

Questioning Gendered Ageism in Job-Related Non-Formal Training and Informal Learning

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Abstract: Age can lead to stigmatization, which is aggravated in groups that are already at risk of exclusion, such as women. This intersectional bias between age and gender (gendered ageism) affects so-called mature workers (aged 50 and over) in different ways. These can include the prejudices on the part of employers and workers regarding their skills and competencies, as well as regarding their motivation to participate in training. In this article we analyse mature female workers' level of training, motivation, and use of job-related skills, with the aim of providing evidence that breaks with ageist gender prejudices on this issue. We conducted a descriptive analysis using ANOVA, and we applied structural equation modelling in an analysis of the PIAAC data of the OECD (2016), dividing the entire sample (n.=31,739) into four subsamples (women -50; women 50+; men -50; men 50+). In our descriptive analysis, female older workers achieve the highest scores in almost all the variables. Our proposed model, resulting from multigroup comparisons among the four subsamples, has a more optimal fit and structural coefficients of greater weight in mature female workers than in younger ones, especially

regarding the influence of informal learning at work on the level of use of job-related skills.

Keywords: gendered ageism, training, work, motivation to learn, mature female workers

Introduction

The ageing of the workforce is a reality. In Europe, the employment rate of those over 50 years of age has increased from 59.9% in 2011 to 67.7% in 2020, and, in the case of women, it has grown by more than 7 percentage points: up to 62.3% (Eurostat 2021). On the other hand, the proportion of workers aged 50 and more has grown from 28.8% in 2011 to 34.8% in 2020, increasing in the same proportion in the case of female employees. Thus, most European governments are having to deal with the increasing ageing of the population, and are encouraging them to work up to a later age (Lössbroek and Radl 2019). However, it appears that few organisations are taking adequate steps to prepare for the projected challenges and opportunities associated with an ageing workforce (Martin, et al. 2014, 1013). This demographic trend towards an ageing workforce has led in recent years to the emergence of research focused on ageing and ageism (Jyrkinen 2014).

Ageism at work is age discrimination that affects workers over 50 years of age ('older workers' according to the OECD 2006) in various ways in their work environment (Itzin and Phillipson 1993). One of these forms of discrimination lies in the existing prejudices in relation to training. Older workers are often regarded as less motivated, as participating less in training, and as being less susceptible to taking advantage of the learning offer to improve their skills (Hsu 2013; Vickerstaff and Van der Horst 2019). Scientific research, however, has shown that non-formal training and informal learning at work¹² are elements that play a fundamental role in the quality of ageing at work (Marcaletti et al. 2019). In today's increasingly technical work environments, the need for constant upskilling through training is necessary for all workers. In fact, the adaptation of skills to the job is

¹ According to OECD, Formal training/learning is always organised and structured, and has learning objectives. From the learner's standpoint, it is always intentional and the learner obtains an official qualification (typical example is learning that takes place within the initial education. Non-formal training/learning is also intentional, but it is more flexible than formal training, not producing necessarily a recognised qualification. It may occur at the initiative of the individual but also happens as a by-product of more organised activities, whether or not the activities themselves have learning objectives. Informal learning is never organised, has no set objective in terms of learning outcomes and is never intentional from the learner's standpoint. Often it is referred to as learning by experience or just as experience.

² In our analysis we have not taken formal (job-related) training into account, because only 9.7% of European workers have participated in it, and only 1.1% of 50+ workers. On the other hand, non-formal training (job-related) represents 56% of participation in training among European workers (53.5% among 50+ workers); moreover, around 66% of European workers participate in informal learning at least once a week (61.9% of 50+ workers) (OECD 2016). On the other hand, as is stated in scientific literature on adult education and training, non-formal training and informal learning are more relevant for adults than formal education. This is due to the less hierarchical, fixed structure of non-formal training and informal learning (which are more adaptable to adults' need for educational flexibility and for adaptability to their more restricted timetables). Moreover, non-formal training and informal learning are much more aligned with the Andragogy perspective, because they meet all adults' requirements for participation in an educational activity, especially from the agent perspective that we adopt in this analysis: i.e., experience provides the basis for the learning activities (i.e. informal learning); adults are most interested in learning subjects that have immediate relevance and impact upon their job; and adult learning is problem-centered rather than content-oriented (Knowles, 1984).

one of the four fundamental variables that Ilmarinen (2006) cites for an optimal quality of aging in employment, given its influence on workability.

Age discrimination affects women to a greater extent, given that it is combined with gender (Krekula, Nikander, and Wilinska 2018). This gives rise to the phenomenon called gendered ageism at work (Itzin and Phillipson 1995), which can affect the quality of ageing at work as experienced by female workers (Íñiguez-Berrozpe et al. 2020), as well as their possibilities for promotion. Salary inequalities are therefore observed between men and women (McBride 2011). Regarding training, older women also experience an even greater degree of discrimination at work (Benan and Lombardi 2019). They are offered less training opportunities because they are considered less motivated and less prone than men to update their competencies through training (Duncan and Loreto, 2004). This limits their opportunities for skill improvement, and, therefore, prevents the above-mentioned possibilities of promotion and salary increase (Itzin and Phillipson 1993).

