	21	87196.63	.974	1.01	7, 161	.424
Hostile ageism	10.78	0.49	21	87196.63	.974	0.37	7, 161	.918
Positive emotions	37.56	1.72	21	87196.63	.022	1.66	7, 161	.121
Negative emotions	37.56	1.72	21	87196.63	.022	0.94	7, 161	.478

A linear regression revealed no multicollinearity issues, with all Variance Inflation Factors values below 5 and Tolerance values above 0.1, see Table 4.

Table 4

Results of Multicollinearity Diagnostics

Covariate	Variance inflation factor	Tolerance
Participant's age	1.00	1.00
Participant's gender	1.00	1.00
Participant's education	1.00	1.00
Participant's technology use at work	1.00	1.00
Participant's working with others	1.00	1.00

Chapter III – Results

3.1 Descriptive Results and Correlations

The descriptive statistics and intercorrelations for all study variables and the exploratory variables of positive and negative emotions were assessed using Pearson's correlation. Notably, average values for benevolent ageism ($M = 2.20$, $SD = 0.65$) and hostile ageism ($M = 2.37$, $SD = 0.79$) were relatively low, considering the 6-point Likert scale (1 = *strongly disagree* to 6 = *strongly agree*). The highest scores for benevolent and hostile ageism were 3.89 and 4.25, respectively, indicating that the full range of the scale range was not used. Several significant correlations emerged among the variables. Warmth positively correlated with competence ($r(167) = .31$, $p < .01$), likability ($r(167) = .92$, $p < .01$), trust ($r(167) = .61$, $p < .01$) and respect ($r(167) = .48$, $p < .01$). Competence showed significant positive correlations with likability ($r(167) = .30$, $p < .01$), trust ($r(167) = .31$, $p < .01$) and respect ($r(167) = .74$, $p < .01$). Likability correlated positively with trust ($r(167) = .59$, $p < .01$) and respect ($r(167) = .45$, $p < .01$). Trust positively correlated with respect ($r(167) = .57$, $p < .01$). Benevolent and hostile ageism were strongly correlated ($r(167) = .50$, $p < .01$). Positive emotions were positively correlated with warmth ($r(167) = .49$, $p < .01$), competence ($r(167) = .63$, $p < .01$), likability ($r(167) = .46$, $p < .01$), trust ($r(167) = .49$, $p < .01$), and respect ($r(167) = .67$, $p < .01$), while showing a negative correlation with negative emotions ($r(167) = -.60$, $p < .01$). In contrast, negative emotions had a significant negative correlation with warmth ($r(167) = -.29$, $p < .01$), competence ($r(167) = -.72$, $p < .01$), likability ($r(167) = -.27$, $p < .01$), trust ($r(167) = -.37$, $p < .01$), and respect ($r(167) = -.62$, $p < .01$), and a positive correlation with hostile ageism ($r(167) = .21$, $p < .01$). Descriptive statistics and Pearson's correlations of all study variables are demonstrated in Table 5.

Table 5

Descriptive Statistics and Bivariate Pearson Intercorrelations of Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Warmth[a]	3.33	0.68	–								
2. Competence[a]	3.35	1.11	.31**	–							
3. Likability[a]	3.36	0.66	.92**	.30**	–						
4. Trust[a]	5.30	0.86	.61**	.31**	.59**	–					
5. Respect[a]	4.70	1.27	.48**	.74**	.45**	.57**	–				
6. Benevolent ageism[a]	2.20	0.65	.04	-.11	.05	-.04	.02	–			
7. Hostile ageism[a]	2.37	0.79	-.00	-.10	-.03	-.03	.03	.50**	–		
8. Positive emotions[a]	3.04	1.29	.49**	.63**	.46**	.49**	.67**	.05	.05	–	
9. Negative emotions[a]	2.28	1.08	-.29**	-.72**	-.27**	-.37**	-.62**	.07	.21**	-.60**	–

[a] $n = 169$. **$p < .01$.

3.2 Main Effects and Interaction Effects

Before examining the specific hypotheses, the effects of target's gender, age, and stereotype behavior on warmth, competence, likability, trust, respect, benevolent ageism, and hostile ageism were tested using a MANCOVA. Target's gender, age, and stereotype behavior were included as between-subject factors, and each dependent variable – warmth, competence, likability, trust, respect, benevolent ageism, and hostile ageism – was analyzed in order. Additionally, participant's gender, age, education, interaction with others at work, and technology use at work were controlled as covariates to account for their potential influence on the outcomes. All main effects are shown in Table 6, while all interaction effects are shown in Table 7, and are described in more detail in the following.

Table 6

Main Effects on Warmth, Competence, Likability, Trust, Respect, Benevolent Ageism, and Hostile Ageism

Dependent variables	Independent variables	$F(1, 156)$	p	η^2
Warmth	Gender	8.25	.005	.05
	Age	5.48	.021	.03
	Stereotype behavior	0.00	.997	.00
Competence	Gender	1.07	.303	.01
	Age	2.21	.139	.01
	Stereotype behavior	409.40	< .001	.72
Likability	Gender	5.87	.017	.04
	Age	9.63	.002	.06
	Stereotype behavior	0.01	.904	.00
Trust	Gender	4.38	.038	.03
	Age	1.49	.224	.01
	Stereotype behavior	0.30	.585	.00
Respect	Gender	2.50	.116	.02
	Age	3.44	.065	.02
	Stereotype behavior	82.82	< .001	.35
Benevolent ageism	Gender	0.00	.982	.00
	Age	0.57	.453	.00
	Stereotype behavior	0.84	.362	.01
Hostile ageism	Gender	0.01	.940	.00
	Age	0.95	.332	.01
	Stereotype behavior	2.38	.125	.02

Table 7

Interaction Effects on Warmth, Competence, Likability, Trust, Respect, Benevolent Ageism, and Hostile Ageism

Dependent variables	Interaction	$F(1, 156)$	p	η^2
Warmth	Stereotype behavior x Age	4.87	.029	.03
	Stereotype behavior x Gender	3.78	.054	.02
	Age x Gender	0.01	.906	.00
	Stereotype behavior x Age x Gender	0.00	.987	.00
Competence	Stereotype behavior x Age	2.20	.140	.01
	Stereotype behavior x Gender	0.40	.529	.00
	Age x Gender	1.15	.286	.01
	Stereotype behavior x Age x Gender	0.25	.621	.00
Likability	Stereotype behavior x Age	6.91	.009	.04
	Stereotype behavior x Gender	1.14	.288	.01
	Age x Gender	0.02	.884	.00
	Stereotype behavior x Age x Gender	0.04	.849	.00
Trust	Stereotype behavior x Age	3.02	.084	.02
	Stereotype behavior x Gender	2.27	.134	.01
	Age x Gender	0.01	.911	.00
	Stereotype behavior x Age x Gender	0.00	.955	.00
Respect	Stereotype behavior x Age	0.86	.354	.01
	Stereotype behavior x Gender	0.01	.946	.00
	Age x Gender	0.61	.436	.00
	Stereotype behavior x Age x Gender	0.09	.769	.00
Benevolent ageism	Stereotype behavior x Age	3.44	.065	.02
	Stereotype behavior x Gender	0.44	.508	.00
	Age x Gender	0.35	.554	.00
	Stereotype behavior x Age x Gender	1.87	.173	.01
Hostile ageism	Stereotype behavior x Age	0.54	.464	.00
	Stereotype behavior x Gender	2.07	.152	.01
	Age x Gender	2.22	.139	.01
	Stereotype x Age x Gender	1.16	.282	.01

Results for the dependent variable of warmth showed a significant main effect of gender on warmth, $F(1, 156) = 8.25$, $p = .005$, $\eta^2 = .05$. This suggests that gender significantly influences warmth ratings, with female targets ($M = 3.48$, $SD = 0.62$) generally receiving higher warmth ratings than male targets ($M = 3.19$, $SD = 0.71$). Additionally, age had a significant main effect on warmth, $F(1, 156) = 5.48$, $p = .021$, $\eta^2 = .03$, indicating that older targets ($M = 3.48$, $SD = 0.67$) received higher warmth ratings than middle-aged targets ($M = 3.18$, $SD = 0.67$). No significant main effect was found for stereotype behavior on warmth, $F(1, 156) = .00$, $p = .997$, $\eta^2 = .00$. Furthermore, the interaction between stereotype behavior and age was statistically significant, $F(1, 156) = 4.87$, $p = .029$, $\eta^2 = .03$, indicating that the effect of stereotype behavior on warmth varies depending on the age of the person displayed in the vignette, which will be discussed in more detail in Chapter 3.3. No other interactions were found to be statistically significant. The interaction of stereotype behavior

and gender, $F(1, 156) = 3.78$, $p = .054$, $\eta^2 = .02$, age and gender, $F(1, 156) = 0.01$, $p = .906$, $\eta^2 = .00$, and the three-way interaction among stereotype behavior, age, and gender, $F(1, 156) = 0.00$, $p = .987$, $\eta^2 = .00$, could not reach levels of significance.

Results for the dependent variable of competence revealed no significant main effect of gender, $F(1, 156) = 1.07$, $p = .303$, $\eta^2 = .01$, and age, $F(1, 156) = 2.21$, $p = .139$, $\eta^2 = .01$. However, there was a significant main effect of stereotype behavior on competence, $F(1, 156) = 409.40$, $p < .001$, $\eta^2 = .72$, indicating that participants exposed to counter-stereotypical behavior ($M = 4.25$, $SD = 0.49$) reported higher competence than those exposed to stereotypical behavior ($M = 2.38$, $SD = 0.68$). None of the interaction effects were statistically significant. The interactions between stereotype behavior and age, $F(1, 156) = 2.20$, $p = .140$, $\eta^2 = .01$, stereotype and gender, $F(1, 156) = 0.40$, $p = .529$, $\eta^2 = .00$, age and gender, $F(1, 156) = 1.15$, $p = .286$, $\eta^2 = .01$, as well as the three-way interaction among stereotype behavior, age, and gender, $F(1, 156) = 0.25$, $p = .621$, $\eta^2 = .00$, all failed to reach statistical significance.

Results for the dependent variable of likability indicate that there is a significant main effect of gender on likability, $F(1, 156) = 5.87$, $p = .017$, $\eta^2 = .04$, indicating that participants rated female targets ($M = 3.48$, $SD = 0.63$) as having higher likability scores than male targets ($M = 3.24$, $SD = 0.67$). There was also a significant main effect of age on likability, $F(1, 156) = 9.63$, $p = .002$, $\eta^2 = .06$, with older targets ($M = 3.53$, $SD = 0.64$) receiving higher likability scores than middle-aged targets ($M = 3.19$, $SD = 0.65$). For the independent variable of stereotype, no significant main effect was observed, $F(1, 156) = 0.01$, $p = .904$, $\eta^2 = .00$. Instead, the interaction of stereotype behavior and age was significant, $F(1, 156) = 6.91$, $p = .009$, $\eta^2 = .04$, indicating that the effect of stereotype behavior on likability differed depending on age of the person displayed in the vignette, which will be discussed in more detail in Chapter 3.3. The interaction of stereotype behavior and gender, $F(1, 156) = 1.14$, $p = .288$, $\eta^2 = .01$, age and gender, $F(1, 156) = 0.02$, $p = .884$, $\eta^2 = .00$, and the three-way interaction among stereotype behavior, age, and gender, $F(1, 156) = 0.04$, $p = .849$, $\eta^2 = .00$, could not reach levels of significance.

