

Too old for the job? Investigating tools for increasing older adult participation in the workforce.

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A thesis submitted for the degree of PhD in Psychology

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April, 2023

DECLARATION

I declare that the work presented in this thesis, “*Too old for the job? Investigating tools for increasing older adult participation in the workforce.*” is my own. Contributions of others are clearly acknowledged at the beginning of the chapters. None of the work referred to in this thesis has been submitted for any other degree at this or any other University or institution. I have used editorial ‘we’ rather than ‘I’ in this thesis to acknowledge the research co-authorship. Any quotations have been distinguished by quotation marks and all sources of information are specifically acknowledged. None of the work in this thesis has been submitted for a higher degree at this or any other University or institution.

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ACKNOWLEDGEMENTS

I would like to start by expressing my deepest acknowledgement to my wonderful supervisor, Dr Marie Juanchich. During my time on this thesis, Marie has been the most incredible mentor, leader, role model and friend. I am so grateful to have had the privilege of her generous support and encouragement over these past years. Simply, this thesis would not have been possible without her. Much of our collaborative work together over the past years exists outside the boundaries of this written thesis, and I am excited for our work to continue beyond it.

I would like to thank my second supervisor, Dr Beatrice Piccoli for always making herself available to offer insight, perspective, and guidance on how I can achieve my goals for this thesis and career. I would like to thank Trudi Day, Dr Rick O’Gorman, Jenny Davies, and Lesley Monk in the University of Essex Psychology Department, for their important administrative support at key moments during my PhD. I would like to thank Zachariah Berry and the teams at Centre for Open Science and #ManyDesigns for their partnership and contributions to the work in this thesis. I would like to thank my University of Essex friends and collaborators who have been with me on this PhD journey and have provided guidance and wisdom in a variety of forms, Dr Dawn Holford, Dr Kathryn Buchanan, Dr Jake Bourgaize, Dr Kelly Wolfe, Dr Rebecca Hornsey, Hazel Sayer, and Caryn Cook. I would like to thank my new colleagues at The Inclusion Initiative at London School of Economics, who have provided a warm welcome and much encouragement over the final stretch of this thesis.

Finally, I would like to thank my partner, Dr Danielle Harris for her support, understanding and enduring of the entire journey. She has helped me recognise when to prioritize it, and when to put it into perspective.

IMPACT OF COVID-19

On March 13, 2020, the University of Essex announced a series of measures to prevent the spread of coronavirus amongst students and staff. Two of these measures impacted the trajectory of this thesis. One of these measures was the effective closure of departments, and the suspension of any in-person testing involving participants. Another of these measures was for the Psychology Department to restrict research expenditure. At this time, I had collected data for my first study on the effects of choice bracketing on hiring decisions. Due to guidelines and expenditure restrictions, I paused my data collection on this project. I instead, continued my research on an externally funded project, which has become Chapter 4 of this thesis. Had this disruption not occurred, it is very unlikely that I would have chosen to undertake cross-sectional research for this thesis, or chosen to revisit the topic of retirement (a topic I previously covered in my Master's Thesis)¹. The research in Chapter 4 has changed my thesis in a substantial manner. Had it not been for this disruption, I would have focused my thesis entirely on experimental work examining hiring decisions with older candidates. Further, one limitation of this research has been that it relies solely on online samples. I cannot say with certainty that I would have chosen to undertake in-person laboratory-based testing for part of this work had it been available to me. However, the constraints on in-person testing in the first two years of my studies meant that this was never an option for consideration. The changes I made to continue my PhD studies during the period of COVID-19 have changed the narrative of this thesis, broadening its scope to older worker participation and retirement intentions. Although COVID-19 caused disruption to the trajectory of this work, I do also believe the final product shows glimpses of flexibility, novelty and breadth that come from working through adversity.

¹ This article has since been published as *'Who will I be when I retire?'* in *Current Psychology*.

THESIS SUMMARY OF WORK

Despite an ageing workforce, older workers face significant challenges resulting from routine, and socially acceptable workplace ageism. Early retirements and employment barriers that result from this ageism are expected to place heavy pressures on labour supplies and social security systems in many countries over the coming years. This is especially unfortunate given the organisational performance benefits workplace age diversity can provide. Across three research streams, this thesis draws on social psychology and judgement and decision-making literatures to understand how we might create longer working lives, from employment to retention. The first stream examines if a choice bundling intervention shown to increase gender diversity can successfully increase age diversity in selection decisions. Across four preregistered experiments ($N = 2,624$), I evidence bias against older job candidates in hiring decisions and demonstrate that choice bundling shown to be effective in increasing the selection of women candidates, fails to increase the selection of older candidates. The second stream explores the role of competition-based incentives on hiring decisions. Across two preregistered experiments ($N = 800$), I investigate if competition moderates age discrimination in selection decisions. The results show limited evidence that competition affects bias in selection decisions. In the third and final stream of research, I aim to understand the relationship between the intergenerational diversity climate perceived by older workers in their organisation and their retirement intentions. In two pre-registered studies of workers aged between 40 and 75 years ($N = 375$), I find that older workers who perceived a more positive intergenerational climate at their workplace had lower intention to retire early, but not greater intention to continue working beyond retirement age. I discuss the theoretical implications and the need for greater understanding of age as a diversity

characteristic to support the design of interventions that meet the challenges of an ageing workforce.

CHAPTER 1.

1. Introduction

1.1 Background

As populations throughout the OECD continue to age, there is increasing research literature on how successful ageing at work can be promoted. Here in the UK, it is projected that one in four people will be aged 65 years and over by 2050 (UK Office for National Statistics, 2021). In the US, labour participation over the past 20 years has nearly doubled for adults over the traditional retirement age of 65, with around one in three US adults aged between 65 and 69 working today (CPS Tables. n.d.). While overall, we are seeing growth in the workforce participation of older adults, there are indicators that older adults are still exiting the workforce too early. In the UK, data shows workers aged over 50 years old were up to 50% more likely than their younger counterparts to have been impacted by redundancy in the past 12 months (UK Office for National Statistics, 2022). While in the US the duration of unemployment increases with age, with the average period of unemployment up to 60% longer for older workers than their younger counterparts (Francioli & North, 2021; US Bureau of Labor Statistics. 2023). Post-pandemic declines in employment among workers in the 55+ age cohort (Bui et al., 2020) have only heightened the case for organisations to attract and retain these older workers, both to ensure equality of opportunity (i.e., eliminating discrimination) and to ensure continued productivity is not impeded by ignoring the best talent or creating worker shortages through early retirements.

Better understanding of discrimination against older candidates in selection decisions and older workers in their workplaces is important to creating longer, fulfilling lives. This thesis draws on social psychology and judgement and decision-making literatures to

understand the cognitive factors that underpin discrimination against older candidates in selection decisions and organisational climates that prevent early retirement and support the retention of older workers beyond retirement age. This understanding is important to the development of organisational tools and interventions to promote longer working lives. A paper in *Personnel Psychology* by Smith (1952) concluded with the quote that "*the company might do well to discriminate less against older workers in hiring policy*". Yet, seventy years later, older workers continue to face barriers in all aspects of job opportunity, including recruitment, training, and promotion (Harris et al., 2018). There is still a great deal that is not understood about age discrimination in the workplace. The first goal of this thesis is to produce empirical work that draws on relevant theory to understand discrimination against older candidates in selection decisions. The second goal of this thesis is to understand how the age climate perceived by older workers in their organisation influences their retirement intentions.

1.1.2 Successful ageing at work

Rather than simply declining from middle to older age, successful ageing at work is the process of adapting to maintain competency and achieve career goals as we age. The concept of successful ageing at work was first introduced by Abraham and Hansson (1995), who suggested that for older workers to maintain job competency is not only a product of their individual characteristics, but also subject to the job, organisation, and broader market contexts in which they operate. Although other conceptualisations of successful ageing at work have emerged (e.g., health, motivation; Kooij, 2015), there is an emerging consensus that this success is contingent on older workers finding the right fit between their individual knowledge, skills, and abilities and what an organisation and job requires of them (Beier et al., 2022). This thesis aims to investigate two barriers that may prevent older adults fitting

their individual skills and abilities to the workplace. The first is hiring discrimination, which can act as a barrier to older workers finding a job where their talents are appropriately utilised. Using simulated hiring experiments, this thesis seeks to explore the individual decision-making processes behind hiring discrimination. These experiments are set in relevant societal contexts that may currently prevent older adults from securing roles to which they are appropriately suited. Specifically, the technology sector and technology roles, where older workers are regularly discriminated against (Perry & Finkelstein, 1999; Schloegel et al., 2018). We also examine hiring practices (contingency recruitment), where competition-based incentives may alter recruiters' decisions to select older candidates. The second barrier investigated by this thesis concerns the age diversity climate older adults experience in their workplace. Successful ageing at work requires older workers to be in an organisational environment where they are valued for their knowledge, skills, and abilities (Beier, et al., 2020). Using surveys of hundreds of older workers, this barrier is examined through the associations between organisational age diversity climate, job satisfaction and individual retirement intentions. Successful ageing at work, and the longer, fulfilling working lives this would bring, requires older adults to be able to access work roles and organisational environments that are motivating and fulfilling (Kooij et al., 2020). It is hoped that the research focused on these two barriers can help improve our understanding of workplace age discrimination. Such understanding is important to progress towards reducing discrimination and encouraging leaders to take steps to improve the situation of older workers within their organisations.

1.1.3 Ageism. Stereotypes, prejudice, and discrimination

Workplace ageism occurs throughout the work cycle. From recruitment, employment opportunities, turnover or dismissal, and eventual retirement (Harris et al., 2018; Truxillo et

al., 2015). The term ‘ageism’ was originally coined by psychiatrist and civic advocate Robert Butler in 1969 who used it to describe homeowner fears of about a social housing project intended for elderly poor residents (Achenbaum, 2015). Today, the term is widely used and can be understood as encompassing negative stereotypes, prejudices and discriminatory actions directed towards people based on their age (Nelson, 2007). While it can refer to prejudice against younger persons, the term typically concerns prejudice against older persons. Stereotypes are classically defined as ‘probabilistic generalizations’ about a particular group (Allport, 1954; Fiske, 1998; Francioli & North, 2021). Stereotypes, whether or not we agree with them, are generally well-known within in a given culture (Devine, 1989). For example, thinking that older adults are less capable with technology is a common (universally recognisable) negative stereotype directed towards older adults. Stereotypes, and the generalizations that accompany them, effectively view individuals from particular social groups as homogenous (Marx & Ko, 2012). Stereotypes are often based on preconceived and unsubstantiated ideas that precede prejudice and discrimination, such ideas tend to be negative, simplistic, and one-sided (Judd & Park, 1993). A review by Posthuma & Campion (2009) shows that when it comes to older workers, stereotypes tend to be primarily negative (e.g., that older workers are less productive, capable with technology, able to learn new things compared to younger counterparts), although there are some that are positive (e.g., that they are more dependable). According to a meta-analysis by Ng and Feldman (2012), most of these common older-worker stereotypes are false, yet they remain widespread.

As distinct from stereotypes, prejudice generally refers to a negative attitude and feeling toward an individual based on their membership in a particular social group (Allport, 1954). Prejudices are usually categorised into explicit and openly admitted prejudices, and implicit attitudes that are automatic and unconscious responses (Greenwald & Banaji, 1995; Nosek et al., 2007; Nosek & Smyth, 2007). Discrimination can be understood as a behaviour,

which is distinct from, but may be motivated by, prejudicial attitudes or stereotypical beliefs (Pager & Quillian, 2005). At an individual level, discrimination can be defined as behaving negatively towards an individual based on a judgment about their social categorization (e.g., race, ethnicity, gender, age) (Allport, 1954; Dovidio & Gaertner, 2004; Quillian & Midtbøen, 2021). For example, choosing not to select a suitably qualified candidate for a role because of their social category (i.e., age). This individual definition of discrimination is distinct from systemic discrimination, where institutional policies and practices can also lead to groups being treated differently (Williams & Rucker, 2000). Targets of discrimination can suffer negative physical and mental health consequences including depression and anxiety (Mays et al., 2007; Swim et al., 2001). Indeed, an emerging stream of research shows that age discrimination can have serious health and well-being consequences for older adults (Chang et al., 2020; Lyons et al., 2018; Nelson, 2016). A study by Bai et al. (2016) found that older adults internalizing negative views towards themselves was a strong predictor of depression and other mental health issues. Similarly, workplace age discrimination is associated with lower self-rated health and increased depressive symptoms (Marchiondo et al., 2019) as well as long term work absence due to sickness (Viitasalo & Nätti, 2015). Thus, ageism and age-based discrimination can have far reaching consequences on health, wellbeing, and human rights, both for those discriminated against and for the broader societies in which it occurs.

1.1.4 Age diversity and business performance

In leading firms, diversity, equity, and inclusion (DEI) strategies are viewed as central to innovation, decision making and talent acquisition. The “business case for diversity”, broadly holds that complex business problems require a variety of perspectives, and that greater diversity is one way to increase the informational perspectives and subsequent solutions to these complex problems (Salas et al., 2018; Van Knippenberg et al., 2004). The exact nature

of the relationship between diversity and productivity is still being debated and explored (Veelen & Ufkes, 2019). A meta-analysis by Bell et al. (2011) examined 40 studies on the relationship between age diversity and team performance, finding no relationship. Other studies have found that age-diverse teams perform better on complex, rather than simple tasks (Wegge et al., 2012). However, it has also been suggested that salient age differences, negative intergenerational climate and agreeableness of team members can influence performance outcomes (Luksyte et al., 2020; Wegge et al., 2012). For example, Luksyte et al., 2020 found that (in samples aged mostly under 40 years) age diversity led to better performance only in teams where a minimum amount of agreeableness was present for all team members. Similar findings across other dimensions of diversity (gender and race) have led to workplace diversity being labelled a 'double-edged sword' (Milliken & Martins, 1996). These inconsistent findings are in line with the Van Knippenberg et al., (2004) categorization-elaboration model (CEM) of diversity. This model suggests that either an *information perspective* (diversity increases knowledge skills and abilities; Cox & Blake, 1991) or a *social categorization perspective* (diversity challenges intergroup relations via categorization; Brewer, 1979; Tajfel & Turner, 1986) might explain the link between diversity and performance depending on the presence of different conditions. Since Bell's (2011) meta-analysis, there has been increasing evidence to suggest that conditions such as age-inclusive organisational climate combined with age-diversity can increase the information, knowledge and social network of an organisation, with the resulting positive impacts on organisational performance (Boehm et al., 2014; Li et al., 2021). Despite this evidence, and a rapidly ageing workforce, current diversity strategies are primarily focused on gender and race, and often ignore the perspectives of 'age' altogether (Akinola, 2019). Despite evidence of age as the characteristic 'most likely' to improve organisational performance outcomes by increasing informational perspectives (Bell et al., 2011; Li et al.,

2021), the benefits of age diverse perspectives remain undervalued (Martin & North 2021). There are two paths towards cultivating this age diversity, such that it takes hold in organisations, sectors and societies. The first is via increased representation of older workers, which requires hiring managers to recognise and embrace this diversity (Boekhorst, 2015). Second, as workforces age and this diversity is increased (via some combination of hiring and ageing of existing employees), age-inclusive organisational climates are required to ensure both the retention and performance benefits of this diversity are achieved (De Meulenaere et al., 2016; Luksyte et al., 2022).

1.1.5 Applied research significance

An ageing workforce has put the question of productivity high on the policy agenda of many industrialized countries, and this workforce (like this thesis) has been changing against a backdrop of the COVID-19 pandemic. At the time of writing this introduction, the UK government was putting a broader agenda in place to entice older workers back from early retirement into workplaces around the country (Zeldin-O'Neill, 2022). In the UK and US there has been broader recognition that the number of older workers who fell out of the workforce during the pandemic far exceeded rates predicted by demographic shifts alone (Bajorek, 2021; Korn Ferry 2022). It should be more concerning than ever that discrimination against older job candidates and older workers remains a widespread societal problem, which has in part, contributed to their disproportionate underrepresentation in the labour market. Prior to the COVID-19 crisis, the global risk posed by early retirements due to workplace ageism was already on the World Health Organization's agenda, estimated to be costing society billions of dollars each year (World Health Organization, 2021). Under-representation of older workers in the labour market means under-utilisation of talent, which results in large productivity costs to firms and society at large (Baert, 2021; OECD, 2020). Given the

enormous costs associated with workplace age discrimination and the substantial personal, organisational, and economic benefits of longer, fulfilling working lives, any research-based interventions that delivers even modest-effects have the potential to improve lives substantially (WHO, 2021).

In Chapters 2 and 3 of this thesis, I examine discrimination against older job candidates in the technology industry in which older workers are largely underrepresented. Both Chapters raise questions about team diversity and how this might be conceptualised or valued by hirers. Secondly, once age-diversity is in place, age-inclusive organisational climates are required to ensure the performance benefits of this diversity are achieved (De Meulenaere et al., 2016). In Chapter 4 of this thesis, I examine this intergenerational diversity climate from the perspective of older workers, with the understanding that positive climates are important to age-diverse workforces achieving the desired productivity outcomes.

1.2 Ageism towards older workers in hiring and selection decisions

Ageism in hiring and selection decisions, is the most prevalent form of workplace age discrimination (Truxillo et al., 2015). In recent decades, there has been positive progress towards reducing workplace discrimination in hiring, however, there continues to be significant discrimination based on age (Colella et al., 2017; Triana et al., 2021). This can make it especially difficult for older workers seeking to re-enter the labour market after a period of unemployment. Ageism directed towards older candidates in hiring decisions has been studied using a range of research methods, including surveys of hiring managers (Lössbroek et al., 2021), CV field experiments (Carlsson & Eriksson, 2019; Neumark et al., 2019), and simulated hiring decision experiments (Gioaba & Krings, 2017; Kaufman et al. 2016; Kleissner & Jahn, 2020). Some of the earliest research on workplace ageing involves

age discrimination in selection decisions (Beier et al., 2022). Here, I examine selection and discrimination against older candidates, age-based stereotypes in hiring decisions, and how experimental designs might be leveraged to increase the hiring of older adults.

1.2.1 Selection and discrimination

Age discrimination in hiring decisions has a long research history. A 1954 study by Kirchner and Dunnette found that supervisors, regardless of their own age, had more unfavourable attitudes towards older workers compared to younger counterparts. Kirchner and Dunnette (1954) concluded that given the important role supervisors had in hiring decisions, this was a significant barrier to the employment of older adults. In 1961, Kirchner (in response to an article suggesting “*only young men, preferably under 30 should be hired*”), noted the wide range of abilities among older workers and that differences in supervisor attitudes may be due to stereotyping as opposed to actual performance differences. Since then, there has been extensive research into hiring and selection decisions and discrimination against older adults.

The first method of research for age hiring discrimination studies has been via CV field experiments, also known as ‘audit’ or ‘correspondence’ studies, which have greatly furthered understanding of age discrimination in selection decisions. Since the 1960s, these studies have provided a tool to study discrimination in hiring decisions in the real world, by having equivalent CVs sent to potential employers, but randomising an individual characteristic (Gaddis, 2018). A recent meta-analysis by Lippens et al. (2023) of more than 300 correspondence studies published between 2005 and 2020, considered 17 studies on age. These studies showed that hiring discrimination against older candidates was strong, with older age reducing call-back rates by around 40%. For context, this level of discrimination was equivalent to discrimination against candidates with salient ethnic characteristics,

Muslim faith, mental disability, and lower physical attractiveness (Lippens et al., 2023). A systematic review and meta-analysis by Batinovic et al. (2022, preprint) including 10 correspondence studies also found significant discrimination against older candidates ranging from 38% to 89% less likely to receive a call-back. Batinovic et al. (2022, preprint) found discrimination starting against candidates aged between 40 and 49, and gradually increasing alongside older age. These meta-analyses add to an established body of correspondence studies showing clear evidence of discrimination against older candidates in Europe and the US. Discrimination against older candidates appears higher in Europe (49% fewer positive call-backs) than the United States (31% fewer positive call-backs) and has remained relatively stable over time (Lippens et al., 2021). Despite the strength of these results, correspondence studies have some general limitations. First, while they provide evidence of discrimination and a real-world measure of the level at which it is occurring, they rarely uncover the potential mechanisms that underpin this discrimination (Adamovic, 2022; Gaddis, 2018). This is primarily because correspondence studies are focused on manipulating details of the candidate application, rather understanding the way the application is assessed by the hirer. Correspondence studies have little to no information about the individual hirers responsible for decision making. Additionally, correspondence studies often rely on indirect signalling of characteristics (e.g., experience or names, rather than actual age; Derous & Decoster, 2017). Finally, correspondence studies do not provide outcomes, and it might be questioned if the rates of call-back from shortlisting are reflected in rates of selection. Therefore, while correspondence studies provide a 'gold standard' for selection and discrimination evidence, experimental methods are important to uncovering and explaining the cognitive underpinnings of discrimination.

Experimental studies in age selection and discrimination have an important role to play in furthering understanding of discrimination because they work with hirers directly to

allow theories to be tested (Adamovic, 2022). Unlike CV experiments, hirers can give greater explanation for their choices. For example, Kaufman et al. (2016) presented artificially adjusted photos of the same fictitious candidates aged to resemble either 30 or 50 years of age. They found that when candidates appeared older, hirers gave them lower assessments of health and fitness, reducing their perception of person-job fit and lowering their probability of hiring these candidates. Not only does this demonstrate discrimination against older candidates, it also suggests that one reason behind this discrimination might be the perception of lower health and fitness. While this example shows an application of experimental design, it can of course be argued that the relationship between age and perceptions of health over the course of working age are no less developmentally separable than age and height in early childhood. Experimental studies have also shown that, and that hirers who have higher levels of ageism (compared to those lower in ageism) are more likely to give lower hire-ability ratings to older candidates who have made between-career transitions (career switches; Fritzsche & Marcus, 2013).

A significant amount of experimental research in hiring and selection decisions has focused on the stereotypes (mostly negative) that might impede older candidates from being successful. Two primary dimensions that influence this impression are perceived warmth and competence (Fiske et al, 2002; 1999), with older adults considered to be high in warmth, but low in competence (Cuddy et al., 2005). These negative competence stereotypes are particularly widespread in the workplace context and broadly suggest that older workers are poorer performers (lower motivation, productivity), who are less capable of learning new things, and more resistant to change (Posthuma & Campion, 2009). Direct causality between negative age stereotypes and selection decisions has recently been questioned. Murphy and Denisi (2021) argued that although age stereotypes exist, there is limited evidence that these stereotypes affect hiring and selection decisions in practice. Whether or not a negative

stereotype is acted upon may depend on a range of contextual factors (Kunda & Spencer, 2003), however, the large body of research showing the existence of negative age stereotypes, and age discrimination across several domains, makes it reasonable to conclude that there is a link between these stereotypes and age discriminatory behaviours (Voss et al., 2018), including in selection decisions (Drury et al., 2022). For example, Abrams et al. (2016) created sets of age-stereotyped job profiles, an older stereotype (e.g., carefulness, solving crosswords) and a younger stereotype (e.g., rapid decision-making, using social media, being creative). They found that hirers showed a significant preference for younger stereotyped candidates, except when these older stereotyped candidates were positioned as subordinate. Although we might question the extent to which these stereotypes are true representations of older and younger workers (Ng & Feldman, 2012), this work shows that the stereotyped attributes themselves are looked upon unfavourably, regardless of their relevance to the job roles (Abrams et al., 2016). Krings et al. (2011) found that bias against older candidates in selection decisions was mediated by competence-related inferences, which suggests that low-competence stereotypes lead directly to age discrimination in selection decisions. More recently, Zaniboni et al. (2019) found that explicit age stereotypes (e.g., productivity, progressiveness, trainability, motivation) can positively influence evaluation of younger candidate resumes, while implicit age stereotypes (measured using Implicit Association Tests, Greenwald et al., 1998) can negatively influence evaluation of older candidate resumes. The link between stereotypes and selection decisions is further supported with findings that older candidates who present counter-stereotypical information about themselves can reduce discrimination in selection decisions. Gioaba and Krings (2017) had undergraduate students listen to fictional job interview recordings of older job candidates, finding that those who contradicted common negative competence stereotypes were perceived as more hireable. While older candidates did not escape discrimination

entirely, counter-stereotypical information helped mitigate it. This suggests that targeted interventions may help stereotypes to be circumvented. Although there is still a need for greater evidence that links explicit age stereotypes with subsequent, discriminatory selection decisions (Rudolph et al., 2022), understanding interventions that can reduce reliance on stereotypes and increase older candidate selections would clearly be beneficial to help extend working lives.

1.2.2 The present research on hiring and selection decisions

One of the biggest gaps in the workplace age literature is understanding processes of age discrimination and how this discrimination might be overcome (Beier et al., 2022). Considerable hiring discrimination across the globe currently prevents older adults from accessing the labour market (OECD, 2020), yet this discrimination is contingent on many factors and is not easily uncovered, varying based on individual, group, organisational and job type (Colella et al., 2017). Hiring decision experiments provide a reliable way to measure discrimination against groups and test interventions that may overcome it, because the level of individuating information (age, gender, background, experience, skills, etc.) can be controlled. The decision to hire (or not hire) is also a behaviour that can be measured as a distinct form of discrimination, separate from prejudicial attitudes (implicit or explicit) or other beliefs that may motivate this discrimination (Pager & Quillian, 2005). While interventions to reduce hirer discrimination against older candidates are limited, at least two studies have tested the effectiveness of anti-discrimination prompts which effectively encourage hirers not to discriminate based on group-level characteristics. A study by Kleissner and Jahn (2021) tested a short anti-discrimination prompt prior to hiring decisions, finding it successful when explicit (but not implicit) age information was available. However, a past study by Lindner et al. (2014) found similar prompts (diversity statements)

have little effect on age-discrimination in hiring decisions. Rather than attempting to change stereotypes, attitudes or beliefs against older workers, we examine aspects of cognitive decision making in hiring selection decisions that may inform strategies to reduce discrimination.

