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Age Discrimination at the Level of Task Allocation

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Michel Nicolas Wirth

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Place & date:	Maastricht, 23rd of August 2018
Name:	Michel Nicolas Wirth
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Abstract

With the help of a vignette study, this paper investigates the question whether discrimination against older workers exists at the level of task allocation. Whereas the literature has so far almost exclusively focused on the hiring process, I analyze the effect of the age of the employee, the age of the employer, the type of task, the provision of training to older employees and the absentee rate on the propensity to assign tasks to older workers. For the maintenance and enhancement of their employability it is pivotal for workers to be allocated to tasks as it allows them to acquire new skills and keep their current skills updated.

My results show that workers who are between 56 and 65 years old are 11%-points less likely to be allocated to a task than their 26 to 35 year old counterparts. I further find that the probability to be assigned to a task for workers who are between 56 and 65 years old does not differ with the type of task. Moreover, my research shows that the age of the employer has no significant impact on the propensity to allocate tasks to younger or older workers. I finally find that the provision of training to older employees and the absentee rate do play a role: employers who in general provide more training to their older employees and who experience higher absentee rates are more likely to assign tasks to older workers.

My results indicate that discrimination against older workers is widely spread among employers and that there is a need to actively counter the discrimination by government action. I suggest the funding of programs which raise the awareness of employers for comparative advantages of older employees and which finance training for older workers in their respective companies. The employability of older workers could thereby be enhanced for the benefit of both the company and the worker.

Table of Contents

1. Introduction

1.1. Economic Problem

In most industrialized nations through the retrenchment of pension rights and the increase of the eligibility ages for state pensions, workers are stimulated to continue working until a later age. And although the workforce is getting, on average, older and older (Truxillo et al. 2012), it is observed that older people are facing serious issues maintaining their employability. For example, once laid off, it takes an older employee[1] longer to re-enter the labor market than his younger counterpart. The probability to get hired for an older worker, compared to a younger person who, except for the age, displays the same characteristics, is substantially lower (Bendick, Brown and Wall 1999, Lahey 2008, Fouarge and Montizaan 2018). This type of age discrimination does not only apply to job offers, but already starts earlier in the application process. Older persons are systematically left out in the decision to be called for an interview (Neumark and Song 2012).

One reason which might explain these differences are the stereotypes which are associated with older workers. Employees over the age of 50 are typically regarded as being less flexible, having lower level of technical competencies and a lower willingness to learn (Karpinska, Henkens, and Schippers 2013).

Concerning age discrimination, the literature has so far almost exclusively focused on the recruitment of older employees, but possibly this focus is too narrow. Employability is not only limited to situations in which employees find themselves in between jobs, but also includes the ability to successfully hold on to their current job. Moreover, it is unlikely that the stereotypes linked to older employees are solely prevalent during the recruitment process. Hence, the treatment of older people who are currently employed by a company is worth examining.

In this thesis, I will investigate whether age discrimination occurs in the task allocation by employers. Task allocation is immensely important as it offers an opportunity for workers to improve their skills and gain valuable experience increasing their employability. Several

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[1] The terms "worker" and "employee" are used interchangeably throughout this work. I use the words for any person employed for salary in the private or public sector.

studies have highlighted the importance of informal learning at the job for maintaining and acquiring new skills (Acemoglu and Autor 2011, Gibbons and Waldman 2006). In case negative stereotypes on flexibility and the willingness to learn significantly influence the task allocation by employers, it may show that older employees are systematically assigned to tasks which are less meaningful and contribute less to their skills development.

1.2. Research Questions

Broadly speaking, discrimination can be explained by two competing theories. Becker (1957) put forward his theory of taste-based discrimination. Hereafter, individuals are actively trying to avoid a certain group of people based on the attributes of the latter such as age. The second theory is commonly referred to as information-based discrimination. In its simplest form, this theory predicts that people are systematically misjudging the abilities and skills of individuals of a certain group, whereas in more sophisticated versions it is assumed that these individuals either have difficulties emitting signals about their true capabilities or that the skills within their group are distributed with an extremely high variance (Levitt 2004).

A reason why employers may avoid older people or engage in information-based discrimination is that they hold prejudices against older workers such as considering them as less flexible, less willing and capable to learn, and less capable to perform certain tasks (Chiu et al. 2001, Finkelstein, Burke and Raju 1995, Karpinska, Henkens and Schippers 2013). As a consequence of these stereotypes, we might expect that employers have a lower willingness to invest in older workers by providing them less frequently with tasks from which they can learn and more often with tasks which demand little flexibility. Linking discrimination to task allocation, the first research question is therefore:

Q1 To what extent do employers discriminate in their task allocation with respect to age?

Distinguishing between fluid and crystallized intelligence, Horn and Cattell (1967) show that older workers may better execute tasks for which a higher level of autonomy and experience is required, whereas they have more difficulties to adapt to completely new situations or to perform tasks which demand capacity to reason and to solve novel problems. Thus, stereotypes concerning older workers are not necessarily negative, as they may have

2

comparative advantages in performing certain tasks. Drawing on these comparative (dis)advantages of older workers, I therefore conjecture that some tasks are more likely to be attributed to older employees than other tasks.

Q2 Does the age discrimination differ with the type of task?

A phenomenon named "in-group" bias has been identified in the discrimination literature (Finkelstein and Burke 1998) as an important determinant. This refers to the observation that people with a certain distinguishing feature are more likely to hire or otherwise prefer people who share this feature – this is part of the taste-based discrimination. Several studies have found conflicting results whether in-group bias is present among older people. Whereas Levitt (2004) finds some evidence for negative in-group bias in an analysis of a game show in which older participants were more likely to get voted out even by other older participants, Finkelstein, Burke and Raju (1995) provide some evidence that younger employers are more likely to grant an interview to younger applicants than older employers. Fouarge and Montizaan (2018) further add to this point by showing that an older applicant has an up to ten percentage higher chance of being hired if the manager in charge is 55 years old or older. In this thesis I will investigate the question whether in-group bias is also observed in the task allocation by employers.

Q3 Is there "in-group" bias regarding age at the level of task allocation?

The provision of training to older employees within a company may further hint at a higher allocation of tasks towards older employees. Becker (1975) argues that it makes less sense for companies to provide training to older employees as the company has less time to benefit from the additional skills which the older worker acquires during the training. Hence, the risk that older employees have a shorter time horizon working may deter employers from training them. Zwick (2015) actually finds that employees over the age of 55 do receive less training. If a company, however, provides training to older employees, then it might believe that it profits from an improved skill set. Hence, the company is also more likely to allocate a higher diversity of tasks to older employees. After all, when employers are more willing to invest in formal training, we can also expect them to invest more in informal skills investments.

Q4 Do managers whose companies more often train older employees display less age discrimination at the level of task allocation?

A final factor which may influence the attribution of tasks is absenteeism. It is likely that employers not only look at the remaining years until retirement when making skills investments, but also on the actual time they can make use of their employees. Although Donders et al. (2012) show that the number of sick days, on average, does not differ between older and younger people, these two groups do differ in many other aspects. Older employees are generally less likely to be absent from work, but if they are, then for a prolonged period of time. Furthermore, older employees are more likely to have a chronic disease compared to their younger counterparts. Investments in the human capital of older employees may therefore be worthwhile from a human capital theory perspective. After all, a lower likelihood that older workers are absent from work may increase the returns to investments. However, when they are absent from work for a long time, this comparative advantage may disappear. Consequently, I want to investigate whether absenteeism rates affect the allocation of tasks.

Q5 Do companies which differ in their absenteeism rate allocate tasks differently?

1.3. Data

To answer the aforementioned research questions, a survey was sent to about 2,500 employers, directors, and HR-managers who are in charge of human resources within their organization. In this survey, the employers were asked to provide details of the company they are working for or are in charge of. These details included questions about the size as well as the industry of the company and more specific questions about the health and the training of its work force. The survey further included questions about how the company applies HR-instruments specifically aimed at older employees.