Results for the dependent variable of trust showed that there is a significant main effect of gender, $F(1, 156) = 4.38$, $p = .038$, $\eta^2 = .03$, with female targets ($M = 5.47$, $SD = 0.82$) receiving higher trust scores than male targets ($M = 5.13$, $SD = 0.88$). There was no significant main effect of age ($F(1, 156) = 1.49$, $p = .224$, $\eta^2 = .01$) or stereotype behavior

($F(1, 156) = 0.30$, $p = .585$, $\eta^2 = .00$). Results also showed that none of the interactions were statistically significant. The interaction of stereotype behavior and age, $F(1, 156) = 3.02$, $p = .084$, $\eta^2 = .02$, stereotype behavior and gender, $F(1, 156) = 2.27$, $p = .134$, $\eta^2 = .01$, age and gender, $F(1, 156) = 0.01$, $p = .911$, $\eta^2 = .00$, and the three-way interaction among stereotype behavior, age, and gender, $F(1, 156) = 0.00$, $p = .955$, $\eta^2 = .00$, could not reach levels of significance.

Results for the dependent variable of respect indicate a significant main effect of stereotype behavior, $F(1, 156) = 82.82$, $p < .001$, $\eta^2 = .35$, indicating that participants exposed to counter-stereotypical behavior ($M = 5.41$, $SD = 0.90$) reported higher respect scores than those exposed to stereotypical behavior ($M = 3.93$, $SD = 1.16$). The independent variables of gender ($F(1, 156) = 2.50$, $p = .116$, $\eta^2 = .02$) and age ($F(1, 156) = 3.44$, $p = .065$, $\eta^2 = .02$) did not have a significant main effect on trust. Furthermore, none of the interaction effects were statistically significant. The interaction of stereotype behavior and age, $F(1, 156) = 0.86$, $p = .354$, $\eta^2 = .01$, stereotype behavior and gender, $F(1, 156) = 0.01$, $p = .946$, $\eta^2 = .00$, age and gender, $F(1, 156) = 0.61$, $p = .436$, $\eta^2 = .00$, and the three-way interaction among stereotype behavior, age, and gender, $F(1, 156) = 0.09$, $p = .769$, $\eta^2 = .00$, could not reach levels of significance.

Results for the dependent variable of benevolent ageism indicate no significant main effect of gender, $F(1, 156) = 0.00$, $p = .982$, $\eta^2 = .00$, and age, $F(1, 156) = 0.57$, $p = .453$, $\eta^2 = .00$. There was also no significant main effect of stereotype behavior on benevolent ageism, $F(1, 156) = 0.84$, $p = .362$, $\eta^2 = .01$. None of the interaction effects were statistically significant. The interactions between stereotype behavior and age, $F(1, 156) = 3.44$, $p = .065$, $\eta^2 = .02$, stereotype behavior and gender, $F(1, 156) = 0.44$, $p = .508$, $\eta^2 = .00$, age and gender, $F(1, 156) = 0.35$, $p = .554$, $\eta^2 = .00$, as well as the three-way interaction among stereotype behavior, age, and gender, $F(1, 156) = 1.87$, $p = .173$, $\eta^2 = .01$, were all non-significant.

Results for the dependent variable of hostile ageism indicate no significant main effect of gender, $F(1, 156) = 0.01$, $p = .940$, $\eta^2 = .00$, no significant main effect of age, $F(1, 156) = 0.95$, $p = .332$, $\eta^2 = .01$, and no significant main effect of stereotype behavior on hostile ageism, $F(1, 156) = 2.38$, $p = .125$, $\eta^2 = .02$. None of the interaction effects were statistically significant. The interactions between stereotype behavior and age, $F(1, 156) = 0.54$, $p = .464$, $\eta^2 = .00$, stereotype behavior and gender, $F(1, 156) = 2.07$, $p = .152$, $\eta^2 = .01$, age and gender, $F(1, 156) = 2.22$, $p = .139$, $\eta^2 = .01$, and the three-way interaction among

stereotype behavior, age, and gender, $F(1, 156) = 1.16$, $p = .282$, $\eta^2 = .01$, could not reach levels of significance.

3.3 Results of Hypotheses Testing

3.3.1 Hostile and Benevolent Ageism as Predictors of Perceptions of Stereotype Violators

The first hypothesis stated that hostile and benevolent ageism are significant predictors of perceptions regarding warmth, competence, likability, trust, and respect in individuals who violate technology-related age stereotypes. To test the hypothesis, a MANCOVA was conducted. Target's gender, age, and stereotype behavior were included as between-subject factors, benevolent and hostile ageism were added as covariates, and each dependent variable – first warmth and competence, then likability, trust and respect – was analyzed. Results revealed that benevolent ageism did not significantly predict perceptions of warmth ($F(1, 154) = 0.72$, $p = .396$, $\eta^2 = .01$), competence ($F(1, 154) = 1.26$, $p = .264$, $\eta^2 = .01$), likability ($F(1, 154) = 1.23$, $p = .269$, $\eta^2 = .01$), trust ($F(1, 154) = 0.12$, $p = .731$, $\eta^2 = .00$) and respect ($F(1, 154) = 0.33$, $p = .556$, $\eta^2 = .00$). Similarly to benevolent ageism, hostile ageism did not predict perceptions of warmth ($F(1, 154) = 1.88$, $p = .172$, $\eta^2 = .01$), competence ($F(1, 154) = 0.03$, $p = .875$, $\eta^2 = .00$), likability ($F(1, 154) = 2.19$, $p = .141$, $\eta^2 = .01$), trust ($F(1, 154) = 0.41$, $p = .522$, $\eta^2 = .00$) and respect ($F(1, 154) = 0.05$, $p = .816$, $\eta^2 = .00$). Hypothesis 1 is therefore not supported, as summarized in Table 8.

Table 8

Benevolent and Hostile Ageism on Warmth, Competence, Likability, Trust, and Respect

Dependent variables	Covariates	*df*	*F*	*p*	η^2
Warmth	Benevolent ageism	1, 154	0.72	.396	.01
	Hostile ageism	1, 154	1.88	.172	.01
Competence	Benevolent ageism	1, 154	1.26	.264	.01
	Hostile ageism	1, 154	0.03	.875	.00
Likability	Benevolent ageism	1, 154	1.23	.269	.01
	Hostile ageism	1, 154	2.19	.141	.01
Trust	Benevolent ageism	1, 154	0.12	.731	.00
	Hostile ageism	1, 154	0.41	.522	.00
Respect	Benevolent ageism	1, 154	0.33	.566	.00
	Hostile ageism	1, 154	0.05	.816	.00

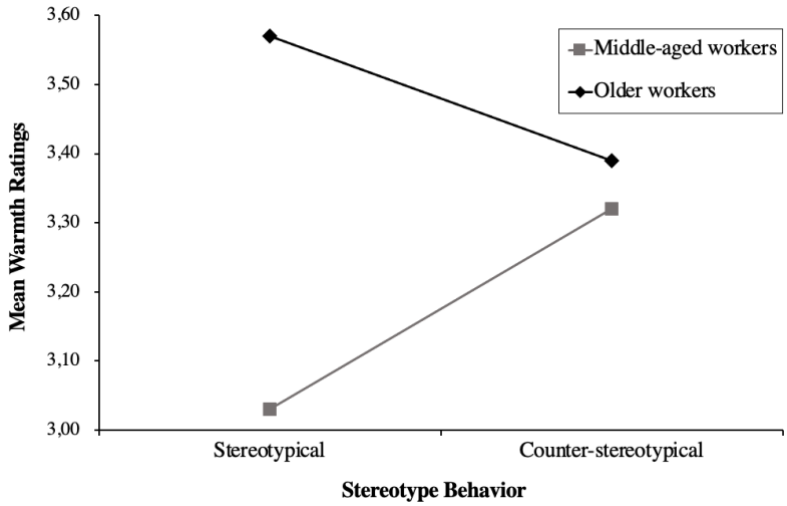
Note. This table presents the results of a MANCOVA examining benevolent and hostile ageism as predictor variables for warmth, competence, likability, trust, and respect.

3.3.2 Impact of Stereotype Violations on Warmth and Competence Ratings

The second hypothesis states that older workers violating technology-related prescriptive stereotypes face lower warmth ratings and lower competence ratings in comparison to their adhering and younger counterparts. To test the hypothesis, a MANCOVA was conducted. Target's gender, age, and stereotype behavior were included as between-subject factors, and the dependent variables – warmth and competence – were analyzed. Participant's gender, age, education, interaction with others at work, and technology use at work were controlled as covariates to account for their potential influence on the outcomes. Results revealed that there is a significant interaction between age and stereotype behavior on warmth ($F(1, 156) = 4.87$, $p = .029$, $\eta^2 = .03$), as seen in Table 7. Middle-aged workers who violated stereotypes were rated higher in warmth ($M = 3.32$, $SD = 0.57$) compared to those who conformed to stereotypes ($M = 3.03$, $SD = 0.74$). Conversely, older workers who conformed to stereotypes were rated higher in warmth ($M = 3.57$, $SD = 0.74$) compared to those who violated stereotypes ($M = 3.39$, $SD = 0.59$). Despite the lower effect size and relatively low power of .59, these findings suggest that stereotype conformity is valued differently depending on the age of the worker. Middle-aged workers appear to benefit in warmth ratings from counter-stereotypical behavior, while older workers benefit from stereotype conformity, as seen in Figure 1. For competence ratings, the interaction between stereotype behavior and age did not reach statistical significance ($F(1, 156) = 2.20$, $p = .140$, $\eta^2 = .01$). As a result, Hypothesis 2 is only partially supported.