1.2.2.1 Choice bracketing and the selection of older candidates

The way options are partitioned (or bracketed) has long been shown to influence decision making, with sets of choices, in which multiple decisions are made simultaneously, often leading to more diverse selections. *Choice bracketing* is the idea that when making multiple choices, a broad view of options allows consequences to be considered together, but a narrow bracket forces each choice in isolation (Read et al., 1999). For example, if choosing twelve bottles of wine simultaneously for a case, greater decision criteria might be used than if choosing a single bottle twelve times, one bottle each month over the space of a year. While broader choice bracketing can provide greater consideration of consequences and yield better decisions than narrow bracketing, it can also lead to more diverse choices when multiple selection decisions are required (Read & Loewenstein, 1995; Read et al. 1999; Simonson, 1990; Simonson & Winer, 1992). This idea was first explored by Simonson (1990), who found that when students were offered the choice of one of seven snacks each week over three weeks (e.g., yogurt, fruit, soft drink), they were significantly more likely to choose the same snack each time than students who chose snacks for all three weeks at the first meeting with their choices replaced after selection. Traditionally, the opportunity for diversity and variety-seeking in this simultaneous ‘set choice’ presentation was thought to meet two psychological needs, the need for change and novelty and the need for protection against uncertainty or miscalculation of future preferences (Sevilla et al., 2019). The need for change and novelty is characterised by decision-making behaviours that avoid satiation. This

can be physical satiation, for example, immediately after eating their fill of ‘bottomless fries’, diners would be expected to report lower liking for fries (Rolls et al., 1981). However behavioural scientists have also shown this satiation can be psychological, listeners choose a variety of songs on a playlist, even when songs are not among the most preferred, rather than risk satiation by repeating their favourites (Ratner et al, 1999). Variety-seeking can provide protection against uncertainty by mitigating risk. The idea that “we should not place all our eggs into one basket” is contained in The Talmud (ca. 200 CE) and espoused by economists since Bernoulli (1738). In financial decision making, investors regularly spread allocations across available categories (e.g., Benartzi & Thaler, 2001) and even show a willingness to pay for diversification (Di Giorgi & Mahmoud, 2016). Children aged between 6 and 12 years old adopt diversification strategies when choosing between sweets, both to achieve novelty (avoiding satiation) when the sweets are known to them, and to minimise risk of dislike when the sweets are unknown (Di Giorgi & Mahmoud, 2017).

Drawing on these choice bracketing strategies, experimenters have shown that when people are tasked with allocating a scarce resource (e.g., money, food, job roles) over a fixed set of possibilities (e.g., investment portfolio, consumption options, job candidates) they first subjectively partition the set of options into groups before distributing the resource evenly across possible options (Fox et al., 2005). In other words, participants choose variety based on the salient grouping attribute. This choice bracketing phenomenon is sometimes referred to as partition dependence, because when options are partitioned on a salient dimension, people tend to choose more evenly from each category (Fox & Clemen, 2005). For example, people allocate retirement savings more evenly across stocks and bonds when they are limited to these two grouping options, compared to different products that contain mixtures of stocks and bonds (Benartzi & Thaler, 2001). Similarly, grouping films either by genre (e.g., action, comedy) or country of origin (e.g., Britain, Australia) leads participants to

choose a variety of films based on the way in which they are grouped, in this case ‘genre’ versus ‘country’ (Fox et al., 2005). There is a growing movement that questions how behavioural science findings, like choice bracketing, can be used to address key societal problems (IJzerman et al., 2020).

When considering the societal problem of diversity and discrimination in hiring and selection decisions, three recent studies have drawn on these literatures of ‘choice bracketing’ and ‘partition dependence’ to investigate if these effects can be used to increase diversity in hiring contexts. The first study by Bohnet et al. (2016), evaluated gender bias in the evaluation of job candidates who were either assessed separately (narrow, i.e., one by one) or jointly in pairs (broad, one man, one woman). They found that gender-biased assessments of job candidates that favour men for male-typed tasks and women for female-typed tasks were lower in the joint evaluation mode because the broader bracketing helped them to focus on individual performance (Bohnet et al., 2016). Thus, evaluating candidates together, broadly in a set, removed reliance on group stereotypes. More recently, Feng et al. (2020) found that partitioning job candidates by gender led people to choose more gender-diverse candidates, and this effect was stronger among people who had lower levels of implicit candidate stereotypes (i.e., higher reaction times in pairing women with engineering roles in an implicit association test). In other words, a salient partition along characteristic lines (i.e., gender) led hirers to select more diverse candidates across that characteristic (i.e., increase gender diversity). A third study by Chang et al. (2020) found that people hired more women for a set of selections (a ‘bundle of choices’) than the same selections made individually, in isolation, arguably because when making a set of selections the grouping characteristic (in this case, gender diversity) was more salient to hirers. In other words, people thought more about gender diversity when hiring simultaneously in a bundle because gender was a more salient grouping characteristic when selecting for multiple roles at once ‘for a team’. Taken together

these studies suggest, a) the presentation of options simultaneously allows hirers to compare candidates on performance, and reduces reliance on stereotypes, and b) when perceived performance differences are low, the way candidates are grouped might influence selection. We sought to extend this knowledge by investigating how choice presentation influences the selection of older candidates, against whom negative stereotypes are strong.

In Chapter 2, we aim to replicate findings from Chang et al. (2020) using the diversity characteristic of age. Choice bracketing (in this case, ‘bundling’) is especially promising for increasing the selection of older candidates because unlike training interventions, it does not aim to change deeply held beliefs and stereotypes about older workers. Rather, the bundling may help managers to reduce discrimination against older candidates and select more age-diverse teams. Based on theories of *choice bracketing*, we expected that bundling multiple hiring decisions would lead participants to consider accumulated outcomes (the team) and make a greater proportion of older candidate selections compared to hiring in isolation.

1.2.2.2 Competition and the selection of older candidates

One common feature of recruiting practice for which there is little understanding of cognitive processes is that of competition. In Chapter 3, we consider the role of competition on discrimination against older candidates. Competition is already firmly embedded in the existing market structure of recruitment, where HR recruitment agencies effectively compete to place candidates for payment or bonuses (Fernandez-Mateo & King, 2011; Finlay & Coverdill, 1999). It has been theorized that broader market competition should reduce individuals’ discrimination by forcing them to overcome stereotypes, as market competition creates incentives for hirers to question the accuracy of these stereotypes (Fernandez & Campero, 2014). Additionally, competition enhances the transparency of selection decisions

and the accountability of decision makers, as these decisions will be scrutinised by another person who is responsible for administering the rewards of the competition. For example, a HR recruiter's shortlisted decisions will be reviewed by a company hiring manager.

Transparency of selection decisions has long been considered a potential mechanism for increasing the fairness of hiring practices and increasing diversity (Alder & Gilbert, 2006; Galinski et al., 2015). However, the effect of competition on discrimination is also likely to depend on the context, including the broader economic environment, governmental policies, sector norms, the organisation's culture and practices, and the individuals' characteristics (Pager & Shepherd, 2008).

There are also situational contexts in which competition may increase potential for discrimination. Prominent or widespread negative stereotypes can influence discrimination against candidates who are not prototypical of the roles being hired for (Correll & Benard, 2006; Eagly & Karau, 2002), and hirers often show a desire to satisfy perceived preferences of those administering the competition (Crandall & Eshleman, 2003; Vial et al., 2019). For example, when racial discrimination is given a business justification by a senior figure, it can increase racial discrimination against Black candidates in hiring (Brief et al., 2000). Similarly, when a senior figure is prejudiced against women, it reduces selection of women candidates. As competition-based incentives generally increase performance (Kim et al. 2022), if the standard for 'better performance' involves discriminatory behaviours based on negative stereotypes, competition may lead to greater discrimination. These studies recognise that there has been little exploration of the effect of competition on hiring discrimination as an individual cognitive decision-making process and aim to fill this gap by examining the effects of competition on older and women candidate selections.

In Chapter 2, we explore the effects of competition on discrimination against both older candidates and women candidates. Few experimental studies have looked at gender and

age simultaneously, to compare and understand the ways in which hiring discrimination against women and older candidates might be similar and differ. While women and older adults are both underrepresented in key STEM industries (EIGE, 2018), correspondence studies evidence that unlike older candidates, women are not discriminated against at the point of application (Lippens et al., 2023). Attitudes towards women candidates tend to be more positive than attitudes towards older male candidates, and significantly stronger commitments are made to gender equality compared to age equality (Martin & North, 2021). Better understanding of how competition affects decision processes and discrimination may help shape interventions and inform policies to reduce underrepresentation. Once this underrepresentation is reduced, attention should turn to creating organisational cultures that maintain it.

1.3 Intergenerational Climate and Retirement Intentions

The fourth chapter of this thesis contains two cross-sectional studies that examine the relationship between intergenerational work climate and retirement intentions in a sample of US adults aged over 40. Successful ageing at work requires older workers to be in a motivating and fulfilling organisational environment where they are valued for their knowledge, skills, and abilities (Beier et al., 2020; Kooij et al., 2020). The absence of this environment represents a risk for organisations that they might lose older workers to retirement (Clark & Ritter, 2020). Already we have seen retirements exceeding expected rates due to the COVID-19 pandemic (Bajorek, 2021; Korn Ferry 2022), with governments trying to entice older workers back into the workforce to address the subsequent labour shortages (Zeldin-O'Neill, 2022). At an organisational level, proactive monitoring of age-diversity and discrimination has the potential to improve the situation of older workers, motivating them to work longer (Beier et al., 2022). Most large organisations now have up to

five generations working side by side (Boehm & Kunze, 2015), which means there is likely to be significant age diversity among team-members working together on interdependent tasks (Jackson et al., 2003). For older workers, their interactions with colleagues and the broader organisational climate in which their work takes place are likely to influence the extent to which they feel valued and motivated in their workplace (Shalk & Desmette, 2014).

1.3.1 Age diversity climate and retirement intentions

The way older workers think about the end of their career and their goals and plans for this end can be understood as their retirement intentions (Feldman, 1994). These retirement intentions can be heavily influenced by the attitudes older workers have towards their work and their perceived value within their workplace (Atchley, 1989; Bal et al., 2012; Feldman & Beehr, 2011). Over the years, these intentions have been considered important because they have reliably predicted actual retirement decisions (Böckerman & Ilmakunnas, 2019). The decision to retire can be understood as a motivated choice, and with this decision made, work activities will decline over time (Beehr & Bennett, 2015; Wang & Shultz, 2010; Wang & Shi, 2014). There are several reasons this retirement decision might be taken, including health, caring responsibilities, leisure, but a key influence are individual attitudes towards work (Wang & Shi, 2014). There are several theories that seek to understand how older worker attitudes towards their work environment influence their retirement decision making. For example, a continuity theory of ageing suggests that older adults are motivated to make later-life decisions that help them to maintain positive self-perceptions (Atchley, 1989). Those who feel valued by their organisation are motivated to stay, those who do not might opt for retirement to pursue other activities in which they do feel valued (Schmidt & Lee, 2008; Topa et al., 2009). Role theory emphasizes factors that relate to people's perceptions about themselves and their role, for example the social norms around retirement

in the job (Van Dalen & Henkens, 2005), and industry norms, as well as how older workers perceive their own productivity (Wang & Shultz, 2010) can all influence retirement decision-making. These theories suggest that if an older worker perceives a climate of discrimination and fewer opportunities in their organisation, it could hasten their decision to exit the workforce permanently (Belotti et al., 2021; Moen et al., 2020).

Older workers who feel valued within their organisation might hold less desire to retire early and might even be more motivated to continue working with the organisation beyond retirement age. One key to being valued is how they perceive their organisations' age diversity climate or work environment (Baltes et al., 2009). A positive age diversity climate can be understood as an environment of age inclusiveness, in which there are high quality of relationships between people of different ages, free from stereotypes and discrimination (King & Bryant, 2017; Lyons & Kuron, 2013). Past research has shown that employees of all ages are motivated to continue working for companies they perceive as having more positive age diversity climates (Bilinska et al. 2016; Boehm et al., 2014). Because diversity climates can impact individual outcomes (including job satisfaction and subsequent turnover intentions; Cox's, 1994), it might be expected that older workers who perceive their organisational as having a more positive age-diversity climate would have lower intention to retire early and greater motivation to continue working beyond retirement age. However, to date, there has been no specific exploration of organisational diversity climate and retirement intentions.

1.3.3 The present research on age diversity climate and retirement intentions

Chapter 4 seeks to be the first study to examine the relationship between age diversity climate and retirement intentions. In doing so, it will extend the current literature on the effect of age diversity climate on individual-level work-related outcomes (e.g., job

satisfaction, turnover intentions) to specific retirement intentions. Past work by Boehm et al. (2014) found that a positive age diversity climate reduces turnover intentions for all employees in an organisation due to workers' expectations that their increased investment in the organisation would be honoured with future return. Similarly, Bilinska et al. (2016) found that among a sample of nurses, a more positive age diversity climate was associated with lower turnover intentions and higher levels of job satisfaction. This research asks if the perceived intergenerational (age) diversity climate perceived by older workers is associated with their intentions to retire early (i.e., before retirement age) or late (i.e., continue working beyond retirement age), and if any association is explained by job satisfaction.

1.4 Chapter References

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CHAPTER 2.

2. Too old to be a diversity hire. Choice bundling shown to increase gender-diverse hiring decisions fails to increase age diversity.

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Author Note

This is a version of a manuscript in preparation. The study conceptualization, experimental design and methods, analysis and authorship of the Chapter is that of the first author under the guidance, supervision, and review of the second author.

All research described in this article was approved based on requirements set out by the University of Essex Ethics Committee (ETH1920-0779). The hypotheses, materials and the analytical approach were pre-registered and the anonymized copies of these pre-registrations, study data and supplementary materials have all been made available via the Open Science Framework (OSF) here,

https://osf.io/ztuyv/?view_only=21a24da39d0a488b88e1b74856446702

2.1 Abstract

Past research has shown that people are more likely to make the decision to hire candidates whose gender would increase group diversity when making multiple hiring choices in a bundle (i.e., when selecting multiple team members simultaneously) compared to making choices in isolation (i.e., when selecting a single team member). However, it is unclear if this bundling effect extends to age diversity and the selection of older candidates, as older workers are often the target of socially acceptable negative stereotypes and bias in recruitment, leaving them unemployed for longer than their younger counterparts. Across four preregistered experiments (total $n = 2,624$), we tested if the positive effect of bundling on diversity of selections extends to older candidates in hiring decisions. We find evidence of bias against older job candidates in hiring decisions and demonstrate that choice bundling fails to increase the selection of older candidates. We discuss the theoretical implications and need for greater understanding of age as a diversity characteristic to support the design of interventions that meet the challenges of an ageing workforce.

Keywords: hiring decisions; ageing; diversity; decision making

Public Significance: This research demonstrates that a theoretically driven behavioural intervention proposed to increase diversity failed to increase age-diversity via the selection of older candidates. This highlights the contextual nature of interventions and suggests that interventions designed to increase diversity for other characteristics cannot be assumed to successfully increase diversity for age.

2.2 Background

Diversity, Equity and Inclusion (DEI) represents one of the most challenging management topics for companies as they seek to attract top talent and remove barriers that have led to underrepresentation of key groups. Historically, DEI practices were shaped by legal and other equitable concerns over discrimination and bias in employment decisions (Kelly & Dobbin, 1998). Increasingly, these practices are being developed with the aim of enhancing performance. The broadly held ‘business case for diversity’ suggests that more diverse workforces outperform organisations with less diversity (Van Knippenberg et al., 2020), with diversity leading to greater innovation and better decision making (Cox & Blake, 1991). This has prompted an ever-increasing number of experimental research studies that can be used by organisational leaders to increase diversity.

Experimental research on diversity has been largely dedicated to helping companies attract more gender and racially diverse groups of employees. Specific research areas include diversity statements and impression management directed towards applicants (e.g., Avery & McKay, 2006; Rau & Hyland, 2003; Windscheid et al., 2016), diversity and bias training initiatives to address existing prejudices (e.g., Devine & Ash, 2022; Chang et al., 2019) and nudging adjustments to recruitment processes to increase representation of women and people of color (e.g., Bohnet et al., 2016; Feng et al., 2020). While companies are still grappling with existing gender and race inequalities, an ageing population (WHO, 2021) represents a new and distinctive diversity challenge. Older workers currently face barriers in all aspects of job opportunity, including recruitment, training, and promotion (Harris et al., 2018). Refusing to hire or advance someone based on their age is a violation of labour laws around the world, and yet age discrimination in hiring and selection decisions remains widespread (WHO, 2021). This has left an experienced, and much needed workforce

vulnerable to discrimination, with 34% of European workers reporting experiences of age prejudice (compared to 25% for gender and 17% race or ethnicity; Abrams et al., 2011). Compared to gender and race, age has received comparatively little scholarly attention (North, 2019). A Google Scholar search (November 2022) found 143,000 results for “gender diversity”, 118,000 results for “racial diversity” and only 19,100 results for “age diversity”. Building on the current body of experimental findings for gender and race, can we expect similar research-based interventions to help increase age-diversity?

In the current research, we investigated if a choice bundling intervention shown to increase the selection of women in technology roles (Chang et al., 2020) would increase the selection of older candidates in the same roles. Hiring and selection decisions are particularly susceptible to age stereotyping and bias because prior to a candidate joining the organisation, their qualities and role performance cannot be evaluated (Beier et al., 2022). Choice bundling interventions are especially promising for overcoming bias in hiring processes as they do not rely on changing negative stereotypes towards particular groups. However, successful replication of these findings is needed to build confidence that existing interventions shown to reduce hiring prejudice and increase diversity on the basis of gender and race can be successfully leveraged to tackle the challenges of an ageing workforce.

2.2.1 Age diversity in the workplace

The need for organisations to effectively build and manage workforce diversity has come into sharp focus in recent decades. Socioeconomic trends, including advances in women’s and civil rights, economic and technological developments, and an ageing population, have led to a more global workplace that encompasses a greater variety of categorical differences (e.g., gender, race / ethnicity, age, etc.), cultural backgrounds and experiences (Roberson, 2019). Organisations have also looked to capitalize on the ‘business

case for diversity’, which suggests that there is value in these differences at a group level because the different knowledge, skills and experiences across categories contribute to varied viewpoints leading to better solutions and performance (Cox & Blake 1991; Milliken & Martins 1996). Team diversity in hiring and selection is therefore highly desirable (Jaffé et al., 2019), and there is a strong demand for organisational practices that help managers achieve this (Dobbin & Kalev 2013). Although age diversity has received comparatively little scholarly attention compared to gender and racial / ethnic diversity (North, 2019), an ageing workforce has increased the number of generations that need to be successfully integrated into the modern workplace (Boehm & Kunze, 2015). Despite the potential for age diversity to enhance organisational performance through diversity in knowledge, skills, perspectives and social connections (Li et al., 2021), for applicants over the age of 50, the link between age and successful hiring decisions is increasingly negative (Wanberg et al., 2016). Older workers are more likely to be out of work than younger workers, and find it harder to get back into employment (UK Office for National Statistics, 2021; US Bureau of Labor Statistics, 2021). This combination of population ageing and employment barriers for older workers is expected to place heavy pressures on labour supplies and social security systems in years to come (Martin, 2018), and the organisational performance benefits of age diversity risk remaining unfulfilled.

Age diversity in the workplace has been labelled the ‘last diversity frontier’, due to routine and socially acceptable age-related biases towards older workers (Mercer, 2019). Converging evidence of bias against older candidates in contemporary hiring has been demonstrated using a range of research methods, including surveys of hiring managers (Lössbroek et al., 2021), CV field experiments (Carlsson & Eriksson, 2019; Neumark et al., 2019) and simulated hiring decision experiments (Gioaba & Krings, 2017; Kaufman et al. 2016; Kleissner & Jahn, 2020). This evidence has largely shown that severe negative

stereotypes lead to lower chances of success for older candidates. For example, older candidates are (falsely) believed to be less motivated and more resistant to change (Ng & Feldman, 2012). Although older workers are stereotypically believed to have positive traits also, such as being warm, cautious and polite, these traits are often associated with lower job competence (Cuddy et al., 2005; Abrams et al., 2016). Poorer performance is often expected of older candidates even though age is largely unrelated to job performance and positively associated with organisational citizenship behaviors (Ng & Feldman, 2008). At a societal level, older workers are often expected to retire to ‘make way’ for younger generations (North & Fiske, 2012, 2016), and therefore in hiring decisions, older candidates from outside an organisation are seen to violate this expectation (North, 2019). Connected to this is the belief that selecting older candidates will deliver a lower return on investment, as ‘retirement’ may shorten the candidate’s tenure. Yet, this too is false, due to lower quitting rates among older workers compared to their younger counterparts (Posthuma & Campion, 2009).

2.2.2 Experimental approaches to increasing diversity

To help overcome bias against job candidates and improve workplace diversity, experimental hiring decision research has revealed a number of hiring and selection process interventions. Psychological theories suggest that to increase diversity, it is necessary to change the attitudes that shape the intentions and selections of decision-makers in their evaluation of underrepresented groups (Ajzen, 1991; Chang et al., 2019). Based on this theory, significant time and expense has been invested in training programs, which often show limited success in changing stereotypes and actions (Forscher et al., 2019; Lai et al., 2016; Noon, 2018), and can undermine the inclusion felt by decision-makers (Dover et al., 2016). An alternative approach from decision sciences is to alter the choice architecture available to decision-makers by deliberately changing hiring decision procedures to facilitate

the selection more diverse candidates. These interventions are especially attractive because they do not involve time-consuming training. A growing literature shows the potential for choice architecture interventions in candidate assessment to increase selection diversity (e.g., Bohnet et al., 2016; Chang & Cikara, 2018; Chang et al., 2020; Feng et al., 2020). For example, Chang et al. (2020) found that when hiring decisions were made for one role in isolation, participants favored the most experienced candidate (a White male). However, when hiring decisions were made for multiple roles simultaneously in a bundle, participants chose to hire more women for the same roles. The authors observed that participants made more gender-diverse hiring decisions when hiring for a set of multiple roles simultaneously in a bundle compared to hiring decisions made in isolation because they gave greater consideration to the diversity of the team. In other words, choice bundling led hirers to consider not just each decision in isolation (hiring the ‘best’ candidate), but also the accumulated outcome of their multiple decisions (selecting a gender-diverse team).

The application of choice bundling to hiring decisions suggests this bundling has the potential to increase age diversity in hiring and selection. The effect of choice bundling on choice diversity is already a well-established phenomenon in consumer and financial decisions. Simonson (1990), first showed that students offered snacks each week over three weeks were more likely to choose the same snack each time than students whose snack choices were bundled for all three weeks at once. Since then, diversification for bundled choices has been shown in a range of contexts, such as grocery purchases (Simonson & Winer, 1992), children’s candy preferences (Read & Loewenstein, 1995), musical playlists (Ratner et al., 1999) and financial decisions (Benartzi & Thaler, 2001). The effect of choice bundling on diversity follows the maxim that it is “not wise to place all our eggs into one basket” (Read & Loewenstein, 1995), with a ‘bundle’ of multiple choices made simultaneously highlighting the opportunity to make more diverse selections that can protect

from uncertainty and help to mitigate risk. Bundling makes us consider the outcome as the product of a group of decisions (e.g., “What do I want to eat now?”, “What might I want to eat later?”, “If I eat the same snack twice, will I want it again a third time?”) compared to decisions in isolation (“What do I want to eat now?”). Thus, choice bundling might lead to more decision inhibition by forcing the decision-maker to consider the broader, accumulated outcome(s) of multiple decisions (e.g., health, social, or hedonic; Ashe & Wilson, 2020; Read et al., 1999). These principles suggest that choice bundling should consistently increase diversity across contexts, including (as demonstrated by Chang et al., 2020) in hiring decisions to increase the selection rate of under-represented groups.

To date, choice architecture interventions in hiring decisions have mainly focused on women and racial minorities, and it remains unclear if similar interventions can successfully increase diversity for other characteristics such as age, which have not been the focus of diversity awareness initiatives (Akinola et al., 2019). Here we evaluate if choice architecture changes on their own can increase the selection rate of a group (older workers) in a context where they are especially targeted by negative stereotypes. Although both women and older workers can be the target of negative and harmful stereotypes, especially in specific industries (i.e., technology), important workplace attitude ratings including liking/respect and likelihood to hire are lower for older men compared to younger men and women (Martin et al., 2019). Additionally, individuals who are committed to diversity and equality on the basis of gender, do not necessarily extend this commitment to the characteristic of ‘age’ (Martin & North, 2021). Despite being harmful and false, negative stereotypes about older workers are widespread and are often viewed as socially acceptable (Swift et al., 2017). In the present article, we test whether a choice-architecture intervention shown to increase gender diversity of candidates selected by presenting multiple roles simultaneously in a bundle also shows positive diversity effects for older job candidates.

2.3 The present studies

In the present studies we aim to replicate past findings showing that choice bundling increases diversity, by evaluating these findings in a hiring context using the diversity characteristic of age. Choice bundling is especially promising for increasing the selection of older candidates because unlike training interventions, it does not aim to change deeply held beliefs and stereotypes about older workers. Theoretically, choice bundling for multiple hiring decisions should lead participants to give greater consideration to accumulated outcomes (the team) and make a greater proportion of older candidate selections than hiring in isolation. However, the intervention may not be as effective for older candidates as it was for women due to the strength of negative stereotypes against older workers and technology (Comunello et al., 2017; Kite et al., 1991; Ng & Feldman, 2012). Older workers might also be expected to carry a longer period of relevant experience commensurate with their age. Despite the need for greater up/reskilling of older workers in technology roles, it is unclear how older workers with comparable relevant experience to younger candidates will be viewed by selectors (Alcover et al., 2021; North, 2019). Furthermore, replicating experimental effects remains a challenge, even for direct replications. The failure rate of exact replications in social sciences is estimated to be as high as 50%, with effect sizes usually smaller than those of the published studies (Camerer et al., 2018; Klein et al., 2018; Stanley et al., 2021). This has led to increasing interest in the need for constructive replicability in organisational sciences (Byington & Felps, 2017; Köhler & Cortina, 2021), where the vast majority of articles in prominent journals do not use any open science practices (Tenney et al., 2021). Extending the bundling effect from Chang et al. (2020) to older candidates, an increasingly relevant diversity characteristic, will provide converging support for bundled choices to increase diversity across contexts, particularly in personnel selection.