More important, the managers participated in a vignette experiment which was part of the survey. This vignette experiment was specifically designed to establish the extent to which age discrimination occurs in the task allocation by employers. In the vignette study, the tasks which the managers have to allocate are characterized by "managing employees,

research and development, gathering and processing of information, and using verbal and communicative skills". The employees differed in five characteristics – age, gender, education, working hours per week, and experience. A total of approximately 541 employers filled out the survey and the vignette.

1.4.   Findings

Workers between the age of 56 and 65 are 11%-points less likely to be allocated to a task than workers between the age of 26 and 35. Although the number of years of experience moderates the discrepancies – 15 years of work experience raises the likelihood to be allocated by 9%-points compared to 5 years of experience and 10 years of work experience raises the likelihood to be allocated by 7%-points compared to 5 years of experience – , it is insufficient to compensate for the disadvantage caused by age.

I find that the type of task plays a limited role. Contrary to the expectations due to the differences in crystallized and fluid intelligence, the older workers are never significantly more likely to be allocated to a task compared to their younger counterparts. Furthermore, older employers do not have the tendency to allocate more tasks to their older employees.

The provision of training to older workers has a predictive power for the allocation of tasks. Companies which offer training to all of their older workers are more likely to allocate tasks to them as well, compared to companies which do not provide any training to their older employees.

I finally find that the absentee rate plays a role as well. The higher the absentee rate the higher the likelihood that the managers allocate tasks to their workers over the age of 55. Both the results on training investments and the absentee rates are thus consistent with the idea that employers care about the returns to their skills investments by allocating tasks.

1.5.   Contribution to Literature

So far, the research into task allocation and the possible discrimination of older people at the workplace has been limited. Most of the studies have addressed the discrimination during the hiring process. Closing this gap, however, is valuable as it provides additional evidence as to whether older people are discriminated already at the workplace, well beyond the point

they become unemployed or have to search for a new job, and therefore experience problems to maintain their employability. This research contributes to the current literature in the following ways.

First, the randomization of employee and tasks characteristics within the vignette study allows me to causally investigate the impact of characteristics of the employees on the likelihood that they are allocated to a task. I can hence provide evidence as to whether older workers are effectively being treated differently than their younger counterparts in the allocation of tasks and whether they are facing more or less discrimination with respect to specific tasks.

Second, I examine whether the idea of "in-group" discrimination is present in the task allocation within the company or whether it is limited to the hiring process. Until now, no research has investigated the extent to which "in-group" discrimination occurs in the task allocation by employers.

Third, I provide additional evidence that the provision of training is extremely important and also helps alleviate the problem of discrimination against older employees. The association of training with discrimination is another novelty of my thesis.

Fourth, the rate of absenteeism has rarely been recognized as a determinant of discrimination. Although the different types of sick leave between employees have been identified, they have only been considered in isolation and with respect to wages. Additional consequences of these differences have not yet been explored sufficiently and a possible link to task allocation has so far been ignored.

Finally, this study adds to the literature underlining the importance of task allocation. Acemoglu and Autor (2011) demonstrate the importance of task allocation on the wage development and Gibbons and Waldman (2006) present a theoretical model linking task allocation to promotions at the work place. This paper adds to this literature by showing how the allocation of tasks within organizations is influenced by age discrimination, employer's characteristics and the organizational features.

1.6.   Link to Policy

Most industrialized nations have a population which is expected to get, on average, older and older in the upcoming decades (Truxillo et al. 2012). Hence, policy makers are faced with

numerous challenges, including adapting public pension schemes. In line with a general tendency to focus on supply side policies and under the assumption of voluntary unemployment (Lahey 2008), governments have tried to accommodate the challenges of an older work force by implementing substantial cuts in the retirement benefits which people receive upon their retirement or raising the retirement age, while in the most extreme cases abolishing the system as a whole (Van Soest and Vonkova 2013).

Although this is an important aspect, it is insufficient to fully explain the percentage of older people who are not working (Lahey 2008, Van Soest and Vonkova 2013). The majority of these people had jobs and are now out of work. Most research (Bendick, Brown and Wall 1999, Fouarge and Montizaan 2018, Lahey 2008) has focused almost exclusively on the re-entry of older employees into the job market. However, the question whether employers are actively stimulating the employability of their older employees and hereby encouraging them to remain employed has largely been ignored.

The discrimination which can be observed at the level of task allocation may be a substantial barrier for older workers to increase their employability. If older workers are not given any meaningful tasks and thereby the possibility to maintain or improve their skills, the perception of managers that they are less productive is self-fulfilling. This thesis shows how important age discrimination is in the task allocation by employers and provides a first indication to policy makers of the urgency to deal with this specific type of age discrimination. A first measure could be to raise awareness among employers that they are actually discriminating against their own older employees and unveil how they are damaging their own company by not making use of the comparative advantages of older employees. Furthermore, policy makers could initiate programs, which target keeping older employees in the labor market by making employers aware of the importance of task allocation and informal skills development, instead of promoting their re-entrance after a spell of unemployment.

2. Literature Review

2.1. The Definition of Discrimination

Before engaging in the discussion whether discrimination exists at the level of task allocation, it is important to explain what the term discrimination exactly means in this context. Forgoing any lengthy legal discussions, I will define age discrimination as "treating an applicant or employee differently because of his or her age." Note that this is a broader definition than the one which is commonly used in the economic context in which discrimination has been limited to remuneration (Aigner and Cain 1977, Arrow 1972, Becker 1957). Discrimination against older employees can take place at many stages during the hiring process or later during the employment relationship. The current literature, however, has almost exclusively focused on the hiring process.

2.2. Evidence of Discrimination against older Employees

Bendick (1983) used an experimental design to show that on average it takes an older worker twice as much time to find a new employment as it does a younger worker. Bendick, Brown and Wall (1999) sent out two identical applications of people aged 57 and aged 32 to 102 entry-level sales positions. The 57-year-old's résumé included a period in which he was either a public-school teacher or on military service so that he was neither unemployed which could have portrayed a negative image, nor could he have gained additional experience in that specific industry which could have been an advantage. Bendick, Brown and Wall (1999) find that the older worker received a less favorable reply in 41.2% of the cases. Most of the cases of discrimination, 31,4%, occurred even before the interview took place. Hence, it is substantially more difficult for older workers to be offered an interview and to present themselves to the potential employer. Neumark and Song (2012) argue that this is the case because this type of discrimination is the least likely to be prosecuted and proven in court.

The results of Bendick, Brown and Wall (1999) are further confirmed by Lahey (2008). Using a similar design of sending out job-applications, Lahey (2008) also finds that the discrimination rate at the interview level is around 40%. Finkelstein and Burke (1998) use a survey method to examine whether age discrimination in the hiring process exists. In their

experiment, 324 managers were asked to complete three managerial decision tasks. Only one was of interest to the authors, whereas the other two served as distractors to ensure that the managers were not aware of the focus of the study. In the task under examination, the managers, who unknowingly had beforehand been divided into groups, were asked to determine whether they would consider job applicants for an interview. One group of managers were to estimate the likelihood of interviewing a 59-year-old, whereas the other group were given the application of a 28-year-old. Similarly to Lahey (2008) and Bendick, Brown and Wall (1999), experience was kept constant by including past jobs in their résumé which were unrelated to the job they were applying for. Finkelstein and Burke (1998) find that, on a scale from one to seven for which one means "definitely would not interview" and seven "definitely would interview", managers rated the older applicant on average with a 5.19 and the younger applicant with 5.53. Hence, the likelihood of an interview being granted to older applicants is substantially lower.

In their oversight paper, Riach and Rich (2002) argue that the age difference which was used in Bendick, Brown and Wall (1999) is too large. They believe that the physical characteristics of 32-year-olds and 57-year-olds are just too different making it impossible to compare their respective response rate for interviews. They believe that it would be helpful to either include in the curriculum vitae an indication that the applicant is in a good physical condition or reduce the age of the older applicant to 48 years when "physical stamina and flexibility should not be too much in doubt (Riach and Rich 2002, p.507)".