Figure 1

Interaction between Target's Age and Stereotype Behavior for Warmth Ratings

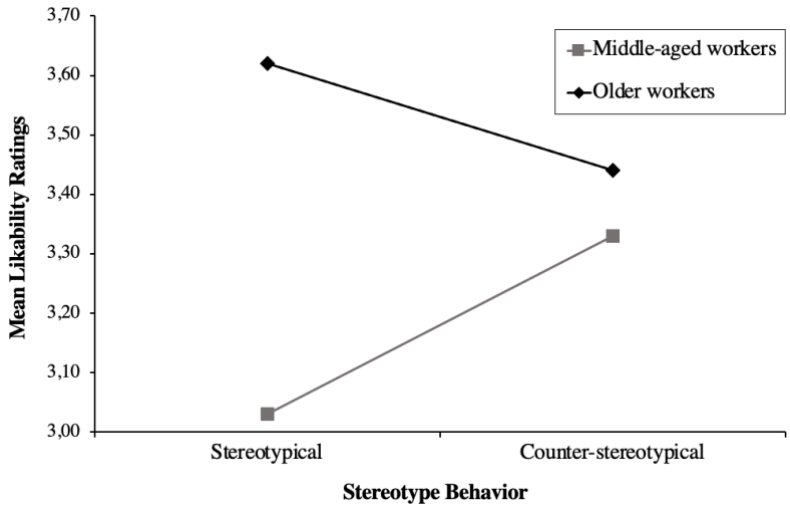


3.3.3 Impact of Stereotype Violations on Likability, Trust, and Respect Ratings

The third hypothesis states that older workers violating technology-related prescriptive stereotypes face lower likeability, trust and respect ratings in comparison to their adhering and younger counterparts. To test the hypothesis, a MANCOVA was conducted. Target's gender, age, and stereotype behavior were included as between-subject factors, and the dependent variables – likability, trust and respect – were analyzed. Additionally, participant's gender, age, education, interaction with others at work, and technology use at work were controlled as covariates to account for their potential influence on the outcomes. Results showed that there is a significant interaction between age and stereotype behavior on likability ratings ($F(1, 156) = 6.91$, $p = .009$, $\eta^2 = .04$), as presented in Table 7. Middle-aged workers who violated stereotypes were rated higher in likability ($M = 3.33$, $SD = 0.60$) compared to those who conformed to stereotypes ($M = 3.03$, $SD = 0.67$). In contrast, older workers who conformed to stereotypes were rated higher in likability ($M = 3.62$, $SD = 0.66$) compared to those who violated stereotypes ($M = 3.44$, $SD = 0.61$). With a power of .74, the results suggest that middle-aged workers gain higher likability ratings when they engage in counter-stereotypical behavior, while older workers are rated higher in likability when they conform to stereotypes, as illustrated in Figure 2. The interaction between stereotype behavior and age did not reach statistical significance for trust ratings ($F(1, 156) = 3.02$, $p = .084$, $\eta^2 = .02$) or respect ratings ($F(1, 156) = 0.86$, $p = .354$, $\eta^2 = .01$). Consequently, Hypothesis 3 is only partially supported.

Figure 2

Interaction between Target's Age and Stereotype Behavior for Likability Ratings



3.3.4 Gender of the Target as a Moderator in Perceptions of Stereotype Violators

The fourth hypothesis claims that the target's gender moderates the relationship between older workers violating technology-related prescriptive stereotypes and the ratings of the target. To test the hypothesis, a MANCOVA was conducted. Target's gender, age, and stereotype behavior were included as between-subject factors, and the dependent variables – warmth, competence, likability, trust and respect – were analyzed. Additionally, participant's age, gender, education, interaction with others at work, and technology use at work were controlled as covariates to account for their potential influence on the outcomes. Results revealed that there is no three-way interaction between stereotype behavior, age and gender for warmth ($F(1, 156) = 0.00$, $p = .987$, $\eta^2 = .00$), competence ($F(1, 156) = 0.25$, $p = .621$, $\eta^2 = .00$), likability ($F(1, 156) = 0.04$, $p = .849$, $\eta^2 = .00$), trust ($F(1, 156) = 0.00$, $p = .955$, $\eta^2 = .00$), as well as respect ratings ($F(1, 156) = 0.09$, $p = .769$, $\eta^2 = .00$). As shown in the results (see Table 6), gender had a significant influence on the overall warmth ($F(1, 156) = 8.25$, $p = .005$, $\eta^2 = .05$), likeability ($F(1, 156) = 5.87$, $p = .017$, $\eta^2 = .04$) and trust ($F(1, 156) = 4.38$, $p = .038$, $\eta^2 = .03$) ratings. Female targets were rated higher in warmth ($M = 3.48$, $SD = 0.62$), likability ($M = 3.48$, $SD = 0.63$), and trust ($M = 5.47$, $SD = 0.82$) compared to male targets, who received lower ratings for warmth ($M = 3.19$, $SD = 0.71$), likability ($M = 3.24$, $SD = 0.67$), and trust ($M = 5.13$, $SD = 0.88$). Although this finding shows that gender influences perceptions of warmth, it does not conclusively support Hypothesis 4.

3.3.5 Influence of the Participants' Age on the Perception of Stereotype Violators

The fifth hypothesis claims that younger study participants show stronger backlash in response to older workers violating technology-related prescriptive stereotypes. To test the hypothesis, the participants were grouped into the age groups of < 25-year-olds ($n = 48$), 26- to 35-year-olds ($n = 63$), 36- to 45-year-olds ($n = 17$), 46- to 55-year-olds ($n = 20$) and > 56-year-olds ($n = 21$). These specific age groups were chosen to distribute the frequency of participants as evenly as possible and to obtain a more differentiated picture of the relevance of the age of the perceivers. To calculate the MANCOVA, target's gender, age, and stereotype behavior as well as participant's age were included as between-subject factors, and the dependent variables – warmth, competence, likability, trust and respect – were analyzed. Additionally, participant's gender, education, interaction with others at work, and technology use at work were controlled as covariates to account for their potential

influence on the outcomes. Results revealed that there is no significant interaction between age of participants, stereotype behavior and age of target for warmth ($F(1, 126) = 1.06$, $p = .380$, $\eta^2 = .03$), competence ($F(1, 126) = 1.20$, $p = .316$, $\eta^2 = .04$), likability ($F(1, 126) = 1.17$, $p = .327$, $\eta^2 = .04$), trust ($F(1, 126) = 0.94$, $p = .445$, $\eta^2 = .03$) and respect ($F(1, 126) = 1.23$, $p = .304$, $\eta^2 = .04$), as demonstrated in Table 9. Thus, Hypothesis 5 is not supported.

Table 9

No Significant Interaction Participant's Age, Stereotype Behavior, and Target's Age

Dependent variables	$F(1, 126)$	p	η^2
Warmth	1.06	.380	.03
Competence	1.20	.316	.04
Likability	1.17	.327	.04
Trust	0.94	.445	.03
Respect	1.23	.304	.04

3.4 Exploratory Analysis of Positive and Negative Emotions

To extend the analysis exploratively, the participants were asked which emotions they associated with the target shown in the vignette. These emotions were categorized into positive and negative associations. Positive emotions included happy, peaceful, pleasant, and cheerful, while negative emotions included irritating, aggravating, annoying, and bothersome. To test the hypothesis, the internal consistencies were first assessed, followed by the conduction of a MANCOVA. The scale for positive emotions had a Cronbach's alpha of 0.898, while the scale for negative emotions had a Cronbach's alpha of 0.861. In the MANCOVA, target's gender, age, stereotype behavior, and participant's age were included as between–subject factors, and the dependent variables – positive and negative emotions – were analyzed. Additionally, participant's gender, age, education, interaction with others at work, and technology use at work were controlled as covariates to account for their potential influence on the outcomes. The results revealed a significant main effect of stereotype behavior on positive emotion ratings ($F(1, 156) = 57.99$, $p < .001$, $\eta^2 = .27$). Targets who violated stereotypes were rated higher in positive emotions ($M = 3.69$, $SD = 1.13$) compared to those who conformed to stereotypes ($M = 2.35$, $SD = 1.06$). There was also a significant main effect of stereotype behavior on negative emotion ratings ($F(1, 156) = 123.39$, $p < .001$, $\eta^2 = .44$), suggesting that targets who conformed to stereotypes were rated higher in negative emotions ($M = 3.03$, $SD = 0.90$) compared to those who violated stereotypes ($M = 1.59$, SD

= 0.71). Main effects of stereotype behavior on positive and negative emotions are shown in Table 10.

Table 10

Significant Main Effect of Stereotype Behavior on Positive and Negative Emotion Ratings

Dependent variables	Independent variables	$F(1, 156)$	p	η^2
Positive Emotions	Gender	6.07	.015	.04
	Age	1.68	.196	.01
	Stereotype behavior	57.99	< .001	.27
Negative Emotions	Gender	1.08	.300	.01
	Age	0.00	.998	.00
	Stereotype behavior	123.39	< .001	.44

A closer examination of positive emotions reveals a significant main effect of target gender on happiness ($F(1, 156) = 4.58$, $p = .034$, $\eta^2 = .03$), pleasantness ($F(1, 156) = 5.11$, $p = .025$, $\eta^2 = .03$), and cheerfulness ($F(1, 156) = 4.65$, $p = .033$, $\eta^2 = .03$). Female targets were rated higher in happiness ($M = 3.19$, $SD = 1.36$), pleasantness ($M = 3.31$, $SD = 1.50$), and cheerfulness ($M = 3.13$, $SD = 1.26$) compared to male targets, who were rated lower in happiness ($M = 2.65$, $SD = 1.55$), pleasantness ($M = 2.80$, $SD = 1.55$), and cheerfulness ($M = 2.64$, $SD = 1.55$). Additionally, there is a significant main effect of stereotype behavior on happiness ($F(1, 156) = 56.14$, $p < .001$, $\eta^2 = .27$), peacefulness ($F(1, 156) = 14.11$, $p < .001$, $\eta^2 = .08$), pleasantness ($F(1, 156) = 74.17$, $p < .001$, $\eta^2 = .32$), and cheerfulness ($F(1, 156) = 34.56$, $p < .001$, $\eta^2 = .18$). Counter-stereotypical targets received higher ratings in happiness ($M = 3.65$, $SD = 1.35$), peacefulness ($M = 3.73$, $SD = 1.26$), pleasantness ($M = 3.90$, $SD = 1.36$), and cheerfulness ($M = 3.47$, $SD = 1.40$) compared to stereotypical targets, who were rated lower in happiness ($M = 2.14$, $SD = 1.18$), peacefulness ($M = 2.86$, $SD = 1.47$), pleasantness ($M = 2.14$, $SD = 1.15$), and cheerfulness ($M = 2.25$, $SD = 1.17$).