In four preregistered experiments, we undertook a well-powered evaluation of the effect of decision bundling on the selection rates of older candidates in technology roles (Brandt et al., 2014). In Study 1, we conceptually replicated the study of Chang et al. (2020, Study 3a) that participants tasked with hiring for multiple positions at once in a ‘bundle’ focused more on diversity and chose a greater proportion of women candidates than participants tasked with hiring for a single position in isolation, substituting women candidates for older male candidates. In three further experiments we extended our replication and investigation of bundling hiring choices on older candidate selections to measure discrimination against older candidates (Studies 2-4).

All studies were preregistered and the preregistrations together with study and supplementary materials and data can be found here.

2.4 Study 1

In Study 1, we tested the effect of bundling hiring decisions that was observed on the selection of women (Chang et al., 2021, Study 3a) with older candidates. Specifically, we tested if participants hiring multiple candidates at once (bundled choice) would choose a higher proportion of older candidates compared to those hiring for a single position in isolation.

2.4.1 Method

Participants. We recruited 501 participants from the United Kingdom through Prolific, an online participant recruitment platform. As per our pre-registration, we excluded data from participants who did not reside in the United Kingdom ($n = 4$) and those who had

mistakenly selected more than one candidate per role ($n = 2$). Our analytical sample was 495 participants (65.5% women; $M_{age} = 38$, $SD = 12$). The sample size for the study replicated Chang et al. (2021, Study 3a), and provided 80% power to detect a small effect size of $w = .10$ (G*Power 3.1; Faul et al., 2007). Participants were paid £0.30 to undertake the three-minute study (hourly rate equivalent of £6.00).

Materials and Procedure. Participants imagined that their job involved making hiring decisions for a technology company that was looking to fill five different roles for a technology team: product manager, software engineer, marketing analyst, user experience designer and sales representative.² All research described in this article was approved based on requirements set out by the University of Essex Ethics Committee, ETH1920-0779.

Participants were randomly assigned to either the *bundled choice* condition or the *isolated choice* condition. Participants were presented with five job descriptions for each role on the team. In the *bundled choice* condition, participants were told they would be hiring an applicant for each of the five roles. Participants in the *isolated choice* condition were told they would be hiring *for one of the roles only*. Participants in the *bundled choice* condition made five hiring decisions at once but only four involved an older candidate, with one filler decision to conceal the study focus on age diversity. Participants in the *isolated choice* condition made just one hiring decision for one of the four same roles involving an older candidate. To balance the number of hiring decisions made across experimental conditions, we randomly assigned four times as many participants to the *isolated choice* condition as the *bundled choice* condition (this left 406 participants in the isolated condition for 406 hiring decisions, and 89 participants in the bundled condition for 356 decisions). Those in the

² Participants were required to complete the study on a PC or laptop and to successfully answer three attention questions to ensure that they understood the purpose of the study (hiring decisions), the type of company (tech company) and the number of roles being hired for (five).

bundled choice made four times as many decisions as their counterparts in the *isolated choice condition*. This is consistent with the original studies by Chang et al. (2020), who ruled out cognitive load or fatigue as explanations for the bundling diversity effects before balancing their experimental conditions in this way.

For each job role, participants could select one of three relevant (fictional) candidates. Participants in the *bundled choice* condition were shown the three candidates for each of the five roles simultaneously in a set and participants in the *isolated choice* condition were shown the three candidates for a single role only (these materials can be viewed in the Online Supplementary Materials). Each candidate was presented with their photo, years of relevant experience and the company they worked for. The age of the candidates was manipulated using photos taken from the Park Aging Mind Laboratory Face Database (Minear & Park, 2004). Participants were shown two younger candidates (22 - 34 years, $M_{\text{age}} = 25$) and an older candidate (61 - 67 years, $M_{\text{age}} = 64$). Replicating the materials from Chang et al. (2020, Study 3a), the experience of the candidates ranged from 0 to 5 years, with the older candidates always having a moderate amount of experience relative to other candidates, neither the least nor the most experienced of the three. For each job, candidates were presented in a fixed order: (1) younger most experienced, (2) older moderately experienced and (3) younger least experienced. The only exception was the filler role of marketing analyst, which included three younger men and was shown in the *bundled choice* condition only, to obscure the focus on age diversity. Recent research suggests that employees now consider approximately 55 years of age the point at which one becomes an ‘older worker’ (Zacher & Rudolf, 2023), thus photos of older candidates who were clearly above this age were chosen as stimuli.

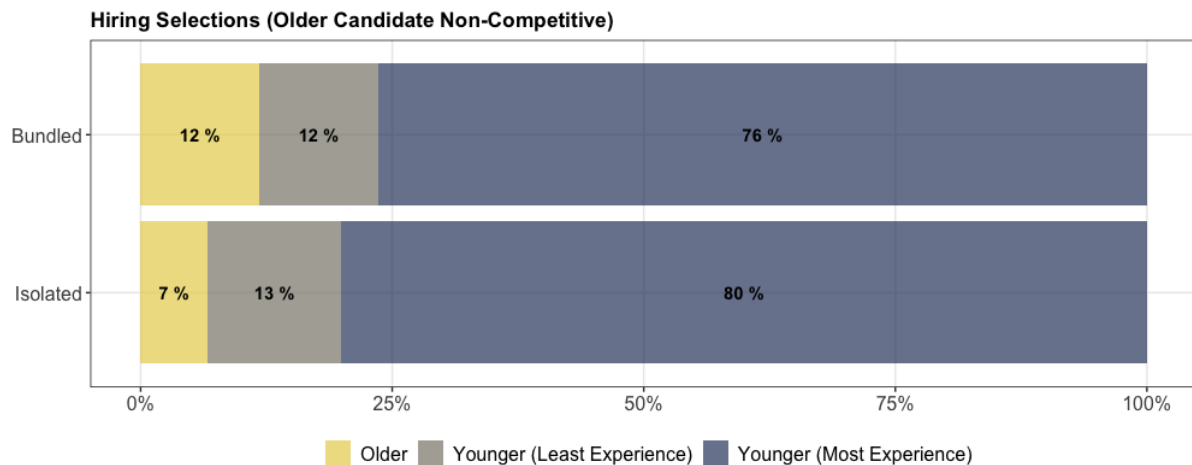
Participants also reported how much they considered age diversity in their hiring decision on a 1-7 scale ranging from 1: *Not at all* to 7: *Extremely*. Finally, participants completed demographic questions (gender, employment status, education, personal income and age), before being fully debriefed.

2.4.2 Results

Across both conditions, participants selected the most experienced younger candidate in 78% of hiring decisions. Participants selected older candidates in just 9% of hiring decisions, less often than the least experienced younger candidate (13%) who had the same or fewer years of experience. Figure 1 shows that, as hypothesised, participants selected more older candidates in the *bundled choice* condition (11.8%) than the *isolated choice* condition (6.6%). A binary logistic regression with standard errors clustered by participant revealed a small, statistically significant effect of choice bundling, $\chi^2 = 4.58$, $SE = .202$, $p = .032$, $w = .07$; 95% *CI*: [1.03, 1.83]. This trend was consistent across all four of the jobs tested (see Online Supplementary Materials). However, sensitivity analysis in G*Power (Faul et al., 2007) suggested the sample size only provided 49% power to detect an effect size of $w = .07$ at $\alpha = 0.05$.

Figure 1

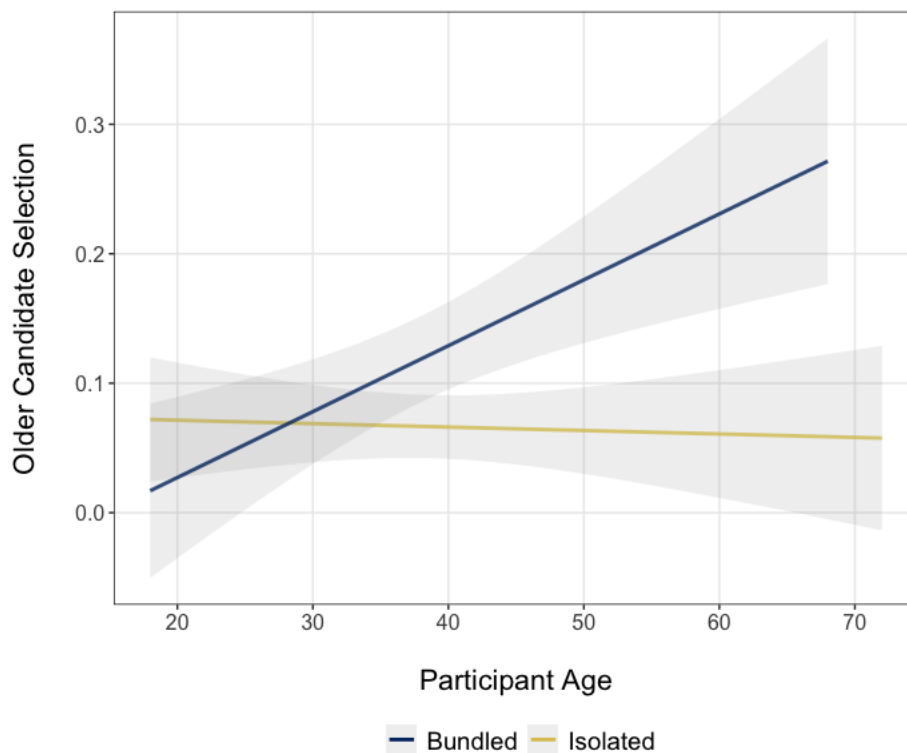
In Experiment 1, the proportion of older candidates selected in the bundled condition ($n_{participants} = 89$, $n_{selections} = 356$) was higher than in the isolated condition ($n_{participants} = 406$, $n_{selections} = 406$).



In an exploratory analysis, we added participants' age to our analysis, assuming that older participants may be more inclined to hire older candidates. While there is mixed evidence that older hirers hold less discriminatory attitudes towards older candidates (Deros & Decoster, 2017), older age can attenuate bias against older candidates (Krings et al., 2011). Accordingly, we found older participants were more likely to select an older candidate than younger participants, $OR = 1.02$, $SE = .011$, $p = .023$. Importantly, this analysis also revealed a significant interaction effect between the choice condition and participants' age. As shown in Figure 2, this interaction reveals that compared to the *isolated choice* condition, the *bundled choice* condition only increased the selection of older workers for older participants (aged 40+ years, where the confidence intervals do not overlap), whereas participants' age did not matter in the *isolated choice* condition.

Figure 2

The effect of the choice condition depended on participants' age in Study 1. The bundled condition (blue) had a higher proportion of older adults chosen than the isolated condition (yellow) for participants over 40 years of age. Confidence intervals are shown in grey, non-overlapping areas represent statistically significant difference.



As expected, participants in the *bundled choice* condition reported that they focused more on age-diversity when making their hiring decisions than participants in the *isolated choice* condition, $M_{bundled} = 3.42$, $SD = 1.92$, $M_{isolated} = 2.97$, $SD = 1.90$; $t(493) = 2.03$, $p = .043$, $d = .24$. Overall, participants who focused more on diversity were more likely to select an older candidate, $OR = 1.25$, $SE = .104$, $p = .008$. To test whether the effect of the choice condition on participants' hiring decisions for those aged 40+ was mediated by this extra focus on diversity (as found in Chang et al., 2020), we ran a Structural Equation Model

(SEM) in STATA (*see* Rijnhart et al., 2019) with clustered standard errors by participant.

This analysis showed the effect of choice bundling was not explained by an increased focus on diversity, $b_{indirect\ effect} = .03$, $SE = .016$, $p = .087$, $CI [-0.004, .059]$, $b_{direct\ effect} = .09$, $SE = .043$, $p = .045$.

2.4.3 Discussion

Generally, we found lower hiring rates for older candidates compared to women candidates in the original study by Chang et al., 2020 (Study 3a; 21.1% *bundled choice* vs 15.3% *isolated choice* compared to Study 1 older workers 11.8% *bundled* vs. 8.8% *isolated*). However, our findings successfully replicated the original findings, with participants tasked with hiring multiple candidates for multiple positions in a bundle choosing a higher proportion of older candidates than participants tasked with hiring for a single position in isolation. The general effect was driven by a subset of the sample, as only participants who were over the age of 40 selected a greater proportion of older adults in the bundled condition. The size of this effect was small and was not explained by an increased focus on age-diversity in the *bundled condition*. Participants may have chosen older candidates in small numbers simply because, based on the hiring task design, they were not the best choice: an alternative, younger candidate was more experienced. Although the low selection rate of older candidates hints at discrimination based on past findings, measuring the prejudice towards older candidates requires ‘evening the playing field’ of candidate experience.

2.5 Study 2

In Study 2, we aimed to test the robustness of our findings in a replication and extend our approach to a situation where older candidates were more competitive. In Study 1, older candidates were hired almost half as often as the women candidates in the original study by

Chang et al., 2020. While the low selection rates of older candidates suggests a level of ageism against older candidates (compared to younger women in the original study), older candidates (like women candidates in the original study procedure) were not the most experienced candidates. To measure this discrimination, it would therefore be important to ‘level the playing field’ between older and younger candidates. In Study 2, we sought to quantify ageism in hiring decisions. Specifically, the level of age discrimination, the behavioural component of ageism as measured by refusal to hire older workers or the use of age as a proxy in making these hiring decisions (Stypinska & Turek, 2017). To achieve this, we wanted to make older candidates equally experienced as the most experienced younger candidates, to a) measure bias against older candidates and b) remove any flooring effects that might have attenuated the effect of bundling on the selection of older candidates in Study 1.

2.5.1 Method

Participants. We recruited 514 participants from the United Kingdom through Prolific. As per our pre-registration, we excluded participants not residing in the United Kingdom ($n = 10$) and one who had mistakenly selected more than one candidate per role ($n = 1$). Our analytical sample had 503 participants (67.5% women; $M_{\text{age}} = 37$, $SD = 13$). Participants were paid £0.45 to undertake the five-minute study (hourly rate equivalent of £5.40).

Materials and Procedure. The manipulation of the choice condition was the same as Study 1, and again we randomly assigned four times as many participants to the *isolated choice* condition as the *bundled choice* condition.³ In addition, participants completed two

³ We included an additional condition in Study 2 and subsequent studies. This was a sequential choice condition, in which participants selected candidates for the entire team, role by role in a fixed order. Results

hiring tasks within-subjects: one where the older candidates were not competitive and one where they were. The first hiring task was exactly the same as in Study 1 and the second task was a close replication with more competitive older candidates.

In the second hiring task, participants read about a new hiring situation for five different roles in an IT team: project manager, software engineer, systems analyst, user experience designer and account manager. For each job role, participants were again presented with three new, relevant candidates and their task was to select one for the job. The three candidates were each presented with new photos (younger candidates: 19 - 28 years, $M_{age} = 22$ and older candidates: 62 - 72 years, $M_{age} = 68$; Minear & Park, 2004), and their relevant years of experience. This time, the older candidates were presented as one of the two most experienced of the three candidates, making them competitive. Again, the bundled condition included a fifth, filler role (systems analyst), for which the candidates were all younger. After participants made their hiring selections for both teams, they reported how much they considered age diversity in their hiring decisions as in Study 1 and answered some sociodemographic questions.

2.5.2 Results

In the task where older candidates had a moderate amount of experience, participants selected the most experienced (younger) candidate in 81% of decisions. Participants selected older candidates in 6% of decisions, less often than the younger candidate with the same or fewer years of experience (13%). When older candidates were competitive, and held the equal most experience, participants selected them more often than the third candidate with the least amount of experience (28% vs., 6%), but at a much lower rate than the equally

showed a similar pattern to the bundled condition. Full data and results available in the Online Supplementary Materials.

experienced younger counterpart (66%). We ran a binary logistic regression with standard errors clustered by participant, including both the participant choice condition (*bundled* vs. *isolated*) and the within-participant hiring task (older candidate non-competitive vs. competitive), which showed an overall model effect that was statistically significant, $\chi^2 = 117.54$, $p < .001$. Participants chose older candidates slightly more often in the *bundled choice* condition, than in the *isolated condition* (18.3% vs 16.2%), however this difference was not statistically significant, $OR = 0.97$, $SE = 0.15$, $p = .888$. Participants selected older candidates more often when they were competitive compared to when they were not competitive (28.4% vs. 6.1%; $OR = 7.07$, $SE = 1.66$, $p < .001$). However, participants showed a clear preference towards experienced younger candidates, even when selecting against an equally experienced older candidate (65.7% vs. 28.4%). We found that the effect of choice bundling was null in both tasks, whether older candidates had less and equal experience, with the two factors not interacting, $OR = 0.77$, $SE = 0.26$, $p = .434$.

Based on our Study 1 exploratory findings, we again added age to our regression model, but we did not find that older participants were more likely to select an older candidate than younger participants, and importantly, age did not interact with either choice condition or the competitiveness of older candidates, respectively, $OR = 0.99$, $SE = 0.01$, $p = .567$; $OR = 1.01$, $SE = 0.01$, $p = .200$.

Consistent with the null effect of choice bundling on the selection of older candidates, participants in the *bundled choice* condition did not report that age-diversity was more salient in their mind when making their hiring decisions compared to participants in the *isolated choice* condition, $M_{bundled} = 3.87$, $SD = 1.67$, $M_{isolated} = 3.71$, $SD = 1.85$; $t(597) = 1.09$, $p = .278$, $d = .09$. Overall, participants who focused more on diversity were, however more likely to select an older candidate, $OR = 1.21$, $SE = .059$, $p < .001$.

2.5.3 Discussion

In the competitive hiring task, when the older candidates had the equal most experience, participants showed bias towards hiring younger candidates. Choice bundling did not remedy this bias, and we did not find evidence to support our Study 1 findings that making hiring decisions in a bundle increases the selection of older candidates compared to making decisions in isolation.

2.6 Study 3

In Study 3, we replicated Study 2 with two methodological improvements. First, a change of display from the original experimental paradigm from Chang et al., 2020, such that in the bundled choice condition, the participants did not have to scroll up or down to review all the candidates and could view them all together on screen. We hoped that this change might make the age diversity of their selections more salient to participants. Second, we randomized the order of the two hiring tasks (*competitive vs. non-competitive* older candidates) to rule out the possibility that completing the task with non-competitive older candidates might affect the selection of older candidates in the competitive task.

2.6.1 Method

Participants. For this study, we chose a sample size of 735 participants to achieve 90% power to detect a choice bundling effect based on the proportion of older candidates hired that we observed in Study 1, χ^2 effect size of $w = .07$ (G*Power 3.1; Faul et al., 2007). The number of participants chosen was a conservative estimate to identify the effect in the *non-competitive*, hiring task. Using a second task provided more statistical power.

We recruited 736 participants from the United Kingdom through Prolific, but 735 completed the study. Participants from prior studies were ineligible. We excluded participants not residing in the United Kingdom ($n = 1$). Our analytical sample had 735 participants (64% women; $M_{\text{age}} = 35$, $SD = 14$). Participants were paid £0.45 to undertake the five-minute study (hourly rate equivalent of £5.40).

Materials and Procedure. The materials and procedure were the same as Study 2, except for two elements. In Studies 1 and 2, we used the same drag and drop selection method as in Chang et al. (2020), but that meant that participants had to scroll down to see some candidates in the bundled condition. To re-enforce the bundled perception, in this study, we used a ‘single click selection’ for each candidate so that participants could see all candidates at once without needing to scroll down (see Online Supplementary Materials). We also counterbalanced the order of the hiring tasks (older candidate *non-competitive* vs. *competitive*).

2.6.2 Results

We used the same binary logistic regression analysis as Study 2 to predict the hiring of an older candidate from the choice condition and hiring task (standard errors clustered by participant), finding an overall statistically significant model effect, $\chi^2 = 142.42$, $p < .001$. Participants in the *bundled choice* condition chose older candidates slightly more often than in the *isolated condition* (17.1% vs. 16.2%), but this difference was not statistically significant, $OR = 1.02$, $SE = .076$, $p = .782$. Participants selected older candidates more often when they were competitive compared to when they were not competitive (26.9% vs. 6.4%; $OR = 5.74$, $SE = 1.13$, $p < .001$), but this did not vary between *bundled* and *isolated choice* conditions, $OR = 1.12$, $SE = 0.32$, $p = .672$. Consistent with Study 2, participants were more

than twice as likely to select younger candidates than older candidates with an equal amount of experience (67.6% vs. 26.9%)

We explored the role of participants' age by adding it to our regression model and found that older participants were no more likely to select an older candidate than younger participants, $OR = 1.01$, $SE = 0.01$, $p = .386$. Importantly, age did not interact with either the choice condition or the competitiveness of older candidates respectively, $OR = 1.12$, $SE = 0.32$, $p = .676$; $OR = 1.01$, $SE = 0.01$, $p = .346$. Participants who focused more on diversity were more likely to select an older candidate, $OR = 1.06$, $SE = .033$, $p = .004$, but this focus on diversity did not differ between the *bundled choice* and *isolated choice* conditions, $M_{bundled} = 3.79$, $SD = 1.90$, $M_{isolated} = 3.60$, $SD = 1.85$; $t(733) = 1.09$, $p = .274$, $d = .10$.

2.6.3 Discussion

Studies 1-3 provide contrasting evidence. Participants consistently selected younger candidates much more often than older candidates, even when the older candidates were equally experienced, but choice bundling only led participants to think more about age diversity and hire a greater proportion of older candidates in Study 1. One reason for the lack of a consistent bundling effect could have been due to the presence of the fifth, 'filler' role in the *bundled choice* condition. The fifth 'filler' role, included three younger male candidates, including a person of color who may have been selected by participants to increase (racial / ethnic) diversity, possibly at the expense of age diversity. This feature of the bundled condition replicates the study design of Chang et al. (2020) and was chosen to reduce demand effects by obscuring our focus on age diversity. The data seems to support the possibility that in the bundling condition, participants increased their team diversity by selecting the person of color as participants selected the younger Black male candidate five times as often as older White candidates with similar relative experience (non-competitive hiring task; Studies 1-3:

36% vs. 7%; see Online Supplementary Materials). Alternatively, it is possible that the choice bundling diversity effect is so small that it cannot be consistently found. Even with 90% power to identify an effect, one has a 10% chance of not identifying it.

2.7 Study 4

In Study 4, we aimed to test the effect of bundling hiring decisions on age diversity, without the potential confound of having a person of color in the filler task of the bundled choice condition. Perceiving diversity along one dimension (e.g., race), can lead people to falsely perceive more diversity on other dimensions (e.g., gender; Daniels et al., 2017). There is evidence that diversity can become curtailed once a social norm has been achieved, for example, hiring less women or minorities to a board once a certain threshold is reached (Chang et al., 2019). When assembling diverse teams, more salient attributes of diversity (e.g., gender, ethnicity) can reduce selection based on other aspects of diversity (e.g., personality traits inferred from facial information; Jaffé et al., 2022), with the mere presence of a higher-status minority decreasing the likelihood of more minority members being hired (Hur & Lin, 2022). Thus, if race is a more salient diversity attribute than age, the presence of candidates of color in the choice bundling conditions of Studies 1-3 may have drawn participants diversity intentions away from age.

2.7.1 Method

Participants. We powered the study in the same way as Study 3, but the total number of participants was slightly higher because of the additional job role in the isolated choice condition (all younger White candidates control role). We recruited 885 participants from the United Kingdom through Prolific (60% women; $M_{\text{age}} = 34$, $SD = 12$). Participants from prior

studies were ineligible. Participants were paid £0.65 to undertake the seven-minute study (hourly rate equivalent of £5.57).

Materials and Procedure. The materials and procedure were the same as Study 3, however we replaced the candidates of color for the fifth ‘filler’ role in each task with a younger White candidate and presented this role to participants in both the *bundled* and the *isolated* choice conditions. Thus, ‘filler’ roles became control roles that included only younger White male candidates, with a level of experience designed to mirror the relative experience of older and younger candidates in the other roles (see Online Supplementary Materials). We then counterbalanced the presentation order of candidates, to rule out any possibility that the preference for younger candidates shown in Studies 1-3 was due to their prime presentation position as candidates. For each team hiring task (*older non-competitive* or *older competitive*) participants were presented older candidates first (followed by the most-experienced younger candidate) or second (following the most-experienced younger candidate).

2.7.2 Results

Selection results for the control role (Figure 3), where a younger candidate matched the relative experience of older candidates in other roles, provided further evidence of the preference for younger candidates over older ones. We used a chi-square test to examine the proportional hiring differences between younger control candidates and older candidates. We found participants were more than three times as likely to select the younger control candidate than older candidates when both were not the most experienced (*non-competitive*), 29.9% vs. 8.5%, $\chi^2(1,623) = 139.32, p < .001, w = .47$. When older candidates were the equal most experienced (*competitive*), the younger control candidate was selected around one and a half times more often than their older counterparts (46.7% vs. 30.5%), $\chi^2(1,623) = 60.31, p <$

.001, $w = .33$. Consistent with Studies 2 & 3, for roles where both a younger and older candidate with an equal amount of relevant experience were available, participants were twice as likely to select the younger candidates (62.2% vs. 30.5%).