Fouarge and Montizaan (2018) use a different approach to investigate the existence of discrimination against older workers. Instead of relying on correspondence studies whose major disadvantage is their inability to identify the reasons for the discrimination, they apply a vignette experiment. In contrast to the study by Finkelstein and Burke (1998) in which the managers were given either the profile of a younger or an older applicant, Fouarge and Montizaan (2018) presented 1,100 managers the artificial profile of two applicants in a vignette study in which qualifications and age were randomized. Their results show that "a 60-year-old has a 41%-point lower probability of being hired (p.5)" than a 35-year-old. More critically, older workers who are in need of training are even 53%-point less likely to be hired. Addressing the critique of the considerable age difference between the applicants by Riach and Rich (2002), Fouarge and Montizaan (2018) show that workers aged 45 and 55 are still six

percentage points and 23 percentage points respectively less likely to be hired. Hence, the backlash of age discrimination is not limited to the 60-year-old worker.

Despite using different techniques, all of these papers find significant evidence for the existence of age discrimination in the labor market. Depending on the reasons why this discrimination occurs, I can expect that discrimination also takes place at the level of task allocation. Stereotyping has been identified as a major determinant of discrimination and I assume that stereotyping affects the allocation of tasks.

2.3. Age Discrimination explained: Stereotyping

Fouarge and Montizaan (2018), Finkelstein and Burke (1998), and Bendick, Brown and Wall (1999) all link their results to stereotypes which are still attached to older employees. Among others, they argue that older employees are considered to be more expensive than their younger counterparts. In a thorough investigation of these stereotypes, Karpinska, Henkens and Schippers (2013) ask 238 managers in the Netherlands to fill out a survey. The results show that managers rate older workers over the age of 60 to be significantly less creative, to have a lower willingness to learn, to be less flexible and to have lower technological skills. In a similar survey also concerning the Netherlands, Fouarge and Montizaan (2018) confirm the results by Karpinska, Henkens and Schippers (2013). Managers rate older employees substantially lower in their ability to deal with organizational change and with technological change and in their overall flexibility. Chiu et al. (2001) provide evidence that the prejudice of lower flexibility is also present in the UK. Gellatly (1995) further maintains that older workers are moreover thought of as having a higher absenteeism rate due to illness.

The stereotyping and discrimination of older employees in different employment situations can be explained by two economic theories – taste-based discrimination and information or statistical discrimination. These theories are not mutually exclusive and may well supplement each other. Becker's (1957) theory of taste-based discrimination is rooted in the observation that black and white people are treated differently in the labor market. The discrimination is equivalent to an economic loss for both the employer and the employee: "If an individual has a "taste for discrimination," he must act as if he were willing to pay something either directly or in the form of a reduced income, to be associated with some

persons instead of others (p.14)." Nevertheless, the person who is discriminating is still acting perfectly rationally as he maximizes his utility by actively avoiding the group which he dislikes. Under perfect competition, Becker (1957) assumes that this taste-based discrimination disappears in the long run. However, this is only the case, because there is a sufficiently high number of companies which are willing to hire the disadvantaged people and hence incur lower costs by having to pay lower wages.

Phelps (1972) introduces the first concept of statistical discrimination. He posits that there exists discrimination among employers who do not generally have a distaste for one group or another. Instead, the origin of discrimination lies in the signal which the individuals are giving off. Although the analyses so far have focused on the difference between black and white workers, I can easily extend it to older and younger workers. Phelps' (1972) starting point is a "test" which informs the employer on the productivity of the individual. This test is unable to accurately transmit the whole information and may contain some spurious signal. To improve upon the signal which the employer receives, he takes into account characteristics of the individual — race, sex, or age — which act as a "cost-minimizing screening device (p.659)". Phelps (1972) assumes that the variance of the signal of the test from blacks is generally higher than from whites. This is not due to inferior innate abilities, but rather, because they might already have suffered from discrimination before entering the labor market, for example during the university admission process. Hence, the wage slope of black employees is flatter as the signal transmits less information. Black workers receive less money than their white counterparts in case of a high signal and more in case of a low signal.[2]

Lundberg and Startz (1983) depart from the assumption that "pre-labor market investments and endowments are given (Aigner and Cain 1977, p.177)" and are the first to integrate human capital investments into the discussion of discrimination. They postulate that the marginal productivity of a worker depends on the innate abilities and the acquired human capital which the individual can purchase at a certain cost. This is an important step as it allows workers to increase their employability. Unfortunately, the employer can, once

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[2] Aigner and Cain (1977) question whether statistical discrimination is actually present in the case described by Phelps (1972) as both groups are still being paid based upon their average productivity. In the extension by Aigner and Cain (1977), if the employer is risk-averse, then the black workers suffer from a "risk discount (p.182)" and earn less. Aigner and Cain (1977) admit that the "risk discount" is probably not sufficient to explain the serious difference between wages which could be observed at that time.

again, not identify the marginal productivity, but only observe a signal containing marginal productivity and noise. It is efficient for the worker to invest into education until the marginal costs equal the marginal increase of the wage conditional on the signal transmitted. Assuming, analogously to Phelps (1972), that blacks send off more heterogenous signals and have less homogenous innate abilities, it follows immediately that they invest less in education which explains their lower wage.

Although some studies have attempted to differentiate between taste-based and information-based discrimination (Lahey 2008, Levitt 2004), Neumark (2012) suggests that it is extremely difficult to do so. It seems, however, reasonable to assume that the statistical-based discrimination is less prevalent at the level of task allocation as managers had the opportunity to update their beliefs on their employees. This effect cannot be observed in the vignette study used in this thesis.

Although most literature has focused on the hiring process to document discrimination against older employees, I conjecture that it is also exists at the level of task allocation. The stereotypes which are present among managers are unlikely to exclusively affect hiring decisions. In fact, the allocation of tasks may exacerbate the importance of stereotypes. If managers not only believe that older employees are less adept at learning from new tasks, but further suppose that they will retire in the near future, then they have little rationale to allocate them to innovative tasks. Recently the importance of tasks has been recognized by the economic literature. Most importantly, tasks have been used to explain the build-up of human capital (Autor and Handel 2013), the "polarization" of the job market (Acemoglu and Author 2011), and promotions (Gibbons and Waldman 2006). All three of these concepts can directly be linked to the employability of employees and their chances to succeed in the labor market. With the concept of tasks rising in importance, it is worth investigating whether older workers suffer from a disadvantage when the tasks are allocated. Based on the literature on discrimination and the stereotyping of older workers, I hypothesize that:

H1: There are significant differences in the allocation of tasks between younger and older employees.

2.4.   Comparative Advantages of older Employees

Part of the negative perception of older employees may originate in an actual decline of a variety of skills with age. It would hence not be unfounded. In their seminal work, Cattell (1963) and Horn and Cattell (1967) provide evidence for the existence of two different categories of intelligence: fluid and crystallized intelligence.

Fluid intelligence is composed of different factors such as inductive reasoning, associative memory, and figural relations. These factors are mostly used in tasks for which one has to adapt to new situations or find innovative solutions to problems. Fluid intelligence is to a certain extent hereditary and affected by injuries. It increases throughout childhood until the beginning of adulthood, but eventually decreases with age. Reasons for this decline are the accumulating effect of minor injuries to the brain which have a limiting effect on the continuous development of fluid intelligence and the fact that the brain reaches its peak of development during the early twenties.

Crystallized intelligence on the other hand is associated with verbal comprehension, mechanical knowledge, and experimental evaluation. Horn and Cattell (1967) further define it as "the extent to which one has appropriated the collective intelligence of his culture for his own use (p.111)". Crystallized intelligence depends to a certain extent on the fluid intelligence as it is easier to learn and build up crystallized intelligence if fluid intelligence is higher. Crystallized intelligence increases throughout the whole lifespan of an individual as it correlates closely with experience.

Importantly, Horn and Cattell (1967) provide evidence that both the decrease of fluid intelligence and the increase of crystallized intelligence with age is independent of other intelligence measurements such as visualization and general speediness. Further factors such as gender or the general level of education do also not alter this relationship.

