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How Skill Requirements Affect the Recruitment Likelihood of Older Workers

The Indirect Role of Age Stereotypes

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Abstract

This article analyses the role of age stereotypes in the employability of older people. Unlike in extant studies, we shift emphasis from stereotypes to job requirements during recruitment. Using five waves of a large-scale, representative employers' survey from Poland, we analyse how the likelihood of recruiting people who are over 50 years old depends on the skill requirements defined by employers for vacancies offered. This study uses a real-life framework, with real employers and real vacancies that reflect labour demands at the scale of an entire national labour market. Results suggest that some job requirements lead to age bias during recruitment, and the chances of an older candidate being hired are especially hindered by high requirements regarding computer and training skills. By illustrating an indirect link between age stereotypes and age discrimination, this study contributes to understanding the mechanism that affects low employability of older people.

Keywords

age stereotypes, older workers, population ageing, recruitment, employability

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Introduction

A primary response to a rapidly ageing population is policies that increase employment among older age groups, but a difficulty developed countries experience is the low employability of older job seekers (Greller and Simpson, 1999; Hurd, 1996; Patrickson and Ranzijn, 2003; Tisch, 2015). Employability—the capability of gaining or maintaining employment—relates to the set of skills offered by a job applicant that can be used at work (Fugate et al., 2004). Unemployed people aged 50 and over have little chance of finding a job, and a much lower probability of changing employers than younger or mid-aged individuals do (Dietz and Walwei, 2011; Gielen and Van Ours, 2005; Heywood et al., 1999). Despite shrinking and ageing labour markets, employers are reluctant to recruit older candidates (Van Dalen et al., 2009). In a meta-analysis of this topic, Wanberg et al. (2016) demonstrate that the chances of reemployment after a job loss greatly deteriorate for individuals over 50. Studies on age norms from various countries report that at some age, people are perceived too old to work. Such labels frequently refer to people in their sixties, or even younger (Conen, Henkens, et al., 2012; Harper et al., 2006; Turek, 2015), which is too early considering the policy goals of extending working lives. Questions on why this happens and what mechanisms drive the low employability of older people are priorities in the research agendas of ageing societies.

It is widely argued that the low employability of older people is triggered by adverse age stereotypes that motivate discriminatory practices by employers (Bytheway, 2005; Kirchner and Dunnette, 1954; OECD, 2006; Perry and Finkelstein, 1999; Warr, 1994). Given the importance and popularity of this thesis, the evidence is surprisingly weak. Three approaches have been represented so far. First, studies investigate general attitudes toward older workers, primarily through surveys (Harper et al., 2006; Lu et al., 2011; Ng and Feldman, 2008; Posthuma and Campion, 2009; Taylor and Walker, 1998; Turek and Perek-Białas, 2013; Van Dalen et al., 2010) or qualitative interviews (Loretto and White, 2006). They suggest that negative opinions about older workers correlate with unfavourable company practices or support of early retirement. Based on these types of data, some authors conclude causal roles of stereotypes (Taylor and Walker 1998), but the data show only a link between general attitudes and recruitment intentions regarding an abstract category of workers, with no clear implication for real-life behaviours. The second approach is quasi-experimental vignette questionnaires (i.e., factorial surveys), with most studies finding that age stereotypes influence hiring intentions (Fasbender and Wang, 2016; Karpinska et al., 2011; Mulders et al., 2016; Mulders et al., 2014), and some reporting no relationship

(Karpinska et al., 2013). The advantage of this approach is that information about individual older workers is incorporated during analyses. However, the main disadvantage is low ecological validity (i.e., approximation of real-world situations); employers report only general attitudes toward hypothetical workers, not real recruitment intentions regarding real older workers. As with the first approach, such opinions predict real behaviours poorly, especially if a company is not hiring at the moment and no preferences exist. The third type of research challenges this limitation. Recruitments arranged as field experiments show some forms of discrimination against older candidates (e.g., older applicants receive fewer invitations for interviews and job offers than younger candidates do). Such findings appeared in France and England (Riach and Rich, 2006; 2010), Australia (Gringart and Helmes, 2001), Sweden (Ahmed et al., 2012), Switzerland (Krings et al., 2011), Spain (Albert et al., 2011), and the United States (Neumark et al., 2016). Although these studies provide reliable proof of age selection mechanisms in real-life contexts, they can mostly only hypothesise why they occurred. In particular, they do not offer evidence of the role of particular age stereotypes in recruitment likelihood. Such experiments were also conducted in specific contexts, limiting external validity. Large-scale, comprehensive studies that assess types of companies and jobs are required for this purpose.

In this paper, we deepen understanding of the role of age stereotypes for the employability of older people in three ways. First, contrary to usual approaches, we shift emphasis from stereotypes to job requirements during recruitment. This offers a more realistic perspective of employers' decision processes, during which the fit of workers' profiles to job requirements is the most important element. Age discrimination does not have to result from conscious and explicit ageist stereotypes but can work indirectly through job requirements. In this study, we ask whether the likelihood of recruiting people over 50 depends on the particular skill requirements defined by employers for offered vacancies. Were employers' recruitment decisions unaffected by age stereotypes, we expect no relationship between skill requirements and age preferences. However, when specific requirements activate stereotypes on older workers' skills, we expect a positive or negative influence on the likelihood of employing older candidates. By avoiding direct opinions about skills of younger and older workers, we limit response biases related to reporting socially correct opinions. Results then provide more robust empirical evidence of mechanisms that link age-based skill stereotypes and the employability of older candidates.