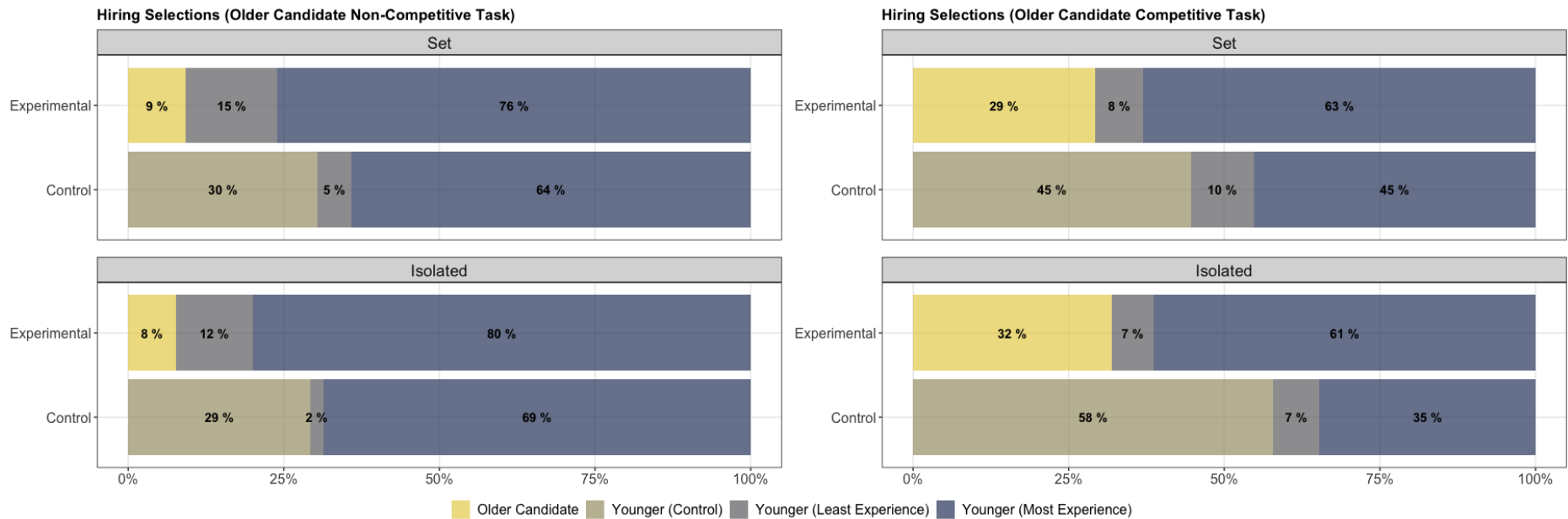
We used the same binary logistic regression analysis as Studies 2 and 3, and found the overall model was statistically significant, $\chi^2 = 160.58$, $p < .001$. Contrary to our hypothesis, participants did not select older applicants more often in the *bundled choice* condition compared to the *isolated choice* condition (19.3% vs. 19.7%), $OR = 0.94$, $SE = 0.06$, $p = .357$; 95% CI [0.82, 1.07]. Once again, participants selected older candidates more often when they were competitive compared to non-competitive (30.5% vs. 8.5%; $OR = 4.75$, $SE = 0.59$, $p < .001$), but this did not vary between *bundled* and *isolated choice* conditions, $OR = 1.40$, $SE = 0.35$, $p = .171$.

We next added the presentation order of candidates as a factor to our model and found that participants did not select a greater number of older candidates when they were presented in prime position (leftmost of the three candidates), compared to when they came second, $OR = 0.84$, $SE = 0.10$, $p = .125$. Including participants' age in the model showed that it did not affect the selection of older candidates, nor did it interact with the experimental manipulation, respectively, $OR = 1.02$, $SE = 0.01$, $p = .079$. $OR = 1.00$, $SE = 0.01$, $p = .885$.

Consistent with the statistically null effect of bundling on the selection of older candidates, participants in the *bundled choice* condition did not report age-diversity was more salient when making their hiring decision than those in the *isolated choice* condition, $M_{bundled} = 3.59$, $SD = 1.77$; $M_{isolated} = 3.52$, $SD = 1.84$; $t(736) = 0.42$, $p = .677$, $d = .04$.

Figure 3

Study 4 showed that participants were much more likely to select younger ‘control’ candidates compared to older candidates (three times as likely in the non-competitive condition, left panel and one and a half times more often in the competitive condition, right panel). This difference was not influenced by the bundling condition and there was no difference in the proportion of older candidates selected in the bundled ($n_{\text{participants}} = 148$; $n_{\text{experimental_selections}} = 1,184$, $n_{\text{control_selections}} = 296$) and isolated choice conditions ($n_{\text{participants}} = 737$; $n_{\text{experimental_selections}} = 1,180$, $n_{\text{control_selections}} = 294$).



2.7.3 Discussion

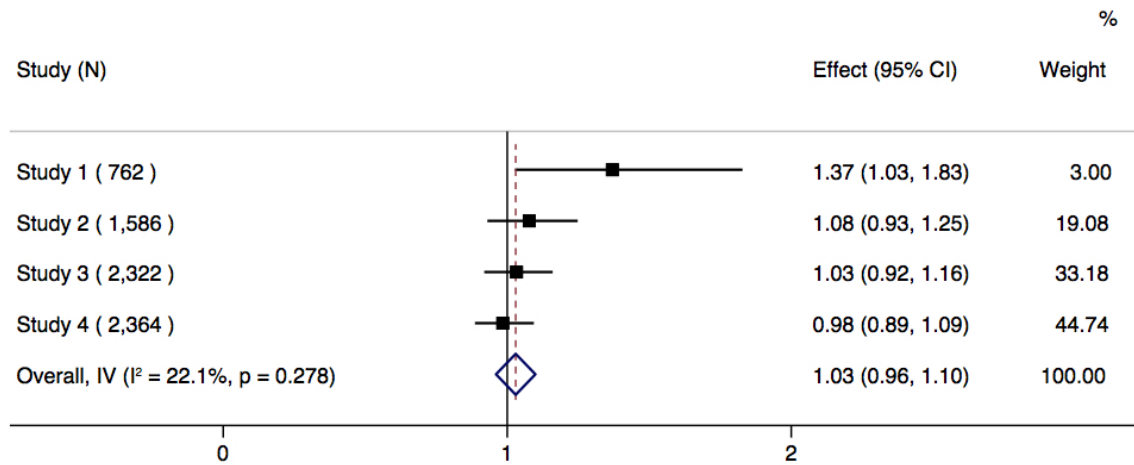
Across four well-powered experiments, only one showed evidence that making hiring decisions in a bundle increases the selection of older candidates compared to decisions made in isolation. Given these mixed findings, it is possible that the bundled choice effect exists, but is so small that it is elusive. A meta-analysis of our studies provides increased statistical power to discern if the effect found in Study 1 was a false positive or if our subsequent results in Studies 2, 3 and 4 were false negatives.

2.8 Meta-Analysis of Studies 1-4

We tested the hypothesis that bundling increased the selection of older candidates in a meta-analysis of the data from Study 1-4 using the ‘metan’ command in STATA (Harris et al., 2008) to apply a fixed-effect method (see Goh et al., 2016; Tufanaru et al., 2015) to the precalculated log-odds ratios and their 95% CI. As shown in Figure 4, the cumulative meta-analytical effect does not support that bundling hiring decisions together increases the selection of older workers compared to making hiring decisions in isolation.

Figure 4

Forest plot of the effect of bundling hiring decisions on the selection of older candidates in Study 1-4 showing no statistically significant effect overall. The squares show the odds-ratio effect in each study, the error bars show the confidence intervals for each study, weight (%) represents the influence of each study on the pooled result (based on sample size and confidence interval) and the diamond represents the pooled result across the four studies.



2.9 General Discussion

Building on a choice architecture design perspective, we expected that hiring a set of applicants simultaneously in a bundle would lead participants to select more older candidates to create a more age-diverse team, compared to hiring for a single candidate in isolation. However, across four preregistered studies, bundling hiring decisions did not consistently increase the age-diversity of candidates selected compared to hiring in isolation.

Our results differ from past work showing that choice bundling leads to greater diversity in selections across other domains, such as food (Read & Loewenstein, 1995; Simonson, 1990; Simonson & Winer, 1992), music (Ratner, Kahn, & Kahneman, 1999) and financial investments (Benartzi & Thaler, 2001). Importantly, our results suggest that the positive effect of bundling hiring decisions on gender-diversity and the selection rates of women (Chang et al., 2020) does not extend to age diversity and older men. Chang et al. (2020) found that choice bundling increased the selection of women, even when they were not the most experienced candidates, and could be considered a suboptimal choice. Yet bundling was unable to raise the selection rate of older applicants, both when older applicants were not the most experienced candidates (Studies 1-4), and when they were one of the two most experienced candidates for the job (Studies 2-4). Nor did bundling decisions

consistently elicit a stronger focus on age-diversity than isolated hiring decisions (Studies 1-4). Thus, while past work has shown that bundling selection decisions has led to more focus on gender-diversity and more diverse selections benefitting women, this did not replicate to more focus on age-diversity or the selection of older candidates.

Although achieving team diversity in hiring and selection decisions has been shown to have a high level of desirability (Jaffé et al., 2019), the undesirability of older candidates in our studies suggests deeply rooted negative attitudes towards older workers. The failure of choice bundling to increase age-diverse hiring choices may help reveal differences between diversity characteristics in workplace contexts, and the limitations of bundling interventions. Applying a decision sciences perspective to problems of diversity by altering the choice architecture may only be effective when there exists prior training and education that has effectively shaped the attitudes towards the group being evaluated. For example, it may be that the success of choice bundling to increase representation of women rests on the prior work that has been done to redress negative attitudes towards women in technology (Williams & Ceci, 2015). Achieving workplace age-diversity might not be considered a desirable outcome compared to gender diversity or diversity in other choice domains (e.g., food, finances), thus choice bundling interventions might be contingent on the relative desirability of a diverse outcome. Pairing choice bundling or other choice architecture interventions with complementary training that reduces negative attitudes towards older candidates and increases awareness of the benefits of age-diversity might yield greater success.

In all four studies participants showed a strong preference for younger candidates. When older candidates had the equal most years of relevant experience they were around one and a half times less likely to be hired than an equivalent younger applicant. When older

candidates did not have the most years of relevant experience, they were more than three times less likely to be hired than an equivalent younger candidate. This builds on past findings that people do not endorse age-equity to the same extent as gender or racial equity (Martin & North, 2021), and that age diversity might not be a desirable outcome compared to gender diversity. Older candidates for the Information Technology industry are at a particular disadvantage given the strength and nature of negative stereotypes against them e.g., that they are not as creative or capable of learning new (technology) skills (Abrams et al., 2016). This points to a potential hazard in the up/reskilling of older workers. While there is an economic need for up/reskilling workers as technologies evolve (Alcover et al., 2021), older candidates may require significantly greater relevant experience with these new skills than younger candidates to be competitive in the job market. This points to a common societal expectation that older workers should ‘step aside’ to provide resources and opportunities for younger generations (North & Fiske, 2013, 2016). There is some evidence that older candidates who have made career ‘switches’ and thus have equal or less relevant experience compared to younger candidates, like those presented in our experiments, violate this societal expectation and are appraised more critically (Martin et al, 2019; North, 2019).

In addition to bias against older workers, the null effect of bundling might be attributed to age not being as salient a diversity characteristic as gender or race. Organisational diversity initiatives tend to be more focused on gender (52%) and race (49%) compared to age (18%; Akinola et al., 2019) and this is reflected in the lesser research attention devoted to ageism compared with literature on racism and sexism (North, 2019). Chang et al. (2020) found that bundling hiring choices increased the selection of women because it led participants to think more about how their selections would affect the gender-diversity of the team, but we did not find consistent evidence of this for age-diversity. When looking at a group of people, accurate diversity impressions about race and gender are formed

quickly (Phillips et al., 2018), and individuals who strongly believe in the value of diversity are more likely to assemble a team that is objectively diverse by drawing on cues from facial information (Jaffé et al., 2022). However, it is unknown if similar impressions are formed for age-diversity or if those who believe in the value of diversity based on other characteristics would choose to assemble an age-diverse team. It is therefore possible that age diversity is not only less desirable, but also less salient than gender diversity in the context of workplace hiring.

2.9.1 Limitations

As a conceptual replication, these studies closely followed an existing experimental paradigm set out by Chang et al. (2020), and some elements of the way this experiment was structured may have influenced participants' hiring decisions. Firstly, the photos used were not 'normed' to balance candidate qualities other than age that might influence hiring decisions. Past work has shown that attractiveness (Jawahar & Mattsson, 2005) and impressions of health and fitness (Kaufman et al., 2016) can influence candidate opportunities. Although this may have placed older candidates at a disadvantage compared to younger candidates, changes in perceived fitness and attractiveness cannot be fully dissociated from age, as such changes occur as a natural part of ageing. Additionally, the photos used were identical between experimental conditions and are therefore unlikely to have influenced the effects of choice bundling on age-diversity. Another potential limitation of the paradigm is that participants in the *bundled choice condition* made five times as many selections as those in the *isolated choice condition*, and therefore fatigue or depletion might have influenced results. However, we did not observe participant fatigue in hiring patterns, with the proportion of suboptimal (least experienced) candidates selected consistent across conditions. This concern was also addressed in the original study by Chang et al., 2020, who

successfully ruled out an effect on hiring decisions by conducting a study using unrelated object selection decisions (e.g., preferred pen in a set of three) in the *isolated choice condition*.

2.9.2 Future Directions

Overall, our findings are consistent with the growing literature showing bias and discrimination against older job candidates in hiring decisions (Lössbroek et al., 2021). The characteristic of age has received comparatively little research attention compared to gender and race (North, 2019), and our results draw attention to the need for greater understanding of age as a distinct diversity characteristic. Theoretically, our failure to replicate the results from Chang et al. (2020) raises questions about ‘desirable diversity’ in choice bundling outcomes. Examining hiring decisions using an intersectional approach, rather than considering gender or age alone, may shed further light on the conditions under which individual characteristics become more problematic or desirable to hirers (Di Stasio & Larsen, 2020). For example, older women who have switched careers may be more attractive candidates relative to older men (Martin et al., 2019), whereas young women and men are judged similarly. Experiments that explicitly test the desirability of diverse outcomes may help establish the boundary conditions for when interventions may or may not be effective. Behavioural interventions designed to improve gender or racial diversity cannot be assumed to be effective for age diversity. Research promoting novel interventions and conceptual replications that manipulate differences in age as distinct from other visible diversity characteristics may help inform interventions that increase age-diversity specifically. However, increasing the attractiveness of diversity for a stigmatised group (like age) might require a two pronged approach: education that targets attitudes by raising awareness of false

or negative stereotypes, and employing choice architecture changes to help decision-makers adopt the desired behaviours.

2.9.3 Implications and Conclusion

An increasing number of generations can now be found in the workforce as a result of an ageing population (Boehm & Kunze, 2015). Like other forms of diversity, age diversity in an organisation can improve performance (Li et al., 2021; van Knippenberg et al., 2020). Despite this, it remains an ongoing challenge to remove the prejudices, stereotypes and biases from organisational hiring processes that might prevent this diversity being achieved (Bezrukova et al., 2012). Hiring a candidate for a job is a complex task, and although there are many varied factors that might influence who gets hired, our findings suggest that candidate age remains one of these factors. Prejudices based on protected characteristics continue to be an influential factor in hiring choices (Baert, 2018), with strong negative stereotypes directed towards older workers (Swift et al., 2017). Bias against older candidates can be expected to undermine the changes needed to support an ageing workforce (Beier et al., 2022), and suggests greater awareness about the benefits of age-diversity in the workplace is needed.

In summary, although past research on choice bundling suggests that bundling leads to greater selection diversity, we find that in the context of hiring decisions, bundled hiring does not increase age-diversity through the selection of more older candidates. This suggests that the effect of choice bundling may not operate independently of held expectations and group-level stereotypes existing against older workers. We conclude that the efficacy of bundling choices to increase diversity in real-world scenarios is likely to vary based on the context and diversity characteristic considered.

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CHAPTER 3.

3. The effect of incentive-based competition on hiring decision quality and selection of underrepresented candidates.

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Author Note

Acknowledgements: The research for Study 1 was supported by the Many Designs project as part of a collaborative project on the effect of competition on moral decision-making. The study conceptualization, experimental design and methods, analysis and authorship of the chapter is that of the first author under the guidance, supervision and review of the second author. All research described in this article was approved based on requirements set out by the University of Essex Ethics Committee (ETH2021-2111). The hypotheses, materials and the analytical approach were pre-registered and the anonymized copies of these pre-registrations, study data and supplementary materials have all been made available via the Open Science Framework (OSF) here,

https://osf.io/edmk7/?view_only=b2074602db994080b741fb45c9acab1a

3.1 Abstract

Underrepresentation of women and older workers in the technology sector is a persistent barrier to equality and productivity. In technology and other sectors, recruiters typically engage in incentive-based competition to place candidates with an organisation, screening and selecting candidates on the organisations' behalf. Although broader market competition has been shown to reduce employer prejudice and discrimination against underrepresented groups, there has been little experimental research of how incentive-based competition influences the selection of underrepresented candidates. Across two preregistered experiments ($N = 845$), we investigate if incentive-based competition helps participants to select the most experienced candidate when this person is a woman or an older candidate. In Study 1, we found that competition-based incentives reduced the selection of older candidates in a sub-sample of recruiters from the UK and US. However, this finding was not replicated in Study 2. Our Study 2 results suggested that competitive incentives might increase selection of older candidates among younger hirers. In both studies, we found significantly fewer of the most-experienced older male candidates were selected compared to most-experienced women and younger male candidates used as a benchmark. To further investigate this, in Study 2, we tested the effects recruiter beliefs on the selection of underrepresented candidates. We found that low selection rates for older candidates were associated with beliefs that they would be less productive and less preferred by the selection panel compared to younger candidates, however competition did not moderate this relationship. We discuss the theoretical and applied implications of these findings for competition, underrepresentation, and discrimination in hiring decisions.

3.2 Background

Discrimination in the hiring of job candidates is a widespread societal problem, leading to underrepresentation, and limiting the access key groups have to the labour market (OECD, 2020). Underrepresentation is often most acute in competitive technology-based roles (EIGE, 2018; EEOC, 2019). More equitable representation in these roles requires multiple obstacles to be overcome, including lack of STEM subject exposure, relevant role models, and hiring discrimination as a barrier to entry (Cheryan et al., 2017). At a macro-level, hiring discrimination in technology roles is somewhat counter-intuitive. This is because competitive market conditions are often found to reduce employer prejudice and discrimination against underrepresented candidates (Johnston & Lordan, 2016; Pager, 2016). When qualified candidates are scarce or in high demand, employers are thought to put aside preferences against (Becker, 1957) or past experiences with (Aigner and Cain 1977; Arrow 1973; Phelps 1972) underrepresented groups to secure the ‘best’ candidates, regardless of their group characteristics. Yet, increased market competition for candidates does not consistently reduce hiring discrimination in technology roles (Fernandez & Campero, 2017; Protsch, 2021). One possible reason for this is that competitive incentives occur not only at a broader market level, but also at an individual recruiter level. Any individual who is engaged in hiring someone for their organisation is competing for incentive, to secure the best candidate for the role, over and above others. Further, many industries, including technology, rely heavily on HR recruitment agencies for shortlisting and selection, with individual recruiters competing for fees and bonuses from the hiring company that are only awarded if their candidates are successfully placed (Finlay & Coverdill, 1999). This results in a highly competitive recruitment model (Fernandez-Mateo & King, 2011), and to date there has been little exploration into how incentive-based competition affects hirers’ individual decision-making processes and the selection of underrepresented candidates. While the effects of

market competition on discrimination have received considerable research attention (Baert, 2021; Lippens et al., 2022), this research looks to investigate the little-known effects of competitive incentives on individual decision-making in hiring and selection decisions.

3.2.1 Competition and hiring discrimination

Hiring discrimination occurs when individual candidates are not selected due to a judgment or stereotype about their social category (e.g., race, gender, age), rather than the individual qualities of the candidate (Allport, 1954; Fiske, 1998; Pager & Quillian, 2005; Quillian & Midtbøen, 2021). These judgements undermine equality of opportunity and can lead hirers to forego the most qualified applicants in important sectors such as technology (Fernandez & Campero, 2014; Protsch, 2021). Negative stereotypes and subsequent discrimination in hiring decisions are considered a key barrier to increasing representation of women (Banchevsky & Park, 2018; Hangartner et al., 2021; Kübler et al., 2018; Leslie et al., 2015; Moss-Racusin et al., 2012) and older workers (Perry & Finkelstein, 1999; Bytheway, 2005; Loretto & White, 2006; Carlsson & Eriksson, 2019; Neumark et al., 2019). Incentive-based competition is typical in the technology sector (Finlay & Coverdill, 1999), where hiring discrimination contributes to the underrepresentation of key groups (e.g., women; Cheryan et al., 2017). Women represent only 17% of technology workers in European Union countries, while the proportion of technology workers aged over 50 is around 30% lower than in other sectors (EIGE, 2018). Here we explore how competition between hirers can moderate the effect of negative stereotypes on the selection of women and older adults.

It has been believed, and to some extent evidenced, that when labour markets are tighter and candidates harder to come by, people are less likely to discriminate against qualified candidates based on their group characteristics (Becker, 1957). Analysis of baseball player movements (Cymrot, 1985), hiring data from the technology sector (Fernandez &

Campero, 2014), job advertisements in Mexico (Arceo & Campos-Vázquez, 2016) and correspondence experiments in Belgium (Baert et al., 2015) all provide some indirect evidence for the link between the competition for candidates and reduced levels of discrimination. For example, a correspondence study in Belgium found that candidate applications given foreign sounding names had equal chance of securing a job interview as applications given local names for occupations where competition for candidates was high, but twice as many foreign-named applications were needed as local-named ones to secure an interview for positions where there was lower competition for candidates (Baert et al., 2015). This suggests that increased competition may motivate recruiters to put aside biases and preferences to secure the most qualified candidates. Yet in practice, bias towards candidates based on protected characteristics including race and ethnicity (Hangartner et al., 2021; Quillian & Midtbøen, 2021), gender (against women in male dominated industries; Hangartner et al., 2021, Kübler & Schmid, 2018) and age (Carlsson & Eriksson, 2019; Neumark et al., 2019) is not only prevalent, but persistent even in highly competitive markets (Kumar et al., 2015; Zhang, 2019). Hiring prejudice and discrimination in the technology sector appears especially resistant to increased employer demand (Fernandez & Campero (2017; Protsch, 2021). In past research, competition has been conceptualised as either an increased demand for suitable candidates from a stable pool of candidates or a reduction in suitable candidates to meet a stable demand. However, in practice, competitive-incentives available to each individual recruiter and the pressures of this competition will vary greatly between recruiters. From a cognitive decision-making perspective, HR recruiters are competing against each other for a placement incentive from a single organisation, with the number of applicants available in the market consistent for all competitors (Fernandez-Mateo & King, 2011; Finlay & Coverdill, 1999). Thus, recruiters who select the best candidates from the applicants available should theoretically maximise their competitive rewards.

Given the inherent competition for employers to recruit the best candidates, and the widespread practices of offering competitive incentives to recruiters for successful selection and placement of job candidates, it is important to understand how this competition affects reliance on stereotypes in decision-making processes. In technology-based roles, stereotypes against women (Hangartner et al., 2021, Kübler & Schmid, 2018) and older candidates (Carlsson & Eriksson, 2019; Neumark et al., 2019) are strong and widespread. Gender stereotypes suggest that women are less competent with technology, have lower raw intellect and mathematical ability (Banchefsky & Park, 2018; Moss-Racusin et al., 2012; Leslie et al., 2015), and that older candidates are less motivated and more resistant to change (Ng & Feldman, 2012), less productive (Bal et al., 2011) and less capable with new technologies (Dordoni & Argentero, 2015; Egdell et al., 2020; Van Dalen et al., 2010). Incentive-based competition increases both financial reward and accountability for decisions. In making these decisions, individuals rely on dual-processes that are more or less intuitive (fast, automatic) or reflective (slow, deliberative) thinking (De Neys, 2017; Evans, 2008; Kahneman, 2011). Financial incentives can improve decision-making by increasing task motivation and ability to regulate bias through reflection (Kim et al., 2022; Lawson et al., 2020). Thus, competing for financial incentives may be expected to reduce recruiters' reliance on stereotypes by increasing motivation to make the 'best' decision to gain reward (Stone & Ziebart, 1995), thereby eliciting greater reflection. For example, a recruiter may inhibit bias against older workers in technology roles if the older candidate is clearly the most qualified. Competition can also raise accountability, by raising recruiters' awareness that their decisions will be subject to scrutiny (Tetlock, 1992). Accountability can increase social motivations to make a good impression or avoiding embarrassment (Larrick, 2004; Tetlock & Mitchell, 2009), which may lead recruiters to increase reflection and inhibit reliance on biases, thereby improving decision-making quality. For example, a recruiter may inhibit bias against older

workers in technology roles if they are not comfortable to justify to others that they overlooked the best candidate because they were older. Therefore, if stereotypes or biases are an obstacle to hiring the ‘best candidates’, increasing analytical reflection in assessing candidates may improve decision quality and reduce underrepresentation by allowing recruiters to notice and correct any biases (Axt et al., 2021; Axt & Johnson, 2021). However, this reflection might only be effective in correcting decision biases if these biases and stereotypes are recognised by decision makers as untrue, and therefore biases to be overcome (Kruglanski & Freund, 1983). If recruiters hold biases towards candidates from underrepresented groups, and they consider these biases to be true and socially acceptable, competition and increased reflection may prompt greater discrimination. In other words, competitive incentives might exacerbate discrimination if they lead participants to give greater consideration to stereotype-based beliefs that underrepresented candidates are inferior, less productive or desirable, and do not represent the ‘best’ candidates. Thus, it is unclear if competition may effectively reduce hiring discrimination in individual hiring selections.

3.3 The present studies

In two studies, we aimed to explore the effect of incentive-based competition on the selection of underrepresented candidates. To date, few studies have set out to experimentally test the effects of incentive-based competition on selection of underrepresented candidates. Across two preregistered experiments, we examined the effect of competition on the selection rates of women and older candidates who were objectively the ‘best’ candidates available for selection based on years of relevant experience.

The preregistrations together with study and supplementary materials and data can be found here.⁴

3.4 Study 1

In Study 1, we expected that competition-based incentives would reduce discrimination by increasing motivation and analytical consideration while reducing reliance on intuitions that might be based on stereotypical content about women and older workers (Evans, 2008; Lerner & Tetlock, 1999; Tetlock, 1992; Tetlock & Lerner, 1999). Additionally, we expected competition to increase accountability, encouraging recruiters to be more analytical, focusing their decisions on the relevant information, which is candidate years of experience (Larrick, 2004; Tetlock, 1992). Based on past work showing likelihood to hire is lower for older men than younger women (Martin et al., 2019), we also expected that older male candidates would be selected less frequently than women candidates.