Our study aims to contribute to scientific knowledge by providing evidence that belies existing prejudices against female older workers in relation to training, especially in terms of the constructs related to their participation in non-formal and informal learning in employment, their degree of motivation to learn, and the level of their use of skills at work. Therefore, our research hypotheses focus on whether older female workers have a high level of motivation to learn; if they have a high level of participation in non-formal training (hereafter NFT) as well as in informal learning at the workplace; if they apply advanced skills at work at the same level as other workers; if their motivation to learn is positively related to non-formal training and informal learning at work, and if these three latter variables are positively related to their level of job skills.

We therefore begin this article with a literature review that explores a series of myths associated with gendered ageism at work (mainly in skilled jobs, due to the fact that we are relying on OECD-PIAAC sample features). Such myths particularly abound regarding women's non-formal training and informal (work-related) learning, motivation to learn, and use of skills. To challenge the aforementioned discriminatory myths related to the topic of job-related training, we propose to analyse the level of non-formal training and informal learning at work and motivation, along with the use of job-related skills on the part of mature female workers. To achieve this, we applied a descriptive comparative analysis (using ANOVA) and structural equation modelling to the PIAAC data of the OECD (2016), dividing the entire sample (n.=31,739) into four subsamples (women -50; women 50+; men -50; men 50+). Our proposed model, resulting from multigroup comparisons among the four subsamples, measures the relationship of motivation to learn with non-formal training and informal learning at work, as well as with the use of job-related skills, while controlling for further variables such as educational level and state of health. This topic has rarely been explored in the scientific literature (EASHW 2016), with a particular paucity in the area of quantitative studies; thus, we aim to provide some evidence through the results of our analysis.

Theoretical Framework

Ageism in On-The-Job Training

Although older workers represent an important segment of the workforce, they suffer from ageism through the fact of being stigmatized (Itzin and Phillipson 1993), as we have seen in the introduction. The term ageism, or age discrimination, includes ‘thoughts, feelings and behaviors, both implicit and explicit that are based on prejudices and myths about older people’ (Jyrkinen 2014, 176). According to Traxler (1980), ageism is due to a series of factors that contribute to the negative image of ageing in Western societies. These prejudices are transferred to the workplace environment. As Beier and Kanfer (2013) point out, the prejudice regarding older workers’ supposedly poorer job performance is possibly one of the most deeply rooted ones in developed countries, affecting such workers even to the point of hindering their recruitment (Loretto and White 2006; McGann et al. 2016). Some of the stereotypes that older workers must face are: being labelled as people with lower productivity, being reluctant to change, having less memory capacity, rejecting orders given by younger people, and having greater difficulties learning new tools or complex tasks (McGann et al., 2016). They are viewed as inflexible and as having little capacity and great reluctance to use technology, all of which purportedly makes them difficult to train (Beier and Kanfer 2013).

The greater need for ICT-related knowledge and skills in many of today's jobs implies that older workers need to learn new skills as a condition for maintaining their position on the labour market (Íñiguez-Berrozpe and Boeren 2019). However, further stereotypes attributed to older workers are that they are less inclined to being trained at work, or have less motivation at the workplace, as well as less motivation in the acquisition of skills (Hsu 2013; Vickerstaff and Van der Horst 2019; Maurer et al., 2008), especially when they are approaching retirement age (Martin et al., 2014). Indeed, it has been argued that changes in older workers’ cognitive abilities reduce their motivation to develop such new competencies (Beier and Kanfer 2013). Results obtained by Carmichael and Ercolani (2014) indicated that workers over 50 completed fewer hours of training than younger ones; throughout the European Union, older workers were ultimately less likely to participate in training in general and in on-the-job training in particular.

These prejudices lead to structural barriers. Nelson (2016) points out that such attitudes can exert an influence on the amount invested by organizations in the training or continuous education of older workers. This, in turn, would accelerate the probability that such workers would have to leave their jobs. Organizations, moreover, would tend to invest more in the training of younger workers, even when the jobs in question are considered as having a lower status. Chiu et al. (2001) showed that stereotypes concerning the adaptability of older workers tended to influence organizations toward giving them less priority in training and promotion opportunities, and toward selecting them more often for dismissal. In this sense, Karpinska et al. (2015) showed that workers aged 62 to 66 were less likely to be offered training opportunities in their organizations than younger workers.

Training at Work: The Impact of Gendered Ageism

Although interest in studying ageism at work is growing, we find that those analyses have often been carried out from an androcentric, Western perspective. Invisible groups and the specificity of women in the labour market are often not taken into account (Íñiguez Berrozpe et al. 2020). In fact, many studies have focused on the analysis of age discrimination as a gender-neutral phenomenon that occurs solely due to the circumstance

of being older: this has been pointed out by authors such as Grant (2011), Maurer and Rafuse (2001), Handy and Davy (2007), and McGrann (2016). However, studies such as that of Duncan and Loretto (2004) show that women are more extremely affected by negative work stereotypes in relation to their age than men; to a greater extent than male workers, they are considered 'older' and, therefore, 'less useful'..