Second, this study analyses the role of age stereotypes in the real-life context of a labour market by focusing on real employers, real vacancies, and a range of real job requirements. Given

this realistic (i.e., not abstract or hypothetical) framework, likelihood of recruitment is a more reliable indicator of real behaviours. Data came from five waves of a large, representative employers' survey in Poland (i.e., Human Capital Study 2010–2014). Employers looking for workers described the positions offered and their requirements, including skills and age requirements. Using logit models, we analyse the likelihood of recruiting people over 50 years old, conditional on a range of skill requirements.

Third, unlike in extant studies (especially field experiments), we use large-scale data that show a representative image of labour demand at the scale of an entire national labour market. The evidence is stronger since it covers a perspective of five years, mitigating period-specific fluctuations. By using one of only a few large-scale employers' surveys conducted in central Europe, this study broadens the empirical base regarding age discrimination. By assessing Poland's labour market, we provide insights from a post-transition labour market, in which employability and employment rates for older people are among the lowest in OECD (OECD, 2015), and adverse old-age stereotypes are strong (Van Dalen et al., 2012). In 2014, Poland's employment rate for the group aged 50–64 was 44% and 60.3%, the average retirement age was 59.8 and 61, and the eligible retirement age was 60 and 65 for women and men, respectively. The harmful effect of age stereotypes on the employability of older people should be reflected in this context.

Theoretical framework

Age-based skill stereotypes

Early research into old-age stereotypes conducted during the 1950s suggested that managers' negative attitudes contribute to the employment problems of older people (Bird and Fisher, 1984; Kirchner and Dunnette, 1954). Since then, multiple studies have investigated ageist opinions, but as Harper et al. (2006) argue, the general picture of an older worker has not changed much. Despite cultural diversity, age-based beliefs are similar in structure and essence across countries (Chiu et al., 2001; Harper et al., 2006; Van Dalen et al., 2009). One of the most harmful old-age stereotypes is low productivity (Ng and Feldman, 2008; Taylor and Walker, 1998; Van Dalen et al., 2010). However, as a general work outcome, productivity cannot be required explicitly for a vacancy, and thus is less relevant while studying recruitment than specific skill stereotypes are. Multiple studies on age-based skill stereotypes reveal a stable set of opinions shared by employers and employees. Taylor and Walker (1998; 1994) point to stereotypes that create primary barriers to old-age employment, i.e., low perceived trainability, creativity, physical

capabilities, and ability to work with younger workers. Posthuma and Campion (2009) report that the most common old-age stereotypes include aversion to change, little flexibility, low learning abilities, and high cost of employment. Positive opinions include responsibility, loyalty, fairness, and engagement. In a meta-analysis, Bal et al. (2011) found that old age associates positively with reliability, but negatively with interpersonal skills and potential for development. Other studies found strong opinions regarding a decline in health and physical abilities among older workers (CIPD, 2005; Conen, Van Dalen, et al., 2012; Ng and Feldman, 2013). In search of factors that underlie employers' attitudes toward older workers, Van Dalen et al. (2010) distinguish two general dimensions of skills—hard and soft. Hard skills include mental and physical capacities to deal with workloads, willingness to learn, adaptability, new technology skills, and flexibility. Soft skills consist of customer-oriented skills, reliability, commitment, and accuracy. In a survey of Dutch employers, they found that workers 50 and over are assessed lower on hard skills but higher on soft skills, in comparison to those below 35. Similar results were obtained in other surveys conducted in the Netherlands (Karpinska et al., 2013; Van Dalen and Henkens, 2017), Poland (Turek and Perek-Białas, 2013) and other European countries (Van Dalen et al., 2012).

Based on the studies on age stereotypes, we may predict to observe the effects of age stereotypes in recruitment context. If the likelihood of recruiting older workers is affected by ageist stereotypes, positive or negative effects of those requirements related to age-based stereotypes are expected. Contrarily, in cases of skills not subjected to stereotypical beliefs based on age, we expect no relationship between skill requirements and age preferences. To specify skills affected by age stereotypes, we use a hard–soft skills approach. Following management science literature (Balcar, 2016; Gustavsson and Hallin, 2014; Hurrell et al., 2013; Laker and Powell, 2011), we define hard skills as technical and practical abilities and competencies that involve working with equipment, data, software, and other tools. Soft skills refer to non-technical interpersonal and intrapersonal abilities, attitudes and predispositions facilitating performance in different work contexts. In comparison to hard skills, they are more subjective, so their evaluation is difficult. We expect that in jobs in which a high degree of hard skills (e.g., physical or computer skills) is required, older job seekers are accepted less often given negative age stereotypes regarding these skills. For the same reasons, in jobs that require a high degree of soft skills (e.g., social or managerial skills), the likelihood of recruiting an older candidate is higher. If there is no evidence of age stereotypes regarding skills (e.g., mathematical skills), and the skills are neither hard nor soft, the requirements should not affect the likelihood of recruiting from any age category. Therefore, our hypotheses hold that:

H1. Employers are less likely to recruit workers aged 50 and over in jobs that require hard skills.

H2. Employers are more likely to recruit workers aged 50 and over in jobs that require soft skills.

H3. The likelihood of recruiting workers aged 50 and over is unaffected by skill requirements that are not a subject of age stereotyping.