The concepts of fluid and crystallized intelligence may to a certain extent explain the ratings which are observed by Karpinska, Henkens and Schippers (2013). In skills which are more closely linked to fluid intelligence such as creativity and flexibility the older workers are more poorly evaluated than their younger counterparts, whereas in skills related to crystallized intelligence such as social and management skills they are preferred to their younger counterparts. The results of Fouarge and Montizaan (2018) mirror the results by

Karpinska, Henkens and Schippers (2013) and the respective link to fluid and crystallized intelligence. When it comes to "problem solving" or "supervision skills", employees aged between 55 and 64 are better rated than their counterparts aged between 35 and 44, for the categories "learning and coping with change" the relationship is reversed. I expect that the divergence in the ratings of the different categories transmits to the allocation of tasks and hence to the discrimination of older employees. In tasks for which the employer believes that skills closer to the fluid intelligence are more useful, he is more likely to entrust a younger employee with them. In contrast, tasks which require a higher level of crystallized intelligence might be more likely to be allocated to an older worker.

Having demonstrated that older workers have comparative advantages in the execution of some tasks and that employers are to a certain extent aware of these advantages, I hypothesize that:

H2: For tasks in which I expect older employees to have a comparative advantage such as "managing employees" and "using verbal and communicative skills", there is less discrimination than in "research and development" and in "processing and gathering of information".

2.5. The Existence of "in-group" Bias

The stereotyping against older employees and the different comparative advantages of younger and older employees may, however, not be the only reasons for discrimination at the level of task allocation. In the psychological literature, it has been established that people view themselves as a member of several groups (Zarate and Smith 1990). These groups are usually defined along categories which are easily observable such as age, gender or race. Furthermore, it is noticeable that group members tend to rate other members of their own group more favorable than individuals who do not belong to their group (Brewer and Kramer 1985). This latter effect is referred to as "in-group" bias (Finkelstein, Burke and Raju 1995). There is mixed evidence as to whether "in-group" bias exists for older people on the labor market.

Fouarge and Montizaan (2018) find that "in-group" bias does exist in favor of older people. Using the aforementioned vignette experiment, they show that job applicants at the

age of 60 have a 10%-point higher likelihood of being hired if the employer is over 54 years old than if he is younger than 36.

In contrast, Levitt (2004) analyses the game show "Weakest Link" with respect to discrimination. In the "Weakest Link" each candidate is supposed to answer questions and after each round of questions one candidate is eliminated by a vote from the other candidates on the show. At the end the two last contestants compete against each other and can gain the price money which is calculated based on the number of questions which were answered correctly in all the previous rounds. Levitt (2004) finds that strategic considerations for voting behavior which play for other contestants such as keeping strong players at the beginning to correctly respond to as many questions as possible and vote them out in the last round to maximize the chances of winning, are absent for older contestants. Controlling for other variables older contestants are more likely to be voted out along all the rounds. Whereas "in-group" bias is present for other groups such as women or blacks, older contestants do vote out other older contestants more often than younger contestants.

Finkelstein, Burke and Raju (1995) run a meta-analytical study to investigate whether "in-group" bias is present in the employment context. The results by Finkelstein, Burke and Raju (1995) point to the existence of "in-group" bias, but only among younger people. Younger raters, aged between 17 and 29, do score younger workers significantly higher in categories such as having more job qualifications, more potential for development and being more qualified for physically demanding jobs. In contrast, older raters did not rate their age equivalents any better than their younger counterparts.

In a follow-up study by Finkelstein and Burke (1998), the authors try to shed some more light on the presence of "in-group" bias. In the aforementioned experiment, 324 managers were further asked to rate the job qualifications. One group of managers had to rate the job qualifications of a 59-year-old, whereas the other group was given the application of a 28-year-old. As described before, experience was kept constant. Finkelstein and Burke (1998) do not find any general support for the "in-group" bias hypothesis. They conclude, however, that if the older rater identifies himself with his age group, then he is more likely to score the older applicant less favorably regarding the economic value. There is no effect on the other variables of interpersonal skills. Hence, in contrast to Finkelstein, Burke and Raju (1995), the results of Finkelstein and Burke (1998) do not support the existence of "in-group" bias.

The evidence on "in-group" bias is inconsistent so far. Hence, I hypothesize that:

H3: Older managers are as likely to allocate the four different tasks to older employees as to their younger counterparts.

2.6. The Provision of Training to older Workers

The provision of training to workers in general has a strong effect on their employability. Trying to explain why older workers receive less training, Zwick (2015) maintains that training is on average less effective for older employees as their differences regarding crystallized and fluid intelligence are not taken into account when providing it.

Becker (1975) further argues that the return to human capital investments in older employees is lower due to the shorter period during which employers can profit from the positive effects of the training. Hence it is economically more reasonable for companies to provide training to younger people and discriminate against older workers. The same argument can be brought forward for the allocation of tasks. Companies expect to benefit for a longer period from the knowledge that the younger workers build up during the task in comparison with their older counterparts. This situation is exacerbated for both the training and the task allocation if older employees are expected to work for the company for only a short time, either because they are made redundant or decide to retire. There is sufficient evidence in support of the argument that the extension of the working life of older employees does not take precedence for many managers.[3] For example, Karpinska, Henkens and Schippers (2013) show that many managers do not prioritize to keep older workers until the mandatory retirement age.[4] However, recent studies have also shows that postponement of retirement forces increases training participation among older employees (Montizaan, Cörvers and De Grip 2010). I assume that if organizations provide training to the older employees then it is more likely that these organizations also expect them to remain with the

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[3] A high turnover rate is very costly for companies which depend on highly-skilled workers as each worker has to build up some specific task-related knowledge (Gibbons and Waldman 2006). Hence, it can be in the best interest of a minority of companies to keep their employees as long as possible.

[4] Armstrong-Stassen and Cattaneo (2010) elaborate on this point and present the argument that it is less problematic to lay off older workers than younger workers due to the fact that it is more widely accepted in society as these older workers do not face the challenge of starting a family.

organization for a substantial amount of time.[5] Moreover, the training participation may point to the existence of anti-ageism policies and signal a more favorable view upon older workers by the managers of these organizations. Hence, my hypothesis is:

H4: Companies which provide more training to their older employees display less discrimination at the level of task allocation.

2.7. The Importance of Absenteeism

One of the stereotypes against older employees is that they are more often absent from work than their younger counterparts (Gellatly 1995). In their review paper concerning the link of health and productivity of older workers, Robertson and Tracy (1998) summarize, however, that "the literature is generally inconclusive as to the relationship between age and absenteeism (p.90)". They continue by stating that "it is often purported that, while older workers experience higher rates of unavoidable absence from work (as measured by absence duration), they have a lower rate of avoidable absence (as measured by absence frequency) than do younger workers (p.90)".

Donders et al. (2012) investigate in more detail the relationship between sick leave and the age of the employee. In their study, they sent out a questionnaire to 3,881 employees of a Dutch university. The questionnaire included questions relating to work-related characteristics, family-related characteristics, health characteristics, and sick leave. The authors defined two different types of sick leave: Prolonged sick leave (PSL), defined as more than two weeks during the past 12 months, and frequent sick leave (FSL), defined as more than three times during the past 12 months. The results reflect the findings by Robertson and Tracy (1998). If the analysis is corrected for sex, employment category, worked hours and chronic diseases, then employees over the age of 55 are only half as likely to report FSL, whereas they are nearly 1.6 times as likely to report PSL. The authors give several explanations for the difference in absenteeism for the two age groups. One factor is that

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[5] There are two reasons for the company to assume this. First, it makes less sense for the company to lay off a worker who has just received training. Second, training is considered as a sign of appreciation by the employee and decreases his intention to resign from the job (Sieben 2007).

family related events lead to a higher likelihood of FSL. Possibly younger employees have more often young children and stay at home, not only when they themselves are sick, but also when their children are sick. Career concern is another factor which contributes to fewer cases of FSL for older employees. Donders et al. (2012) caution that their investigation was done among university employees and that the results may not translate to more physically demanding jobs. As the tasks which are allocated during the vignette are not necessarily physically demanding, this limitation should not be of a great concern. However, if employers assign a worker to a task, then they count on the task being executed. Hence, planning security is extremely valuable for employers. If the company faces high absenteeism rates, it might be more likely to assign tasks to older employees as they are absent less often and hereby ensure the planning security. My last hypothesis is therefore:

H5 Companies which suffer from higher rates of absenteeism have rates of task discrimination.