A closer examination of negative emotions reveals a significant main effect of gender on bothersome ratings ($F(1, 156) = 6.11$, $p = .015$, $\eta^2 = .04$), with male targets ($M = 2.55$, $SD = 1.43$) receiving higher ratings than female targets ($M = 2.07$, $SD = 1.17$). Additionally, significant main effects of stereotype behavior were found for irritating ($F(1, 156) = 43.70$, $p < .001$, $\eta^2 = .22$), aggravating ($F(1, 156) = 76.90$, $p < .001$, $\eta^2 = .33$), annoying ($F(1, 156) = 67.83$, $p < .001$, $\eta^2 = .30$), and bothersome ($F(1, 156) = 110.14$, $p < .001$, $\eta^2 = .41$) ratings. Targets adhering to stereotypes elicited higher ratings of irritating ($M = 2.75$, $SD = 1.16$), aggravating ($M = 3.10$, $SD = 1.26$), annoying ($M = 3.09$, $SD = 1.14$), and bothersome ($M =$

3.20, *SD* = 1.17), whereas stereotype-violating targets elicited lower ratings of irritating (*M* = 1.67, *SD* = 0.93), aggravating (*M* = 1.50, *SD* = 0.98), annoying (*M* = 1.68, *SD* = 0.97), and bothersome (*M* = 1.49, *SD* = 0.86). None of the positive or negative emotions showed any significant interaction effects, nor were there any main effects of age. The significant main effects of age and stereotype behavior on the different positive and negative emotions are presented in Table 11.

Table 11

Main Effects of Gender, Age and Stereotype Behavior on Facets of Positive and Negative Emotions

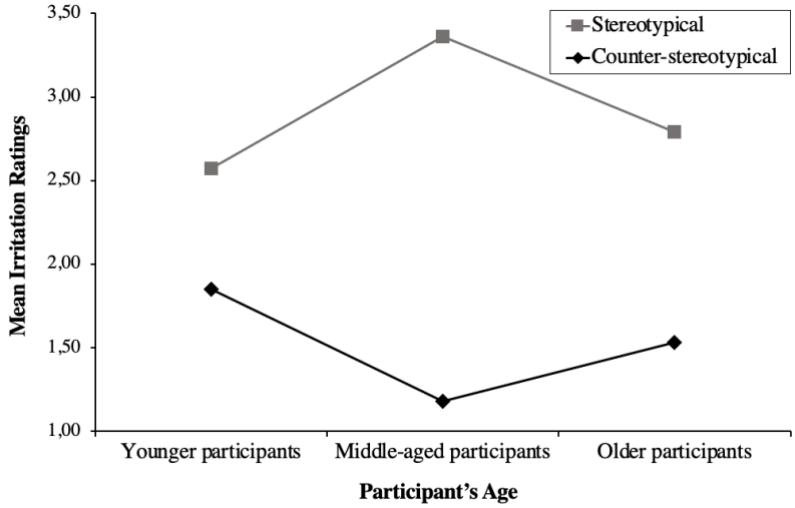
Dependent variables	Independent variables	$F(1, 156)$	p	η^2
Happy	Gender	4.58	.034	.03
	Age	3.47	.064	.02
	Stereotype behavior	56.14	< .001	.27
Peaceful	Gender	2.97	.087	.02
	Age	0.13	.723	.00
	Stereotype behavior	14.11	< .001	.08
Pleasant	Gender	5.11	.025	.03
	Age	0.13	.722	.00
	Stereotype behavior	74.17	< .001	.32
Cheerful	Gender	4.65	.033	.03
	Age	3.28	.072	.02
	Stereotype behavior	34.56	< .001	.18
Irritating	Gender	0.01	.942	.00
	Age	0.11	.746	.00
	Stereotype behavior	43.70	< .001	.22
Aggravating	Gender	0.83	.364	.01
	Age	0.01	.930	.00
	Stereotype behavior	76.90	< .001	.33
Annoying	Gender	0.03	.856	.00
	Age	0.08	.783	.00
	Stereotype behavior	67.83	< .001	.30
Bothersome	Gender	6.11	.015	.04
	Age	0.28	.598	.00
	Stereotype behavior	110.14	< .001	.41

Furthermore, this study explored whether the age groups of younger (< 35-year-olds, *n* = 106), middle-aged (35- to 50-year-olds, *n* = 31), and older (> 50-year-olds, *n* = 32) participants associate violations of age stereotypes with different emotions. To gain insight into the relevance of participant age, the same age groups used to describe the vignettes were applied, following the approach by Hanrahan (2016) and Hanrahan et al. (2023). Results showed that there is a significant interaction between age of participants and stereotype behavior on irritation ratings ($F(1, 141) = 5.56$, $p = .005$, $\eta^2 = .07$). Younger participants

rated stereotype-conforming targets as more irritating (M = 2.56, SD = 1.24) than stereotype-violating targets (M = 1.86, SD = 1.00). Middle-aged participants showed a more pronounced reaction, with stereotype-conforming targets receiving significantly higher irritation ratings (M = 3.36, SD = 0.93) compared to stereotype-violating targets (M = 1.24, SD = 0.56). Furthermore, older participants rated stereotype-conforming targets as more irritating (M = 2.79, SD = 0.98) than stereotype-violating targets (M = 1.38, SD = 0.77). The significant interaction between participant's age and stereotype behavior on irritation is driven by the differences between young and middle-aged participants. Middle-aged participants rated stereotype-conforming targets as significantly more irritating than young participants did (M difference = 0.79, p = .017). Additionally, they also rated stereotype-violating targets as significantly less irritating than young participants (M difference = -0.63, p = .028), as illustrated in Figure 3.

Figure 3

Interaction between Participant's Age and Stereotype Behavior on Irritation Ratings



The impact of benevolent and hostile ageism on the ratings of various positive and negative emotions was further explored using MANCOVA. Gender, age, stereotype behavior and participant's age were included as between-subject factors, benevolent and hostile ageism were added as covariates, and each dependent variable – first happy, peaceful, pleasant and cheerful, then irritating, aggravating, annoying and bothersome – was analyzed. Results reveal that associations of happiness, peacefulness, pleasantness and cheerfulness do not in any form stand in a relation to benevolent and hostile ageism. Instead, results reveal

that there is a significant main effect of benevolent ageism on annoyance ($F(1, 139) = 4.52$, $p = .035$, $\eta^2 = .03$), a significant main effect of hostile ageism on irritation ($F(1, 139) = 5.33$, $p = .022$, $\eta^2 = .04$) and a significant main effect of hostile ageism on annoyance ($F(1, 139) = 10.44$, $p = .002$, $\eta^2 = .07$).

To further investigate the predictive effect of benevolent and hostile ageism, a regression analysis was conducted. The results revealed that both, stereotype behavior and hostile ageism are significant predictors of irritation and annoyance, while benevolent ageism is not. Specifically, stereotype behavior was negatively associated with irritation ($B = -1.05$, $\beta = -0.45$, $t(165) = -6.59$, $p < .001$) and annoyance ($B = -1.36$, $\beta = -0.54$, $t(165) = -8.56$, $p < .001$), indicating that individuals who violate stereotypes are rated lower in their irritation and annoyance than stereotype adhering individuals. Hostile ageism was positively associated with irritation ($B = 0.29$, $\beta = 0.19$, $t(165) = 2.42$, $p = .016$) and annoyance ($B = 0.37$, $\beta = 0.23$, $t(165) = 3.20$, $p = .002$), suggesting that higher levels of hostile ageism correspond to increased irritation and annoyance scores. Benevolent ageism, however, did not significantly predict irritation ($B = -0.21$, $\beta = -0.12$, $t(165) = -1.46$, $p = 0.145$) and annoyance ($B = -0.24$, $\beta = -0.12$, $t(165) = -1.68$, $p = .094$). Overall, the model explained 22.7% of the variance in irritation (Adjusted $R^2 = .23$), with a standard error (SE) of the estimate of 1.03, and 33.8% of the variance in annoyance (Adjusted $R^2 = .34$), with a SE of the estimate of 1.03. The models for irritation ($F(3, 165) = 17.42$, $p < 0.001$) as well as for annoyance ($F(3, 165) = 29.61$, $p < .001$) were statistically significant. The Durbin-Watson statistic of 2.27 for irritation and 2.07 for annoyance indicated no significant autocorrelation in the residuals, and the Normal P-P Plot suggested that the residuals were approximately normally distributed. Table 12 presents the predictors of irritation and annoyance related to stereotype violation and hostile ageism among middle-aged and older workers.

Table 12

Stereotype Violation and Hostile Ageism as Predictors of Irritation and Annoyance

	Irritation			Annoyance		
	B	*SE*	Beta	*B*	*SE*	Beta
Constant	3.57***	.41		4.07***	.41	
Stereotype Violation	-1.05***	.16	-.45	-1.36***	.16	-.54
Hostile Ageism	0.29*	.12	.19	0.37**	.12	.23
Benevolent Ageism	-0.21	.14	-.12	-0.24	.14	-.12
F	17.42			29.61		
df	3, 17			3, 17		
Adjusted R^2	.23***			.34***		

* $p < .05$. ** $p < .01$. *** $p < .001$.

Chapter IV – Discussion

The primary aim of this study was to explore how violating technology-related age stereotypes affects the perception of individuals. Building on the work of North and Fiske (2013), Hanrahan (2016), and Hanrahan et al. (2023), this study extends existing research on prescriptive age stereotype violations and individuals' perceptions of it. First, it examines the influence of benevolent and hostile ageism on violations of prescriptive age stereotypes – a factor that has not been previously considered. Additionally, it investigates perceptions of individuals who violate technology-related prescriptive age stereotypes, focusing on attributes such as warmth, competence, likability, trust, respect, and emotional responses. Lastly, the study explores the impact of the perceiver's age and the worker's gender on the perception of age-stereotype violators, providing greater clarity in an area that has been under-researched.

The online vignette experiment conducted for this study yields several important insights. First, backlash effects were observed in ratings of warmth and likability. Older workers who conformed to stereotypes were perceived as warmer and more likable than those who violated them. For middle-aged workers this effect is reversed. These findings confirm and expand upon the results of Hanrahan (2016) by incorporating the perspective of technology-related age stereotypes. Contrary to previous research (Hanrahan et al., 2023; North & Fiske, 2013), this study found that middle-aged and older workers displaying counter-stereotypical behavior were perceived as more competent and respected than those who conformed to stereotypes.

Moreover, counter-stereotypical behavior was associated with positive emotions such as happiness, peacefulness, pleasantness, and cheerfulness, while stereotypical behavior was linked to negative emotions like irritation, aggravation, annoyance, and bother. This highlights a shift in how counter-stereotypical behavior is valued, challenging traditional views on the emotional and social consequences of stereotype conformity. The study also revealed significant relationships between hostile ageism and emotions such as irritation and annoyance when evaluating older individuals who violate age stereotypes. Specifically, hostile ageism emerged as a key predictor of increased irritation and annoyance ratings for age stereotypes violators. However, contrary to expectations, no significant relationship was found between benevolent or hostile ageism and perceptions of warmth, competence, likeability, trust, or respect. These findings provide new insights into ageism

research. Additionally, the study suggests that female workers are generally rated more positively, regardless of their age or violation of stereotypes. Female workers were perceived as warmer, more likable, and more trustworthy, and were more frequently associated with emotions of happiness, pleasantness, and cheerfulness, whereas male workers were more often associated with being bothersome. Finally, the present study found no evidence that younger people would react more negatively to the violation of stereotypes by older employees, which contrasts with previous findings by North and Fiske (2013), Hanrahan (2016), and Hanrahan et al. (2023). However, the study suggests that young perceivers show greater irritation towards workers behaving counter-stereotypically compared to middle-aged workers.