Furthermore, we expect that employers have requirements regarding trainability of a candidate—a set of skills, abilities, and attitudes that allow updating and acquiring knowledge and competencies. This is suggested by evidence of strong stereotypes, according to which the ability to learn and develop declines with age (Maurer, 2001; Posthuma and Campion, 2009; Taylor and Walker, 1998), and by economic theory. Human capital theory, the deferred payment model (Heywood et al., 1999; Hutchens, 1988; Lazear, 1979), and human accounting models (Flamholtz, 1972) predict that companies focus on training younger workers as a more reasonable strategy from a career perspective. In this view, returns on investment in the human capital of older workers are lower due to shorter expected work times. Data from many countries also suggest lower participation in training of older employees (Cedefop, 2012; Lazazzara et al., 2013). Hence the fourth hypothesis:

H4. Employers are less likely to recruit workers aged 50 and over in jobs that require a high degree of training.

Previous studies show also that the acceptance rate of older candidates differs due to the size and industry of a company, and the type of job offered (Perry and Finkelstein, 1999; Posthuma and Campion, 2009; Rudolph et al., 2017). Staff shortages and difficulties with recruiting also encourage companies to accept older people (Henkens et al., 2008; Taylor et al., 2012).

Data and methods

Data

Data came from five waves of the Human Capital Study–Employers Survey (HCS-ES) conducted in Poland between 2010 and 2014. The sample ($N_{2010–2014}$=80,017; N_{2010}=15,841; N_{2011}=16,158; N_{2012}=16,000; N_{2013}=16,005; N_{2014}=16,013) included Polish private and public enterprises of all sizes and sectors, excluding agriculture and public administration. The samples are representative at the national and regional levels. Sampling was stratified by six main sectors, 16 regions, and four size groups, and it was split into random and panel part. The random sample covered companies employing 1 to 99 people and was independent for each wave. The panel survey included all Polish companies with more than 100 employees who were contacted at each

wave (12,002 companies participated in more than one wave, and 551 in all five). Data were collected through telephone interviews (CATI – 96%), supported by personal (CAPI) or web (CAWI) interviews. The survey was a part of Human Capital Study, one of the largest labour-market research programmes in Europe, which includes separate studies of employers, the general population, unemployed people, students, pupils, and training institutions (Górniak, 2015).

Dependent variable

Respondents were asked whether their companies were "currently looking for any people to work", and those who answered affirmatively identified and described the positions. If a company was offering two or more jobs, one was selected randomly. Respondents were then asked about the position's characteristics and requirements, including skills and preferred age of candidates. The dependent variable indicates acceptance of a worker aged 50 years or more (No/Yes), and was prepared based on open-ended question about age preference for a candidate: "What is the minimum and maximum age of a person you are looking for this position?". Respondent indicated both a low and high age, or could answer that one or both age brackets were unimportant.

We restricted the sample to employers that reported an upper age limit. An alternative approach, in which we included respondents without age preferences, assuming they accept everybody, returned nearly the same results (see sensitivity analysis), but was problematic regarding interpretation. The analysis suggested that companies without age preferences were equally willing to accept a person of any age; even very old candidates had high acceptance rates. Additionally, respondents without age preferences had more missing data for other questions concerning job requirements, suggesting that the option *not important* served as an evasive answer for unmotivated respondents. Excluding the group ensured a clearer view of age preferences, but it should be noted that this might have resulted in underestimation of predicted acceptance rates. We tested other threshold values for the dependent variable (e.g., 45 or 55 and over), and results were consistent. We chose 50 and over due to its embeddedness in social awareness as an indication of an older worker, and its standard use in public policies (OECD, 2006).

Skill requirements

Each employer was asked about requirements for a candidate for a specific position. Skill requirements were measured with the question "Are these skills required for this position? If yes, at what level?," followed by a set of pre-defined skills, with answers ranging from 0 (not required) to 4 (very high level). Skills were grouped into three categories according to the definitions above. Hard skills included office, technical, computer, and physical skills, and soft skills included

creativity, social, managerial, independence at work. A neutral group was created using analytical and mathematical skills because they were not expected to be a subject of age stereotyping, given no evidence in this respect. Training skills requirements were indicated using a separate question about planned initial job-training intensity, with scale ranging from 0 (low degree, i.e., a newly hired person will be fully prepared to work and require no training) to 3 (high degree, i.e., she or he will get a full job training). Detailed wording of all items appears in Table 1. To provide better comparativeness in multivariate models, the variables were standardised into z-scores, with mean=0 and standard deviation (sd)=1.

Table 1. *Skill requirements – definitions*

Group	Skills	Question wording	
Hard skills	Office	*Organization and performance of office work*	*0 – not required* *1 – basic level* *2 – medium level* *3 – high level* *4 – very high level*
	Technical	*Service, repair and installation of technical equipment*	
	Computer	*Use of computer and internet*	
	Physical	*Physical skills*	
Soft skills	Creativity	*Artistic and creative abilities*	
	Social	*Contacts with other people, both co-workers and clients*	
	Managerial	*Managerial skills and organisation of the work*	
	Independence at work	*Organization of own independent work and taking initiative*	
Neutral skills	Analytical	*Searching and analysing information and drawing conclusions*	
	Mathematical	*Performing mathematical calculations*	
Training skills		*Do you plan that the newly hired person will:* *0 –be fully prepared to work and require no training* *1 –get a little job training* *2 –get a more extensive job training* *3 –get a full job training*	

Control variables

Company characteristics. The models controlled for the size of a company (i.e., number of employees categorised into four groups) and its sector of activity (6 sectors). We also included type of ownership (i.e., public or mixed, private) and region (i.e., 16 voivodships). Training indicated whether the company provided training to workers within the last 12 months. Recruitment problems were based on the question "Does your company have any problems with finding suitable candidates for this position? (No/Yes)."