3.4.1 Method

Participants. We recruited 449 English speaking participants from around the world through Prolific, an online participant recruitment platform. Our analytical sample was 449 participants (56.5% women; $M_{\text{age}} = 33$, $SD = 13$). Participants represented diverse countries including the United Kingdom (28%), United States (17%), South Africa (13%), Portugal (7%), Poland (5%), Italy (4%), Mexico (4%), Germany (3%), Spain (3%) and other nations (<2% each, adding up to 16%). Participants were paid £1.30 to undertake the eight-minute

⁴ The author completed Study 1 as part of the #ManyDesigns collaborative project which examined the effects of competition on moral behavior. The research was funded by the #ManyDesigns project and the author is listed as a contributing author on the manuscript for this work, which is currently under review.

study (hourly rate equivalent of £9.75). Participants held different levels of education, from a master's degree or higher (18%), bachelor's degree (41%), some university education (21%), and A-levels (10%) or GCSEs equivalents (6%). The majority of participants reported a personal income below £19,000 per year (54%; 28% earned £20,000 to £39,000; 18% above £40,000). The sample size for the study provided 90% power to detect a small to medium effect size of $d = .30$, with $\alpha = .05$ (G*Power 3.1; Faul et al., 2007)

Design. This experiment employed a 2 (competition vs. control) x 2 (women vs. older applicants) x 8 (selection trials) + 4 (control trials) mixed design. Participants were allocated to either a competition or control condition as a between-subject factor. We manipulated the under-represented group as a within-subjects with a series of selection decisions involving either women or older candidates. We also included a series of control selection decisions involving male-only candidates to benchmark selection rates. We used the sum of the most experienced underrepresented candidates chosen (women and older candidates) as the dependent variable.

Materials and Procedure. Participants imagined that their job involved making hiring decisions for a technology company that was looking to fill twenty roles for a technology team including roles such as product managers, software engineers, marketing analysts, user experience designers and sales representatives.⁵

Participants were randomly assigned to either the *competition* condition or the *control* condition. In the *competition* condition, participants were told they would be competing against other hirers for a recruitment bonus of up to £1.50 based on their hiring performance. They were told that responses would be collected from 200 participants on Prolific and that a

⁵ Participants were required to complete the study on a PC or laptop and to successfully answer three attention questions to ensure that they understood the purpose of the study (hiring decisions), the number of roles being hired for (20) and who the company is looking to hire (a new technology team).

hiring performance score would be calculated for each participant based on the candidates selected. In the *competition* condition, participants were also told that their hiring performance score would be ranked against other participants and that the top 100 (50%) of participants would get a bonus over and above the base reward. Specifically, the top 50 participants (top 25%) would be awarded a bonus of £1.50. Participants ranked between 51-100 (next 25%) would be awarded a bonus of £0.75, and participants who ranked lower than 100 (lower 50%) would not be awarded any bonus (see Online Supplementary Materials for task details). In the *control* group, no reference was made to any competition.

Participants in both conditions were presented with twenty roles to fill together with three candidates for each of the roles in a sequential order (randomized). For each role, instructive information was given (e.g., “*There are three candidates for the position of Software Developer on the tech team. A Software Developer writes computer code to program web applications and other software. Who would you like to hire for the Software Developer job?*”). Participants were then tasked with selecting the candidate they wished to hire for each role from the three presented candidates (order randomized from left to right). Each candidate was presented with photo, job title, current employer and years’ experience (see Figure 5). The experience of the candidates ranged from 0 to 8 years, and underrepresented candidates (women and older men) had greater experience than the other two candidates.

Of the twenty roles presented, sixteen included a minority candidate who held the most relevant experience, either a woman or an older candidate. In eight of these roles, the two younger male candidates (19 - 34 years, $M_{\text{age}} = 24$) were presented alongside a third candidate with more experience, a younger woman (22 - 34 years, $M_{\text{age}} = 25$). In 8 of the roles, the two younger men were presented alongside a more experienced older man (61 - 72

years, $M_{\text{age}} = 66$; see *Figure 5*). The age of the candidates was manipulated using photos taken from the Park Aging Mind Laboratory Face Database (Minear & Park, 2004). “These photos were chosen as to clearly distinguish older from younger employees, with approximately 55 years of age currently considered the point at which workers become ‘older’ (Zacher & Rudolf, 2023). To benchmark any discrimination against women or older candidates, four roles were presented exclusively with three white male ‘benchmark’ candidates (19 - 41 years, $M_{\text{age}} = 30$). In these roles, only the relevant years of experience and previous employer varied, allowing us to evaluate the impact of gender and age in other roles. All photos used were of White candidates.

Participants also reported how much they considered the diversity of the team in their hiring decisions on a 1-7 scale ranging from 1: *Not at all* to 7: *Extremely*. Finally, participants completed demographic questions (gender, employment status, education, personal income and age), before being fully debriefed.

Figure 5

Sample of hiring decision stimuli used where the under-represented candidate was an older candidate. Photos used in experiments were taken from the Park Aging Mind Laboratory Face Database (Minear & Park, 2004). Photos displayed here are for illustrative purposes only (courtesy of Generated Photos, 2022).

There are three candidates for the position of **Software Developer** on the tech team. A Software Developer writes computer code to program web applications and other software.

Who would you like to hire for the **Software Developer** job?

 <p>Software Developer Haier Years exp: 4</p>	 <p>Software Developer LG Years exp: 3</p>	 <p>Software Developer Texas Instruments Years exp: 1</p>
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3.4.2 Results

Overall, participants selected older candidates in just 40% of hiring decisions and women in 75% of hiring decisions. In other words, when the most experienced candidate was a woman, they had a 75% chance of being hired, which was the same chance as the most experienced younger male candidates used in our benchmark roles. Participants did not always select the most experienced candidate for the job, but older candidates were selected at a significantly lower rate than younger male benchmark candidates. Chi-square tests of independence confirmed that older men were selected significantly less often than the

younger men in benchmark roles, but women were not, $\chi^2(1, N_{older_selections} = 5,375) = 585.67, p < .001$; $\chi^2(1, N_{women_selections} = 5,375) = 0.77, p = .973$, respectively.

While hirers in the competition condition selected fewer underrepresented candidates overall (*see Tables 1 & 2, Figure 6*), a mixed-design ANOVA with competition (competition vs. no competition) and underrepresented candidate group (women vs. older men) as independent variables (main and interaction effects) and the number of underrepresented candidates as dependent variable, showed that the effect of competition as a between-subject factor was not significant, $F(1,446) = .141, p = .736, \eta_p^2 = .00$. There was a significant effect of underrepresented group as a within-subject factor, such that participants selected significantly more women than older men, $F(1,446) = 542.84, p < .001, \eta_p^2 = .55$. However this selection of underrepresented candidates did not vary based on condition, $F(1,433) = 0.12, p = .727, \eta_p^2 = .00, M_{diff} = -2.35; 95\% CI[-0.09, 0.57], p = .151$.

Table 1

Study 1 selection means and standard deviations for most experienced candidate between conditions (N = 448), no competition (n = 220) and competition (n = 224).

	<i>1. No Competition</i> <i>M (SD)</i>	<i>2. Competition</i> <i>M (SD)</i>	<i>Total</i> <i>M (SD)</i>
Older Men	3.15 (2.42)	2.91 (2.18)	3.05 (2.31)
Women	5.81 (1.92)	5.65 (1.86)	5.74 (1.87)
Total	8.95 (3.63)	8.56 (3.26)	8.75 (3.45)

Table 2

Study 1 selection frequencies for most experienced candidate between conditions (N = 448), no competition (n = 220) and competition (n = 224).

Category		1. No-Competition		2. Competition		Total	
		n	%	n	%	n	%
Older Men	1. Product Manager ⁶	64	29%	44	19%	108	24%
	2. Systems Engineer	77	35%	81	36%	158	35%
	3. UX Designer	67	31%	64	28%	131	29%
	4. Sales Representative	92	42%	87	38%	179	40%
	5. Project Manager	103	47%	103	45%	206	46%
	6. Systems Engineer	89	41%	93	41%	182	41%
	7. UX Designer	104	47%	97	43%	201	45%
	8. Account Manager	100	46%	93	41%	193	43%
	Average		40%		36%		40%
Women	1. Product Manager ⁷	119	54%	101	44%	220	49%
	2. Systems Engineer	167	76%	169	74%	336	75%
	3. UX Designer	140	64%	129	57%	269	60%
	4. Sales Representative	170	77%	178	78%	348	78%
	5. Project Manager	188	86%	193	85%	381	85%
	6. Systems Engineer	182	83%	178	78%	360	80%
	7. UX Designer	150	68%	157	69%	307	69%
	8. Account Manager	167	76%	183	80%	350	78%
	Average		73%		71%		75%
Younger Men	1. Marketing Analyst	159	72%	142	62%	301	67%
	2. Systems Analyst	195	89%	186	82%	381	85%
	3. Systems Developer	152	69%	141	62%	293	65%
	4. Systems Developer	169	77%	176	77%	345	77%
	Average		77%		71%		75%

3.4.3 Exploratory Analysis UK & US Populations

The population for initial sample in this study was global.⁸ However, there is considerable variance in discrimination laws and outcomes between countries around the

⁶ Two candidates had the title ‘Senior Product Manager’.

⁷ One of the less experienced male candidates had the title of ‘Senior Product Manager’.

⁸ As this project was funded externally, a global sample was used as per the requirements of the funding project.

world based on age (Lahey, 2010) and gender (Htun et al., 2019). Examining UK and US populations only ($n = 200$), participants selected older candidates in 49% of hiring decisions and women in 79% of hiring decisions, slightly more than in the population overall. When the most experienced candidate was a woman, they had a 79% chance of being hired, which was the same as the most-experienced younger male candidates used in our benchmark roles (77%).

To assess the effect of competition on this refined sample, we conducted a mixed-design ANOVA, with competition as a between-subjects variable (competition vs. no competition) and underrepresented candidate group as a within-subjects variable (women vs. older men). In this sample also, participants selected significantly more women ($M = 6.08$, $SD = 1.84$) than older men ($M = 3.81$, $SD = 2.47$), $F(1,198) = 515.96$, $p < .001$, $\eta_p^2 = .49$. More importantly, hirers in the competition condition selected fewer underrepresented candidates overall, $F(1,198) = 5.73$, $p = .018$, $\eta_p^2 = .03$ (see Table 3 and Figure 6), however the effect of competition was significant for hirers in the selection of older candidates only, $F(1,198) = 4.27$, $p = .040$, $\eta_p^2 = .02$.

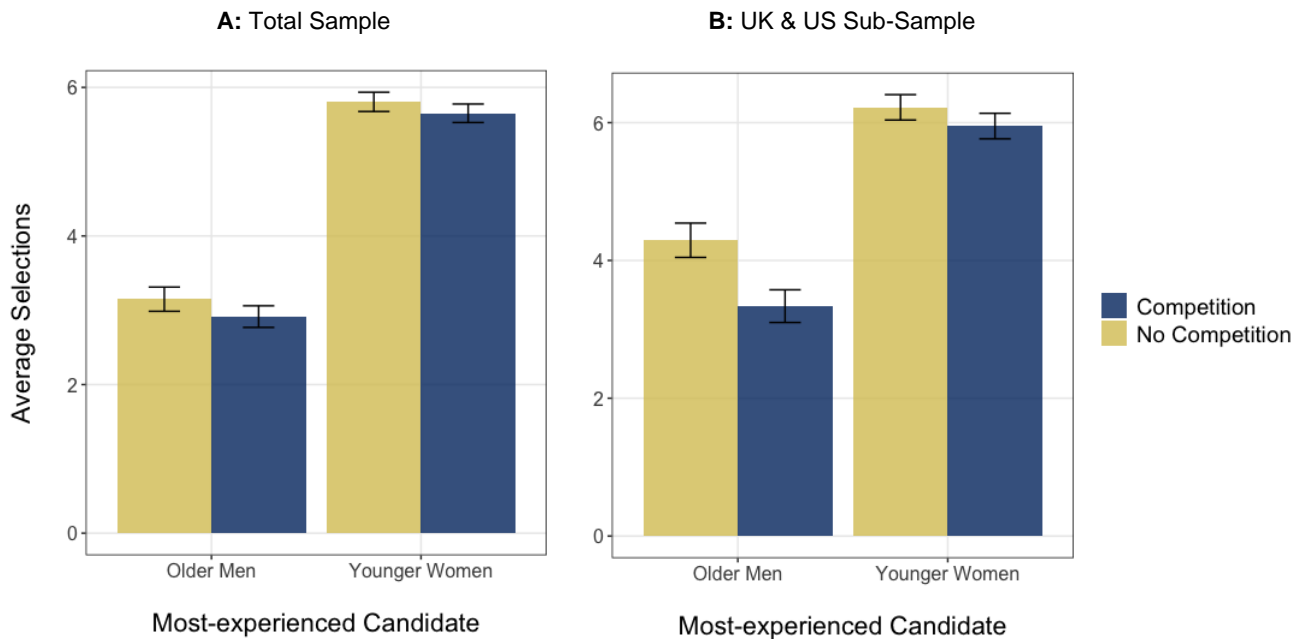
Table 3

Study 1 selection means and standard deviations for most experienced candidate between conditions in the US-UK sub-sample sample ($N = 200$), no competition ($n = 101$) and competition ($n = 99$).

	<i>1. No Competition M (SD)</i>	<i>2. Competition M (SD)</i>	<i>Total M (SD)</i>
Older Men	4.29 (2.48)	3.34 (2.38)	3.81 (2.47)
Women	6.22 (1.92)	5.95 (1.86)	6.08 (1.85)
Total	10.51 (3.77)	9.29 (3.47)	9.89 (3.66)

Figure 6

Study 1 selection frequency and proportion of total for most experienced candidate between conditions in A) the total sample ($N = 448$), no competition ($n = 220$) and competition ($n = 224$) and B) the US-UK sub-sample sample ($N = 200$), no competition ($n = 101$) and competition ($n = 99$). Error bars represent standard errors.



3.4.4 Discussion

In Study 1, we set out to test the influence of competition on the selection of older and women candidates in an industry within which they have been traditionally underrepresented (technology). We hypothesised that competition would increase the selection rate of underrepresented candidates when they were objectively the most experienced. Although competition did not influence selection rates in the global sample, an exploratory analysis looking at the US and UK selections only, revealed that competition significantly reduced the selection rate of older candidates. This suggests competitive incentives might exacerbate discrimination and hints that analytical thinking re-enforced (rather than inhibited) the use of stereotypes against older workers. This is consistent with the assumption that the negative

stereotypes about older workers were deemed relevant in the decision-making process. If these stereotypes are relevant to selection decisions, what might explain the inconsistent findings between women and older candidates? The difference might be explained by the nature of the stereotypes against these two groups, with older candidates more negatively assessed for hireability (Martin et al., 2019). Consistently, we found that the selection rate of older applicants was much lower than selection rates of women and the younger male benchmark candidates (which did not significantly differ). In Study 2, we aimed to replicate the effect of competition in a UK only sample, and to explain differences in the effect of competition on the selection rate of older workers. Based on the results of Study 1, greater reflection might increase reliance on stereotype-based beliefs that underrepresented candidates are less productive or desirable in the role for which they are being hired.

3.5 Study 2

Overall, Study 1 did not find a significant effect of competition on the selection of underrepresented candidates. However, within a subsample of UK and US participants, we found that competition-based incentives reduced the selection rates of older candidates. If recruiters held negative beliefs about older candidates as a group (e.g., that older candidates are less productive or capable in technology roles), competition may have reduced selection by increasing reflection on and justification of these beliefs (Brief et al., 2000; Kim et al., 2022; Kruglanski & Freund, 1983). Competition may have also motivated recruiters to satisfy the perceived preferences of the selection panel (Crandall & Eshleman, 2003; Umphress et al., 2008; Vial et al., 2019a, 2019b), selecting fewer older candidates if they imagine the selection panel to have negative stereotypical beliefs about older workers. Specifically, recruiters may believe that selection panel members view older candidates as less productive

or capable in technology roles, and therefore will not reward the selection of older candidates.

In Study 2, we replicate Study 1 in a larger sample of UK workers. In Study 1, we did not find any effect of competition on the selection rate of women candidates, possibly because in many of the roles used (e.g., marketing; Hesmondhalgh & Baker, 2015), the stereotypes for women are positive. To reduce the selection rate of women and to have a better chance of identifying the effect of competition, we adapted the roles to be more prototypically associated with men (e.g., software developer rather than marketing analyst; Ehrlinger et al., 2018). We also explored participant motivations not to select older workers and women by assessing their expectations of candidate performance and beliefs about what the selection panel may reward based on applicant age and gender. We expected competition to lead hirers to select fewer older candidates depending on their beliefs about candidate productivity and selection panel preferences. Specifically, to select fewer older candidates, and to a lesser extent women candidates, when they believe that they are less productive, and / or they believe this would satisfy the expectations of the selection panel.

3.5.1 Method

Participants. We recruited 401 participants from the United Kingdom through Prolific. All participants were working full-time or part-time and had experience making hiring decisions. Our analytical sample was 401 participants (54% women; $M_{\text{age}} = 43$, $SD = 11$). Participants were paid £0.75 to undertake the seven-minute study (hourly rate equivalent of £6.43). Participants held different levels of education, from a master's degree or higher (28%), bachelor's degree (47%), some university education (7%), and A-levels (12%) or GCSEs equivalents (6%). Participants reported a personal income below £19,000 per year

(6%), between £20,000 and £39,000 (42%), between £40,000 and £59,000 (31%) and above £60,000 (19%). The sample size for the study provided 90% power to detect a small to medium effect size of $d = .30$ at $p < .05$ (G*Power 3.1; Faul et al., 2007)

Materials and Procedure. We employed the same experimental design as in Study 1. Again, participants imagined that they are working for a HR recruitment agency and their job involved selecting candidates for a technology company that was looking to fill eighteen roles for a technology team.⁹ We narrowed the range of roles from Study 1 to data engineers, software developers and software engineers.

Participants were randomly recruited to either the *competition* condition or the *control* condition. In the *competition* condition, participants were told they would be competing against other participants for a recruitment bonus of up to £1.00 based on their hiring performance. They were told that responses would be collected from 200 participants on Prolific and that each participant would receive a hiring performance score, given by a panel based on the candidates selected. Participants were explained that their hiring performance score would be ranked against other participants and that the top 50 (25%) of participants would get an incentive-based reward £1.00 over and above the base payment (see *Participants*). Participants who ranked lower than 50th would not be awarded any additional bonus (see Online Supplementary Materials for task details). In the *control* group, no reference was made to any competition.

Participants followed the same task procedure as Study 1. In Study 2, all participants made 18 hiring decisions. Of the 18 roles presented, 12 included an underrepresented candidate, a woman or an older man (61 - 72 years, $M_{\text{age}} = 66$), with two younger men who

⁹ Participants were required to complete the study on a PC or laptop and to successfully answer three attention questions to ensure that they understood the purpose of the study (hiring decisions), the number of roles being hired for (18) and who the company is looking to hire (a new technology team).

were less experienced (19 - 34 years, $M_{\text{age}} = 25$). To provide a within-subjects control and mask the purpose of the study, a further six ‘benchmark’ roles had three candidates, all younger men with varied years of relevant experience (19 - 34 years, $M_{\text{age}} = 25$). Across each of the six roles for each of the three social groups (older men, younger women, younger men) the roles and relevant experience was counterbalanced, and all candidates were white (see Online Supplementary Materials). The relevant experience of the candidates ranged from 0 to 8 years.

After completing the task, participants completed the measures of selection panel and productivity expectations.

Selection Panel and Productivity Expectations. Participants were asked which characteristics they considered to be more preferential to the selection panel and productive in the technology roles hired (data engineer, software engineer and software developer) on a 1-7 scale. Participants were asked about gender and age characteristics, ranging from 1: *Men are more preferred / productive* to 7: *Women are more preferred / productive*, with 4: *No difference*, and age characteristics; 1: *Younger workers are more preferred / productive* to 7: *Older workers are more preferred / productive*, with 4: *No difference*.

Finally, participants completed demographic questions (gender, employment status, education, personal income, and age), before being fully debriefed.

3.5.2 Results

Overall, participants selected the most-experienced older candidates in just 52% of hiring decisions, the most-experienced woman candidates in 83% of hiring decisions and the most-experienced younger male candidates in 69% of hiring decisions. To test our hypotheses, we ran a mixed-effects ANOVA with competition (competition vs. no

competition) and best candidate type (women vs. older men vs. younger men benchmark) as independent variables (main and interaction effects), with the number of best candidates selected as the dependent variable. This showed a statistically significant effect of the three candidate types on the selection rate (older men, women vs. younger men; $F(1, 399) = 95.76$, $p < .001$, $\eta_p^2 = .19$; see Table 4). As expected, participants selected significantly fewer older candidates ($M = 3.11$, $SD = 2.03$), compared to younger men benchmark candidates ($M = 4.13$, $SD = 1.69$) and women, who were the most selected candidates ($M = 4.97$, $SD = 1.36$). A post-hoc test of differences showed significant differences between older candidates and younger men benchmark candidates ($M_{diff} = -1.03$ 95% CI[-1.24, -0.82], $p < .001$), older and women candidates ($M_{diff} = -1.86$ 95% CI[-2.07, -1.65], $p < .001$) and women and younger men benchmark candidates ($M_{diff} = -0.83$ 95% CI[-0.97, -0.70], $p < .001$). The main effect of competition was not significant, $F(1, 399) = 0.01$, $p = .922$, $\eta_p^2 < .01$, but competition had a significant interaction with candidate type, $F(2, 398) = 3.55$, $p = .029$, $\eta_p^2 = .01$, such that competition increased the selection of older candidates (+5%) and decreased selection of women and male benchmark candidates (-4% and -2%, see Figure 7). Post-hoc tests showed the effect of competition was not significant for any of the candidate types alone, older men (-3.04 95% CI[-0.70, -0.09], $p = .136$), women (0.15 95% CI[-0.12, 0.42], $p = .273$), nor the younger men benchmark candidates (0.11 95% CI[-0.22, 0.45], $p = .495$).

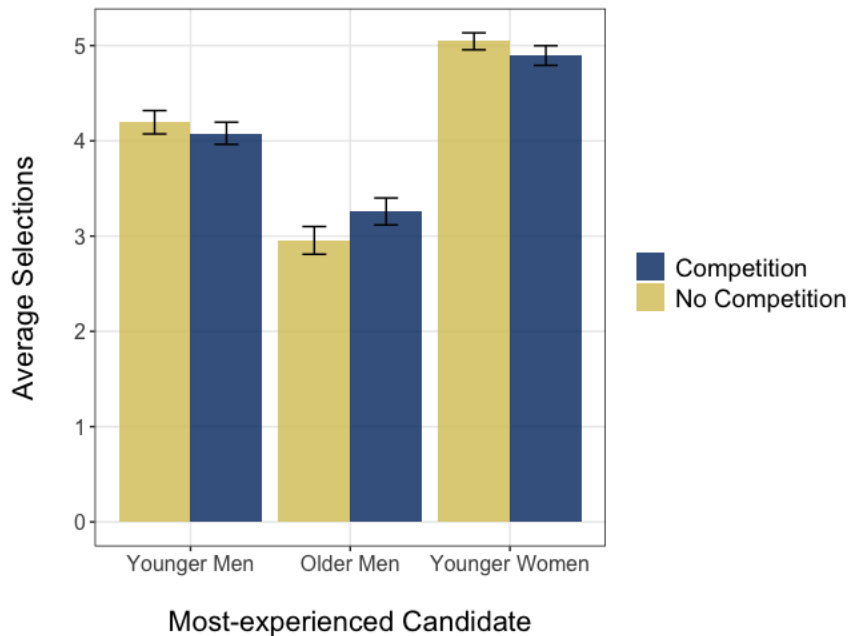
Table 4

Study 2 selection frequency and proportion of total for most experienced candidate between conditions (N = 401), no competition (n = 201) and competition (n = 200).

	Category	1. No-Competition		2. Competition		Total	
		#	%	#	%	#	%
Older Men	1. Software Engineer	90	45%	95	48%	185	46%
	2. Software Engineer	99	49%	117	59%	216	54%
	3. Software Developer	112	56%	119	60%	231	29%
	4. Software Developer	104	52%	114	57%	218	40%
	5. Data Engineer	119	59%	129	65%	248	46%
	6. Data Engineer	78	39%	87	43%	165	41%
	Average		50%		55%		52%
Women	1. Software Engineer	140	70%	125	63%	265	66%
	2. Software Engineer	169	84%	165	83%	334	83%
	3. Software Developer	179	89%	155	78%	334	83%
	4. Software Developer	177	88%	178	89%	355	89%
	5. Data Engineer	186	93%	177	89%	363	91%
	6. Data Engineer	168	84%	162	81%	330	82%
	Average		84%		80%		82%
Younger Men	1. Software Engineer	95	47%	93	47%	188	47%
	2. Software Engineer	151	75%	154	77%	305	76%
	3. Software Developer	160	80%	144	72%	304	76%
	4. Software Developer	163	81%	162	81%	325	81%
	5. Data Engineer	119	59%	107	54%	226	56%
	6. Data Engineer	151	75%	160	80%	311	78%
	Average		70%		68%		69%

Figure 6

Study 2 average selections for most experienced candidate by group between conditions ($N = 401$), no competition ($n = 201$) and competition ($n = 200$).



Although most participants believed that age did not matter, 24% believed that younger people were more productive, and 40% believed that the selection panel would prefer a younger candidate (*see Table 5*). A one-sample t-test against a value of '4' (no difference), showed that these beliefs about productivity and selection panel preferences were statistically significant, $t_{productivity}(400) = -3.46, p < .001, d = 0.88$; $t_{panel_preference}(400) = -10.52, p < .001, d = .91$. For gender, 88% believed productivity did not differ and 83% believed that there would be no difference for the selection panel. However on average, participants believed women were more productive, but that the selection panel would slightly prefer men candidates, $t_{productivity}(400) = 4.24, p < .001, d = 0.21$; $t_{panel_preference}(400) = -2.78, p = .006, d = 0.61$.

Table 5

Participants who believed that age and gender mattered/did not matter in work productivity and panel preference in Study 2.

	Age			Gender		
	Younger Higher	No difference	Older Higher	Male Higher	No difference	Women Higher
Productivity Beliefs	24%	64%	12%	4%	88%	8%
Panel Preference	41%	53%	6%	11%	83%	6%

We expected competition to moderate the relationship between participant beliefs and the selection of underrepresented candidates. To test this, we ran a hierarchical regression analysis with underrepresented candidate selections (older candidates or women) as the dependent variables. Productivity and panel preference were mean-centered and the competition condition variable dummy-coded (0 = no competition, 1 = competition). We entered the competition condition and beliefs for underrepresented candidates (older candidates or women), together with their interaction terms (*see* Table 6). Participants who believed older candidates were less productive or preferred by the company selection panel selected fewer older candidates. However, these beliefs had no effect on the selection of women candidates. Contrary to expectation, no interaction was found between these beliefs and the competition condition.