As already specified in the Introduction section, the stigmatization that ageing in employment causes in working women has been termed 'gendered ageism' (Itzin and Philipson 1995, 84). According to these authors, gendered ageism explains the combined effects of discrimination based on age and gender in employment conditions and professional opportunities for women. Various studies have evidenced this double standard of ageing (age and gender) that women have to face (Sontag,1972).

Gendered ageism can affect the recruitment and promotion of women, along with their opportunities for updating their competencies (Itzin and Philipson 1995; McBride 2011). Regarding recruitment, a study on perceived age discrimination by McGann et al. (2016) found qualitative differences in the level of perceived discrimination according to gender: women (especially those over 45 years old) expressed that they perceived greater age discrimination as a barrier to finding work than men. The reincorporation of older female workers into the labour market is also hindered by structural barriers, including the difficulty or impossibility of accessing training opportunities throughout their working lives (Green 2003).

In job training, gendered ageism manifests itself in agency variables and in structural variables. Older female workers suffer under personal conditions that can constitute obstacles in terms of training opportunities. Their training is related to the obligation of looking after someone's needs: not so much after their children, but after elderly relatives who are often in their care (European Agency for Safety and Health at Work -EASHW-2016; X 2020). The study by Grant (2011), cited above, indicated that a high number of women who are seeking a balance between personal and work life end up reducing their working hours due to the commitment involved in taking care of their family.

The self-perceived health level of older workers also appears to be a relevant condition for their participation in training (EASHW 2016; X 2020; in measurements of workability and quality of ageing at work, the self-perceived health level constitutes the basis, or the 'bedrock', according to Ilmarinen 2006). It largely affects female older workers since it is associated with specific conditions faced by women, such as symptoms derived from menopause, workplace stress because of their family caring responsibilities, and ergonomic features specifically designed for men that can cause musculoskeletal problems in women (EASHW 2016). The worker's educational level has also traditionally served as an explanatory variable in relation to participation in training: the lower the educational level, the less the possibilities of participating in training activities (Íñiguez-Berrozpe et al. 2020).

All these conditions generate a lack of confidence in women regarding their own ability to obtain educational achievements, as well as to reincorporate themselves into educational, work, or training processes at an older age; they will be more likely to believe

that they are too old to study, or they will have less confidence in their learning abilities (Grant 2011).

Access to training opportunities is thus sometimes based on assumptions about older women's age-related skills, learning capacity, and mental acuity. Such assumptions generate doubts and mistrust, which constitute true structural obstacles (Grant 2011). The aforementioned stigmatization is also more clearly manifest in women than in men: women have a lower rate of competence update (Itzin and Philipson 1995; EASHW 2016). In fact, Itzin and Philipson (1995) explained that one of the glass ceilings for mature female workers is the lower amount of possibilities their employers offer them to train and promote. The same conclusion was reached by Duncan and Loreto (2004): they showed that women were regarded as 'too old for a promotion' to a greater extent than men. In reference to promotion, a qualitative study carried out by Jykinen (2009) among female directors revealed the discrimination they had to face, and the effort they had to exert to develop their careers 'in the face of a triple danger: gender, age and lookism' (Jyrkinen 2009, 182).

These difficulties often tend to be motivated by beliefs and not based on evidence. This is the case, for instance, in the tendency to view older female workers as less motivated to train, or less prone to update their competences (Itzin and Philipson 1995; EASHW 2016). In fact, Benan and Lombardi (2019) show that what women struggle with most at work is not sexism, but age discrimination: 25% of women state that age affects their experiences at work to a greater degree than 'physical capacities and limitations' (20%) or 'gender' (17%).

In an analysis of the degree of participation of older workers in training, Lössbroek and Radl (2019) focused on gender differences. They showed that although the rate of training of older men and women in educational programs and on-the-job training was similar, men more frequently received funding from their organisations to carry out such training, while women more often paid for training out of their own pocket. In addition, they found that older women tended to work in organisations that offered more training opportunities for their staff (for example, in the public sector), although they could likewise pursue their career in job sectors where those types of courses tend to be less on offer. Finally, those authors showed that negative employer stereotypes regarding gender and age had a negative influence on older workers' access to training.

Regarding the subject of gendered ageism at work, institutions such as EASHW (2016) report a general lack of knowledge about how ageing in employment affects women: specifically, a lack of knowledge regarding its relationship with on-the-job training, motivation to learn, and skills. In this sense, Walker et al. (2007) suggest that public policies to combat age discrimination should take the gender dimension of age discrimination into account, as well as the different ways in which it affects older women.