2.8. Theoretical Framework in an Overview

Figure 1 provides an illustration of the hypotheses which I evaluate in this thesis. The focus of this thesis lies on the discrimination of older workers at the level of task allocation. The hypotheses are represented by a capitalized H and the corresponding number. The main hypothesis (H1) is that the age of the employee is one of the determinants in the allocation of tasks and is negatively related to it. The extent to which the age of the employee is significant depends on a variety of factors. I expect that the type of task has an ambiguous effect on the discrimination - exacerbating it for tasks using more fluid intelligence and alleviating it for tasks requiring more crystallized intelligence (H2). Whether the age of the manager is a determining factor is analyzed in Hypothesis 3 (H3). The "in-group" bias framework would predict that it does and positively so, but the evidence on the latter is mixed when it comes to older workers in the labor market. I further scrutinize the effect of the provision of training on discrimination. I conjecture that if the company provides additional training measures to its older employees, then the company expects that it will profit from the additional knowledge of the worker and hence also assign them to a wider variety of tasks (H4). Lastly, the role of absenteeism is analyzed. Higher absenteeism rates should lead

to lower discrimination as older workers are less often sick than their younger counterparts (H5) and hereby contribute to a higher planning security for the employer.

Figure 1: Illustration of the hypotheses

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   ┌─────────────────────┐        ┌─────────────────────┐
   │ Age of the employer │        │     Type of task    │
   └─────────────────────┘        └─────────────────────┘
             │                              │
             │ H3                           │ H2
             ▼                              ▼
┌───────────────────────┐          ┌────────────────────────┐
│  Age of the employee  │───H1────▶│   Allocation of tasks  │
└───────────────────────┘          └────────────────────────┘
             ▲                              ▲
             │ H5                           │ H4
             │                              │
   ┌─────────────────────┐        ┌─────────────────────┐
   │  Absenteeism rate   │        │ Provision of training│
   └─────────────────────┘        └─────────────────────┘
```
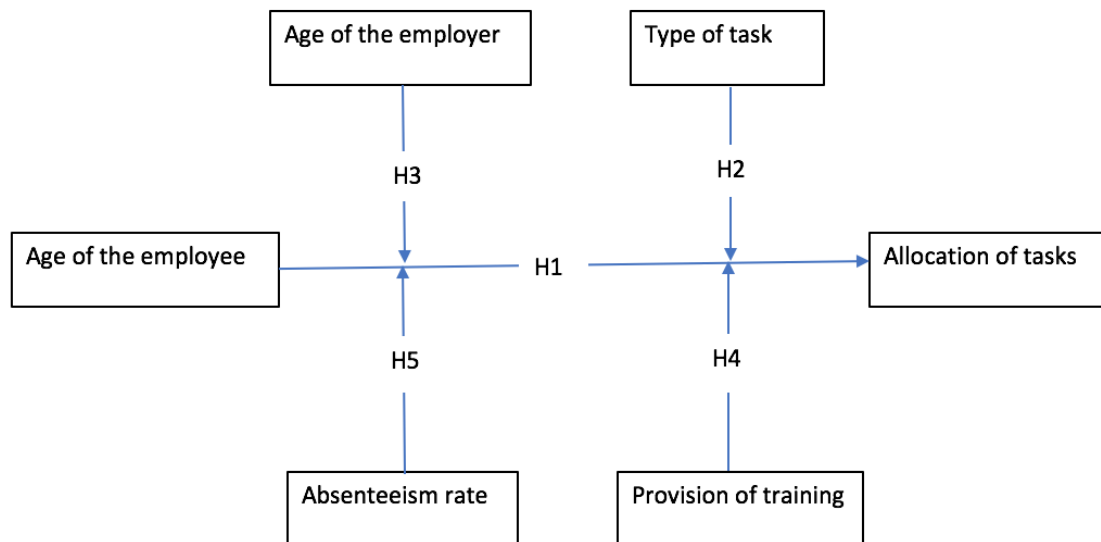
3. Data

3.1. Data Gathering

The data which is used for my analysis comes from a unique survey which was carried out among the Dutch public and private sector employers in 2012 (ROA Public Sector Employers survey). For this survey the Stichting Pensioenfonds ABP (referred to as ABP), the pension fund for the public, education and privatized sector in the Netherlands, sent one e-mail to each institution (2,500 employers were approached) with a link to the survey. The e-mails were addressed to one manager in charge of hiring and retiring decisions as well as other areas in relation to human resources. The e-mail provided a link to a survey which aimed at gathering detailed information on HR policies, policies on the employability of older workers, the size as well as the industry of the company and more specific questions about the health and the training of its workers. The questions also covered the absenteeism rate in the company. Moreover, the survey included the vignette experiment which is analyzed in this thesis. In this vignette experiment, managers had to allocate tasks between two employees whose characteristics were randomized over the different vignettes. A total of 541 employers responded to the survey and the vignette experiment.

3.2. The Vignette

To investigate whether discrimination against older people exists, most publications have so far relied on audit studies (Bendick, Brown and Wall 1999, Lahey 2008). In audit studies, applications are sent out either in response to posted job advert or to a randomly assigned number of companies (Neumark 2012, Riach and Rich 2002). The applicants do not differ, except for the characteristic at the center of interest – namely age. The difference in the rates of positive responses is usually taken as evidence for discrimination. The studies differ, however, in the treatment of cases in which neither candidate gets an offer. Whereas some studies do not consider these cases at all, other studies consider them as evidence for the non-existence of discrimination. Further differences emerge in the timing in which the applications are sent out: some studies always send out the minority application first, whereas others send half of the time the majority and the other half of the time the minority

application first (Riach and Rich 2002). The drawback of audit studies is that it is impossible to analyze the specific reasons which lead to the refusal of the applicant. Furthermore, Neumark (2012) points out that audit and discrimination studies are at risk of under- or overestimating discrimination. This spurious evidence may appear, because there are unobservable characteristics not included in the curriculum vitae which the employer assumes to differ between the groups under consideration.

The data for my analysis comes from a vignette study. Vignette studies or factorial design (Karpinska, Henkens and Schippers 2013) can be considered as the simulation of a realistic situation in which the manager has to make a decision. Hitherto, vignette studies are not very common in economics (Fouarge and Montizaan 2018). Although most studies still rely on revealed preference experiments, stated preference experiments such as vignette studies elude many of the obstacles which hinder an audit study. In my case, managers are forced to make a decision; hence, we are never faced with the situation that neither applicant is allocated to the task. Additionally, the issue with the timing of the application is avoided. The combination of the vignette and the survey allows us to infer relations between the characteristics of an employer and the allocation of a task which is impossible in audit studies as the researcher cannot be free from doubt about who took the ultimate decision.[6]

In the vignette study, the managers have to decide to allocate six times a different task between two employees. The different tasks allow me to evaluate the hypothesis relating to crystallized and fluid intelligence. The tasks are defined as:

1) managing employees,

2) research and development,

3) using verbal and communicative skills,

4) gathering and processing of information.

The employees in the vignette differ in five characteristics – age (35, 45, 55, or 60 years old), gender, education (MBO, HBO, or WO), working hours per week (16, 32, or 40) and experience (5, 10, or 15 years).

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[6] Kapteyn, Smith and Soest (2007) point out that the prerequisite for a vignette study is "response consistency: each respondent uses the same scale for the self-report and the vignette evaluation (p.462)". They find evidence that this might not be the case if a vignette study is carried out in different countries. This is especially important for the questions relating to the HR-instruments as they are rated on a scale from one to five. As the vignette is only carried out in the Netherlands, this should not be of any concern.