Job characteristics. Employers offering a job were asked about the occupation using an open-ended question. Answers were coded into categories from the International Standard Classification of Occupations (ISCO-08). We used eight general ISCO categories, excluding category 6, skilled agricultural, because this study does not assess the agricultural sector. For descriptive purposes, they were grouped into three classes of high-, medium-, and low-skill jobs

(Table 2) based on ISCO classification and the average years of education of the current workforce.[1]

Table 2. *Descriptive statistics of dependent and independent variables (only respondent with age preferences)*

			%	N
Accepts candidate 50+		No	56.0	5804
		Yes	44.0	4567
Company size		1-9	23.7	2458
		10-49	33.5	3471
		50-249	26.3	2730
		250+	16.5	1712
Sector of company (NACE)		Manufacturing, Mining	30.2	3126
		Construction, Transport	20.2	2094
		Trade, Services	22.1	2288
		Professional services	12.6	1301
		Education	6.9	712
		Heath, Culture, Public administration	8.1	836
Experienced recruitment problems		No	28.1	2871
		Yes	71.9	7344
Training for workers (past 12m)		No	31.4	3250
		Yes	68.6	7106
Type of ownership		Public or mixed	16.4	1704
		Private	83.6	8667
Occupation (ISCO)	High skills jobs	1. Managers	3.6	359
		2. Professionals	20.0	1994
	Medium skills jobs	3. Technicians	10.8	1074
		4. Clerical, office	5.5	551
		5. Services and sales	15.0	1494
	Low skills jobs	7. Craft (skilled manual)	26.9	2676
		8. Plant, machine operators	12.6	1251
		9. Elementary	5.6	558
Year of research		2010	20.0	2073
		2011	22.3	2314
		2012	21.9	2274
		2013	16.7	1734
		2014	19.1	1976
Total			100.0	10371

***Notes**: 16 regions (voivodships) not shown.*

Analytical approach

We used pooled data from all five waves of HCS-ES, but restricted them to only companies that were looking for employees (approximately 17% during each wave). We analysed only those employers that reported an upper age limit as a criterion for employment (76% of those employing). Consequently, about 10,000 observations were used in the models. We used random-effects logit models with clustered standard errors to estimate the probability of hiring a candidate aged 50 or over. The longitudinal version of logit models (with observations clustered in companies) was used to control for the repeated appearance of some companies across waves, and to correct standard errors for within-correlations. Logit models with unclustered observations

[1] The average number of years spent in education was 15.9 for high-, 13.1 for medium-, and 11.4 for low-skill jobs (based on HCS Population Survey 2010–2014).

produced nearly the same results. Data were unweighted, but the models included sampling variables (i.e., sector, region, and size).

Results

Descriptive statistics

The maximum age of a candidate was unimportant to 24% and the minimum age was unimportant for 31% of employers who were hiring. The remainder reported values with average age brackets that ranged from 24.3 (sd=4.9) to 45 (sd=9.5). Based on these age ranges, the acceptance rate for candidates aged 50 and over was 44% (in 2010, it was 41.0%; 2011, 41.1%; 2012, 46.7%; 2013, 44.9%; and 2014, 46.8%). Assuming that respondents for which age range did not matter would accept a candidate of any age, acceptance increased to 57%.[2] Still, the results suggest that 4 to 6 of 10 job offers rejected older people in advance.

Skill requirements differed due to the type of job offered (Table 3). For high- and medium-skill jobs, the most desired were social skills (required in more than 80% of job offers) and independence at work (66% to 84%). Also in high demand were computer (44% to 66%) and analytical (43% to 71%) skills. In low-skill jobs, most important were physical ability (53%) and independence (43%). The least desired skills were creativity (10%) and office skills (14%). Initial training intensity was low; 33% of companies planned extensive or full job training for newcomers.

Table 3. *Descriptive statistics of skill requirements (original values)*

		High skill jobs		Medium skill jobs		Low skill jobs		Total	
		% high	M	% high	M	% high	M	% high	M
Hard skills	Office	23.4	1.51	22.1	1.26	2.0	0.24	13.6	0.87
	Technical	9.7	0.68	7.8	0.61	24.8	1.49	16.2	1.03
	Computer	66.3	2.74	43.6	2.01	6.3	0.57	32.8	1.55
	Physical	23.9	1.51	29.3	1.73	53.5	2.47	38.6	2.00
Soft skills	Creativity	19.4	1.04	9.2	0.71	5.0	0.44	9.8	0.67
	Social	86.6	3.16	80.1	3.04	40.5	2.20	63.7	2.69
	Managerial	35.1	1.70	16.9	1.06	8.6	0.73	18.0	1.08
	Independence at work	83.5	3.07	65.6	2.70	43.2	2.21	60.1	2.57
Neutral skills	Analytical	70.7	2.77	42.7	2.02	16.1	1.19	37.8	1.83
	Mathematical	41.7	1.92	35.8	1.81	13.6	1.09	27.7	1.52
Training skills		24.3	0.97	40.1	1.44	31.3	1.24	32.8	1.24

Notes: *M – mean;*
% high – Percentage of companies requiring high level of the skill. For skills: answers 3 "High" and 4 "Very high" are combined. For training skills: answers 2 "extensive training" and 3 "full training" are combined.
N ranged from 10,334 to 10,371.

[2] Acceptance was 55% for 45 and over, and 19% for 55 and over. When employers without age preferences were included, acceptance was 65% and 38%, respectively.