Breaking the Myths of Ageism and Gendered Ageism in Workplace Training

Despite this widely observed phenomenon of internalised ageism, recent scientific literature has begun to pay increasing attention to evidence that breaks the myths associated with global ageing (Merriam and Kee 2014, 3; WHO 1999, 7). Age is increasingly seen as a socially constructed category that is by no means equivalent to a

personal characteristic (Krekula 2009). In fact, as Beier and Kanfer (2013) point out, the literature shows little evidence of a relationship between older age and lower job performance. A study by Ng and Feldman (2008) found that age was not significantly related to the performance of basic tasks. Conversely, although it was shown that older workers' performance in training programs was slightly lower than that of young people, no significant differences were found in terms of qualities such as creativity. Kooij et al. (2011), analysed a series of different motivations for work in relation to age. Their results showed high levels of intrinsic motivation among older workers. Although the motivation to obtain a promotion or to obtain a salary increase decreased with age, the motivation to perform satisfactory work, to use one's skills, and to develop a more independent job increased.

There is little evidence that older workers are less innovative than younger workers. Studies referring to a greater need to allot training time to older workers do not always take into account the possible impact that certain training formats can have on those workers (Beier and Kanfer 2013). A study by Leppel, Brucker and Cochran (2012), carried out among workers born before 1964 showed that older workers' job satisfaction increases in parallel with the greater amount of training opportunities made available by organizations, as well as with the perceived quality level of such training.

Certain studies even affirm that older women receive more training than men: since labour participation is usually lower among older women than among older men, older female workers would conform a selective group of highly engaged female employees (Lössbroek and Radl 2019). This leads us to our first hypothesis:

- (H1) Older female workers have the same level of motivation to learn than other groups of workers.

In certain countries, older women are more likely to be trained than younger women, as pointed out by Carmichael and Ercolani (2014). They found that when women start to age, they spend more time in training compared to younger ones – especially in job-related training. Along the same lines, Fitzenberger and Muehler (2015) found that females obtain more training as they age. The majority of the older female workers in the sample studied by Jyrkinen (2014, 182) stated that they were committed to their job: they trained actively and continuously, and sought new work challenges – in spite of having suffered under the prejudice of gendered ageism. In view of these considerations, we propose the two following hypotheses:

- (H2) Older female workers have a higher level of participation in non-formal training (hereafter NFT) than other groups of workers.
- (H3) Older female workers have a higher level of participation in informal learning at the workplace than other groups of workers.

Training at the workplace can indeed serve as a means for older female employees to catch up: in fact, they may find it necessary to engage to a greater degree in workplace training than males of equal age. As the above-cited authors explain, women use workplace training to signal their high degree of attachment to the labour force, and to

improve their skills (Jyrkinen 2014, 182). These observations lead us to formulate the following hypothesis:

- (H4) Older female workers apply advanced skills at work, scoring even higher than other groups of workers.

Although Loretto and White (2006) point out that prejudices regarding older workers' lower capacity and motivation can affect their self-concept, which, in turn, can lead them to discriminate against themselves by limiting their own ability to learn as well as their participation in professional progress (Beier and Kanfer 2013), other studies find that older female workers' motivation to learn is high and leads them to take part in non-formal training and informal learning to an even greater degree than younger employees (Jyrkinen, 2014, 182). In view of these observations, we hypothesise that:

- (H5) In older female workers, motivation to learn is positively related to non-formal training, and older female workers score higher than younger ones.
- (H6) In older female workers, motivation to learn is positively related to informal learning at work, and older female workers score higher than younger ones.

Although age is regarded in some studies as a variable that makes employees less effective in terms of skills performance at the workplace (McCann and Giles 2002), other authors, such as Leppel, Brucker, and Cochran (2012), state that when organisations provide a greater amount of non-formal and informal learning opportunities, this tends to increase the independence and satisfaction of workers regarding their use of skills. This is especially relevant for older workers (Uhunoma, Lim, and Kim 2021). In our study we aim to ascertain whether this relationship is also evident in older female workers, hypothesising that:

- (H7) In older female workers, non-formal training is positively related to the level of job skills to a greater degree than in younger workers.
- (H8) Older female workers score higher than younger workers in the relationship between informal learning at work and job skills.

Operationalisation of Variables and Hypothetical Model

In line with the issues raised in the previous section, and regarding the need to acquire more knowledge on the topic, we have focused in this paper on the following tasks: 1) a descriptive analysis of older female workers' motivation to learn, along with their participation in NFT and informal learning, and their use of advanced skills at work, comparing them to the other worker subgroups (H1; H2; H3; H4); 2) the construction of a model that takes those variables into account that are related to training and gendered ageism at work, as highlighted by the scientific literature (H5; H6; H7; H8).

With the aim of operationalising the analysis, we have transformed our theoretical arguments into OECD PIAAC data variables.