Table 6

Multiple linear regression analyses on selection of older and women candidates in Study 2 by beliefs (N=400).

	Selection rate of older candidates				Selection rate of women candidates			
	Productivity		Selection Panel Preference		Productivity		Selection Panel Preference	
	B	SE B	B	SE B	B	SE B	B	SE B
Age Belief (younger vs. older)	.94***	.14	1.01***	.14				
Gender Belief (men vs. women)					.02	.19	-.02	.16
Competition (=1)	.15	.19	.19	.19	-.15	.14	-.15	.14
Competition × Beliefs	-.31	.22	-.16	.21	.11	.26	.18	.22
<i>R</i> ²	.13***		.18***		.00		.01	
F	20.06		29.51		0.58		0.77	

Note. *** $p < .001$

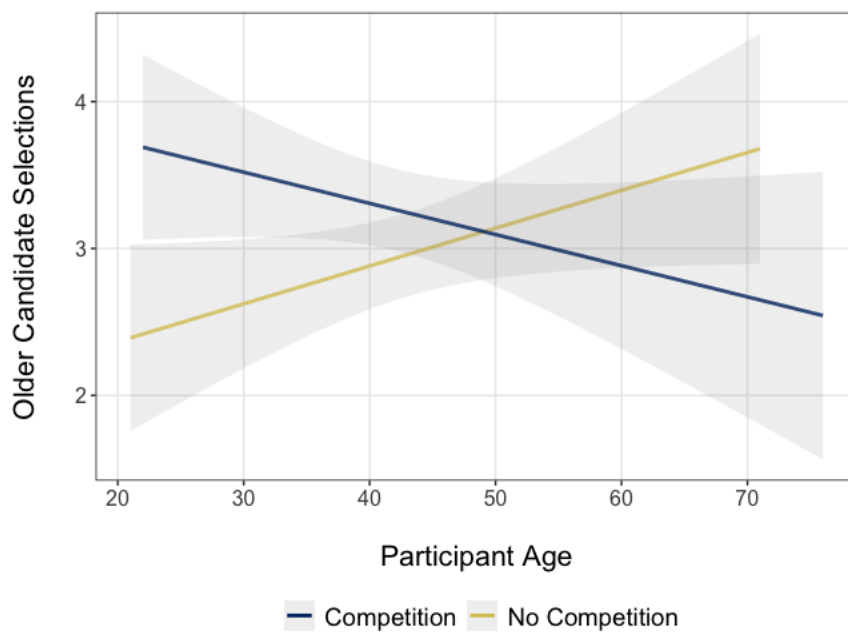
3.5.3 Exploratory Analysis

We tested the effect of participant attributes on the selection of underrepresented candidates using a hierarchical linear regression with interaction terms for competition. Age on its own was not associated with selection of older workers, $b_{\text{age}} = 0.00$, $p = .680$. However, a significant interaction was found between participant age and competition, $b_{\text{age} \times \text{competition}} = -0.05$, $p = .015$. Probing this interaction with the Johnson-Neyman technique (Hayes & Matthes, 2009), showed that the region of significance ($p < .05$) was for participants below the age of 40 (see Figure 8). Specifically, participants below the age of 40 in the competition condition selected significantly more older candidates than those in the no competition condition. Participants under the age of 40 selected significantly more older candidates in the competition condition ($M = 3.47$, $SD = 2.00$) than those in the non-competition condition ($M = 2.69$, $SD = 2.16$; $t(174) = 2.48$, $p = .014$, $d = 2.07$). A bivariate correlation showed that younger participants, held stronger beliefs that younger candidates would be more productive

and more preferred candidates for the company selection panel, $r_{\text{productivity}(399)} = .19, p < .001$; $r_{\text{panel_preference}(399)} = .14, p = .006$. There was no significant effect of gender or gender together with competition on the selection of women candidates, $b_{\text{gender}} = 0.05, p = .771$; $b_{\text{gender*competition}} = 0.36, p = .189$. Male hirers assessed women's productivity more positively ($M = 4.15, SD = 0.59$) than women hirers ($M = 4.02, SD = 0.44$; $t(398) = 2.45, p = .015, d = 0.52$).

Figure 7

The effect of competition depended on participants' age in Study 2. The competition condition (blue) showed higher candidate selections among participants under 40 years of age, compared to the no competition condition (yellow). Confidence intervals are shown in grey, non-overlapping areas represent statistically significant difference.



3.5.4 Discussion

In Study 2, we set out to replicate the effect of competition observed in the UK & US samples in Study 1, specifically that competition exacerbated discrimination against older applicants. We also looked to explain the reasons that competition might attenuate this selection. As in Study 1, we found significantly fewer older male candidates were selected, compared to women and benchmark younger male candidates (where only experienced varied). Overall, competition did not have a consistent, significant effect on the selection of women or older candidates. Older candidates were believed to be both less productive and less preferred by the selection panel compared to younger candidates, and these beliefs were stronger among younger participants. Among younger participants (those aged below 40 years), competition slightly increased the selection of older candidates.

3.6 General Discussion

Across two studies, we aimed to examine the effect of competition on discrimination in hiring decisions involving underrepresented candidates. Both studies focused on the technology industry as a context in which both older workers and women have been traditionally underrepresented (Ansari, 2020; EIGE, 2018; EEOC, 2019), and subject to negative stereotypes. In the case of women, these stereotypes include that women have lower raw intellect (Leslie et al., 2015), mathematical ability (Tiedemann, 2000) and technical skills (Klinger & Svensson, 2021). In the case of older candidates, stereotypes include that older workers are less motivated and more resistant to change (Ng & Feldman, 2012) and less capable with new technologies (Van Dalen et al, 2010). We expected that competition-based incentives would increase selection of the ‘best’ (most experienced) candidates who belonged to negatively stereotyped and underrepresented groups by increasing motivation and accountability, which in turn would lead to greater analytical consideration (Evans, 2008;

Larrick, 2004; Lerner & Tetlock, 1999; Tetlock, 1992; Tetlock & Lerner, 1999), and reduce recruiters' reliance on stereotypes (Brief et al., 2000; Kim et al., 2022).

We found contradictory evidence about the influence of competition on the selection of underrepresented candidates across our two studies. In Study 1, we found that competition decreased selection of older candidates in a sub-population of UK and US workers. However, in Study 2 we found that competition actually increased selection of the 'best' (most experienced) older candidates among participants aged 40 years and younger. In both studies participants were less likely to select older candidates when they were the 'most experienced' compared to the 'most experienced' women and younger men. Participants who selected fewer older candidates believed older candidates to be both less productive and less preferred by the selection panel compared to younger candidates. Age was also associated with these beliefs, such that younger participants believed more strongly that older candidates were less productive and less preferred by the section panel.

3.6.1 Theoretical Implications

Theoretically, we expected that competition-based incentives could either reduce or increase discrimination against underrepresented candidates, depending on whether stereotypical judgments were believed to be valid information for the decision. Study 1, provided evidence that the effect of competition differed as a function of the characteristics of the best applicants: it reduced the selection of older candidates (increased discrimination) but slightly increased the selection rate of young women and men, in a subsample of US and UK respondents where gender and age are protected characteristics. However, this effect was not replicated in Study 2. Rather, competition had the opposite effect on the selection rate of older applicants, increasing the selection rate of older candidates among younger participants.

These findings limit the conclusions that can be drawn. The effect of competition on selection appears very context dependent, changing as a function of recruiter and candidate characteristics. No blanket effect of reduced discrimination under competitive conditions was found, as has been shown in some of the large economic studies (Arceo & Campos-Vázquez, 2016; Baert et al., 2015; Johnston & Lordan, 2016). Nor was there any clear effect that might indicate that the incentive and accountability created by competition-based incentives may have led to greater analytical reflection about hiring decisions (Brief et al., 2000; Evans, 2008; Kim et al., 2022; Larrick, 2004; Lerner & Tetlock, 1999; Tetlock, 1992; Tetlock & Lerner, 1999). Findings from Study 2 suggest that beliefs about candidate group productivity and selection panel preferences are important in influencing the selection of older candidates. Specifically, that as well as personal beliefs, hiring decisions can be influenced by the perceived preferences of the selection panel. This extends past findings showing that recruiters can align hiring decisions to the perceived prejudices of others to win approval (Vial et al., 2019a), be it in the form of social approval or monetary incentive.

3.6.2 Applied Implications

While in both our studies, older candidates were clearly the ‘best’, they faced significantly lower levels of selection. This suggests that the underrepresentation of older workers in technology industries seen in Europe and OECD countries is, at least in some part, due to active discrimination in hiring. Given the ageing workforce, failure to address this discrimination is likely to increase economic costs to firms and societies via under-utilisation of talent (Baert, 2021; OECD, 2020) and social system pressures (Li & Mutchler, 2020). As many roles rely on HR recruitment agencies engaged in competitive recruitment for incentives (Finlay & Coverdill, 1999), understanding the effect of competition on individual

hiring decisions has important real-world implications. It has long been suggested that structural factors can exert significant influence on prejudices and discriminatory actions in hiring (Pager & Quillian, 2005), yet our studies provide mixed evidence for this.

Finding that older men, but not women candidates were discriminated against supports previous findings that prejudicial attitudes towards older male candidates are stronger than for younger candidates, for whom attitudes do not differ by gender (Martin et al., 2019). Although women remain heavily underrepresented in technology industries (EIGE, 2018; EEOC, 2022), our studies found no evidence of discrimination against women candidates. This indicates that the underrepresentation may be caused by other factors including pipeline ‘leakage’ (where women drop out of STEM studies; Cheryan et al., 2017; Klinger & Svensson, 2021), that women are put-off by the culture that accompanies many computer science degrees (Miller et al., 2021), and that a legacy of male-representation in technology has inhibited women’s opportunities to gain commensurate experience (Koput & Gutek, 2010).

3.6.3 Limitations and future directions

There are a few points that should be considered when interpreting our findings. First, although our studies were designed to simulate the conditions of contingency recruitment, the bonuses paid to hirers were low, and there are differences between experimental conditions and the way contingency recruitment works in practice. HR recruiters often develop relationships which help guide their selection criteria and there is often a level of exclusivity in the candidates (and information about those candidates) that recruiters have access to. Future experimental studies that simulate the conditions of contingency recruitment might wish to increase bonuses to make them a greater proportion of payment or vary the incentive

such that, they are competing to avoid losing a bonus (which may or may not alter hirer behaviour; Gal & Rucker, 2018). Additionally, in competition resulting from contingency recruitment, the applicant pool is limited, and each candidate can only be selected once by a recruiter to be put forward to a company (Fernandez-Mateo & King, 2011). The same candidate cannot be selected multiple times by multiple recruiters, thus in this respect our competition manipulation was not quite ‘realistic’. Second, in our competition experiments, we did not explicitly state the selection panel criteria for the ‘best candidates’. While this was helpful to understand participant selections and their perceptions of unspoken criteria, often criteria is explicitly stated. For example explicit diversity statements made by organisations might influence the selection of underrepresented candidates by hirers in the technology sector under conditions of competition. One Silicon Valley technology company gained publicity by explicitly stating in their job advertising “*We do not discriminate based on age. Experience matters.*” (Kelly, 2021). When authentic, these statements have the potential to promote diversity (Avery & McKay, 2006; Carnes et al., 2019; Windscheid et al., 2016) and could shape hirers’ understanding of selection panel preferences (Vial et al., 2019a, 2019b).

Economies around the world are currently grappling with how they will reskill tens of millions of midcareer, middle-aged workers in response to technological shifts (Illanes et al., 2018). Our studies suggest that technologically reskilled older workers with more accumulated relevant experience than their younger counterparts will face significant discrimination in the job market. How these reskilled older candidates in technology roles might take action to avoid such discrimination in practice remains a question for future research. Similarly, although we did not find evidence of discrimination against women in hiring decisions, more research is needed to understand the systemic reasons that they are currently underrepresented in technology sectors.

3.6.4 Conclusion

The present findings contribute to existing psychological literature on competition and selection decisions concerning underrepresented candidates. Overall, incentive-based competition may have negligible effects on selection of the ‘best candidates’ for technology roles. One exception is that competition may motivate younger participants to inhibit bias and increase their selection of older candidates, who currently face significant hiring discrimination for these roles. We find that older candidates are believed to be less productive and less desirable to selection panels, which (at least partly) explains why they are selected in lower proportion to similarly experienced younger candidates. The most experienced younger women candidates are selected in equal or greater proportion than younger men and are perceived as more productive and equally preferred to selection panels. We conclude that the effect of incentive-based competition on hiring of the best candidates might be limited to contexts where the decision maker can be motivated via reward to attenuate a strong, known biases against a candidate group.

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[Oup](https://eige.europa.eu/publications/work-life-balance/eu-policies-on-work-life-balance/women-in-ict#:~:text=Currently%20only%20around%2017%25%20of,need%20to%20be%20trained%20)

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CHAPTER 4

4. Workplace intergenerational climate and retirement intentions among older workers

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Author Note

This is a version of a manuscript in preparation. Acknowledgements: This research was supported by the Centre for Open Science (COS) as part of a Many Labs replication project. The data for Study 2 was collected in collaboration with the second author. All research described in this article was approved based on requirements set out by the University of Essex Ethics Committee (ETH1920-1011). The hypotheses, materials and the analytical approach were pre-registered and the anonymized copies of these pre-registrations, study data and supplementary materials have all been made available via the Open Science Framework (OSF) here,

https://osf.io/7mtc8/?view_only=73cc2d387ae8490389e68c761c5a901e

4.1 Abstract

Retaining older workers represents a growing challenge for organisations seeking to adapt to an ageing workforce. This study examines how the intergenerational diversity climate perceived by older workers in their organisation is associated with their retirement intentions, specifically their intention to either retire early or to retire later by continuing to work beyond retirement age. We conducted two pre-registered studies of workers aged between 40 and 75 years ($N = 375$), finding older workers who perceive a more positive intergenerational climate at their workplace have lower intention to retire early, but not greater intention to continue work beyond retirement age. This relationship was partly mediated by variations in job satisfaction. Implications for theory, practice and future research are discussed.

Keywords: ageing workforce, retirement, organisational culture/climate, job satisfaction, age diversity.

4.2 Background

Creating a workplace climate that aims to retain older workers has become an important business strategy for many organisations, with early retirements representing a significant risk amid an ageing workforce (Clark & Ritter, 2020). Retirement intentions refer to the way older workers think about the end of their career and their goals and plans for this end (Feldman, 1994). These intentions can be conceptualized as either late (i.e., continuing to work beyond retirement age) or early (i.e., retiring before retirement age) (Bal et al., 2015; Kanfer et al., 2013; Topa & Zacher, 2018), and tend to predict actual retirement behaviors (Böckerman & Ilmakunnas, 2019; Solem et al., 2016). With an ageing workforce changing the retirement landscape, greater understanding is needed of how organisational climate influences the intentions of older workers to stay in the workforce for longer (Henkens et al., 2018).

Organisational climate refers to how employees perceive their work environment (Baltes et al., 2009), a specific aspect of which is the quality of relationships between people of different ages, the intergenerational diversity climate (Lyons & Kuron, 2013). Employees are motivated to continue working for companies they perceive as having a positive diversity climate (Lee et al., 2020; Mor Barak et al., 1998), including positive age (intergenerational) diversity (Bilinska et al. 2016; Boehm et al., 2014). A positive intergenerational climate is characterised by inclusiveness and quality relationships between employees of different ages and an absence of age-based stereotypes (King & Bryant, 2017). In the workplace, negative age-based stereotypes are mostly directed towards older workers (Macdonald & Levy, 2016; North & Fiske, 2016; Palcari et al., 2019), broadly associating older age with lower levels of competence (Abrams et al., 2016) or prescribing that older workers should ‘step-aside’ to make way for younger generations (North & Fiske, 2013). To retain older workers in the

workplace for longer, it is therefore important to understand if the way older workers feel about their organisation's intergenerational diversity climate is related to their retirement intentions (Henkens et al., 2018; Zacher & Yang, 2016).

A continuity theory of ageing suggests that older adults are motivated to make later-life decisions that help them to maintain positive self-perceptions (Atchley, 1989). Older workers who feel valued by their organisation's climate are unlikely to have early retirement intentions and may be more motivated to continue working with the organisation beyond retirement age. By contrast, those who do not feel valued may have greater intentions to leave the organisation to pursue activities of value in retirement (Schmidt & Lee, 2008; Topa et al., 2009). Social interactions (Fasbender et al., 2016), HR practices directed towards older workers (Armstrong-Stassen & Schlosser, 2011) and age-related work stereotypes (Gaillard & Desmette, 2010) can all shape older worker's retirement intentions in this way. A validated workplace intergenerational climate scale (WICS; King & Bryant, 2017) can be used to establish an overall picture of the intergenerational climate perceived by older workers that includes these aspects. This scale is used to establish if the intergenerational climate is free from generational stereotypes that can undermine older workers productivity (Abrams et al., 2016), that there is the necessary positive affect between workers of different generations (Joshi et al., 2011), that a level of friendliness and inclusiveness precludes the presence of in-group and out-group tensions between older and younger workers (North & Fiske, 2012), and, that there exists a prejudice-reducing level of cooperative contact between these workers (Allport, 1954).

Hypothesis 1. We expect intergenerational climate to shape older worker's retirement intentions. Specifically, a positive intergenerational climate will be positively related to later

retirement intentions (H1a, Studies 1 & 2) and negatively related to early retirement intentions (H1b, Study 2).¹⁰

The relationship between various organisational measures and older workers' retirement intentions is often explained by changes to job satisfaction. For example, perceived organisational support (Armstrong-Stassen & Ursel, 2009; Hofstetter & Cohen, 2014), working conditions, and management practices (Böckerman & Ilmakunnas, 2019) all predict the job satisfaction and subsequent retirement intentions of older workers. Workers (younger and older) who report a more positive intergenerational climate in their workplace have higher job satisfaction (King & Bryant, 2017), and changes to job satisfaction can increase older worker's intention to continue working and retire later (Templer et al., 2010) and lower intention to retire early (Zacher & Rudolph, 2017).

Hypothesis 2. We expect the relationship between intergenerational climate and retirement intentions to be mediated by job satisfaction.¹¹

4.2.1 Method

Participants. In two studies, we recruited 183 (Study 1) and 192 (Study 2) participants from Amazon's Mechanical Turk (MTurk) using TurkPrime pre-screening to target only participants who were employed for 20hrs+ per week, resident of the United States, and aged 40 or older. Although there is no precise age at which a worker becomes an 'older worker', 40 years of age is the definition used in the U.S. Age Discrimination in Employment Act (EEOC, 2022) and is the age used in past research on workplace intergenerational climate (King & Bryant, 2017). There is considerable evidence that using

¹⁰ Reviewer note: H1a corresponds with H3 in the pre-registrations for Studies 1 and 2. H1b corresponds with H5 for Study 2.

¹¹ Reviewer note: H2 corresponds with pre-registered H5 for Study 1, and H6 and H7 for Study 2.

MTurk together with screening tools provides equally reliable and more representative data when compared to data collected in-person or via market research companies (Kees et al., 2017; Chmielewski & Kucker, 2020; Litman et al., 2017), including for organisational research (Keith et al., 2017). Participants were paid \$1.20 to undertake the 10-minute survey. Table 7 provides descriptive statistics for both samples. These samples were representative for gender and income when compared to U.S. Census Bureau (2019) data, but participants were slightly more educated (48% held a Bachelor's degree or higher vs. 31% in the general US population) and slightly less racially diverse (81% White vs. 76%).

Table 7*Descriptive statistics for study samples.*

Sample	Study 1		Study 2	
	<i>n</i>	%	<i>n</i>	%
<i>N</i>	183		192	
Gender				
Female	101	55%	94	49%
Male	82	45%	98	51%
Age				
40 – 49	99	54%	101	53%
50 – 59	59	32%	70	36%
60 – 69	23	13%	19	10%
70+	2	1%	2	1%
Education				
High school diploma or less	13	7%	11	6%
Some college	17	9%	33	17%
Associate or Bachelor's degree	98	54%	107	56%
Master's degree or higher	53	29%	41	21%
Personal Income				
Less than \$20,000	17	10%	39	20%
\$30,000 - \$79,000	109	60%	120	63%
Greater than \$80,000	55	30%	33	17%
Race/Ethnicity				
Asian / Pacific Islander	15	8%	7	4%
Black or African American	8	4%	10	5%
Hispanic or Latin	10	6%	6	3%
Native American or Alaska Native	1	1%	4	2%
White / Caucasian	147	80%	158	82%
Other	2	1%	4	2%
Not specified	0	0%	3	2%

Materials and Procedure. Participants provided informed consent before completing the following measures:

Workplace intergenerational climate was measured using the Workplace Intergenerational Climate Scale (WICS; King & Bryant, 2017), a 20-item measure of employees' attitudes and perceptions about workers of different ages in the workplace. The WICS includes five interrelated subscales, each with four statements. Four of these subscales are completed on a 4-point scale (1: *strongly disagree*; 4: *strongly agree*); Lack of Generational Stereotypes (LGS; e.g., "Co-workers outside my generation usually talk about things that don't interest me", all items reverse-coded), Positive Intergenerational Affect (PIA; e.g., "I enjoy interacting with co-workers of different generations", one item reverse-coded), Workplace Generational Inclusiveness (WGI; e.g., "Workers of all ages are respected in my workplace") and General Age- Related Friendliness (GAF; e.g., "I feel pressure from younger workers to step down" , all items reverse-coded). The fifth subscale, Intergenerational Contact (IC; e.g., "How often do you eat meals with co-workers outside your generation during the workday?"), is completed on a 4-point scale (1: *never*; 4: *very often*). Higher scores reflect more positive intergenerational attitudes. Prior to our analysis, we successfully replicated the original findings of King & Bryant (2017) among our sample of older workers, validating the intergenerational climate scale by showing it predicted unique variance in older workers' positive contact with younger workers +11% (Study 1) and +19% (Study 2) over and above measures of job satisfaction, perceived differences between younger and older workers, and attitudes towards older people in society.¹²

¹² The complete findings of this replication and details of measures used are presented in the online supplementary materials [here](#). This data was collected as part of a Many Labs-style replication conducted as part of the SCORE project (COS SCORE, n.d.).

Retirement intentions were measured as either late (Studies 1 & 2) or early (Study 2). Late retirement intentions were based on the Motivation to Continue Working Scale (MCW, from Bal, de Jong, Jansen & Bakker, 2012), and early retirement intentions were based on the Retirement Intentions Scale (from Adams & Beehr, 1998). Both measures contained four items measured on a 5-point Likert scale (1: *strongly disagree*; 5: *strongly agree*) of either intention to work beyond retirement age (e.g., “Barring unforeseen circumstances, I would remain working as long as possible”) or to retire early (e.g., “I expect to retire in the near future”). Higher scores reflect greater intention to retire later or earlier respectively.

Job satisfaction was measured using the Job Satisfaction Survey (JSS; based on Bellingham, 2004), a 10-item measure of job satisfaction (e.g., “I find meaning in my work”). Participants respond on a 4-point scale (1: *strongly disagree*; 4: *strongly agree*).

Participants responded to demographic measures either after completion of these measures (Study 1) or before (Study 2). Means, standard deviations, alphas and correlations between variables are presented in Table 8.

The complete details of hypotheses, replication and measures used are presented in the online supplementary materials here.