Multivariate models

We estimated four random effects logit models (Table 4). All models had approximately 10,000 observations from about 9,000 companies investigated across all five waves. Model 1 includes year, region, and control variables regarding a company. Model 2 adds information regarding the occupation of vacancy. Model 3 includes skill requirements. In addition to odds ratios (OR), Model 3 also included average adjusted predictions (AAP) for categorical variables, and the min-max change in probability (MMC) for dichotomous and continuous variables (Long, 1997). AAP estimates the probability of a positive outcome, adjusted for a category of variable, and can be compared with the average probability of accepting a person aged 50 and over (44%). MMC calculates the difference in percentage points (pp) between AAP estimated for minimum (in this case zero) and maximum (1 for dichotomous, 3 for training, and 4 for other skills) values.

Table 4. *Logit models for the likelihood of accepting a candidate aged 50+*

		Model 1 OR	Model 2 OR	Model 3 OR	AAP	MMC
Size:	1-9	1.00	1.00	1.00	0.38	
	10-49	1.46***	1.50***	1.44***	0.44	
	50-249	1.80***	1.91***	1.81***	0.48	
	250+	1.94***	2.18***	2.08***	0.50	
Sector:	Manufacturing, Mining	1.00	1.00	1.00	0.42	
	Construction, Transport	1.52***	1.25*	1.19	0.44	
	Trade, Services	0.57***	0.79*	0.82*	0.38	
	Professional services	0.77**	1.32*	1.40**	0.47	
	Education	0.92	1.84***	1.77***	0.51	
	Heath, Culture, Public admin.	1.91***	4.13***	3.57***	0.63	
Experienced recruitment problems (0-1)		1.26***	1.20**	1.22**		0.033**
Provided training (last 12 months)		0.74***	0.79***	0.88		0.020
Private ownership		1.02	1.07	1.10		0.016
High-skill jobs:	Managers		1.00	1.00	0.50	
	Professionals		0.44***	0.53***	0.39	
Med.-skill jobs:	Technicians		0.56**	0.63*	0.42	
	Clerical, office		0.36***	0.39***	0.34	
	Services and sales		0.60**	0.50***	0.38	
Low-skill jobs:	Craft (skilled manual)		1.46*	0.92	0.48	
	Plant, machine operators		1.97***	1.23	0.53	
	Elementary		1.79**	1.10	0.51	
Hard skills:	Office [a]			0.94		-0.034
	Computer [a]			0.65***		-0.194***
	Technical [a]			1.03		0.017
	Physical [a]			0.86***		-0.079***
Soft skills:	Social [a]			0.91**		-0.066**
	Managerial [a]			1.13***		0.063***
	Creativity [a]			0.92**		-0.051**
	Independence at work [a]			0.96		-0.026
Neutral skills:	Analytical [a]			1.05		0.021
	Mathematical [a]			1.00		0.002
Training skills [a]				0.90**		-0.050**
_cons		0.42***	0.34***	0.38***		
_cons lnsig2u		2.02***	2.25***	2.13***		
N (of observations)		10186	9787	9744		
N_g (of companies)		9115	8799	8765		
AIC		13592	12786	12580		
BIC		13823	13066	12939		

Notes: [a] *Z-scores.*
OR – odds ratio. AAP – average adjusted predictions. MMC – min-max change in probability.
Not shown: year, region.

Acceptance increased with size; companies that employed 250 or more workers were twice as likely to respond affirmatively than micro companies were (OR_{Model3}=1.98). Industries with the greatest acceptance rates were health, culture, and public administration (AAP=63%), and those with the lowest were trade and services (38%). Occupations with the highest AAP were plant and machine operators (53%), elementary professions (51%), and craft workers (50%). The lowest values were for clerical and office workers (34%). Companies that experienced problems during recruitment had 22% higher chances of accepting workers 50 and over, but in terms of predicted probabilities, the difference was 3.3 pp (MMC=0.033). Companies that provided training to employees in the last 12 months were less willing to accept older candidates, but the effect was

significant only in models that did not control for skill requirements (OR_{Model2}=0.79). Type of ownership was non-significant.