First of all, the PIAAC data include the two variables ‘*Job-related non-formal training*’ and ‘*Informal learning at the workplace*’ as constructs related to the most common mode of skill acquisition on the part of workers in the PIAAC Conceptual Background Framework Main Survey Questionnaire (2011). Non-formal (job-related) training is defined by this source as training that is intentional and organised, but not part of the formal educational system; it is job-related, and is measured as activities of this sort in which the employee has participated in the last 12 months prior to the survey (answered as yes/no in the PIAAC Survey). Informal learning at the workplace is learning that occurs away from a structured, formal classroom environment, and it can take place in many different ways. The PIAAC survey measures it as a construct formed by the variables ‘Learning from others’, ‘Learning-by-doing’, and ‘Keeping up to date with new products or services’. Informal learning at work is a training variable that measures workers’ engagement with interactive and dialogical learning and learning-by-doing, which, according to Uhunoma, Lim, and Kim (2021), enables older workers to become more engaged at the workplace, as they are encouraged by their motivation to learn and engagement with training (Marcaletti, Íñiguez-Berrozpe and Koutra 2018).

According to Gorges et. al. (2016), the ‘*Motivation to learn*’ construct is defined in the PIAAC data as ‘readiness to learn things’, and it is measured as a construct formed by the variables through which the respondent can evaluate his/her attraction toward learning new things and toward looking for further information. It is reflected in such items as ‘Incorporating new ideas into real life’, ‘I like learning new things’, ‘Attribute something new’, ‘Getting to the bottom of difficult things’, ‘Figuring out how different ideas fit together’, and ‘Looking for additional info’

In the PIAAC data (OECD, 2016), the ‘*Level of job skills*’ measures the level of use of advanced skills in the workplace and at home, such as writing, reading, numeracy, planning, influencing, task direction, and use of technology. In this study we have only taken skills into account that are used in the workplace.

As we also aim to analyse the relationships established in the previous section between older female workers’ level of training, motivation, and use of job skills, we have built a hypothetical model that tests these relations and compares them to the remaining subsample relationships. On the basis of our literature review in the introductory section, we have chosen two control variables: the workers’ educational level, on the one hand, and their perceived level of health status, on the other. As a variable directly related to job-related training, we used ‘motivation to learn’, hypothesizing that it would display a significant relationship with ‘Participation in (job-related) NFT in the last 12 months’ (whereby NFT is the most common learning activity among adults, according to Eurostat 2021, and according to the PIAAC data [OECD 2016], see Footnote 1). Both variables (‘motivation to learn and’ ‘job-related NFT’) act as exogenous variables upon the endogenous variables that directly measure this training’s possible benefits. The ‘Index of informal learning at work’ acts as a training variable that measures workers’ engagement with interactive and dialogical learning and learning-by-doing. According to Uhunoma, Lim, and Kim (2021), such activities enable older workers to become more engaged at the workplace, as they are encouraged by their motivation to learn, as well as by their commitment to training (Marcaletti et al. 2019). The level of ‘job skills’ acts as a measure of the impact of these workers’ training (Fleischmann and Koster 2018;

Nelson, 2016), which can imply higher workplace quality (Leppel, Brucker, and Cochran, 2012; X 2019).

The visual representation of the model is shown in Figure 1.

<< Figure 1 >>

Materials and Methods

Selection of Tools and Variables

Our analysis is based on data from the first (2013) and second (2016) rounds of the International Program for the Assessment of Adult Competencies (PIAAC) Survey, which measured the abilities of adults in key skills, such as literacy, numeracy, and problem solving in technology-rich environments. The dataset also contains information on how these skills are used in different settings, such as at home or in the workplace (OECD, 2016) and sociodemographic and socioeconomic variables.

The PIAAC survey dataset includes 1,329 variables, from which we have selected several observed variables. On the basis of these, we have built latent variables, as shown in Table 1, to test our hypothetical model presented above. We have based our selection on a review of the existing literature, specifically on the variables related to non-formal training and informal learning, work, motivation to learn, and the level of skills used at work, controlled by educational level and health level. Other variables (such as work hours) were taken into account in an initial exploratory analysis. Ultimately, however, as they do not bias the results, we did not include them in the final model. The CFAs of the scales we used are displayed in Appendix I, Table 2.

<< Table 1 >>

Participants

For this study we selected data from the first two rounds of the PIAAC survey (OECD, 2016), published in 2008-2013 and 2012-2016, respectively. In those two rounds, ca. 250,000 adults were assessed in 40 OECD countries. For the present analysis, we decided to work with data from the European countries that participated in the survey: Belgium, the Czech Republic, Denmark, Estonia, Finland, Ireland, Italy, the Netherlands, Norway, Poland, the Slovak Republic, Spain, Sweden, and the United Kingdom. As each of the two rounds covered different OECD countries, we used them both and merged them in the same database. From these countries we selected women and men between 25 and 65 years of age who were working at the time of the survey (n.=12,884 European working women and n.=18,855 European working men). We then proceeded to divide the data into four subsamples: female workers under 50 years of age (n.-50=9,415), female workers aged 50 and over (n.50+=3,469), male workers under 50 (n.-50 = 13,041) and

male workers aged 50 and over ($n_{50+}=5,914$). The total mean age of the sample is 42.1 ($SD=11.3$)³.