4.1 Theoretical Implications

4.1.1 Effects of Benevolent and Hostile Ageism on Age Stereotype Violations

Contrary to the hypothesis, the data revealed that factors such as whether a person was middle-aged or older, conformed to or violated stereotypes, or was male or female, were not related to benevolent or hostile ageism. Specifically, the study suggests that neither benevolent nor hostile ageism acted as predictors of ratings for warmth, competence, likability, trust, and respect. Thus, a person's levels of benevolent and hostile ageism do not help in explaining any variation in these ratings. These findings diverge from the stereotype content model (Fiske et al., 2002) and ambivalent ageism research (Glick & Fiske, 1996), which propose that individuals high in benevolent ageism perceive older adults as warm but incompetent, while those high in hostile ageism view them as neither warm nor competent (Glick & Fiske, 1996; Fiske et al., 2002). Although benevolent, and especially hostile, ageism must be interpreted with caution due to the limitations outlined in Chapter 4.2, the findings may suggest that ageism is deeply ingrained in societal attitudes and structures in Germany and Austria, persisting across various workplace contexts, which contributes to a broader understanding of workplace ageism. This explanation aligns with the research of North and Fiske (2012), which emphasizes that ageism can persist across time and contexts unless it is actively challenged. One way to challenge ageism is by presenting older individuals who violate stereotypes (Cuddy et al., 2005; North & Fiske, 2012; Rothermund et al., 2021). However, the results of this study suggest that tackling ageism in the workplace requires more than just the isolated positive example featured in the vignette. A broader and

more sustained effort is needed to make a significant impact. The results of the study also showed that middle-aged and older workers who conformed to stereotypes, thus showed technological ineptitude, were perceived as more irritating and annoying, which is consistent with existing research (Hanrahan, 2016). This could indicate that counter-stereotypical behavior in the workplace tends to be evaluated more positively than stereotypical behavior. However, the study also suggests that individuals with higher levels of hostile ageism perceive middle-aged and older workers as more irritating and annoying overall, regardless of whether they conform to or violate stereotypes. This aligns with the existing literature, which suggests that higher levels of hostile ageism are generally associated with more negative emotions toward older individuals regardless of context (Vauclair et al., 2017), and that older people are often perceived as more irritating overall (Greenberg et al., 2002). This is also consistent with Nelson's (2005) functional perspective, which explains that individuals tend to view old age negatively and to psychologically distance themselves from older people as a social group. This distancing helps reduce anxiety about aging while maintaining a positive self-image and group esteem (Nelson, 2005).

4.1.2 Perceptions of Individuals Violating Prescriptive Age Stereotypes

Previous research suggests that violating age stereotypes, especially among older adults, often triggers backlash due to violation of societal norms (Hanrahan, 2023; North & Fiske, 2013). However, this study presents a more nuanced view. While there is evidence for the backlash effect, it was selective, primarily influencing ratings of warmth and likability. The findings suggest that older workers who conform to age stereotypes by displaying technological ineptitude receive higher warmth and likability ratings, whereas this effect reverses for middle-aged workers, highlighting the backlash effect. This is consistent with earlier findings by North and Fiske (2013), Hanrahan (2016), and Hanrahan et al. (2023), which show that stereotypical behavior among older individuals leads to higher ratings of warmth and likability. At the same time, these findings expand on existing research and offer a new perspective, as this is the first study to show that the effect reverses for middle-aged workers. A possible explanation for these results may lie in life stage expectations and associated social roles. Older adults are generally expected to adhere to established social norms, and when they do, they are perceived more positively, consistent with developmental intergroup theory (Bigler & Liben, 2007). Warmth and likeability are

qualities that are often associated with the roles traditionally ascribed to older adults, such as being nurturing, caring or passive (Bigler & Liben, 2007). When older people conform to these age stereotypes, they adapt to societal expectations. Furthermore, developmental intergroup theory suggests that individuals prefer behaviors that maintain social harmony and predictability (Bigler & Liben, 2007), which can lead to them being perceived as warmer and more likeable. The reversal effect of counter-stereotypical behavior on warmth and likability ratings depending on the target's age may suggest that the stereotype of technological incompetence applies to older individuals but not to middle-aged workers. Results therefore suggest that middle-aged workers are likely expected to be tech-savvy, and failure to meet this expectation may result in backlash, manifested as lower ratings of warmth and likability. This offers a new perspective on research into age stereotype violations and expectations related to technological expertise. It is also worth noting that trust did not show any significant effects in relation to counter-stereotypical behavior. Although warmth significantly decreased for tech-savvy older workers, and trust is often associated with warmth (Fiske et al., 2002), counter-stereotypical behavior had no impact on trust as an independent construct. These findings extend the work of North and Fiske (2013) and Hanrahan (2016), contributing to the understanding of backlash theory in the context of technology-related age stereotype violations.

However, when it comes to attributes such as competence and respect, the results suggest that counter-stereotypical behavior does not trigger backlash. Instead, middle-aged and older workers are seen as more competent and are shown greater respect when they are described as tech-savvy, thus behaving counter-stereotypically, compared to when they adhere to stereotypes. Previous research does not offer a clear consensus on this issue. Some studies have found an increase in perceptions of competence with counter-stereotypical behavior (Cuddy et al., 2005; Cuddy et al., 2008), others have observed a decrease (North & Fiske, 2013), and some report no change at all (Hanrahan et al., 2023). Cuddy et al. (2005) emphasize that when older individuals display counter-stereotypical behavior, it can increase perceptions of competence but decreases perceptions of warmth. Although warmth and competence are distinct dimensions, evaluated independently (Cuddy et al., 2008), individuals who conform to stereotypes are usually seen as warm but incompetent (Cuddy et al., 2005). This suggests that the effect may reverse for counter-stereotypical behaviors like showing technological competence and adaptability. The findings of the present study

are therefore consistent with those of Cuddy et al. (2005) and extend them to prescriptive technology-based age stereotypes.

One possible theoretical explanation for why older workers who violate age stereotypes are perceived as more competent lies in the activation stereotype (Havighurst, 1961). The prescriptive stereotype of activation suggests that older people are expected to remain cognitively fit (North & Fiske, 2013), competent and engaged in their roles (de Paula Couto et al., 2022), and generally healthy, mentally fit, and socially and economically engaged (de Paula Couto et al., 2022; Havighurst, 1961). In the context of technology use among older workers, it appears that the stereotype of activation – being cognitively fit, competent, and engaged – competes with the stereotype of identity, which suggests that older people should behave in ways deemed appropriate for their age, including being less competent with technology. The results of this study suggest that the stereotype of activation predominates, as older workers who exhibit counter-stereotypical technology behavior are rewarded with higher competence ratings. This finding enhances the understanding of how violations of technology-related age stereotypes influence perceptions of competence.

In addition to insights about the activation stereotype, the study's findings also allow for conclusions to be drawn about the succession stereotype of North and Fiske (2013). Since backlash effects were only observed in perceptions of warmth and likability, not in ratings of competence, trust, and respect, it appears that older workers who violate technology-related age stereotypes are rated higher in terms of competence and respect. These findings challenge the underlying explanation of the succession stereotype (North & Fiske, 2013), which suggests that older adults are evaluated more negatively when violating prescriptive stereotypes because they are expected to step aside for the younger generation. Although tech-savvy older workers are rated lower in warmth and likability, they are perceived as higher in competence and respect, even if their technological skills may enable them to remain in the workplace longer. Furthermore, stereotype-violating older workers are associated with positive emotions such as happiness, peacefulness, pleasantness, and cheerfulness, while those conforming to stereotypes are linked with negative emotions like irritation, aggravation, annoyance, and bother. This reinforces the positive perception of counter-stereotypical individuals, particularly older workers who demonstrate technological competence and adaptability. These results suggest several conclusions about the succession stereotype. Societal expectations regarding when older individuals should step down may be

evolving, with technologically competent and adaptable older workers being more welcomed and respected in the workplace for longer periods. Second, evaluations of counter-stereotypical behavior may be more context-dependent than previously thought. North and Fiske (2013) noted that in contexts where competence is highly valued – such as the workplace – violating stereotypes might lead to increased perceptions of competence. This may explain why older workers who engage in counter-stereotypical behavior receive more respect and are associated with more positive emotions.

These findings underscore the growing importance of technological competence in the workplace, particularly for older workers, and enhance our understanding of how, additionally to warmth and likability, counter-stereotypical behaviors influence perceptions of competence and respect, as well as their association with positive emotions.

4.1.3 Perceiver Age and Target Gender on Perceptions of Age-Stereotype Violators

The findings of this study indicate that neither age of the perceiver nor gender of the target significantly affect the backlash effect. In other words, whether older workers are treated differently from middle-aged workers based on their counter-stereotypical behavior is not influenced by the perceiver's age or the worker's gender. Contrary to prior research (e.g., North & Fiske, 2013), which suggested that younger perceivers would exhibit stronger backlash effects than older ones, this study did not fully support that relationship. Similar to Hanrahan et al. (2023), it found no significant relationship between the perceiver's age and ratings of warmth or competence. Additionally, no significant associations were found between the perceiver's age with other ratings such as likability, trust, or respect. However, it is important to note that compared to the younger participants (n = 106), only a few middle-aged (n = 31) and older (n = 32) participants completed this study. Therefore, the generalizability of the results is limited.

The only partial support for this assumption is found in the observation that younger perceivers, in contrast to middle-aged workers, experienced greater irritation when confronted with counter-stereotypical behavior such as technological proficiency. These findings re-evaluate and extend the understanding provided by North and Fiske (2013) and Hanrahan et al. (2023) on the role of younger individuals in assessing counter-stereotypical behaviors in middle-aged and older workers by highlighting perceptions of irritation for both genders. One possible explanation for this new perspective can be provided by

developmental intergroup theory (Bigler & Liben, 2007), which highlights that individuals from a young age learn to categorize people based on characteristics like age. This categorization is reinforced by societal expectations, which may explain why young individuals internalize the belief that not only older people are less suited for technology-related tasks in the workplace. Additionally, the role congruity theory (Eagly & Karau, 2002) provides another perspective, explaining that negative perception can arise when the stereotypes associated with a social role (such as being technologically proficient in the workplace) do not align with the stereotypes associated with a particular group (such as being older). Besides from the perception of irritation, there are no notable age differences among young, middle-aged, and older perceivers of counter-stereotypical behavior, which offers possible implications for the self-stereotyping tendencies of older workers. Like their younger and middle-aged counterparts, older workers rate individuals of their own age group with greater warmth and likability when they conform to age-related stereotypes. Moreover, counter-stereotypical behavior is associated with higher ratings of competence and respect across all age groups, though the specific consequences for older individuals at the workplace remain uncertain.