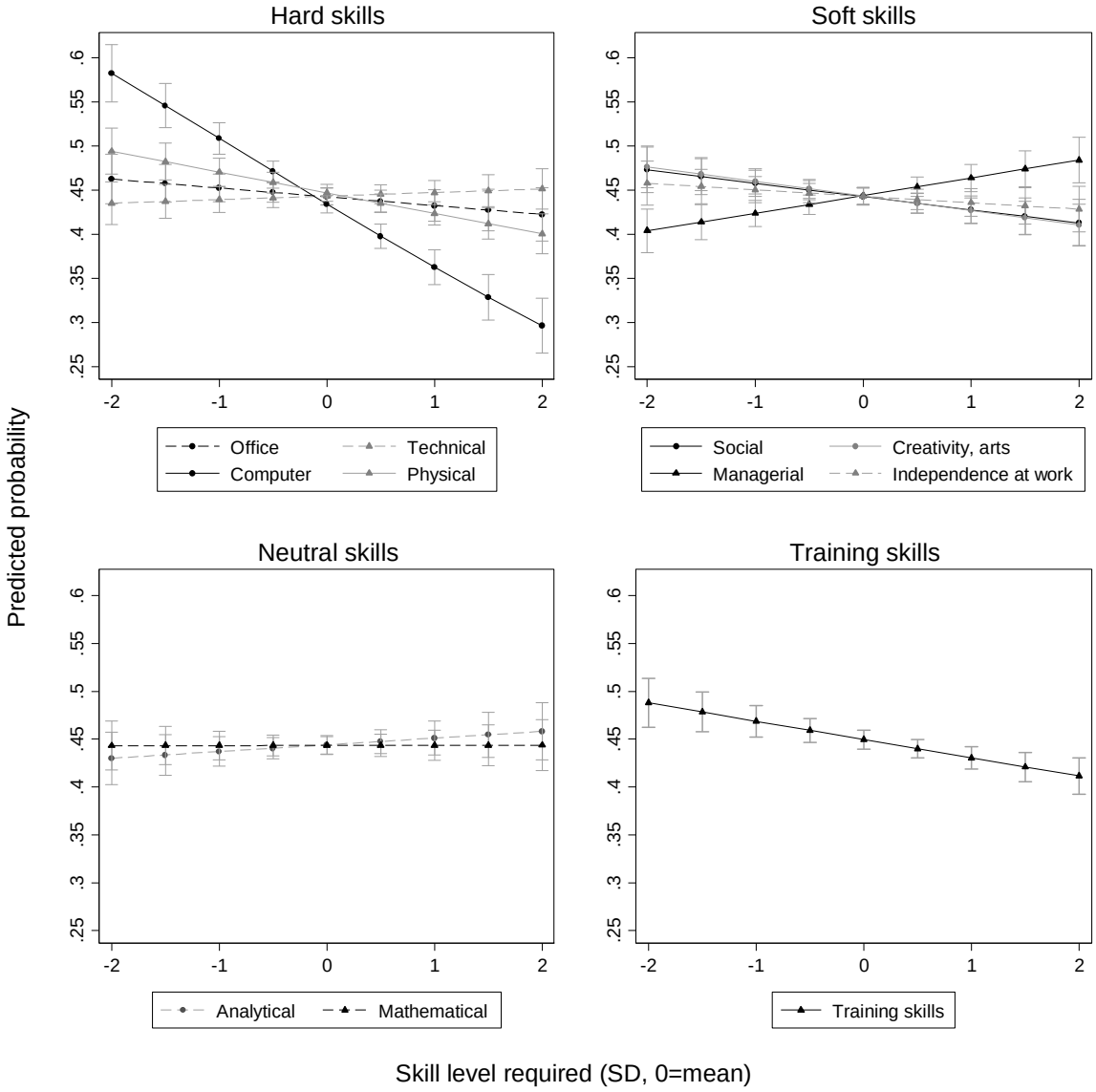
The effects of skill requirements are shown in four panels in Figure 1. They were standardised to allow comparisons of effect sizes, with standard deviations on the horizontal axis and predicted probabilities on the vertical. As hypothesised (H1), hard-skills requirements had mainly a negative effect. The strongest influence was computer skills. When the required level increased by one standard deviation, the chances of accepting a 50 and over worker dropped 35% (OR=0.65). MMC was -0.194, suggesting that for vacancies that required the maximum of the skill, the predicted probability was lower by almost 20 pp than for vacancies that had zero requirements for the skill. For jobs that demanded physical skills, older workers also had lower chances of employment; a 1 standard deviation increase caused a decrease of 14% (OR=0.86), and MMC was -0.079. Technical and office skills were non-significant.

The soft-skills group was hypothesised to facilitate the likelihood of recruiting older workers (H2), but only managerial skills were beneficial. A 1 standard deviation increase resulted in 13% higher chances of a positive outcome (OR=1.13). The MMC suggested that for vacancies that required very high managerial skills, the probability was higher by 6.3 pp versus no requirement. Both social skills and creativity had negative effects, or a 10% decrease per 1 standard deviation increase, with MMCs of -5.1 and -6.6, respectively. Independence at work was not statistically significant.

We expected no effect of neutral skills (H3), and indeed, analytical and mathematical skills did not affect employment.

Results supported H4; companies that invested in training more intensively were less willing to accept older workers. A 1 standard deviation increase in training intensity resulted in a 10% decrease in recruitment likelihood. The difference between minimum and maximum trainability requirements was -5 pp. The effect was moderate but stable and significant, even when controlling for training offered to employees.

Figure 1. Predicted probability of accepting a worker aged 50+ conditioned on the level of skill requirements (z-scores)