The main benefit of vignette experiments is that these characteristics can be varied randomly and hence we can estimate the causal importance of each attribute. By doing so the effect of age on the allocation of tasks is singled out. The inclusion of the attribute experience is important as it allows the employer to make the difference between age and experience, which might otherwise be treated as interchangeable.

3.3. Survey Questions

To identify and quantify the importance of HR-instruments dedicated to older workers in the context of task allocation, the survey participants were asked to respond to the following question: "To what extent does your organization use the following tools specifically aimed at older employees?". To evaluate my fourth hypothesis regarding the provision of training, I analyze the responses to the tool: "participation in additional training or other courses". This tool had to be evaluated on a scale from one to five for which "one" indicates that the instrument is not available for any older employee and "five" that it is available for all older employees.

In order to appraise the evidence of "in-group" bias, the participants were asked to specify their age (in years). Further characteristics of interest included their gender and their tenure at the company. To evaluate whether the percentage of absent employees is a determining factor, the managers were asked to indicate the absentee rate for the last year.

3.4. Descriptive Statistics

Table 1 shows us the information relating to the personal characteristics of the managers. The average age of a manager is 51.17 and the standard deviation is of 8.51. Importantly, the age difference and the standard deviation among the managers are substantial, as this again allows us to estimate the interaction effect of the age of the employer and the age of the employee. Noteworthy is that 23% of the workforce is older than 55, so I can expect that a substantial group of managers have experience with accommodating to the needs of older employees. Most of the managers are male (58%) and have an average tenure of 13 years. The average tenure is important as it hints at the fact that the managers have the knowledge of how to best allocate the tasks within the company. Again, the standard deviation is high

with nearly eleven years. The average response to the provision of training is 2.3 and has a fairly high standard deviation of over 1. This shows that the provision of training to older workers greatly varies from company to company. The average absentee rate is 5% and has a standard deviation of 2.2.

Table 1

Descriptive statistics: Organization and personal characteristics of employers

	mean	st.dev	min	max
Gender (male =1)	0.58	0.49	0	1
Tenure	13.00	10.93	41	0
Age	51.17	8.51	26	69
Provision of training	2.27	1.13	1	5
Absentee rate	5.15%	2.21%	0%	15%

Table 2 shows us the correlation matrix between the characteristics of the employee and the likelihood of being allocated to a task. The fact that the age of the employee is significantly negatively correlated to the likelihood to be allocated, is a first hint at a possible discrimination of older employees. Furthermore, the variables, gender, education, and hours worked per week are statistically significantly correlated. Men and those who work longer hours are more likely to be allocated. People with a high education level are less likely to be allocated (to a task which is below their skills level).

Table 2

Correlation matrix

	Likelihood of being allocated to a task	Age of the employee	Gender of the employee	Experience of the employee	Education of the employee	Hours per week worked
Likelihood of being allocated to a task	1					
Age of the employee	-0.0744***	1				
Gender of the employee	0.0453***	0.00265	1			
Experience of the employee	-0.0160	-0.00774	0.0187	1		
Education of the employee	-0.0984***	-0.00845	0.00208	0.00826	1	
Hours per week worked	0.157***	-0.00891	0.0156	0.00774	-0.0144	1

$^{*} p < 0.05,\ ^{**} p < 0.01,\ ^{***} p < 0.001$

3.5. Empirical Strategy

I want to examine whether the tasks in the vignette are differently allocated between younger and older employees and whether there are factors which enhance this relationship. I start by estimating an ordinary linear probability model.

$$(1)\ pr[\text{Response}_i = 1] = \alpha + \beta_{it}A_{it} + \rho_{it}E_{it} + \tau_{it}H_{it} + \omega_{it}G_{it} + \vartheta_{it}Ed_{it} + \theta X_{it} + e_{it}$$

Equation (1) estimates the likelihood that a certain individual is allocated to the task. The tables display the marginal effects – the discrete percentage point change of the dummy variable. A_{it} denotes the various dummy variables standing for the age of the worker. The base line is a worker aged between 26 and 35. The other possibilities are for an employee

aged 36 to 45, 46 to 55 or 56 to 65. E_{it} stands for the experience of the employee, either 5, 10, or 15 years (ref. = 5). H_{it} represents the number of hours worked per week, either 16, 32, or 40 (ref. = 16). G_{it} is for the gender (male = 1) and Ed_{it} is used for the level of education of the employee, either MBO, HBO, or WO (ref. = HBO). The subscript i is to designate the individual employer and t is for the observation of the vignette. X_{it} is a dummy variable for the ordering of the vignettes and e_i designates the error term.

As each manager has to choose six times, I use cluster error at the individual level. As a robustness check I use a fixed effect and a conditional logit estimation. As the vignette consists of six different decisions regarding the four tasks, I can use the first decision of the vignette as the observation at time one, the second decision as the observation at time two and so forth. With the six different observations I create a synthetic panel. This synthetic panel allows me to run a fixed effect analysis. As the characteristics of the manager do not change, I do not expect any changes in the significance of the independent variables in comparison with the ordinary least square estimates. With the conditional logit, I condition the model to the fact that if one employee is allocated to the task than the other candidate is automatically not. In the ordinary least square estimates I use both the assignment and the non-assignment as independent observations.

Then for the second hypothesis, I estimate an interaction effect between the age and the type of task on the task allocation.

$$(2)\ pr[\text{Response}_i = 1]$$
$$= \alpha + \beta_{it}A_{it} + \gamma_{it}T_{it} + \delta_{it}(A_{it} * T_{it}) + \rho_{it}E_{it} + \tau_{it}H_{it} + \omega_{it}G_{it} + \vartheta_{it}Ed_{it}$$
$$+ \theta X_{it} + e_{it}$$

Again, I regress the age of the employee (A_{it}), but in equation (2) I include the four tasks (T_{it}) as a dummy variable. The base line for the tasks is "managing of employees" and for the age of the employee it remains "26–35 years old". I include the three other tasks (research and development, using verbal communication skills, and gathering and processing of information) separately and with the interaction of age to test whether the employers make use of the differences in crystallized and fluid intelligence. The other variables and the error term remain unchanged.

I further use the employer age as an independent variable. Similarly to equation (2), I include the age of the employer separately and as an interaction term with the age of the employee. Equation (3) shows this regression.