In Table 1 of Appendix I, the characteristics of the four subsamples are presented with the aim of contextualizing the data presented in the Results section. In most of the countries we selected, age distribution is more or less equal, with the exception of Denmark (with an overrepresentation of women and men aged 50 years or more) and Poland (with a much higher proportion of workers under 50 years of age). Regarding the place of birth, the percentage of migrants in all groups lies below 11%. The participants' educational level is high, given that half of the women and more than one third of the men had tertiary education. This also translates into occupational status, given that half of the men and more than 60% of the women exerted skilled occupations, especially in the case of women 50+ (67.0). This may bias the sample. However, as stated by Jyrkinen (2014) older female workers in skilled occupations suffer gendered ageism to the same degree as other female employees.

For missing data, we applied listwise deletion, being “by far the fastest and simplest answer to the problem of missing data (...), although difficulties are encountered in SEM when sample sizes are small” (Byrne, 2010, p.355). The variables “gender”, “age”, and “educational level” did not have missing data. The remainder of measured variables presented no more than 0.3% of missing data, except “Learning from co-workers/supervisors”, with 8.8% missing values.

Analysis

We first decided to compare the four subsamples with one another, using the analysis variables according to our hypothetical model. To compare the two groups, we performed the means comparison test with ANOVA, and found significant differences in almost all the variables analysed ($p<0.001$) with small effects ($\eta^2\leq 0.02$) calculating Eta squared. Correlations were subsequently obtained among all the factorial scores of the variables in the subsamples (see Appendix I, Table 3). We compared the four subsamples by applying Fisher's Z transformation of the correlation coefficient. ICC was moderate for the ‘Index of informal learning at work’ scale (.70), and optimal for the ‘Motivation to learn’ scale (.80) and the ‘Job skills’ scale (.82).

To test our proposed hypothetical model resulting from our theoretical review in the Introduction section, we performed an SEM analysis. SEM is a technique that is rarely used in the analysis of adult education, with certain exceptions such as Scandurra and Calero (2017), Manninen and Meriläinen (2011), Íñiguez-Berrozpe and Boeren (2019), and Íñiguez-Berrozpe et al. (2020). To carry out this analysis, we used IBM-SPSS and its AMOS extension (Version 26). We initially conceived a model in which the contribution of each observed variable to its corresponding latent variable and the values of the proposed structural model were made visible, including the observed variables and latent

³ As explained above in the introduction section and according to the OECD definition of ‘older worker’, the cut-off point for dividing our sample was the age of 50. To ensure this, we performed additional analysis with other cut-off points (45 and 55 years old), obtaining similar results without relevant differences.

variables (see the Results section, Figure 2). The selected estimator was the Maximum Likelihood Estimator (MLE).

The model's goodness of fit was tested using the χ^2 test, as well as the normal relationship and χ^2 / degrees of freedom (CMIN/DF in AMOS), applying the RMSEA and GFI indicators and their critical levels. We carried out multigroup analysis to verify if the interviewees of different gender and age groups would show significant differences in the analysed effects. To make this distinction, we compared a series of nested models. To contrast the differences between groups and to choose the best fitting model, we compared the models by calculating the differences in the AIC indicators (Byrne, 2010)⁴.

An invariance test was conducted to make certain whether the components of structural model is remained equivalent across the four subsamples. The result indicated the baseline model was invariant across gender and age (CMIN/DF=43.616; $p < .0001$; GFI=.93; CFI=.90; RMSEA=.036; $\Delta CFI < .01$).

Results

Before testing the structural equation model, we descriptively compared the four subgroups that make up the sample. Table 2 shows that significant differences can be observed between educational level, health level, and the level of motivation to learn (although the difference is quite small in this case), in favour of the younger female workers. However, this motivation is higher in older female workers than in older male workers: 3.8(.8)*** vs. 3.6(.9)***, respectively. The proportion of workers having 'participated in NFT for job-related reasons' is also highest in the case of female workers aged 50 and over, 67.1***. The same can be said of the average use of advanced job skills, 2.3(.8)***.

<< Table 2 >>

In this initial descriptive approach to the variables that make up the model, we measured the correlations among them (Table 3 in Appendix I). They are significant in all cases, although they are higher in the subsample of men and women aged 50 and over, especially in motivation to learn, in the index of informal learning at work, and on the level of job skills. ($r > .3$; $p < .001$).

As these previous analyses yielded differing results in terms of age and gender, we carried out a multigroup comparison of structural models according to these variables, with the aim of ascertaining which data best fit the hypothetical model. The resulting model with the most optimal fit was the Unconstrained Model⁵ (differences between subsamples were found in all the effects) (CMIN/DF=43.616; $p < .0001$; GFI=.93; CFI=.90; RMSEA=.036; AIC=20034.317), i.e., the model in which all effects are different in each group.