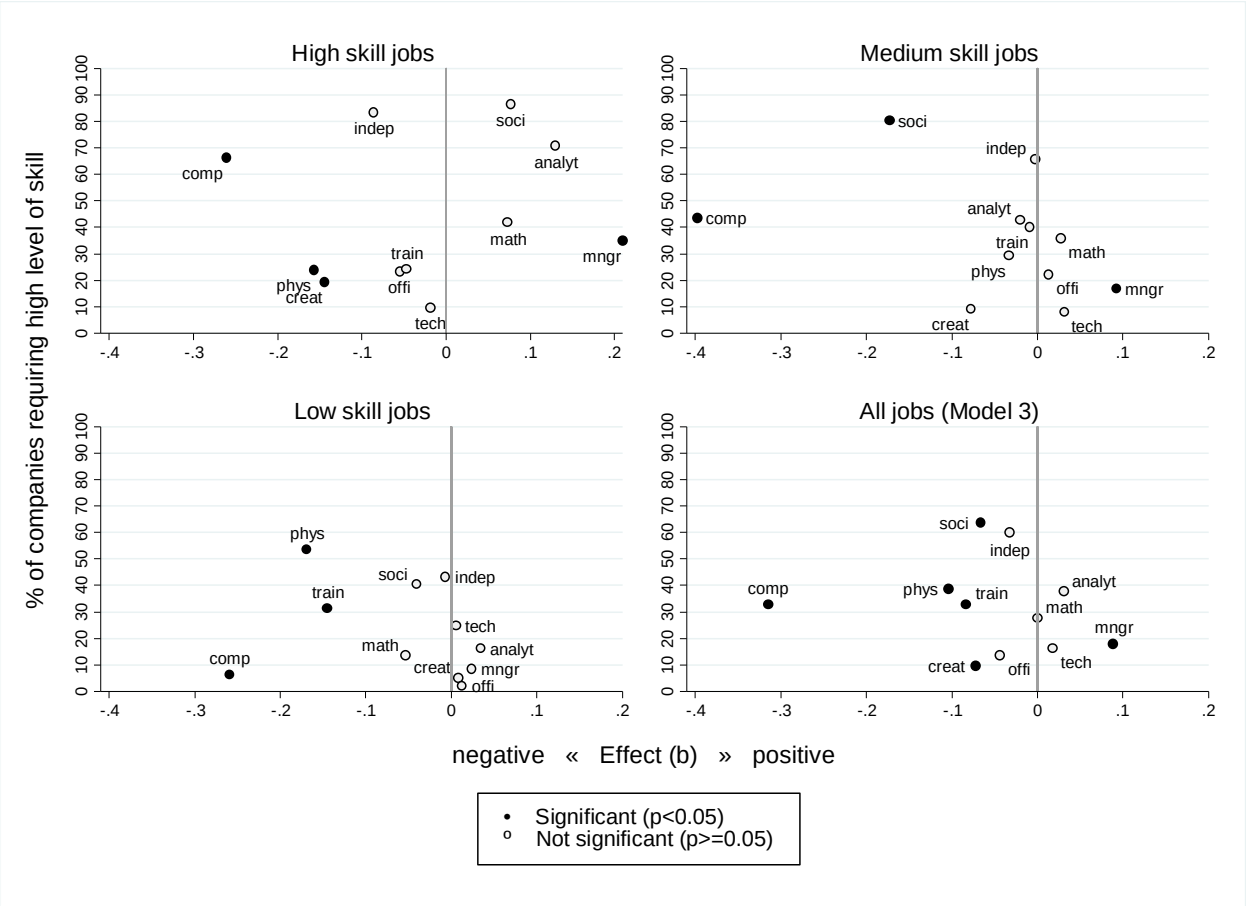


Notes: *Dashed lines indicate results not significant at p=0.05.*
Estimations based on Model 4.

During additional analyses, interactions between job type (i.e., high-, medium-, and low-skill jobs) and skill requirements were tested (Figure 2). For each occupational group, the effects of skill requirements are presented with the importance of the skills. For example, for high-skill jobs, the percentage of companies that required a high degree of computer skills was 66%, and computer skills had the most negative effect on the likelihood of recruiting a 50 and over candidate. For low-skill jobs, physical skills had a strong, negative effect and high average importance. The positive effect of managerial skills was significant for high- and medium-skill jobs, though its importance was low. The effect of social skills was negative for medium-skill jobs, and was the

most common requirement. The negative effect of training skill requirements was significant only for low-skill jobs.

Figure 2. Effect and importance of skill requirements for different occupational groups



Notes: *Estimations based on Model 3 performed separately for each occupation group.*

Sensitivity analysis

Sensitivity analyses were conducted to test the robustness of results (Appendix, Figure A2). We tested models that included employers that did not have age preferences, assuming they accepted candidates of any age, and the difference threshold for the dependent variable (e.g., 45 or 55 and over). We also used alternative statistical methods, logit models without correction for repeated measures and linear regression models with maximum accepted ages as a dependent variable. All approaches did not alter conclusions based on models presented in Table 4. Sensitivity analysis suggested that the strongest effects of job requirements, particularly the negative effects of computer, physical, and training skills, were stable.

Conclusions

We investigate whether the low employability of older people results from age-based stereotypes regarding skills. Using large survey data that are representative of the Polish labour market, we analyse the influence of job requirements on the likelihood of recruitment of older workers. We expected a positive or negative influence of skill requirements in cases in which they are affected by age stereotypes. We hypothesised a negative role of hard skills and training skill requirements, a positive role of soft skills requirements, and a neutral role of requirements that should not be biased by age stereotypes.

The results evidence that recruitment decisions are affected by age-based opinions, with two findings having particular importance. First, the job requirement with the most rejective effect was computer skills. If a job required good computer skills, the likelihood of recruiting a person aged 50 and over was much lower than if such skills were not required. This relationship was universal across all types of occupations, but it was especially prominent for high- and medium-skill jobs, in which about half of vacancies required a high degree of computer skills. The effect was even stronger than the effect of physical requirements. Although physical ageing might be a barrier for many jobs (39% of job offers required a high degree of physical abilities), results suggest that the ability to deal with computer technologies should be considered a primary area of concern for policymakers. Modern economies are less dependent on physical work; technological progress and informatisation continuously increase demand for digital competencies. Advancing age poses no strict and universal obstacle for acquiring and updating skills in new technologies (Wagner et al., 2010), but employers' beliefs that people aged 50 and over cannot work with computers might harm labour market chances for this group.