(3) $pr[\text{Response}_i = 1]$
$$= \alpha + \beta_{it} A_{it} + \varphi_{it} M_i + \delta_{it}(A_{it} * M_i) + \rho_{it} E_{it} + \tau_{it} H_{it} + \omega_{it} G_{it} + \vartheta_{it} E d_{it} + \theta X_{it} + e_{it}$$

I wish to hereby pinpoint the discrepancies in discrimination which exist among employers by their age. The variable M_{it} is a dummy variable for the age of the employer; the base line is for a manager aged younger than 37. The other categories are for managers aged between 37 and 46, between 47 and 56 and for managers older than 56. Most importantly, I want to test whether the existence of "in-group" bias is present.

I then extend the analysis to the responses which the managers gave in the survey to the question "To what extent does your organization use the following tools specifically aimed at older employees". I look at the ratings concerning the "participation at additional training or courses". I will use the ratings described above, separately use them as independent factors and interact them with the other independent variables. T_{it} is the dummy variable which can take on any value between one and five.

(4) $pr[\text{Response}_i = 1]$
$$= \alpha + \beta_{it} A_{it} + \lambda_{it} T_i + \gamma_{it}(A_{it} * T_i) + \rho_{it} E_{it} + \tau_{it} H_{it} + \omega_{it} G_{it} + \vartheta_{it} E d_{it} + \theta X_{it} + e_{it}$$

For my last analysis I make use of the responses which the managers gave to the question regarding the absentee rate at their company. I enter the absentee rate as a linear variable denoted by R_{it}. Once again, the absenteeism rate is used both as independent factors and as interaction term with the other independent variables. The regression is formalized in Equation 5.

(5) $pr[\text{Response}_i = 1]$
$$= \alpha + \beta_{it} A_{it} + \lambda_{it} R_i + \gamma_{it}(A_{it} * R_i) + \rho_{it} E_{it} + \tau_{it} H_{it} + \omega_{it} G_{it} + \vartheta_{it} E d_{it} + \theta X_{it} + e_{it}$$

4. Results

4.1. Basic Results: Age Discrimination at the Level of Task Allocation

Table 3 shows the results for the estimation of my basic model, in which I regress the characteristics of the worker (age, experience, educational background, gender and the number of hours worked per week) on the probability to be allocated to a task. Column 1 displays the result for the ordinary least square (OLS) estimation, whereas Column 2 and 3 present the results for the fixed effect and the conditional logit estimation. The table shows that the likelihood of being allocated to a task decreases significantly for employees who are between 56 and 65 years old compared to their younger counterparts. Whereas the likelihood of being allocated to a task does not significantly differ for the employees who are between 36 and 55 years old, an employee between 56 and 65 years old is 11%-points less likely to be assigned to a task than an employee whose age is between 26 and 36.

The number of years of experience of an employee does affect his chances to be allocated to a task. An employee who has 10 years of experience is 7%-points more likely to be allocated than an employee with 5 years of experience and someone with 15 years of experience is 9%-points more likely to be allocated. Apparently, the number of years of experience that an employee has helps a manager to decide whom he allocates the task to. However, experience is not sufficient to compensate for the disadvantage that older employees have due to their age, as there remains a significant age effect despite the fact that I control for experience. Gender influences the allocation of tasks. A woman has a 4%-points higher likelihood of being allocated to a task than a man. The importance of gender is higher in the public sector than it is in the private sector where the differences of being allocated are negligible. The educational background of the employee is an additional factor in the task allocation. The lower the level of education, the less likely the employee is to be assigned to a task. An employee with an MBO diploma is 43%-points less likely to be assigned to a task than an employee holding an HBO degree. A worker with a WO degree is 12%-points less likely to be assigned. The number of hours the employee works per week further determines if an employee is assigned to a task. If an employee works 32 or 40 hours per week, he is 20%-points respectively 19%-points more likely to be allocated to a task than a person who only works 16 hours a week. Hence, the number of hours worked per week

enhances the likelihood of being allocated to a task but seems to reach a ceiling at 32 hours after which additional hours do not have an effect anymore.

Table 3 thus provides support for Hypothesis 1. It is the case that older employees are discriminated against when it comes to the allocation of tasks.

Table 3

Basic results: age discrimination at the level of task allocation

Likelihood of being allocated to a task	(1) OLS	(2) Fixed effects	(3) Conditional logit
36-45 years (26-35 years = ref.)	0.007	0.009	0.007
	(0.019)	(0.017)	(0.016)
46-55 years	0.015	0.014	0.013
	(0.019)	(0.017)	(0.016)
56-65 years	-0.112***	-0.119***	-0.110***
	(0.020)	(0.017)	(0.015)
10 years of experience (5 years = ref.)	0.066***	0.069***	0.064***
	(0.018)	(0.015)	(0.013)
15 years of experience	0.092***	0.098***	0.091***
	(0.016)	(0.015)	(0.013)
32 hours per week	0.201***	0.210***	0.194***
	(0.018)	(0.015)	(0.014)
40 hours of week	0.194***	0.203***	0.188***
	(0.020)	(0.015)	(0.014)
Gender of employee (1 = female)	0.043***	0.043***	0.041***
	(0.015)	(0.012)	(0.011)
MBO (HBO = ref.)	-0.433***	-0.453***	-0.412***
	(0.019)	(0.015)	(0.012)
WO	-0.117***	-0.123***	-0.112***
	(0.019)	(0.015)	(0.015)
Constant	0.497***	0.498***	
	(0.025)	(0.020)	
Observations	6,452	6,452	6,452
R-squared	0.188	0.197	
Number of id		547	

OLS estimates including robust standard errors corrected for clustering on the individual level in parentheses in Column 1. Column 2 presents fixed effect results. Column 3 reports the marginal effects from a conditonal logit model. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

4.2.   Age discrimination for different tasks

The allocation of tasks may vary according to the task in question. The differences between fluid and crystallized intelligence would favor an allocation of older employees to the tasks "managing employees" and "using verbal and communicative skills". As the analyses in the paper by Karpinska, Henkens and Schippers (2013) and Fouarge and Montizaan (2018) demonstrate, managers correctly predict the areas of competence in which they expect that older workers perform better. Hence, I expect that the latter are more often allocated to tasks requiring these competencies.

Table 4 shows the estimation results, in which I interact the different types of tasks with the age of the employee. Illustrating the interaction effect through a margin plot, Figure 1 shows that for the task "managing employees" there is an upwards trend in the likelihood of being allocated until the age of 55. An employee who is between 46 and 55 years old is nearly 9% points more likely to be allocated to the task "managing employees" than his counterpart aged between 26 and 35. Additionally, it is the only task for which there is no significant difference in the likelihood of being allocated between the employee who is between 26 and 35 and the older employee aged 56 to 65.