Table 8*Descriptive statistics and correlations between variables.*

Variable	Mean	SD	α	Range	(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)
Study 1 (N = 183)					(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)
1. Workplace Intergenerational Climate (WICS)	2.99	0.39	0.81	1.75 – 4.00	-								
2a. Late Retirement Intentions (LRI)	3.42	1.25	0.92	1.00 – 5.00	.03	-							
3. Job Satisfaction Scale (JSS)	3.18	0.51	0.91	1.00 – 4.00	.58**	.21**	-	-					
4. Age	50.49	7.47	-	41.00 – 78.00	-.09	.05	-	.06	-				
5. Years with employer	11.25	8.66	-	1.00 – 43.00	.02	-.03	-	.16*	.27**	-			
6. Weekly hours worked	40.03	5.18	-	20.00 – 60.00	.05	.05	-	-.04	.05	.11	-		
7. Gender (Men=1, Women=2)	-	-	-	-	.07	.15*	-	.04	.12	-.03	-.07	-	
8. Income	-	-	-	-	.04	-.20**	-	.01	.02	.13	.31**	-.37**	-
9. Health (self-reported)	3.82	0.76	-	2.00 – 5.00	.20**	.09	-	.23**	.08	.04	.03	-.04	.12
Study 2 (N = 192)					(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)
1. Workplace Intergenerational Climate (WICS)	2.89	0.37	0.88	2.15 – 4.00	-								
2a. Late Retirement Intentions (LRI)	3.60	1.19	0.94	1.00 – 5.00	-.01	-							
2b. Early Retirement Intentions (ERI)	2.59	1.21	0.92	1.00 – 5.00	-.41**	-.14	-						
3. Job Satisfaction Scale (JSS)	3.20	0.51	0.92	1.10 – 4.00	.45**	.21**	.01	-					
4. Age	50.00	7.70	-	40.00 – 74.00	.12	.17**	-.06	.09	-				
5. Years with employer	9.23	6.91	-	1.00 – 34.00	.30**	-.11	-.08	.30**	.20**	-			
6. Weekly hours worked	38.56	10.53	-	20.00 – 60.00	.15*	-.01	-.16**	.05	-.17*	.11	-		
7. Gender (Men=1, Women=2)	-	-	-	-	.18*	.02	-.08	-.03	.12	-.03	-.14	-	
8. Income	-	-	-	-	.17*	-.14*	.00	.21**	-.15*	.24**	.21**	-.07	-
9. Health (self-reported)	3.94	0.80	0.80	2.00 – 5.00	.10	-.01	.11	.36**	-.18*	-.08	.07	-.09	.19**

Note. ** $p < .01$, * $p < .05$; Scale reliability measured using Cronbach's Alpha (α)

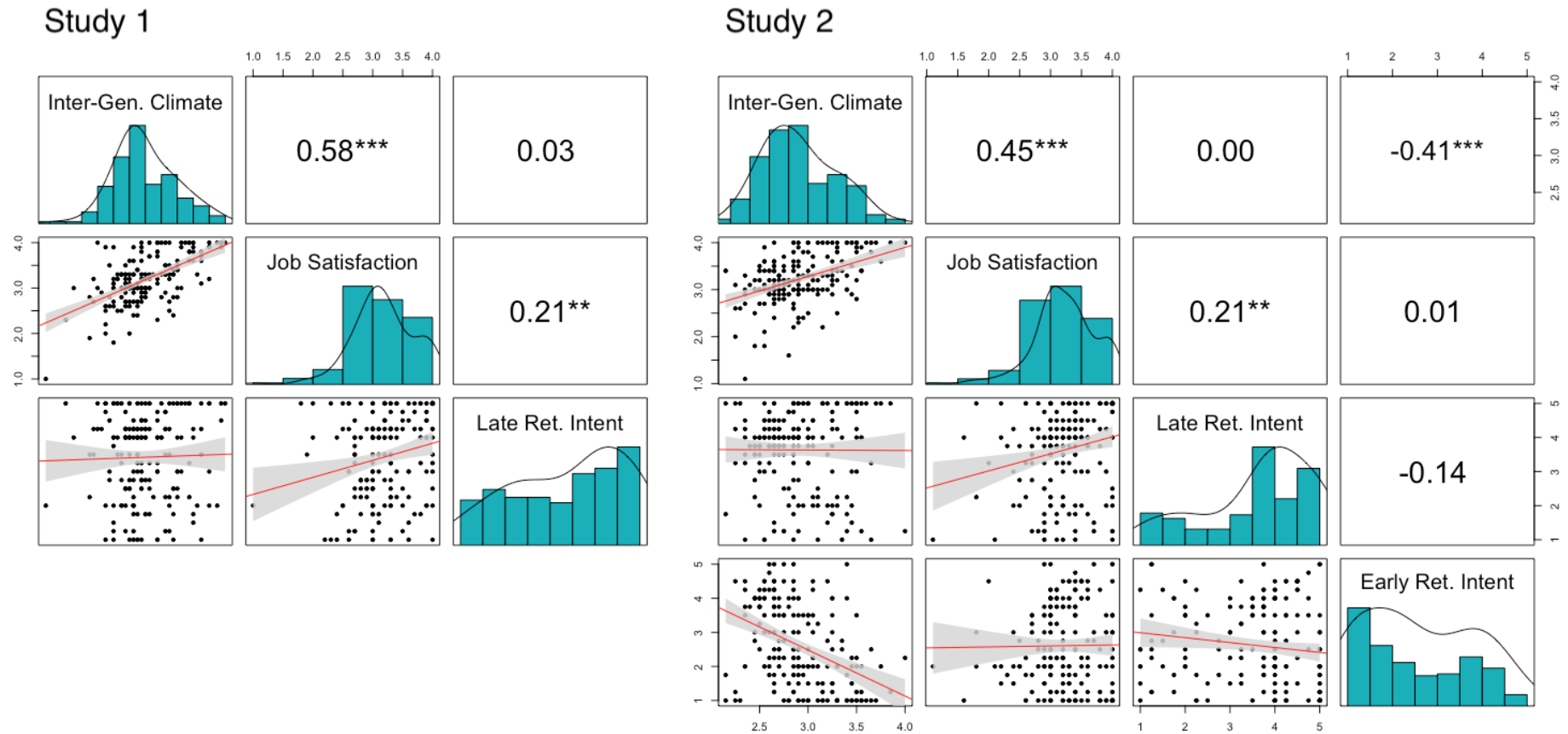
Analyses. To test Hypothesis 1, we used correlation analyses to test the simple relationships, before using regression analyses to control for factors that might influence retirement intentions such as health (e.g., Desmette & Gaillard, 2008; Shultz & Wang, 2007), gender (e.g., Talaga & Beehr, 1995; Kim & Moen, 2002) and finances (e.g., Adams, 1999; Davies et al., 2017). To test Hypothesis 2 we used bootstrapped mediation analysis.

4.3 Results

As shown in Figure 9, in Studies 1 and 2, we found no evidence that older workers' perception of their workplace intergenerational climate was related to their intention to retire later, but Study 2 showed that this perception was associated with earlier retirement intentions. To further test our hypothesis that perceived intergenerational climate would be associated with retirement intentions among older workers, we ran a hierarchical regression analysis controlling for job satisfaction and demographic variables for both late retirement and early retirement intentions (Table 9). In Step 1 of the analysis, we assessed the role of demographics and job satisfaction, finding that in both Study 1 and 2, older workers with higher job satisfaction had greater intention to retire later, but not earlier. In Step 2, we added intergenerational climate to the predictive model, and found that older workers who perceived a more positive intergenerational climate in their organisation did report lower intention to retire earlier (H1b) but not greater intention to prolong retirement to retire later (H1a). Thus, older workers who reported a more positive intergenerational climate did not show significantly greater intent to prolong their careers beyond retirement age but were significantly less likely to hold intentions to cut their career short and retire early.

Figure 8

Distribution and correlations between measures of intergenerational climate, job satisfaction and retirement intentions in Studies 1 (N = 183) and 2 (N = 192).



Note. Inter-Gen. Climate (intergenerational climate), Late Ret. Intent (late retirement intentions), Early Ret. Intent (early retirement intentions); *** $p < .001$, ** $p < .01$

Table 9

Summary of Study 1 and Study 2 hierarchical regression analyses predicting older worker's retirement intentions.

Variable	Study1 (N = 183)				Study 2 (N = 192)							
	Late Retirement Intentions				Late Retirement Intentions				Early Retirement Intentions			
	Step 1		Step 2		Step 1		Step 2		Step 1		Step 2	
	β	SE	β	SE	β	SE	β	SE	β	SE	β	SE
Age	.04	.01	.01	.01	.16*	.01	.17*	.01	.05	.01	-.01	.01
Gender (women = 1)	.07	.19	.08	.19	-.01	.17	.02	.17	-.09	.18	.02	.17
Health (self-rated)	.07	.12	.09	.12	-.09	.12	-.09	.12	.10	.13	.09	.11
Income	-.22**	.04	-.21*	.04	-.13 [^]	.03	-.12 [^]	.03	.02	.04	.04	.03
Weekly hours worked	.13 [^]	.02	.14 [^]	.02	.06	.01	.08	.01	-.18*	.01	-.11	.01
Years with employer	-.05	.01	-.06	.01	-.23**	.01	-.21**	.01	-.04	.02	.03	.01
Job satisfaction	.10**	.18	.30**	.22	.32***	.19	.37***	.20	-.00	.20	.20*	.20
Intergenerational climate			-.17 [^]	.29			-.12	.26			-.51***	.25
F Δ (df)	(7,175)		(1,174)		(7,184)		(1,183)		(7,167)		(1,166)	
	= 3.06**		= 3.39 [^]		= 4.32***		= 1.98		= 1.59		= 44.04***	
ΔR^2			.02				.01				.20	
Total R^2	.11		.13		.14		.15		.05		.24	

Note. *** $p < .001$, ** $p < .01$, * $p < .05$, [^] $p < .10$.

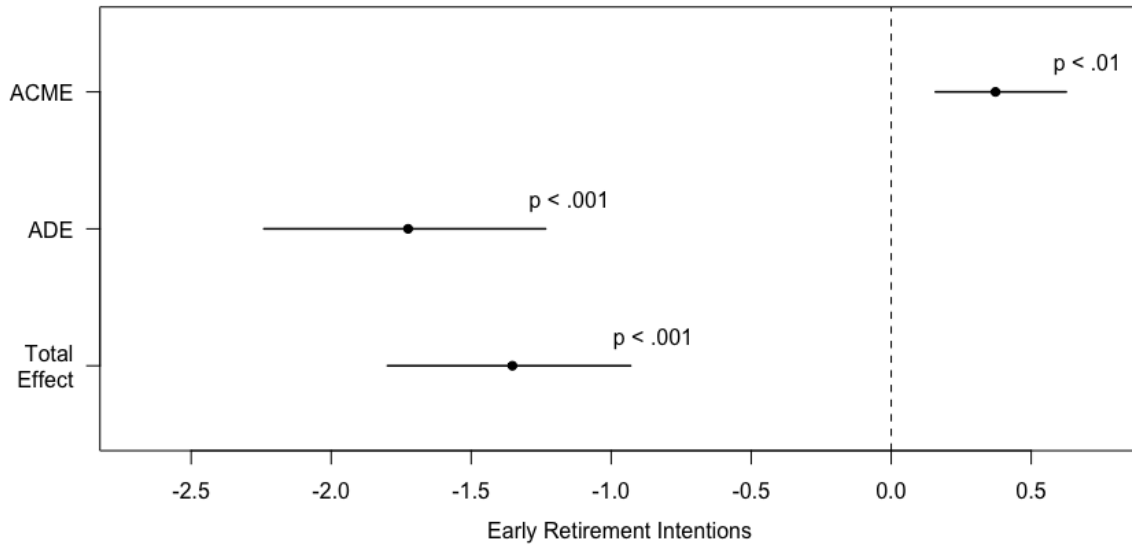
We next tested Hypothesis 2, that the relationship between intergenerational climate and early retirement intentions would be mediated by job satisfaction (see Figure 10). We conducted a bias-corrected bootstrapping mediation analysis with 5000 resamples (Hayes, 2013) and found that job satisfaction partially mediated the relationship between intergenerational climate and early retirement intentions (direct effect, $b = -1.72$). However, the direct (unmediated) effect was also statistically significant, indicating that the variation in early retirement intentions was not explained by changes in job satisfaction alone (total effect, $b = -1.35$). No covariates were used in the mediation analysis. The analysis showed that job satisfaction partially explained the relationship between intergenerational climate and early retirement intentions. However, the direction of the relationship between job satisfaction and greater to intention to retire earlier in the mediation model is the opposite of what we expected (*positive*, rather than *negative*; see Figure 10). Job satisfaction and intergenerational workplace diversity climate are *positively* associated, as hypothesized and intergenerational workplace diversity climate is *negatively* associated with early retirement intentions, as hypothesized (i.e., those who experience better workplace climates have lower intention to retire early). But, the effect of job satisfaction on early retirement intentions in the mediation model is *positive*. In other words, job satisfaction could be considered an attenuator or suppressor of the relationship between a more positive intergenerational climate and early retirement intentions, rather than an explainer (MacKinnon et al., 2007).

Figure 9

The mediation effect (ACME) of job satisfaction partially explained the relationship between intergenerational climate and early retirement intentions among older workers the direct

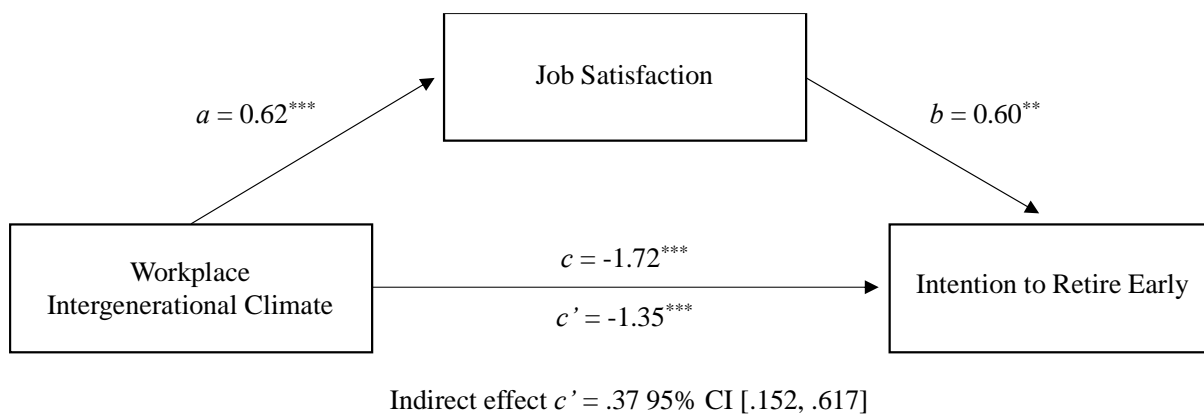
effect (ADE) of in Study 2 ($N = 192$). Figure 10A shows the graphical summary of the mediation analysis, while Figure 10B shows the path diagram between variables.

10A



Note. ACME (Average Causal Mediation Effect), ADE (Average Direct Effects).

10B



4.4 Discussion

We hypothesized that older workers who perceived their organisation to have a more positive intergenerational climate would report greater motivation to continue working past normal retirement age and lower intention to retire early. We found that older workers who perceived their organisation's intergenerational climate to be more positive, reported lower early retirement intentions but these older workers did not show greater intention to continue working and retire later. Across both studies, older workers who perceived their organisation to have a less positive intergenerational climate had lower job satisfaction, and this partially explained the relationship between intergenerational climate and intention to retire early.

These findings demonstrate that older workers have lower intention to retire early when they perceive a more positive intergenerational climate in their organisation. We build on past findings that workers have lower intention to leave an organisation for another job when it has a positive intergenerational climate (Boehm et al., 2014; Bilinska et al., 2016; von Hippel et al., 2012) by showing that this intention extends to leaving the workforce entirely via retirement in the case of older workers. Our study also complements past findings that older workers' general attitudes to their job and organisation influence their decision to delay retirement, whereas organisation-based problems (reflected in workplace climate) are more likely to influence early retirement intentions (Schalk & Desmette, 2015). In our findings job satisfaction predicted late retirement intentions, but only workplace intergenerational climate predicted early retirement intentions. This supports an account of 'early exit' being used as a coping strategy by older workers to withdraw from climates they perceived as discriminatory (Gaillard and Desmette, 2010).

Changes in older worker's job satisfaction are often thought to explain variations to their retirement intentions in general, however our findings showed differences for early and later retirement intentions. Our studies showed that job satisfaction predicted intentions to retire later, supporting prior findings (e.g., Templer et al., 2010). By contrast, we did not find evidence that job satisfaction predicted early retirement intentions. Past literature on the relationship between job satisfaction and general retirement intentions has yielded mixed findings (Fisher et al., 2016; Zacher & Rudolf, 2017), and our results suggest this might be explained by the lack of distinction between early and late retirement intentions.

Consequently, this research offers an important contribution to the measurement of retirement intentions. Although studies often conceptually distinguish between early and late retirement intentions, these are often treated as two sides of the same coin (Bal et al., 2015; Kanfer, Beier, & Ackerman, 2013). For example, recent studies predicting retirement intentions have relied on a single-item measure of retirement thoughts (e.g., "*How often have you considered retiring in the near future in the past six months?*"); Böckerman & Ilmakunnas, 2019; Zacher & Rudolf, 2017). Our finding that early and late retirement intentions have different predictors calls into question the reliance on single item measures of retirement intention, and cautions that intention to retire early is not the opposite of intention to delay retirement to continue working.

Our findings showed that job satisfaction partially explained the relationship between intergenerational climate and early retirement intentions. However, job satisfaction attenuated rather than mediated the relationship between a more positive intergenerational climate and early retirement intentions. Although we did not hypothesise this effect, and it may appear contradictory, past findings show that older workers largely expect to enjoy retirement, and can hold positive attitudes towards their work and retirement simultaneously, recognizing

retirement as the opportunity to pursue new life goals (Brougham & Walsh, 2009; Jolles et al., 2022). While we did not find a significant association between job satisfaction and early retirement intentions, the introduction of intergenerational climate into the regression and mediation analysis led to job satisfaction being positively associated with early retirement intentions. In other words, more satisfied older workers showed *higher* rather than *lower* desire to retire early after controlling for shared variances between older worker's job satisfaction and their perceived workplace intergenerational climate. As intergenerational climate encompasses many organization-related aspects of older worker's job satisfaction, controlling for shared variances may have increased the predictive value of job satisfaction based on individual factors. Specifically, individual characteristics that are positively associated with both job satisfaction and thoughts about retirement, such as self-esteem (Chang et al., 2012), proactiveness (Young et al., 2018) and promotion-focused motivation (Beier et al., 2018), might explain this effect. This would support our theoretical conclusion that intentions to retire early tend to arise due to organization-based problems (workplace diversity climate), rather than individual attitudes or motivation towards the job (job satisfaction).

4.4.1 Implications for practice

HR practitioners could monitor workplace intergenerational climate and may target interventions towards improving it, such as age-specific HR practices around recruitment, retention and development opportunities (Boehm et al., 2014), education and increasing intergenerational contact (Burnes et al., 2019; Truxillo et al., 2015) and specific messaging to workers around 'early' and 'late' retirements.

4.4.2 Limitations and Future Directions

These findings have some potential limitations for consideration. First, our research is on self-reported intentions, rather than actual retirement decisions. However, understanding intentions is important when the goal is to shape them, and the reasons given post-retirement to justify decisions can be clouded by bias (e.g., older adults enhanced memory for positive events; Mather & Carstensen, 2005). Second, our research is cross-sectional rather than longitudinal, and it is therefore difficult to conclude causation. Yet, the relationship between workplace climate and early retirement intentions is unlikely to be reverse-causal (climate is more likely to influence intentions than vice-versa) and cross-sectional research is valuable in establishing these relationships as a basis for theory, further research and potential interventions (Spector, 2019). Third, staying in the workforce beyond retirement age is not always the norm (Van Dalen & Henkens, 2005) and our research addresses only early and late retirement intentions, without explicitly capturing older worker's intention to retire 'on time' when retirement age is reached. Finally, as this research was conducted during the first wave of the COVID-19 pandemic, participants' mean responses for retirement intentions, job satisfaction and intergenerational climate may not be representative of people during 'normal' times. To mitigate the effect of these exceptional circumstances, participants were instructed to consider 'normal' working conditions and analysis was focused on relationships between variables, and not absolute values.

Future studies may wish to replicate these results longitudinally and across different samples outside of COVID-19 affected times. This might help us to better understand the role of workplace diversity climates on retirement intentions, be they to retire 'on-time' at retirement age, 'later' through continued working or 'early', as well as the subsequent retirement outcomes for these workers.

4.4.3 Conclusion

For older workers, a more positive perception of their organisation's intergenerational climate was associated with greater job satisfaction and lower intention to retire early, but not intention to delay retirement to continue working. Overall, this research shows the potential importance of positive intergenerational climates in preventing early retirements among older workers.

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CHAPTER 5

5. Thesis General Discussion

5.1 Overview

As populations around the world age, we are seeing increasing workforce participation of older adults (UK Office for National Statistics, 2021; CPS Tables., n.d). Promoting this participation is important to ensure equality of opportunity for older workers and to maximise workforce productivity by increasing labour participation. Despite this, ageism in recruitment or within organisations can lead older workers to be shut or pushed out of the workforce prematurely (Harris et al., 2018; UK Office for National Statistics, 2022; Truxillo et al., 2015), and there is still a great deal that is not understood about age discrimination in the workplace. Therefore, the goal of this thesis was to produce empirical work drawing on relevant social psychology and judgement and decision-making literatures to understand discrimination against older candidates in selection decisions, and how the age climate perceived by older workers in their organisation is associated with their retirement intentions. Specifically, this thesis aimed to investigate two potential barriers, recruitment and workplace intergenerational climate, which may prevent older adults from bringing their skills and abilities to the workplace and successfully ageing at work (Abraham and Hansson, 1995).

In Chapters 2 and 3, we focused on recruitment decisions, which can act as a barrier to older workers finding a job where their talents are appropriately utilised, especially in the technology sector where older workers are underrepresented (EIGE, 2018) and regularly discriminated against (Perry & Finkelstein, 1999; Schloegel et al., 2018). In both chapters, we found that recruiters held strong preferences for younger candidates over older candidates, and

Chapter 3 showed that this preference is associated with beliefs that older candidates are less productive and less preferred by selection panels compared to younger candidates. These results are consistent with a long-established literature showing discrimination against older candidates in hiring decisions, dating back to Kirchner and Dunnette (1954).

In Chapter 4, we examined the relationship between workplace intergenerational climate and retirement intentions. A motivating and fulfilling organisational environment is important to successful ageing at work (Beier et al., 2020; Kooij et al., 2020). The retirement intentions of older workers can be heavily influenced by their perceived value within their workplace climate (Atchley, 1989; Bal et al., 2012; Feldman & Beehr, 2011). We therefore sought to understand if organisational age diversity (intergenerational) climate might be a barrier to successful ageing at work, as indicated by retirement intentions and job satisfaction. We found that older workers who perceived their organisation's intergenerational climate to be more positive reported lower intention to retire early. However, across two studies, we did not find any relationship between the intergenerational climate perceived by older workers and their intention to delay retirement and continue working. Our findings are consistent with past work showing that older workers' general attitudes towards their job and organisation influences their decision to delay retirement, whereas organisation-based problems (e.g., a negative climate) are more likely to lead older workers to consider 'early exit' into retirement (Gaillard and Desmette, 2010; Schalk & Desmette, 2015).

5.1.1 Generalisability of Results: Ageism towards older workers in hiring and selection decisions.

In Chapters 2 and 3, we found that recruiters held strong preferences for younger

candidates over older candidates. This is not new, as discrimination against older candidates has been established through a range of research methods, including correspondence studies (*for a meta-analysis see* Lippens et al., 2023). However, in applying experimental methods that draw on judgement and decision-making literatures, this thesis provides new perspectives about these preferences against older candidates. In Chapter 2, choice bundling shown to increase selection diversity compared to selections made in isolation, did not consistently increase the age-diversity of candidates hired. These results mark a significant departure from past work showing that choice bundling leads to greater diversity in selections across a range of domains (Benartzi & Thaler, 2001; Read & Loewenstein, 1995; Simonson, 1990; Simonson & Winer, 1992; Ratner, Kahn, & Kahneman, 1999), including gender-diversity via the selection of women candidates in a similar experimental paradigm (Chang et al., 2020). The failure of choice bundling to increase age-diversity, suggests the positive effects of choice bundling on diversity might be contingent on either desirability or salience of a diverse outcome, which has not been explored in past research. For example, Simonson's (1990) foundational work on choice bundling considered snack choices (yogurt, bagels, fruit, soft drink, chocolates, soup, etc.), with a total of seven options provided. This differs from hiring studies in two important ways. Firstly, it provides a more diverse array of options than selecting either younger or older candidates (alternatively, men or women candidates; Chang et al., 2020). A more diverse array gives greater opportunity for diverse selections to be achieved, especially if one category is undesirable (e.g., a gluten intolerance may rule out bagels, but leave up to 5 alternate categories from which to make diverse selections). Secondly, the relative desirability of different choices was not measured, but it might be assumed that for most undergraduate students, the majority of snack options were relatively desirable. Although achieving team diversity in hiring and selection decisions is highly

desirable to potential recruiters (Jaffé et al., 2019), age-diversity is overlooked by many organisational diversity strategies (Akinola et al., 2019) and attitudes towards equality based on gender (women) are more positive than attitudes towards equality based on age (Martin & North, 2021). Building on this, in Chapter 3, we found further evidence of bias against older men candidates, but no evidence of bias against younger women candidates. The failure of choice bundling to increase age-diversity in Chapter 2, and the differential selection rates for equivalent older men and younger women candidates in Chapter 3 raises two important questions. First, is age-diversity what recruiters think about when considering diversity (i.e., is age a salient diversity characteristic)? Second, is age-diversity in technology teams considered desirable? This has important theoretical implications. Although a growing literature shows the potential for choice architecture interventions to increase selection diversity independent of changing stereotypes or attitudes (e.g., Bohnet et al., 2016; Chang & Cikara, 2018; Chang et al, 2020; Feng et al., 2020), these interventions have been successful in areas where attitudes towards diversity are already positive (specifically, gender; Martin & North, 2021). Significant expense has been invested in diversity training (Forscher et al., 2019; Lai et al., 2016) based on psychological theory that more diverse hiring behaviours require changes in the attitudes that shape hiring intentions (Ajzen, 1991; Chang et al., 2019). While diversity training programs often shows limited success (Noon, 2018), they might be a pre-requisite in areas of diversity that have received less attention (such as age) if choice architecture interventions are to be successful. In other words, applying choice architecture to problems of diversity may only be effective if prior training and education has made age-diversity more desirable (Williams & Ceci, 2015) and / or more salient (Phillips et al., 2018) for recruiters.

Chapter 3 found that recruiters who believed that older candidates are less productive

compared to younger candidates selected fewer older candidates. The role of age-based stereotypes in hiring decisions is a much-discussed topic in the research literature (Murphy & Denisi, 2021). In both Chapters 2 and 3, we found significant bias against the selection of older candidates. In Chapter 3, we explicitly measured recruiters' stereotypes around the productivity of older workers, finding that lower productivity beliefs for older (vs. younger) workers were associated with fewer selections of older candidates. That negative productivity stereotypes are associated with fewer selections of qualified older candidates supports the theory that stereotype impressions are primarily formed based on perceived warmth and competence (Fiske et al, 2002; 1999). Specifically, that the chances of recruitment for older candidates is undermined by perceptions that they are low in competence (Cuddy et al., 2005) and presumed to have lower productivity (McCann & Giles, 2002). Both women and older men are underrepresented in technology industries (EIGE, 2018; EEOC, 2019), which is assumed to be (at least in part) due to negative stereotypes, with both groups subject to negative stereotypes about their competence with technology (Banchefsky & Park, 2018; Leslie et al., 2015; Moss-Racusin et al., 2012; Ng & Feldman, 2012). Chapter 3 found bias only against older men candidates, and significantly lower expectations of older men candidate's productivity compared to younger women candidates. This suggests that negative competence stereotypes are more strongly against older men candidates than women candidates. However, it also raises the question if, in addition to competence, broader attitudes and more precise, negative stereotypes might be disadvantaging older candidates in hiring and selection decisions (Rudolph et al., 2022). For example, other age-based beliefs that are not directly related to competence might be expected to influence the selection rates of older candidates. These include 'succession' beliefs (that older workers should step aside for younger workers; North & Fiske, 2013), 'health and fitness' perceptions (that younger

workers are healthier; Kaufmann et al., 2016), and projected return on investment based on years of tenure (the false belief that older candidates will have shorter tenure based on proximity to retirement; Posthuma & Campion, 2009). Additionally, while gender is largely demographically equal (the population is more or less 50% men and women), studies show that people are very inaccurate in other demographic estimations (e.g., proportion of Muslim faith, LGBTQ; Landy et al., 2018). This means it is entirely possible that failure to select more older men candidates is due to an intuition that they are a less significant percentage of the working population, and / or that they are overrepresented in the technology roles being hired for and therefore do not warrant a strong diversity focus. Thus, beyond expected productivity, there remains much research to understand the precise stereotypes and attitudes that drive discrimination against older candidates.