Considering role congruity theory (Eagly & Karau, 2002), it is also reasonable to expect that, as the study's additional findings suggest, female workers are generally perceived as higher in warmth, likability and trust than their male counterparts. This aligns with other studies in the field (Cuddy et al., 2015; Eagly & Karau, 2002; Heilman, 2012; Heilman & Okimoto, 2007). Furthermore, the findings indicate that female workers are more often associated with positive emotions such as happiness, pleasantness, and cheerfulness, while male workers are more likely to be perceived as bothersome. The results appear consistent with the study of Williams and Tiedens (2016), which found that women are associated with more positive emotions like warmth, cheerfulness, and agreeableness in the workplace. The findings also align with the tendency to associate women with communal traits – such as warmth, nurturing, and supportiveness (Eagly & Karau, 2002). Interestingly, no gender difference could be found when rating competence and respect of counter-stereotypical and stereotypical targets. While technological competence is typically considered an agentic trait, the association of men with agentic characteristics such as assertiveness and competence, as suggested by Eagly and Karau (2002), was not evident in this study. As Heilman (2012) also demonstrated, women who display agentic behavior and

men who exhibit communal behavior are often perceived more negatively. This suggests that backlash effects, leading to lower ratings of warmth, competence, likability, trust, and respect, may not be influenced by gender in the workplace in Germany and Austria when individuals engage in counter-stereotypical behavior. These findings offer deeper insight into how women in the workplace are perceived. They are viewed not only as higher in warmth and likability than their male counterparts but also as higher in trust and associated with more positive emotions. Moreover, women do not face greater repercussions than men when they are seen as technologically proficient and adaptable.

4.2 Limitations

This study focused on the stereotypes that older people have lower technological skills, show less adaptability to technology and are uncomfortable and overly cautious with technology. The selection of these stereotypes was primarily based on the literature review by Burn et al. (2020). Although their review included studies published after 1980, some of the research on which these stereotypes are based is somewhat outdated. While several studies in the literature review suggest that these stereotypes have remained consistent over time, their relevance today should be re-evaluated in future research. Additionally, this study was conducted in Germany and Austria. Although the literature review from Burn et al. (2020) focused on studies from Western countries, cultural influences specific to the study's location cannot be completely ruled out, which limits the generalizability of the study's findings to other Western countries.

Another limitation that should be acknowledged relates to the core literature on which this study is based. In addition to North and Fiske's (2013) foundational work on the effects of prescriptive age stereotype violations, this study also draws on the research of Hanrahan (2016) and Hanrahan et al. (2023). While the latter was published in a peer-reviewed journal, it is based on Hanrahan (2016), a dissertation from Northern Illinois University. Despite being a dissertation, Hanrahan (2016) meets the quality criteria of a robust study and provides valuable insights, particularly in the areas of associated emotions and ratings of likability, trust, and respect regarding counter-stereotypical behavior. Therefore, Hanrahan's (2016) study was selected to be included alongside the other works.

It is also important to acknowledge that the sample for this study was selected using non-probability sampling, based on non-random criteria. The survey was distributed among

colleagues, university group chats, and friends and family of acquaintances, leading to a convenience sample. This approach can introduce selection bias, as the sample may not be representative of the broader population (Vehovar et al., 2016). In addition, the sample in this study was predominantly composed of younger participants, with fewer middle-aged and older individuals. Most of the sample also consisted of women (59.8%) compared to men (39.6%), an imbalance that must be recognized as a limitation. To address this, future studies should use probability sampling methods, such as random or stratified sampling, and aim for a larger, more age- and gender-balanced participant pool to increase representativeness and minimize selection bias.

Another limitation is that this study concentrates on the disparities between individuals aged 44 and 62, rather than incorporating a third age group. Past studies (e.g., Hanrahan et al., 2023; North & Fiske, 2013) have already shown that stereotypes in the workplace differ significantly between middle-aged workers (44 years old) and older workers (62 years old). The goal is to examine these differences more closely. This approach facilitates the development of targeted policies that address the distinct needs of older individuals compared to middle-aged workers. Policies tailored to the specific experiences of these demographic groups hold significant potential for influencing demographic trends and effectively addressing age-related stereotypes in the workplace. However, to make inferences about the behavior and necessary policies for younger individuals compared to middle-aged and older workers, it is important to include this group in future studies.

As a further limitation, it should be mentioned that this study focused only on the investigation of adhering to or violating negative age stereotypes among older workers, while positive stereotypes were neglected. This focus is mainly because the study focuses on technology-related age stereotypes, for which there are no well-researched positive stereotypes related to older people's attitudes or technology use. The potential impact of positive stereotypes should not be overlooked in research on the effects of violating prescriptive age stereotypes. Internalizing positive age stereotypes can yield beneficial outcomes, such as higher life satisfaction (Kornadt & Rothermund, 2011) and may reduce the likelihood of a backlash effect (Hanrahan et al., 2023). To gain a more comprehensive understanding of the effects of age stereotype violation among older adults, future studies should also consider research on positive stereotypes.

Another potential limitation is that while the study provides insight into gender differences, it only considers the categories of "male" and "female". Due to the complexity and the potential for confounding variables, gender identities such as nonbinary, genderfluid, or transgender were not included in the vignette study. Future research could expand the investigation of gender differences to include these additional identities. However, given that the study found minimal gender differences, it is uncertain whether further exploration of gender in the context of technology-related age stereotype violation would bring valuable insights.

An important limitation to note is also the Cronbach's alpha for the hostile ageism scale, which was 0.69 – slightly below the accepted 0.70 cutoff (Taber, 2018). Despite attempts to improve it by removing items, no improvement was seen. Additionally, the average scores for benevolent (M = 2.20, SD = 0.65) and hostile ageism (M = 2.37, SD = 0.79) were low on a 6-point Likert scale, with the highest scores being 3.89 and 4.25, respectively, suggesting the full range of the scale wasn't utilized. Therefore, the results concerning benevolent and hostile ageism should be interpreted with caution.

The various positive and negative emotions explored in this study were measured as single items, which presents another limitation of this study. Participants were asked to associate specific emotions with the individuals depicted in the vignettes (e.g., "When you think about Mary's/James' actions, please rate how much you feel her actions are irritating/cheerful/aggravating/etc."). This approach was chosen because the analysis was exploratory, aimed at determining whether counter-stereotypical behavior is associated with emotions in this study. As the results suggest that the violation of age-related stereotypes is indeed related to emotions, future studies could investigate this aspect further.

Another limitation of this study is the violation of the assumption of homogeneity of covariance for warmth and competence (p = .041) as well as for positive and negative emotions (p = .022). This violation could affect the reliability of the results, requiring cautious interpretation. However, since this study did not rely on a full multivariate analysis to test the hypotheses, but focused only on between-subject effects, this issue is not expected to significantly bias the results. Nevertheless, it is important to acknowledge the violation of homogeneity of covariance for warmth and competence, as well as positive and negative emotions as a potential limitation.

While most of the significant effects in this study demonstrated sufficient statistical power (> .80) alongside significant p-values and reported effect sizes (η^2), some significant results exhibited lower power. For instance, the interaction between stereotype behavior and age on warmth ratings had a power of only .59. Although the study met the minimum sample size required based on the a priori power analysis, certain effects with lower power might be due to factors such as the exclusion of participants with incomplete responses. This led to uneven participant distribution across conditions. In addition, the number of participants is not evenly distributed across the age groups, which also represents a limitation and can contribute to reduced power for some findings. As a result, these findings should be interpreted cautiously. Future research should aim for a larger sample size with more diverse age groups to verify the results observed in this study.

4.3 Practical Implications and Suggestions for Future Research

Drawing from this study's findings, it is crucial for workplace supervisors to create an environment where individuals feel encouraged to engage in counter-stereotypical behavior without facing negative judgment and repercussions from others. Promoting technological skills among older workers enhances perceptions of their competence and respect in the workplace. However, as this study has shown, without active measures to counterbalance, this may lead to a decrease in perceptions of warmth and likability. When workers are perceived as having low warmth and likability, they are more likely to be excluded from informal networks and less likely to receive help from others, which can negatively impact their job performance, chances for promotions, and career development (Becker & Asbrock, 2012; Cuddy et al., 2011; Van Kleef et al., 2004). Additionally, the increase in stress and health issues associated with low warmth ratings can also lead to decreased job satisfaction and job performance (Heaphy & Dutton, 2008). This research suggests that two perspectives should be considered for counterbalancing negative repercussions of counter-stereotypical behavior: that of the person exhibiting counter-stereotypical behavior and that of those who observe and evaluate such behavior. For perceivers, this study proposes that promoting diversity and intergenerational contact in the workplace is crucial to effectively reduce prejudices and backlash. For those engaging in counter-stereotypical behavior, the present study suggests that opportunities for continuous learning, particularly in technological skills, should be provided, and age-inclusive policies

should support flexibility in roles and responsibilities. For those who have already experienced backlash, the results of this study emphasize the importance of establishing interventions that highlight positive stereotypes, thereby improving perceptions of warmth and likability. This aligns with the European Commission's (2023b) recommendations for addressing demographic changes, which underscore that intergenerational fairness, gender equality, and non-discrimination must be integral components of all policies.

This approach of diversity, intergroup contact, and continuous learning can empower older workers to take on new challenges or shift roles without the pressure of conforming to age-related expectations as well as dismantle age-based prejudice in younger and middle-aged workers (Pettigrew & Tropp, 2006; Zaniboni et al., 2013). This approach aligns with Allport's (1954) intergroup contact theory, which emphasizes that interaction between members of different (age) groups can reduce prejudice and improve relations. It also aligns with the World Health Organization's (2021) recommendation to foster intergenerational contact as a strategy to combat ageism. Marques et al. (2020) stress that the quality of contact is crucial in reducing the prevalence of ageism. When older individuals are presented in a positive way, ageism can be reduced. However, if they are portrayed in a negative way, ageism may be reinforced (Marques et al., 2020). This also highlights the importance of emphasizing positive stereotypes of older people. It is also important to note that cross-age interactions and therefore intergenerational contact can trigger stereotype threat in both younger and older individuals, especially when older individuals worry about their perceived warmth and younger individuals about their perceived competence (von Hippel et al., 2023). Since perceived warmth is already lower in older individuals who violate prescriptive age stereotypes, as this study has shown, efforts must be made to avoid adding stereotype threat to the mix.

Such efforts could focus on enhancing self-efficacy and alleviating the fear of technology among older workers. As Ivanov (2020) observed, older employees often have greater concerns about their ability to learn new technologies and fear being replaced by younger, more tech-savvy colleagues. They also highlighted that a supportive workplace environment, which encourages continuous learning and establishes age-inclusive policies, can significantly help older workers improve their attitudes toward technology and reduce intergenerational tensions. This is particularly important because the increase in older workers in the workplace has also led to a rise in conflicts between different generations

(Rudolph & Zacher, 2015). The potential negative influence of stereotype threat should also be considered here. Mariano et al. (2022) showed that older adults underuse technology because of the threat that they might confirm ageist stereotypes about having less technological ability than younger age groups. How exactly such interventions will impact the promotion of counter-stereotypical behavior among older workers and how it is perceived by young and middle-aged workers still needs to be explored in future studies.