The second major finding of this study is the negative effect of training requirements. The likelihood of employing a 50 and over person was lower for jobs in which more intensive initial training was planned, though the size of the effect was moderate. Previous research evidenced the lower participation of older workers in training (Cedefop, 2012; Lazazzara et al., 2013; Taylor and Urwin, 2001). The current study adds that employers are also less willing to recruit older candidates if a job requires training, which hinders their employability directly. Two mechanisms explain this negative effect of training requirement on recruiting older workers. The first concerns stereotypes. The prevailing opinion is that older workers are difficult to train (Harper et al., 2006; Posthuma and Campion, 2009; Taylor and Walker, 1998; Van Dalen et al., 2010). Although older workers learn efficiently and a potential cognitive decline associated with ageing is not the case

with 50 or 60 year olds (Willis and Schaie, 2006; Zwick, 2012), a stereotypical view from employers on this matter might create barriers to human capital investment. Moreover, employees' willingness to train depends on self-confidence regarding learning skills that often declines with age as a result of age stereotypes at work (Maurer, 2001; Posthuma and Campion, 2009). The second explanation concerns economic calculation. Employers' attitudes might result from rational cost–benefit calculations, in which expected retirement translates to shorter periods of return on investments, which makes employers reluctant to recruit older workers who require training (Heywood et al., 1999; Hutchens, 1988). A challenge for public policies aiming to increase educational attainment in older groups is eliminating a backward loop in which adverse, age-based stereotypes regarding skills and trainability are followed by reluctance to invest in training, resulting in a lack of opportunities for older workers to develop. In addition, negative training attitudes reinforce the significance of results regarding computer abilities: a combination of strong discriminatory effects of computer and training skill requirements suggests a general image of older workers unable to adjust to a modern economy and high-skilled specialisations.

The influence of other skill requirements for the likelihood of employing 50 and older workers was found not as strong as expected. Office and technical skills, independence at work, and creativity had low or no influence. Only requirements regarding managerial skills benefited older jobseekers, corroborating findings from studies on age stereotypes (Turek and Perek-Białas, 2013). Contrary to expectations, the effect of social skills requirements was negative, though it was significant only for medium-skill jobs, primarily in trade and services (this is in jobs requiring contact with clients).

The main strength of this study is a real-life framework that demonstrates whether job requirements lead to age bias during recruitment. We investigated real employers, vacancies, and job requirements in an entire national labour market. Instead of soliciting opinions on the skills of younger and older workers, we focused on a tangible element of recruitment—job requirements and hiring intentions. However, we had no information on real candidates who fulfilled vacancy requirements. Although this study is representative of the Polish labour market, generalisations to other countries are speculative. In Western Europe, which is characterised by higher employment rates for older workers and a different structure of the supply and demand of human capital, results might have been more favourable for older job seekers.

We argue that age should be viewed in light of the meanings and expectations that employers impose on it. Despite progress with anti-age discrimination legislation (Neumark, 2009), which covers recruitment (e.g., prohibition of age as a factor for hiring), age remains a

candidate's essential characteristic. It serves as a convenient though unreliable indicator of skills, productivity, costs, and remaining work time. As this study shows, age discrimination influences recruitment, but often does so indirectly through job requirements that an employer defines. Job requirements influence preselection of candidates based on age, and thus must be considered a source of discriminatory practices that decrease older workers' employability.

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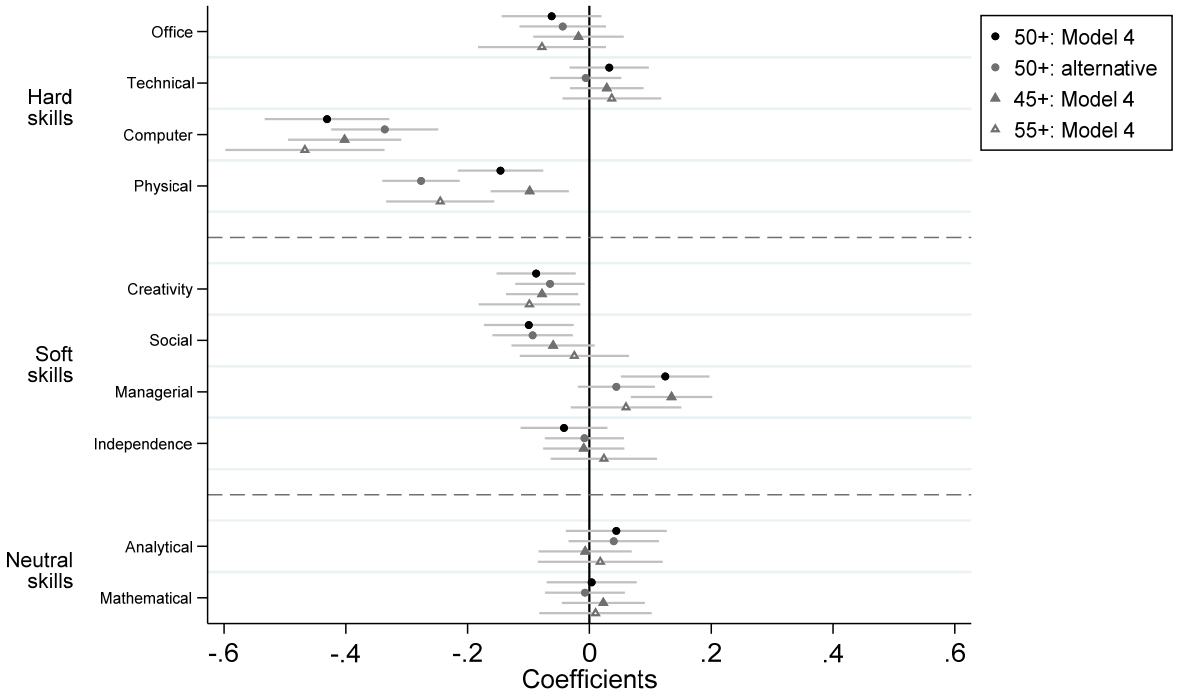
Appendix

Figure A1. Sensitivity analysis for coefficients of skill requirements



***Notes**:* *Model "50+" is the one used in the article (Model 4).*
Model "50+: alternative" assumes that employers who did not have age preferences accept candidates in any age.
Models "45+" and "55+" use different threshold for the dependent variable.