⁴ See Appendix II for Scientific and Ethical Validity of the Study

⁵ See Appendix I, Table 4 for model comparison

The results of the structural model represented in Figure 2 show that the group with highest scores in most of the effects is that of male older workers. However, the coefficients of female older workers are higher in all the effects (except for the effect of participation in NFT in job skills) than those of younger women. Motivation to learn is a highly relevant predictor of informal learning at work, as well as of the level of use of job skills in all groups, especially in older males ($\beta=.368^{***}$ and $\beta=.316^{***}$ respectively) and in older females ($\beta=.298^{***}$ and $\beta=.271^{***}$ respectively). Notably, we found that informal learning at the workplace is a highly relevant predictor of the job skills level of female workers over 50 ($\beta=.410^{***}$), significantly higher than for younger female workers. ($\beta = .273^{***}$) and younger male workers ($\beta=.354^{***}$). Motivation to learn is less important in the case of non-formal work activities, except for older male workers ($\beta=.124^{***}$). The high relevance of the ‘motivation to learn’ variable is explained for women over 50 by their health status, with a not very high coefficient ($\beta=.103^{***}$), and by their educational level ($\beta=.236^{***}$). For men, however, these variables are more relevant; educational level also affects participation in non-formal job-related activities in all the groups, but is particularly highly in male workers. This variable of ‘participation in non-formal job-related activities’ also exerts an influence on informal learning in the work environment, but less relevantly so than ‘motivation to learn’ in all the subgroups.

For mature female workers, this model explains 31.2% of the job skills level, 11.1% of the informal learning they carry out in the workplace, and 6.6% of their motivation to learn: they achieve higher percentages than younger female workers in almost all cases, but those percentages are lower than those achieved by older male workers (Table 3).

<<Figure 2>>

<<Table 3>>

Discussion

As a point of departure, this paper started by analysing a topic of considerable current relevance, given the high proportion of female older workers in the workforce (Eurostat 2021) and the stigmatization that a relevant percentage of them report to have experienced (Benan and Lombardi 2019). The topic has nevertheless been rarely explored in the scientific literature (EASHW 2016), with a particular dearth in the area of quantitative studies. Despite the limitations of a study on a subject such as this one, regarding which scientific knowledge is still in a semi-embryonic state, the current investigation represents an advancement, as it provides evidence that overcomes the possible prejudices that can be found when analysing female older workers and their relationship with non-formal training and informal learning at work, motivation to learn, and the level of job skills use.

Regarding our first group of hypotheses, the descriptive conclusions of our analysis show a motivation to learn lying at the same level as in the rest of subsamples, whereby it is even higher in women, thus confirming H1. A high participation of female workers aged 50 and over can be observed in non-formal job-related training activities, with a score that lies above that of younger female workers, and which is also much higher than male workers, thus supporting H2. Regarding H3, the ‘informal learning at work’ variable,

both female age groups have higher scores; still, H3 cannot be totally confirmed because the younger female group scores are slightly higher. In the use of advanced skills at work (H4), older female workers achieve the highest score, although differences are not as pronounced. These results call many myths associated with older female workers into question, such as the assumptions that they show lower motivation to learn or to acquire skills (Hsu 2013; Vickerstaff and Van der Horst 2019), the assumption that they experience greater difficulties in learning to use new tools or accomplish complex tasks (McGann et al. 2016; Beier and Kanfer 2013), and the assumption that they are less interested in new training opportunities or that they participate to a lesser extent in them (Maurer et al. 2008; Itzin and Philipson 2002; EASHW 2016). Our results are in line with previous studies (Kooij et al., 2011), which indicated that there is no significant relationship between older age and less use of skills at work. Our results are likewise in agreement with the studies by Jyrkinen (2014) and Fitzenberger and Muehler (2015), in which older female respondents stated that they were committed to their job, and that they were training actively and continuously.

In this analysis we take into account that women who occupy 'skilled occupations' are overrepresented in the PIAAC survey (OECD, 2016) on which our study is based. Thus, their higher level of participation in training would be associated with jobs that require advanced competencies, leading these women to be highly committed to their job-related training, as Lössbroek and Radl (2019) have pointed out.

Regarding our second group of hypotheses, and, considering the results of the structural equation (SEM) model, 'motivation to learn' turns out to be a highly relevant predictor of informal learning at work and of the level of use of skills at work, especially in the case of mature female workers and male workers, thereby confirming H5 and H6. These results would support the results of previous research: Kooij et al. (2011) found that the motivation to perform a satisfactory job led older workers to develop and use their skills through learning, while encouraging them to work more independently. Motivation to learn is less important in NFT, but is more pronounced in older workers than in younger ones, thus refuting the idea that supposed changes in their cognitive abilities would likewise reduce their motivation to learn to develop new skills (Beier and Kanfer 2013).