Future research should also investigate the predictive power of hostile and benevolent ageism and how individuals who engage in counter-stereotypical behavior impact these forms of ageism. Counter-stereotypical behavior may particularly reduce benevolent ageism, as people may offer less unsolicited help and exhibit fewer benevolent ageist attitudes when they see that older individuals do not require assistance, such as with technology (Levy, 2009). To accurately measure the impact of behavior on ageism, more than a single positive example or vignette might be necessary, and this could be better assessed through a longitudinal study. In this study, the situational context in which counter-stereotypical behavior occurred did not affect perceptions of warmth and competence. However, since some literature (North & Fiske, 2013; Rudman & Glick, 2001; Vauclair et al., 2017) has reported connections between hostile ageism and stereotype violation, particularly concerning competence (Cuddy et al., 2015), it would be important for future research to investigate the situational context further. The results of this study also suggest that hostile ageism may be linked to prescriptive stereotypes, while benevolent ageism may be associated with descriptive stereotypes, like North and Fiske (2013) suggested. Although the study does not provide definitive evidence for this, it would be valuable to examine this relationship and its interplay in greater detail in future studies. Moreover, future research should extend beyond technology-based age stereotypes and consider other types of age stereotypes as well. Further research should also continue to consider the role of gender, as the connection with communal and agentic traits may offer additional insights into how gender relates to violations of age stereotypes among older workers.

Conclusion

This study aimed to explore whether older individuals experience backlash in the workplace regarding technology use when they violate age-related prescriptive stereotypes. The findings from the factorial vignette experiment suggest that while backlash exists due

to technology-based violations of age stereotypes, counter-stereotypical behavior is also increasingly rewarded. Specifically, the study revealed that older workers who exhibit technological competence, thereby behaving counter-stereotypically, are perceived with reduced warmth and likability. Interestingly, this effect is reversed for middle-aged workers. Both middle-aged and older workers, however, are perceived as more competent and respected when they display technological proficiency, which contradicts initial expectations. Contrary to expectations, benevolent and hostile ageism did not show a significant relationship with perceptions of warmth, competence, likability, trust, or respect. However, exploratory findings indicate that individuals with higher levels of hostile ageism perceive middle-aged and older workers as more irritating and annoying, consistent with previous ageism literature. Older workers who demonstrated high technological competence and adaptability were associated with positive emotions such as happiness, peacefulness, pleasantness, and cheerfulness, while those with low technological competence were more associated with negative emotions such as irritation, aggravation, annoyance, and bother. Additionally, young perceivers showed more irritation when encountering tech-savvy older workers. No other differences in the evaluation of counter-stereotypical behavior could be linked to the perceiver's age. Gender also had no significant impact on perceptions of counter-stereotypical behavior. While women in this study are generally viewed as warmer, more likable, and more trustworthy, men are often perceived as more bothersome. However, no gender differences were found when women showed technology competence and adaptability. These findings align with research on communion but not on agency, suggesting the need for further investigation in this area. These overall findings largely reflect previous research and contribute to a more unified understanding of the impact of counter-stereotypical behavior on perceptions by others. The results expand previous research by introducing the perspective of technological competence as well as benevolent and hostile ageism, which have not been previously connected to violations of age stereotypes in this manner. Additionally, the findings highlight the importance of promoting technological competence and adaptability among older individuals to help them stay confident in the workforce longer if they choose to do so. Creating an environment that fosters continuous learning, emphasizes positive stereotypes of older individuals, and promotes intergenerational collaboration is crucial to mitigating the reduction in warmth and likability that accompanies counter-stereotypical behavior. To generalize the effects of this

study to other cultural contexts, additional research is required, as the current findings are based on data from Austria and Germany. Additional research should also re-evaluate the current relevance of the prescriptive age stereotypes and further explore the role of emotions in perceptions of stereotype violating individuals since this study only used single items to explore emotions. Further limitations include the use of a non-representative convenience sample and the exclusion of non-binary gender identities. Future research should further investigate the predictive power of hostile and benevolent ageism and how individuals who engage in counter-stereotypical behavior impact these forms of ageism, as well as exploring the role of the situational context in this relationship. Additionally, it is crucial to explore how benevolent and hostile ageism and violations of age stereotypes influence descriptive versus prescriptive stereotypes, as research lacks a consensus on these issues. Ultimately, challenging age-related stereotypes in the workplace is crucial not only for promoting inclusivity and diversity but also for unlocking the full potential of employees of all ages.

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Appendix A – Summary of Technology-Related Stereotypes About Older Workers

Technological skills	"[less] technological ability"	Vines et al. (2015)
	"lack capacity to deal with new technologies"	van Dalen, Henkens, and Schippers (2009)
	"[less likely to] understand new technologies"	AARP (2000)
	"[less] technological competence"	Kroon et al. (2016)
	"[more likely to] have problems with technology"	McGregor and Gray (2002)
Technological adaptability	"[less] technological adaptability"	Kroon et al. (2016)
	"Older workers adapt to new technology slower than younger workers."	McCann and Keaton (2013)
	"[less likely to] learn new technologies,"	AARP (2000)
	"[less likely to] accept new technology"	Lyon and Pollard (1997)
	"less readily accept the introduction of new technology"	Warr and Pennington (1993)
	"[lower] ability to adapt to change, to learn and be trained, and to accept new technology"	Redman and Snape (2002)
	"difficult to train", "unable to adapt to new technologies"	Hayward et al. (1997)
Less comfortable, too cautious and fearful with technology	"[less] comfortable with new technologies"	AARP (2000); Hanks and Icenogle (2001)
	"too cautious [with technology]"	Hayward et al. (1997)
	"younger workers are less fearful of technology than older workers"	McCann and Keaton (2013)

Note. The data in this table were adapted from the literature review of Burn et al. (2020)

Appendix B – Vignette Selection

Middle-aged, Female, Adheres to Stereotype

Mary is a 44-year-old woman and works in a consulting firm. As technology becomes more integrated into daily work, Mary finds herself at a crossroad. Her colleagues describe her as having very poor technological skills, meaning that she struggles with using new technology. Additionally, she is also known for her lack of technological adaptability, as she has a poor ability to adapt to change, learn and be trained, and accept new technology. Mary generally feels deeply uncomfortable with technology and is too cautious and afraid to use new technology in the workplace.

Middle-aged, Female, Violates Stereotype

Mary is a 44-year-old woman and works in a consulting firm. As technology becomes more integrated into daily work, Mary finds herself in her element. Her colleagues describe her as having exceptional technological skills, meaning that she is very good at using new technology. Additionally, she is also known for her technological adaptability, as she has a high ability to adapt to change, learn and be trained, and accept new technology. Mary generally feels deeply comfortable with technology and is not too cautious nor too afraid to use new technology in the workplace.

Middle-aged, Male, Adheres to Stereotype

James is a 44-year-old man and works in a consulting firm. As technology becomes more integrated into daily work, James finds himself at a crossroad. His colleagues describe him as having very poor technological skills, meaning that he struggles with using new technology. Additionally, he is also known for his lack of technological adaptability, as he has a poor ability to adapt to change, learn and be trained, and accept new technology. James generally feels deeply uncomfortable with technology and is too cautious and afraid to use new technology in the workplace.

Middle-aged, Male, Violates Stereotype

James is a 44-year-old man and works in a consulting firm. As technology becomes more integrated into daily work, James finds himself in his element. His colleagues describe him as having exceptional technological skills, meaning that he is very good at using new technology. Additionally, he is also known for his technological adaptability, as he has a high ability to adapt to change, learn and be trained, and accept new technology. James generally feels deeply comfortable with technology and is not too cautious nor too afraid to use new technology in the workplace.

Old, Female, Adheres to Stereotype

Mary is a 62-year-old woman and works in a consulting firm. As technology becomes more integrated into daily work, Mary finds herself at a crossroad. Her colleagues describe her as having very poor technological skills, meaning that she struggles with using new technology. Additionally, she is also known for her lack of technological adaptability, as she has a poor ability to adapt to change, learn and be trained, and accept new technology. Mary generally feels deeply uncomfortable with technology and is too cautious and afraid to use new technology in the workplace.

Old, Female, Violates Stereotype

Mary is a 62-year-old woman and works in a consulting firm. As technology becomes more integrated into daily work, Mary finds herself in her element. Her colleagues describe her as having exceptional technological skills, meaning that she is very good at using new technology. Additionally, she is also known for her technological adaptability, as she has a high ability to adapt to change, learn and be trained, and accept new technology. Mary generally feels deeply comfortable with technology and is not too cautious nor too afraid to use new technology in the workplace.

Old, Male, Adheres to Stereotype

James is a 62-year-old man and works in a consulting firm. As technology becomes more integrated into daily work, James finds himself at a crossroad. His colleagues describe him as having very poor technological skills, meaning that he struggles with using new technology. Additionally, he is also known for his lack of technological adaptability, as he has a poor ability to adapt to change, learn and be trained, and accept new technology. James generally feels deeply uncomfortable with technology and is too cautious and afraid to use new technology in the workplace.

Old, Male, Violates Stereotype

James is a 62-year-old man and works in a consulting firm. As technology becomes more integrated into daily work, James finds himself in his element. His colleagues describe him as having exceptional technological skills, meaning that he is very good at using new technology. Additionally, he is also known for his technological adaptability, as he has a high ability to adapt to change, learn and be trained, and accept new technology. James generally feels deeply comfortable with technology and is not too cautious nor too afraid to use new technology in the workplace.