Chapters 2 and 3 find strong evidence of bias against older candidates, yet it remains somewhat unclear if this bias (as evidenced by low selection rates) would be so strong in the real world. For example, CVs and subsequent job interviews provide far more information about the candidate as an individual, reducing the decision-maker's reliance on stereotypes (Drury et al., 2022). A good example of this comes from a study by Gioaba and Krings (2017), who played interview excerpts to student recruiters. By manipulating these excerpts, they found that older candidates who contradicted common negative competence stereotypes in their interviews were perceived as more hireable by recruiters. While older candidates did not escape discrimination entirely in the study, when decision-makers were exposed to counter-stereotypical candidate excerpts, it did help to reduce discrimination. Might older candidates in real-interview situations be able to draw on their broader life experience and skills to increase their impressions of competence? Might perceived warmth associated with older candidates (Krings et al., 2011) be

more important to recruiters in a face-to-face setting than in CV or experimental candidate evaluations? Alternatively, given the absence of photos in CVs in most countries, might real world discrimination (from the point of interview) actually be stronger than correspondence studies suggest? Results from Chapters 2 and 3, together with these questions raise two important considerations for real-world applications. First, results from these chapters show that older candidates are unlikely to be viewed by potential recruiters as competitive against younger candidates with similar relevant experience. There is a strong economic need for up/reskilling workers as the population ages and technologies evolve (Alcover et al., 2021). If real-world situations replicate experimental conditions where older workers' cumulative experiences or perceived positive stereotypes (warmth; Cuddy 2005) do not enhance their candidature to a competitive level with younger candidates, this may present a significant barrier to older adults re-entering the workforce. Second, this points to the potential importance of experiments in concert with field studies in future to better understand hiring decisions and bridge findings from the lab with data in the field. An example by Oesch (2020) used both a fictional CV experiment and corresponding data from 1,200 displaced workers from a Swiss firm to show that older workers are less likely to be hired than younger ones. To reduce bias against older candidates, findings from this work suggest focus will be needed on the experience of older workers who are up/reskilling, and that findings from experimental might be enhanced with evidence from real-world situations.

5.1.2 Generalisability of Results: Intergenerational climate and retirement intentions

Retirement represents a major life event, and there are several factors that can motivate the decision to retire. Personal factors including physical health, cognitive and mental health,

financial resources, demographic, family and psychological factors have all been shown to influence retirement intentions and decision making (Fisher et al., 2016). Beyond these personal factors, work-related factors including attitudes towards the job role and organisation, as well as an older workers' perceived value within the organisation can also influence retirement intentions (Atchley, 1989; Bal et al., 2012; Feldman & Beehr, 2011). From an organisational perspective, understanding these intentions is important because retirement has implications for staffing, succession planning and benefits (Wang & Shultz, 2010). Chapter 4 set out to examine the relationship between age diversity climate and retirement intentions, finding that older workers who perceived their organisation's intergenerational climate to be more positive reported lower intention to retire early, and those with higher job satisfaction showed greater motivation to continue working beyond retirement age. These findings broadly support the importance of work environment to retirement timing. Older workers experience of fit with their job (as indicated by job satisfaction) and their organisation (as indicated by workplace age-diversity climate) is important to their intended retirement timing (Feldman, 2013). These findings are also consistent with past work showing that older workers' general attitudes towards their job and organisation influences their decision to delay retirement, whereas organisation-based problems (e.g., a negative climate) are more likely to lead older workers to consider 'early exit' into retirement (Gaillard and Desmette, 2010; Schalk & Desmette, 2015). However, there are a range of other workplace factors beyond age-diversity climate and job satisfaction that might influence retirement decision-making. For example, the social norms within the organisation (i.e., when peers choose to retire; van Solinge & Henkens, 2014), the organisational incentives or bonuses to retire or continue working (e.g., health insurance; Zhan 2012) and the flexible working arrangements on offer (e.g., flexible work hours; Bal et al., 2012). In addition to

organisational climate and job attitudes, there is a growing literature around Human Resources (HR) practices in relation to retirement timing (Beier et al., 2022). A recent longitudinal study by Jiang et al. (2022) of more than 750,000 US workers, found that positive investment in HR practices including training and development, performance management and appraisal, job design, compensation and development reduced retirement intentions among workers aged 50 and over. Jiang et al. (2022) also found that this relationship between HR practices and retirement intentions has been getting stronger since 2008. Boehm et al. (2014) found that similar HR practices contribute to a more positive age-diversity climate for workers of all ages, however the causal relationship between HR practices and age-diversity climate remains somewhat unclear. For example, a recent article by Li et al. (2022), suggests that older workers who perceive a more age-inclusive climate participate more in relevant training, which then informs their retirement decision. In other words, an older workers' intention to retire might be assuaged by a more age inclusive climate resulting from positive HR practices. However, it also might be that a more age inclusive climate encourages older workers to invest in the HR opportunities available to them in order to continue working past retirement age.

In Chapter 4, 'retirement intentions' are conceptualised as a total exit from the workforce, which has been the primary empirical definition for research focused on understanding drivers of these intentions (Wang & Shultz, 2010). In our results for retirement intentions, we are making two important assumptions about the responses received from older workers. Firstly, retirement intentions assume that workers will have personal control over the timing of their retirement. This is desirable, as low levels of control and choice over the timing of retirement (known as 'involuntary retirement') can negatively affect physical and mental health, wellbeing and life satisfaction (Dave et al., 2008; Hershey & Henkens, 2013). However, in reality a large

proportion (20-30%) of retirements are perceived as involuntary (Fisher et al., 2016), with many older workers making the decision to retire as a result of health, caring responsibilities or redundancy (van Solinge & Henkens, 2007; Wang & Shultz, 2010). Secondly, full exit from the workforce is becoming increasingly rare, and fails to capture the diversity of career trajectories that might await older workers upon 'retirement'. It is possible that our conceptualisation of retirement as 'total exit' is not what older adult participants think of when they consider their own retirements, and retirement intentions. In other words, 'retirement' might not mean leaving their job or the workforce entirely. Prior to COVID-19, an increasing number of older workers were engaging in bridge employment, whereby they engaged in either steady or intermittent work after reaching retirement age, in either a new field or in their previous career field, as employed by their previous employer, a new employer or as self-employed (Beehr & Bennett, 2015). There is also 'unretirement', whereby workers retire before later returning to some form of paid work, leaving around 40% of retirees reversing their retirement decision (Maestas, 2010). The rise of 'gig work' (a temporary contract between a self-employed worker and clients; Spreitzer et al., 2017), recent levels of inflation, and efforts (notably by the UK Government) to lure retirees back into the workforce may prove to increase the rate of older adults 'unretiring' (Andrews, 2022; Partington, 2023). As the economic landscape shifts, empirical definitions and measures of retirement intentions may need to shift alongside it, beyond simply 'earlier' or 'later' exits from a primary full-time position.

5.2 Limitations

While this thesis has shown some strong results which have significant potential to contribute to the existing literature on workplace ageing, they should also be considered within

limitations. The first of these limitations is the experimental methods used. Chapters 2 and 3 focus on experimental hiring decisions in which hirers were asked to select or shortlist candidates based on very limited information. While experimentally, this was effective in reducing the ‘noise’ of other hiring criteria other than age that might influence participant decisions (e.g., variety of past roles held, key skills, etc.), it also arguably limits the ecological validity of results. Hiring decisions rarely rely on photo and brief information alone. CVs and job interviews provide more detailed candidate information, which may increase the likelihood of success for older candidates for some roles (Singer and Sewell, 1989). For example, if older candidates are seen to evade common negative stereotypes by promoting their technology skills, ability to learn new skills or adaptability to change, they might improve their chances of success (Gioaba & Krings, 2017). Alternatively, if a job or hiring manager value qualities of warmth, social skills, cooperation or interpersonal relationships, the positive stereotype prescriptions in these areas might benefit their candidature (Cuddy et al., 2005; Krings et al., 2011; Lee et al., 2015). Taken together, if these warmth attributes are possessed by the older candidate, and they are willing to self-promote attributes that are counter-stereotypical to negative competence stereotypes, it may help them to build a positive relationship with hirers and evade negative biases in practice. The reliance on photos alone to indicate the candidates age was also limited. Candidate age was based on the actual age of the subject in the photo, and there was no norming of the photos prior to experiments. Nor was there any manipulation check following experiments to confirm the perceived age of each candidate as they appeared to hirers. Although candidates in photos may have been perceived as older or younger than their actual ages, the consistent bias shown against older candidates in selection compared to comparatively experienced younger

candidates, based on these photos alone, suggests age derived from appearance was significant to hiring decisions.

A second limitation of our studies was the similar relevant experience of the most-experienced candidates in Chapters 2 and 3. In both studies, older candidates had years of experience that were commensurate with recent, relevant experience. Thus, rather than 20 or 30 years of relevant experience, they had a maximum of six years' experience so that they could be competitively judged against younger candidates. Specifically, in Chapter 3, when older adults were the most experienced candidates, they were separated from the next most experienced candidate by only one year. In Chapter 2, there was no scenario where older adults held the most experience, however they held an equal amount of experience as the most experienced candidate in Task 2 of Studies 2-4. In addition to the lack of individuating information in our tasks (limited to a photo, most recent company, relevant years' experience, and job title), the similar experience between candidates may have suggested to recruiters that the top candidates were generally comparable (Guion, 1998), which can make selection open to more subjective influences (Highhouse, 1997), in this case, candidate age. Additionally, the experience level of older candidates may have violated recruiter expectations. Specifically, the lower level of experience of older candidates in our studies might have led them to be perceived by recruiters as 'career switchers', candidates who have transitioned to a new role and have forfeited their tenure and experience (North, 2019). It is unclear from our studies the extent to which a) older candidates were perceived as 'career switchers', and b) this was helpful or harmful to their selection. On the one hand, the forfeiting of career experience, together with the violation of common expectation that older workers should 'step-aside' to make way for younger generations (North & Fiske, 2013), means that older 'career switchers' can be judged more harshly and viewed as less

hireable (Fritzsche & Marcus, 2013; North, 2019). On the other hand, a career switch might signal to recruiters an increased willingness to learn (Fernandez & Vecchio, 1997) and openness to change (Canduela et al., 2012) counter to the negative stereotypes that are commonly associated with older workers (Ng & Feldman, 2012). Thus, in Chapter 3, it may have been interesting to a) more explicitly understand if there was any relationship between recruiter perceptions of ‘career switch’ and the selection rate of older candidates, and b) understand if the level of discrimination against older candidates would have persisted or abated if older candidates’ experience was increased commensurate with their age to (e.g., having 15 to 25+ years relevant experience). Greater development of these areas may have helped to understand how potential up/reskilling of older candidates is perceived by recruiters, as well as the relationship between relevant experience and selection for older candidates.

A further limitation of these studies is the narrow use of age diversity in Chapters 2 and 3, where age was measured using photos of ‘older white men’. Diversity in the real world is less categorical than multi-dimensional, and this thesis does not consider the intersections of say, age and gender or age and race. Intersectionality in diversity is of research importance, as individuals often fit into multiple social categories (Roberson et al., 2017), it is not clear that hiring decisions for ‘older white men’ will work in the same way as ‘older white women’. There is some evidence that older women receive greater discrimination (Duncan & Loretto, 2004) and other evidence that they escape some of the judgments directed towards older white men (Martin, 2019). Including older women in these studies may have helped to further understanding about how they are discriminated against compared to older men. This also points to another limitation of the present studies. In Chapter 3, Study 2, younger women were selected in significantly greater numbers than similarly experienced younger men. This points to gender

as a salient diversity characteristic (Phillips et al., 2018), that may have made women candidates ‘stand out’ against younger male candidates. This suggests two opportunities for further research, the first is greater understanding of how age intersects with other visible diversity characteristics (e.g., gender and race) under choice conditions. The second opportunity is understanding the relative salience of age diversity when mobilized as narrowly as was done in these studies. Specifically, are age difference recognizable when perceiving group diversity, and if so, how does this perceived diversity differ to, and or intersect with, perceptions of gender or racial diversity.

In Chapter 4, we explored the relationship between workplace intergenerational climate and retirement intentions. In this Chapter, we conceptualised retirement as a total exit from the workforce. Questioning intentions suggests that the eventual decision will be a choice available to the older workers, yet as discussed in the generalisability section, many retirement decisions are made involuntarily as a result of health, caring responsibilities or redundancy (van Solinge & Henkens 2007; van Solinge & Henkens 2010; Wang & Shultz, 2010) and full exit from the workforce is becoming increasingly rare. Thus, our conceptualisation of retirement may fail to capture the diversity of career trajectories that might await older workers upon ‘retirement’. Expanding retirement intentions to encompass some of these alternative pathways that are now being pursued may help deepen understanding into how an organisations’ age diversity climate shapes intentions beyond early retirement or continued employment.

A specific limitation of Chapter 4 is that the two studies employed cross-sectional rather than longitudinal or quasi-experimental methods. Although the relationship between workplace age-diversity climate and early retirement intentions is unlikely to be reverse-causal (climate is more likely to influence intentions than vice-versa), is not possible conclude causation. An

argument can be made that older workers who are working towards early retirement may reduce their investment and encounter greater challenges in their organisation, which would influence their perceived climate. Similarly, without longitudinal data that looks at actual retirement decisions, rather than retirement intentions, it is not possible to firmly establish that a poor organisational age-diversity climate leads older workers to retire early. However, it is hoped that these cross-sectional findings help inform theory, further research and potential interventions (Spector, 2019). The use of correlational methods in Chapter 4 of this thesis also provides some additional breadth to the topic of workplace ageing. This breadth comes from two perspectives. The first is methodological, in that correlational studies replicate at significantly higher rates than experimental studies, including in the organisational sciences (Youyou et al., 2023). This is illustrated in the inconclusive and at times contradictory results seen in experimental studies from Chapters 2 and 3, compared with the consistency of the two studies undertaken in Chapter 4. Thus, the addition of correlational methods in Chapter 4 provides an alternate methodological approach to the study of workplace age-diversity. The second perspective is that Chapter 4 focuses solely on responses from older workers about their current organisational climate and retirement intentions. For a thesis on older adult workplace participation to have examined only how older candidates were perceived by potential recruiters of all ages, may have excluded the perspectives and experiences of older workers themselves.

Finally, all reported studies in Chapters 2 to 4 used exclusively online samples (*see* Impact of COVID-19). Questions of a) ‘where research takes place?’ and b) ‘who participates?’, are of importance to research outcomes. Regarding where research takes place, the growth of the internet revolutionized data collection for behavioural sciences, which traditionally relied on undergraduate students in the lab (Gosling et al., 2004). The more recent rise of online

recruitment platforms like Prolific and Amazon MTurk, as well as the recent COVID-19 pandemic has pushed even more behavioral research online (e.g., Greene & Naveh-Benjamin, 2022). While this is often perceived as a limitation, effects for studies conducted are largely comparable to, and at times superior to lab-based measures (Casler et al., 2013; Stanton et al., 2022; Tripathi & Bhullar, 2022). Regarding ‘who participates’, online recruitment platforms allow greater diversity of recruitment than relying on undergraduate populations. This is particularly important to organisational research and the study of older workers where it is beneficial to access a wider portion of the working population (Keith et al., 2017). For example, in Chapter 3, I was able to use pre-screening methods to target specific participants with experience and responsibility for hiring decisions. Thus, sampling via online recruitment platforms in these studies reflects the growing importance of online recruitment to behavioural sciences and the potential advantages of accessing more diverse and specific participants outside of traditional laboratory settings.

5.3 Applied implications

With the workforce growing older and more age diverse, this thesis points to a number of practical implications for individuals, organisations and policymakers. At an individual level, this thesis identifies some of the challenges that older workers may confront in selection and recruitment and in achieving longer term job satisfaction in their organisations’ climate. For organisations, these findings point to bias in the selection of older candidates. These biases can, at least in part, be attributed to negative stereotypes and beliefs about the productivity of older workers and the preferences of selection panels for younger talent. Chapters 2 and 3 raise questions about how these biases should be addressed, suggesting that choice architecture

interventions and competition-based incentives alone might not be enough to overcome them. Organisations may seek to avoid these selection biases through a combination of training and awareness activities as well as looking at hiring process interventions to ensure the ‘best candidates’ are hired. Once hired, age-inclusive HR practices such as training and development, job design, and merit-based compensation can contribute to a positive age-diversity climate for workers of all ages (Boehm et al., 2014), however there is evidence that feelings of inclusion are especially important to older workers (Li et al. 2022). It is also worth noting, that Chapter 4 results showed that older adults generally perceive their work more positively than not, expressing job satisfaction. To this end, organisations may wish to consider the inclusive steps they can take to create even more positive age-diverse climates such as investing equally in the knowledge, skills and abilities of older workers (e.g., Burmeister et al., 2018; Fasbender & Gerpott, 2021). Rather than invest in age-specific training (which itself can convey age-specific stereotypes), age-inclusive training (like inclusion more broadly) suggests that well-designed training is beneficial to all age groups (Wolfson et al. 2014) but might especially benefit older learners (Kraiger & Ford, 2021). For policy makers, this research raises questions about how older workers might be effectively re-integrated within the workforce, given the biases against recruitment of older candidates. At the time of writing, around 3.6 million people in the UK aged 50 to 64 are economically inactive with 760,000 actively seeking work (UK Office for National Statistics, 2022). Productivity levels in the UK have remained weak since 2008, leading to a renewed government push towards upskilling and reskilling of adults to encourage lifelong learning (McAlary & Mutebi, 2021). Results from Chapters 2 and 3 suggest that after gaining new skills, older workers may face considerable hurdles in hiring and selection processes compared with younger candidates with equivalent or even less experience. From a policy

perspective, tighter partnerships between skills training providers and employers may be required to ensure that reskilling is focused on areas of skill deficit and that once acquiring the relevant skills, older candidates have a clear pathway to employment.

5.4 Future research

This thesis raises important questions for the future of research in workplace ageing and diversity more generally. The first important question concerns the link between age-diversity and organisational performance. Chapter 4 showed that a more positive intergenerational climate, that is, the relationships between people of diverse age groups (King & Bryant, 2017; Lyons & Kuron, 2014), increased job satisfaction and reduced early retirement intentions. This adds to the literature that shows that workplace climate can reduce turnover intentions, by examining retirement intentions specifically. However, little consideration has been given to ‘how’ or ‘when’ greater age diversity is beneficial to other measures of organisational performance including, creativity, innovation or increased sales or market share. Research on team and demographic diversity in the workplace has become an important topic in management literature (Roberson et al., 2017), and there is a considerable literature that considers the relationship between diversity and performance. At multiple points in this thesis, I have referenced the desirability of a diverse workforce for organisations in pursuit of improving business performance by increasing the variety of perspectives, the ‘business case for diversity’ (Salas et al., 2018; Van Knippenberg et al., 2004). Although the relationship between diversity and productivity is difficult to quantify (Veelen & Ufkes, 2019), there is a growing literature that explores the relationship between age diversity and business performance measures. A meta-analysis by Bell et al. (2011) examined 40 studies on the relationship between age diversity and

team performance, finding no relationship (the same meta-analysis found slightly negative relationships between gender and racial diversity and performance). Some studies have found that age-diverse teams perform better on complex, rather than simple tasks (Wegge et al., 2012). However, it has also been suggested that salient age differences, negative intergenerational climate and agreeableness of team members can influence performance outcomes (Luksyte et al., 2022; Wegge et al., 2012). Recent research from Chinese firms shows that age diversity can enhance organisational performance through diversity in knowledge, skills, perspectives and social connections (Li et al., 2021). Research that helps establish a clear link between age-diversity and business performance outcomes as well as dispelling myths about age and individual performance are important to shifting attitudes towards age diversity in the workplace.

Relatedly, the next question for further investigation concerns age as a distinct diversity characteristic and whether it is perceived to be both salient and desirable. In Chapter 2, it was unclear if age diversity was salient to hirers as a diversity characteristic, and if salient, if it was desirable. When looking at a group of people, observers can accurately assess the gender or racial diversity of the group quickly (Phillips et al., 2018), and diversity is considered highly desirable when recruiting teams (Jaffé et al., 2022). However, less is known about accurate perceptions of age-diverse groups and the desirability of age-diverse teams in hiring decisions. The perception and desirability questions may help us to understand the interplay between psychological theories of diversity, specifically that changing attitudes will shape the intentions and selections of decision-makers (Ajzen, 1991; Chang et al., 2019), and a decision sciences approach to alter the choice architecture to facilitate the selection more diverse candidates. The application of choice architecture interventions in candidate assessment to date have mainly focused on gender, showing that increasing gender diversity is generally desirable to potential

hirers (e.g., Bohnet et al., 2016; Chang & Cikara, 2018; Chang et al., 2020; Feng et al., 2020). However, attitudes towards older candidates can be quite negative, and commitment to workplace age equality is low (Martin et al., 2019; Martin & North, 2021). Compared with gender diversity, it is less clear that a) age diversity is attractive to potential hirers, and that b) the proportion of workers from various age brackets would signal optimal diversity is known to potential hirers. It may be that for interventions to be successful in circumventing (Chapter 2) or overcoming (Chapter 3) age stereotypes, they require a) attitudes to meet a threshold level of positivity towards older workers that has not yet been achieved, and b) an understanding of the proportion of working age adults in their locality or industry that might signal age-diverse representation. Future research could examine if training or information paired with these decision interventions can help to make them successful. Similarly, increased intergenerational contact is associated with more positive attitudes towards older adults (Drury et al., 2016) and may be a substitute for training or information to be paired with decision interventions. In addition to understanding the current salience and desirability of age-diverse work teams, future research could examine if changing attitudes (via training or information) could make age-diversity more salient and / or desirable to hirers. Given the strong negative biases against older candidates, raising awareness about an ageing workforce, underrepresentation, reskilling, and falsity of stereotypes against older workers may show greater success than past training interventions for gender and race (Chang et al., 2019; Noon, 2018). Thus, testing if raised awareness paired with interventions leads to increased selection of older candidates is an opportunity to understand the interplay between psychological theories and decision applications for eliciting behaviour change, as well as the boundary conditions for diversity.

Chapters 2 and 3 also raised questions about contextual factors in which bias against

candidates occur, specifically roles for the technology industry. The experiments in these chapters were solely concerned with instances where older adults were counter-stereotypical candidates (technology), and where there were existing negative stereotypes about older workers (that they have lower technological ability than younger counterparts). Whether older candidates experience bias against them or not may depend on the job role (Salas et al., 2017). For example, older workers may be preferred candidates for roles in which cumulative life experience is seen as desirable or stereotypical (e.g., educators, counsellors). Similarly, it feels appropriate to understand age as a diversity characteristic combined with others through the study of intersectionality. Would older women evade some of the negative stereotypes that are typically associated with older workers? Would racially-diverse older candidates be more desirable, as they would increase the racial-diversity of selections? There is reason to believe that the intersectionality could either reduce or increase prejudices associated with each categorical component (Martin et al., 2019; North, 2019; Purdie-Vaughns & Eibach, 2008). For example, women are more likely than men to experience ageist attitudes concerning appearance or sexuality (Duncan & Lorretto, 2003), however the belief that older workers should ‘step aside’ for younger generations is more strongly directed towards older men (Martin, et al., 2019). As well as the intersection between age and group-level characteristics, it has been argued that the intersection between age and generation, experience and gender may shed light on different challenges and opportunities of different older worker composites (North, 2019; North & Shakeri, 2019). Thus, greater understanding of different hiring contexts and candidate presentations would provide greater insight into the conditions in which we might expect bias against older candidates.

5.5 Final comments

To date, there has been limited research to understand how choice design and incentives influence hiring decisions involving older candidates. Additionally, limited research has been undertaken to understand how age-inclusive organisational climates influence the retirement intentions of older workers. Thus, the findings in this thesis provide a novel contribution to ageing research. As much of the world seeks to increase productivity and personal wealth, while relieving pressures on spending for an ageing population, this thesis evidences some of the potential areas of challenge and opportunity. Avoiding the economic risks of an ageing workforce rests on two key assumptions, firstly that older workers have equal opportunity to participate in the workforce and secondly, that the ‘business case’ for diversity extends to age diversity. Chapters 2 and 3 of this thesis deal firmly with the first assumption by showing that older workers are unlikely to be treated fairly in hiring decisions or given equal opportunities to participate. Chapter 4 begins to point towards the second assumption, showing that a more positive age-diversity climate is associated with higher job satisfaction and lower early retirement intentions, both of which are proxy measures for productivity. However, future work is required to better understand age as a diversity characteristic and the contexts in which age-diversity is recognised and either considered or proven to be beneficial for business outcomes.

This research also makes a significant contribution to psychological and behavioural sciences both theoretically and in the open-science practices applied. Chapter 2 furthers the debate between psychological approaches to diversity (attitude change as a precursor to behavioural change) and decision sciences approaches to diversity (changing the decision architecture). Rather than an either / or approach, Chapter 2 suggests the interplay between these two approaches might be important. Additionally, Chapter 2 makes a unique contribution by

considering how the salience and desirability of a diversity characteristic might influence the level of diversity sought. More broadly, Chapter 2 shows how context matters to the replicability of research experiments. The largely inconclusive results of Chapter 3 raise questions about the role of incentives in decision making, showing that incentive-based rewards may not always lead to ‘better performance’. Finally, Chapter 4 shows that some constructs (i.e., retirement intentions), can have quite different correlates when parsed (i.e., early vs. late retirement intentions).

In conclusion, the current work adds to the growing body of research on workplace ageing by highlighting the potential barriers older candidates may face in hiring decisions and the importance of an age-inclusive organisational climate to prevent early retirements. This work points to the uniqueness of age as a relatively under-researched diversity characteristic, for which greater understanding may help us achieve a mix of training and choice interventions that move us towards creating longer, fulfilling working lives.

5.6 Chapter References

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ONLINE APPENDIX

All appendices, including preregistrations, stimuli and study data for this thesis have been made available online via the Open Science Framework (OSF):

CHAPTER 2.

https://osf.io/ztuyv/?view_only=21a24da39d0a488b88e1b74856446702

CHAPTER 3.

https://osf.io/edmk7/?view_only=b2074602db994080b741fb45c9acab1a

CHAPTER 4.

https://osf.io/7mtc8/?view_only=73cc2d387ae8490389e68c761c5a901e