One of the most relevant results of the model we tested is that mature workers clearly want to pursue non-formal training and informal learning activities; this, in turn, relates positively to their use of advanced job skills. This relationship, however, is a bit weaker in female older workers regarding non-formal training; H7 is thus not confirmed. Nevertheless, as far as informal learning and job skills are concerned, the relationship is notably more pronounced in female older workers, thereby supporting H8. The study by Leppel, Brucker and Cochran (2012) had already stated that when organisations provide a greater amount of training opportunities, this tends to increase the independence and satisfaction of older workers regarding their use of skills. Non-formal training activities also have an influence on participation in informal learning activities at work, which, in turn, leads to a greater use of advanced job skills. Thus, informal learning is not only highly relevant due to the engagement and dialogical learning that it fosters according to Uhunoma, Lim, and Kim (2021); it also seems to play an important role in fostering the use of advanced skills at work, especially in the case of female and older male workers.

Finally, the central variables described above, ‘motivation to learn’ and ‘participation in non-formal training activities (job-related)’, are explained less, in the case of women, by their health status and educational level than in the case of male older workers. Although these are potential obstacles faced by female older workers, as noted by Grant (2011), and EASHW (2016), they seem to pose less of a hindrance than for male older workers.

Conclusions

As a conclusion arising from our study, we can affirm that the analysis of the variables that make up non-formal training and informal learning can break stereotypes such as ageism and, specifically, gendered ageism, thereby leading to a greater appreciation of older female workers’ commitment to learning, development of skills, and use of skills in the workplace. Our results suggest that organisations and institutions still have an important margin of action to promote non-formal and informal job-related learning through motivational growth, thereby discarding ageist beliefs that might exclude mature workers under the erroneous assumption that they are gradually losing their motivation to learn. In addition, the promotion of spaces and activities for informal learning at the workplace seems to be a thoroughly relevant course of action that can be adopted by organisations with the goal of increasing skills, especially in the case of female workers aged 50 and over.

In view of these potential fields of action, scientific research should achieve more in-depth knowledge concerning gender ageism in the work environment, and it should help to identify specific personal and organizational barriers that hinder women’s access to on-the-job training (EASHW 2016; Krekula, Nikander, and Wilinska 2018). From the vantage point of public policy, it is essential to promote training and learning activities throughout life that take the specificity of mature women into account (Walker et al. 2007). For organisations to deal with ageing in employment, it would be important to implement specific actions that take the gender variable into account, while giving priority to training as a quality element of ageing in employment (Maurer and Rafuse 2001). It would likewise be important for organisations to promote interactive spaces for informal learning. Specifically, in relation to gendered ageism, political responses to age discrimination should address the gender dimension in order not to incur the so-called ‘double danger’ (Handy and Davy 2007, 86) of age discrimination and sexism that women often tend to encounter as they age (McGrann 2016, 386).

Political initiatives and awareness campaigns must therefore go beyond unitary approaches in order to recognize that not all workers should be considered ‘older’ in the same way. Strategies to prevent any sort of discrimination will be most effective when they take the gendered nature of the work environment into account, along with the different ways in which older men and women experience age discrimination. This is particularly topical, as previous studies, along with our own, show that reality lies beyond stereotypes: older workers have a true desire to train, they are motivated to do so, and non-formal and, especially, informal learning both have a thoroughly positive impact on their on-the-job skills. As Grant (2011) specifies, the current lack of rigorous action to reduce perceptions of age discrimination will deny many older women in the future the opportunity to demonstrate what they can actually do.

Limitations of the Study and Prospective Research

Regarding our study's limitations, the PIAAC data's overrepresentation of women in skilled jobs can lead to a certain bias in results, as indicated above, because certain job skills, motivation to learn, and participation in training can all depend on what type of profession the respondents exert, and on what kind of organisation they work for. However, this overrepresentation occurs in all subgroups; the comparison between the subsamples is thus still valid. Also, although our paper's goal was to present an all-encompassing panorama that would allow for a better understanding of this field, cross-country comparisons were not conducted. Results could therefore be somewhat biased. Future research on differences from one country to the other regarding training and learning behaviour among older employees would further contribute to knowledge on this topic. Finally, the variables we selected do not cover the entire spectrum of elements that affect the experience of on-the-job training: for example, certain structural barriers should be more thoroughly investigated in non-formal training and agentic factors should be explored in informal learning. However, we did select those which the scientific literature considers most relevant from an agentic point of view, thereby yielding an optimal model with significant results. As a recommendation for future lines of research that would allow the scientific community to expand its knowledge on this subject, we suggest the use of samples with a greater representation of less qualified jobs, and the consideration of other types of variables that can be affected by gendered ageism, such as job access and promotion, in conjunction with structural variables that can promote or prevent gendered ageism at work. In general, a more in-depth analysis of ageism and gendered ageism at work would be required. Such analyses could pinpoint the age of onset at which ageism starts manifesting itself, they could study how gender affects this manifestation, and they could aid us to grasp how we should be dealing with these types of discrimination at the workplace from structural and agentic points of view.

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