Appendix C – Scales for Dependent Variables

Scale for Warmth

As viewed by society, how …. are colleagues like Mary/James?	**Not at all**	**Slightly**	**Moderately**	**Very**	**Extremely**
1. friendly	1	2	3	4	5
2. well-intentioned	1	2	3	4	5
3. trustworthy	1	2	3	4	5
4. warm	1	2	3	4	5
5. good-natured	1	2	3	4	5
6. sincere	1	2	3	4	5

Note. This scale is adapted from Fiske et al. (2002)

Scale for Competence

As viewed by society, how …. are colleagues like Mary/James?	**Not at all**	**Slightly**	**Moderately**	**Very**	**Extremely**
1. competent	1	2	3	4	5
2. confident	1	2	3	4	5
3. capable	1	2	3	4	5
4. efficient	1	2	3	4	5
5. intelligent	1	2	3	4	5
6. skillful	1	2	3	4	5

Note. This scale is adapted from Fiske et al. (2002)

Scale for Likeability

As viewed by society, how …. are colleagues like Mary/James?	**Not at all**	**Slightly**	**Moderately**	**Very**	**Extremely**
1. kind	1	2	3	4	5
2. considerate	1	2	3	4	5
3. polite	1	2	3	4	5
4. sincere	1	2	3	4	5
5. warm	1	2	3	4	5

Note. This scale is adapted from Harnish et al. (1990)

Scale for Trust

Please rate how much you agree with the following statements.	**Not at all likely**	**Unlikely**	**Somewhat unlikely**	**Neither likely nor unlikely**	**Somewhat likely**	**Likely**	**Very likely**
1. I would give colleagues like Mary/James an important letter to mail after they mention they are stopping by the post office today.	1	2	3	4	5	6	7
2. If colleagues like Mary/ James promised to copy a presentation for me they would follow through.	1	2	3	4	5	6	7
3. If colleagues like Mary/James and I decided to meet for coffee, I could be certain they would be there.	1	2	3	4	5	6	7
4. I would expect colleagues like Mary/ James to tell me the truth if I asked them for feedback on an idea related to my job.	1	2	3	4	5	6	7
5. If colleagues like Mary/ James were late to a meeting, I would guess there would be a good reason for a delay.	1	2	3	4	5	6	7
6. Colleagues like Mary/ James would never intentionally misrepresent my point of view to others.	1	2	3	4	5	6	7

7. I would expect colleagues like Mary/ James to pay me back if I loaned them 40€.	1	2	3	4	5	6	7
8. If colleagues like Mary/ James laughed unexpectedly at something I did or said, I would know they were not being unkind.	1	2	3	4	5	6	7
9. If colleagues like Mary/ James gave me a compliment on my haircut I would believe they meant what was said.	1	2	3	4	5	6	7
10. If colleagues like Mary/ James borrowed something of value and returned it broken, they would offer to pay for the repairs.	1	2	3	4	5	6	7

Note. This scale is adapted from Dunn & Schweitzer (2005)

Scale for Respect

Please rate how much you agree with the following statements.	**Disagree strongly**	**Disagree**	**Somewhat disagree**	**Neither disagree nor agree**	**Somewhat agree**	**Agree**	**Agree strongly**
1. I would respect colleagues like Mary/ James very much as a person.	1	2	3	4	5	6	7
2. Colleagues like Mary's/ James's opinion would matter to me.	1	2	3	4	5	6	7
3. Other people would respect colleagues like Mary/ James.	1	2	3	4	5	6	7
4. Colleagues like Mary/ James would be held in high regard.	1	2	3	4	5	6	7
5. I would look up to colleagues like Mary/ James.	1	2	3	4	5	6	7

Note. This scale is adapted from Hanrahan et al. (2023)

Scale for Emotional Reactions to the Vignette

When you think about Mary/James's actions, please rate how much you feel her actions are …?	**Not at all**	**Slightly**	**A little**	**Somewhat**	**A lot**	**Very much so**
1. irritating	1	2	3	4	5	6
2. happy	1	2	3	4	5	6
3. aggravating	1	2	3	4	5	6
4. peaceful	1	2	3	4	5	6
5. annoying	1	2	3	4	5	6
6. pleasant	1	2	3	4	5	6
7. bothersome	1	2	3	4	5	6
8. cheerful	1	2	3	4	5	6

Note. This scale is adapted from Hanrahan et al. (2023)

Scale for Hostile and Benevolent Ageism

Please rate how much you agree with the following statements.	**Disagree strongly**	**Disagree**	**Somewhat disagree**	**Somewhat agree**	**Agree**	**Agree strongly**
1. It is good to tell old people that they are too old to do certain things; otherwise they might get their feelings hurt when they eventually fail.	1	2	3	4	5	6
2. Even if they want to, old people shouldn't be allowed to work because they have already paid their debt to society.	1	2	3	4	5	6
3. Even if they want to, old people shouldn't be allowed to work because they are fragile and may get sick.	1	2	3	4	5	6
4. It is good to speak slowly to old people because it may take them a while to understand things that are said to them.	1	2	3	4	5	6
5. People should shield older adults from sad news because they are easily moved to tears.	1	2	3	4	5	6
6. Older people need to be protected from the harsh realities of society.	1	2	3	4	5	6
7. It is helpful to repeat things to old people because they rarely understand the first time.	1	2	3	4	5	6
8. Even though they do not ask for help, older people should always be offered help.	1	2	3	4	5	6
9. Even if they do not ask for help, old people should be helped with their groceries.	1	2	3	4	5	6
10. Most old people interpret innocent remarks or acts as being ageist.	1	2	3	4	5	6
11. Old people are too easily offended.	1	2	3	4	5	6
12. Old people exaggerate the problems they have at work.	1	2	3	4	5	6
13. Old people are a drain on the health care system and the economy.	1	2	3	4	5	6

Note. This scale is adapted from Cary et al. (2017)

Appendix D – Ethical Approval

UNIVERSIDADE CATÓLICA PORTUGUESA

Deliberação da Comissão de Ética em Tecnologia, Ciências Sociais e Humanidades sobre o estudo

Deliberation of the Ethics Committee for Technology, Social Sciences and Humanities concerning the research study

Breaking Stereotypes or Facing Backlash? The Impact of Technology Use by Older Workers in the Modern Workplace

Com base nos elementos apresentados pela investigadora Katharina Christina Hörmann no Mestrado de Psicologia na Gestão e Economia da Universidade Católica Portuguesa, relativos ao projeto de investigação intitulado *"Breaking Stereotypes or Facing Backlash? The Impact of Technology Use by Older Workers in the Modern Workplace"*, a Comissão de Ética em Tecnologias, Ciências Sociais e Humanidades (CETCH), considerou estarem reunidas as informações necessárias para poder avaliar o processo, tendo deliberado dar parecer ético favorável, ao pedido submetido em 21 de março de 2024 sob o nº CETCH2024-75.

Considering the elements presented by the researcher Katharina Christina Hörmann, from Master's in Psychology in Business and Economics at Universidade Católica Portuguesa, regarding the research project entitled "Breaking Stereotypes or Facing Backlash? The Impact of Technology Use by Older Workers in the Modern Workplace", the Ethics Committee in Technology, Social Sciences and Humanities (CETCH), considered that the required elements were present in order to evaluate the process, and decided to favorably recommend the ethical approval of the request submitted on 21st of March 2024 under number CETCH2024-75.

2 de maio de 2024

O Vice-Presidente da CETCH | *The Vice-President of CETCH*

(William Hasselberger)

Appendix E – Consent Form, Participation Requirements & Debriefing

Consent form

Welcome to the study "Technology use in modern work environments"

Dear Participant,

Thank you for taking the time to participate in this study.

The objective is to gain a deeper understanding of perceptions and attitudes towards different employees in the workplace. Your insights are extremely valuable and will significantly contribute to research in this field.

Completing this questionnaire should take approximately 10 minutes.

Please note that all your responses will be treated with strict confidentiality and are used for research purposes only. There are no "right" or "wrong" answers, I am interested in your honest and personal viewpoint.

If you have any questions, please feel free to contact me via e-mail (s-khormann@ucp.pt).

Thank you very much in advance for your valuable time and candid responses. Have fun!

Sincerely,
Katharina

Participation Requirements

I would like to point out that this study is specifically aimed at people who work full-time in companies and whose professional activity is not exclusively based on manual or physical work, as is the case in the craft sector, for example.

It is also necessary that all participants are at least 18 years old and currently live in Germany or Austria.

If you do not meet these criteria, I would like to thank you for your interest. In this case, please discontinue your participation in the survey.

☐ I confirm that I fulfill the participation requirements for this study.
☐ I do not confirm that I fulfill the participation requirements and would like to end the study.

General information on research purpose and data protection

Before you can start the study, you will receive information about the research project, the conditions of participation and the handling of the data collected.

General information on the research project:
This research project is part of a dissertation in Psychology at the Universidade Católica Portuguesa. The aim is to collect personal perceptions of participants on the use of technology in their work environment. Participation in this research project is not expected to lead to any discomfort or harm.

Voluntariness:
Your participation in this research project is voluntary. You are free to end your participation at any time by simply closing the browser window and this will have no negative consequences for you.

Privacy and anonymity:
Personal data collected in this research project (such as your age, gender or occupational group) will only be used for statistical analysis at group level. Individual data does not play a role in the questions of this study, and it is not possible to relate any results directly to you personally.

Use of the data:
The data will be analyzed exclusively for research purposes. They serve as the basis for a dissertation and can also be used in scientific publications without the participants being identified.

☐ I have read and understood the above information on voluntariness, data protection, anonymity and use of the data and would like to participate in the study.
☐ I have not read the information on voluntariness, data protection, anonymity and use of the data and would like to end the study.

Debriefing

Dear participants,

Thank you very much for taking part in the study! You have now reached the end of the survey. Your commitment is making a decisive contribution to developing a deeper understanding of the perceptions and attitudes of employees in different working environments.

For your information:
The person profile used in this study was a fictitious creation. Depending on the group to which you were randomly assigned, the person described was portrayed as either particularly tech-savvy or tech-sceptical. The aim of this study is to find out to what extent attitudes towards people differ depending on their age and technical skills.

If you have any questions about the content, purpose or research ethics of this survey, if you are interested in the results or if you want to withdraw your survey answers, please contact s-khormann@ucp.pt.

Please click on “NEXT PAGE” at the bottom right - only then will the survey be completed and your data saved.

Thank you again for your time and effort!

Appendix F – Demographics for Pretest and Main Study

What gender do you identify as?
- o Male
- o Female
- o Other:

What is your age? (open question)

In what country do you currently live?
- o Germany
- o Austria
- o Other:

What is the highest degree or level of education you have completed?

- No school education completed
- Some high school, no diploma
- Intermediate secondary school certificate
- High school graduate
- Apprenticeship/ vocational training
- Bachelor´s degree or equivalent
- Master´s degree or equivalent
- Doctorate degree, or higher
- Other:

Are you currently...? (Multiple answers possible)

- An employee
- Self-employed
- Unemployed
- A student
- Retired
- Unable to work
- Other:

How many hours do you work per week (according to your employment contract)?
Please state your working hours in whole hours (open question).

How do you primarily complete your tasks at work?

- Almost entirely through technology or laptop use
- Mostly through technology or laptop use, with some manual work or physical labor
- Equally through manual work/physical labor and technology/laptop use
- Mostly through manual work or physical labor, with some technology or laptop use
- Almost entirely through manual work or physical labor

What percentage of your total weekly work hours do you on average spend working in the office? Please give an estimate in percent.

What percentage of your total weekly work hours do you on average spend working remotely? Please give an estimate in percent.

Do you work with or have interactions with coworkers in your current work setting?

- Always
- Often
- Sometimes
- Rarely
- Never

Do you work with people from different age groups in your current work environment?

- Always
- Often
- Sometimes
- Rarely
- Never