For "using verbal and communicative skills" a different picture emerges. There is a slight general decreasing tendency to allocate the task to older employees. The biggest difference, however, exists for the oldest employees. For the latter the likelihood of being assigned to the task is 15%-points lower than for their counterparts aged between 26 and 35.

Figure 1 further depicts the relationship between the task "gathering and processing of information" and the age of the employee. The category of the youngest workers is 9%-points more likely to be allocated to this task than to "managing employees". It is difficult to make a statement about the relationship between "gathering and processing of information" and the age of the employee. Once again the big difference can be seen for the oldest employee who is 13%-points less likely to get this task than the employee who is between 26 and 35 years old.

Lastly, I analyze the task "research and development". The likelihood of being assigned to "research and development" peaks between the age of 36 and 45 and rapidly decreases hereafter with the biggest slump of all the tasks at the oldest employees. On average the two

categories of younger workers have a higher probability to be assigned to the task than the two categories of older workers.

Figure 1 and Table 4 partially confirm my second hypothesis regarding the differences of discrimination among the four different tasks. For the task "managing employees" the discrimination is, as predicted, less severe than for any other task. The 46 to 55-year-olds have an advantage compared to their younger counterparts and the employees between the age of 56 and 65 do not have a disadvantage. For "using verbal and communicative skills", this does not hold anymore. In "research and development" and in "gathering and processing of information" the discrimination is substantial as I predicted based on the fluid and crystallized intelligence literature. It is concerning that there does not exist any task for which the 56 to 65 years old employees have a higher likelihood of being assigned to it. So although there are tasks for which the discrimination is less pronounced, there does not exist any task for which the oldest employees actually have an advantage. In contrast it seems that the managers believe that the capabilities of people over the age of 56 decrease regardless of their assignment. Generally speaking, the difference in the allocation of tasks by age category is less severe than expected. There does not exist a task for which the confidence intervals at the 95% do not intersect.

Table 4

**Age discrimination interacted with the type of task**

Likelihood of being allocated to a task	
36-45 years (26-35 years = ref.)	0.046
	(0.036)
46-55 years	0.086**
	(0.035)
56-65 years	-0.022
	(0.036)
Using verbal and communicative skills (ref. = managing of employees)	0.097***
	(0.032)
Research and development	0.050*
	(0.030)
Gathering and processing of information	0.090***
	(0.032)
36-45 years* Using verbal and communicative skills	-0.073
	(0.054)

36-45 years* Research and development	0.021
	(0.049)
36-45 years* Gathering and processing of information	-0.103*
	(0.053)
46-55 years* Using verbal and communicative skills	-0.120**
	(0.051)
46-55 years* Research and development	-0.057
	(0.048)
46-55 years* Gathering and processing of information	-0.107**
	(0.049)
56-65 years* Using verbal and communicative skills	-0.146***
	(0.050)
56-65 years* Research and development	-0.102**
	(0.050)
56-65 years* Gathering and processing of information	-0.114**
	(0.051)
10 years of experience (5 years = ref.)	0.066***
	(0.018)
15 years of experience	-0.092***
	(0.016)
32 hours per week	0.202***
	(0.018)
40 hours of week	0.195***
	(0.020)
Gender of employee (1 = female)	0.044***
	(0.015)
MBO (HBO = ref.)	-0.433***
	(0.019)
WO	-0.116***
	(0.019)
Constant	0.436***
	(0.030)
Observations	6,452
R-squared	0.191

OLS estimates including robust standard errors corrected for clustering on the individual level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Figure 1

Likelihood of being assigned to the four tasks (95% CIs)
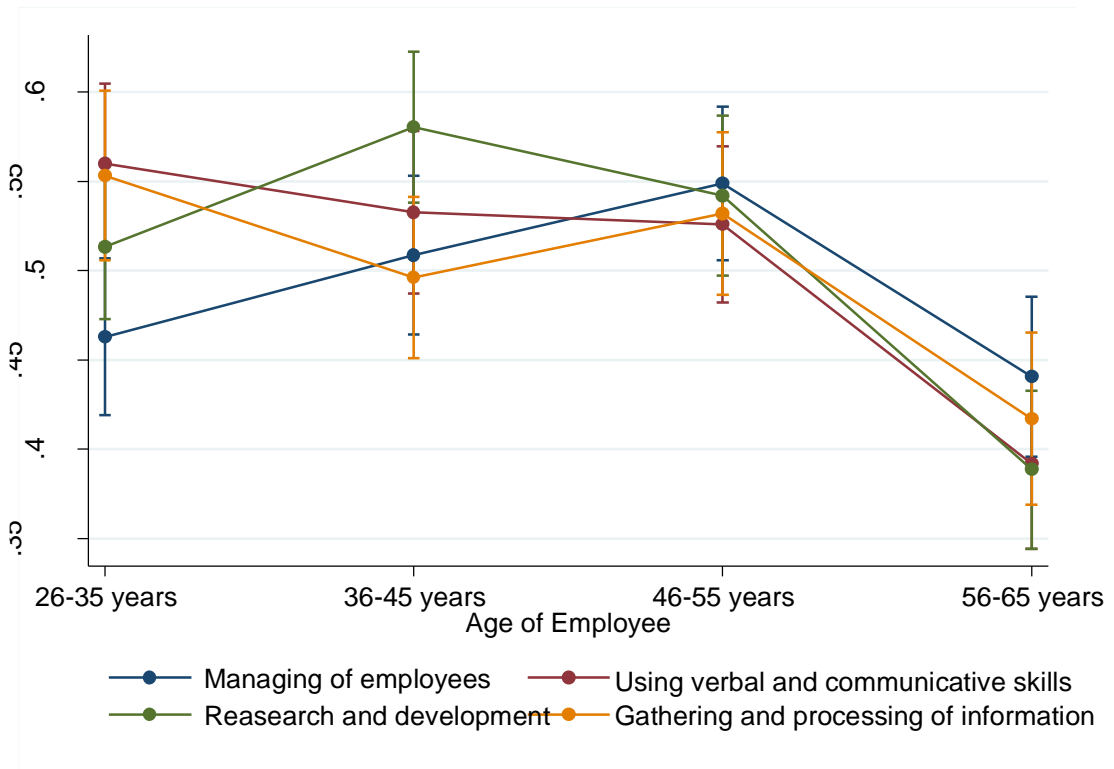
4.3.   Employer Characteristics and the Probability to be allocated to a Task

"In-group" bias predicts that older employers would prefer older employees when allocating tasks. Following this rationale, age discrimination would be worsened when a younger employer is in charge of the allocation of tasks and ameliorated in case an older employer is. After a comprehensive examination of the literature on discrimination of older employees on the labor market, I was, however, cautious to adopt the "in-group" bias hypothesis.

Table 5 displays the estimation results, when the age of the employee is interacted with the age of the employer. Although none of the estimates are significant, it is noticeable that the direction of the estimates for the age of the employer does not support the existence of "in-group" bias. Contrary to the "in-group" bias prognosis, the youngest employers are the most likely to assign an older worker to a task and the oldest employer is the least likely to do so. Altogether the older employees remain the least likely to be allocated to a task. Table 5 and Figure 2 provide support for my hypothesis that there are no significant differences in the allocation of tasks between younger and older employers.

Table 5

**Employer's age interacted with the age of the employee**

Likelihood of being allocated to a task	
36-45 years (26-35 years = ref.)	0.023
	(0.070)
46-55 years	-0.005
	(0.066)
56-65 years	-0.142
	(0.089)
Employer age 37-46 years (36 years or younger = ref.)	-0.052
	(0.054)
Employer age 47-56 years	-0.021
	(0.050)
Employer age 57 years and older	0.034
	(0.051)
36-45 years* Employer age 37-46 years	0.037
	(0.081)
36-45 years* Employer age 47-56 years	-0.002
	(0.076)
36-45 years* Employer age 57 years and older	-0.070
	(0.076)
46-55 years* Employer age 37-46 years	0.073
	(0.080)
46-55 years* Employer age 47-56 years	0.020
	(0.072)
46-55 years* Employer age 57 years and older	-0.009
	(0.074)
56-65 years* Employer age 37-46 years	0.093
	(0.099)
56-65 years* Employer age 47-56 years	0.070
	(0.093)
56-65 years* Employer age 57 years and older	-0.049
	(0.096)
10 years of experience (5 years = ref.)	0.066***
	(0.018)
15 years of experience	0.092***
	(0.016)
32 hours per week (16 hours = ref.)	0.201***
	(0.018)
40 hours per week	0.193***
	(0.019)
Gender of employee (female = 1)	0.044***
	(0.015)
MBO (HBO = ref.)	-0.432***
	(0.019)
WO	-0.117***

	(0.019)
Constant	0.504***
	(0.052)
Observations	6,452
R-squared	0.190

OLS estimates including robust standard errors corrected for clustering on the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 2

Likelihood of being allocated to a task depending on the age of the employer (95% CIs)
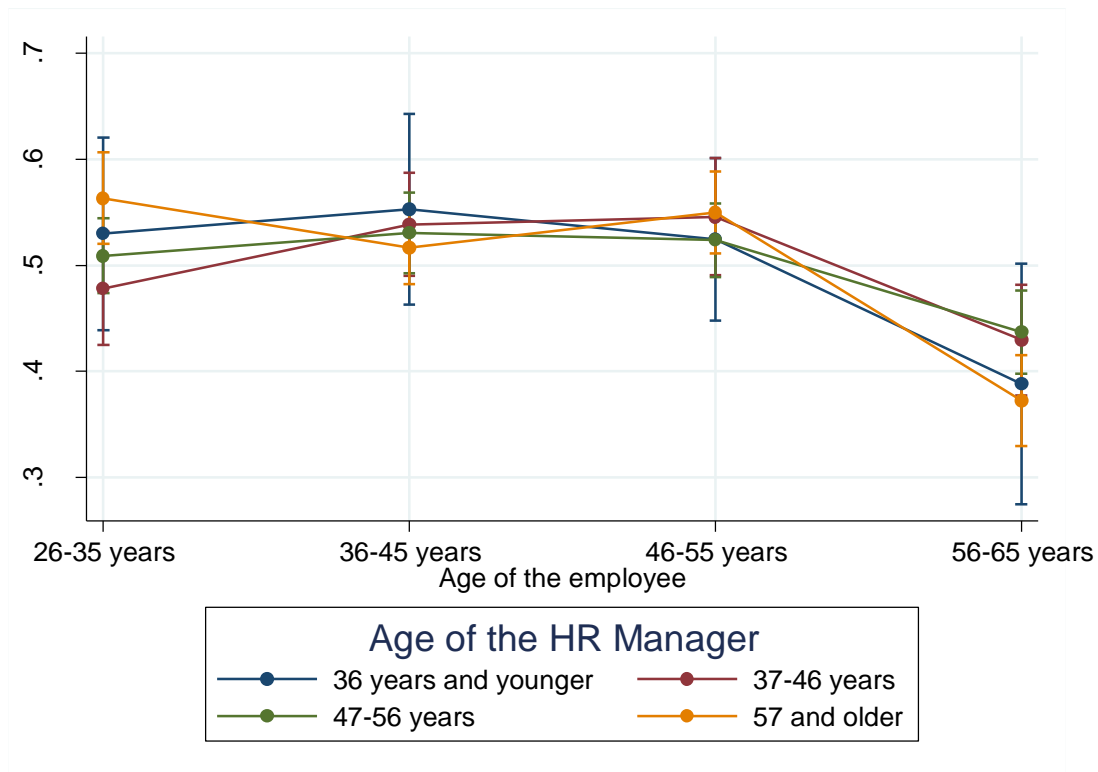
4.4.   The Provision of Training and the Likelihood of being allocated to a Task

Using the human capital theory, I predicted that companies which provide their older workers with training are more likely to allocate them to a variety of tasks. If the companies believe that they benefit from additional training of their older workers, then I assume that they also are more likely to believe that they benefit when the older workers execute a broad variety of tasks and hereby build up new skills.

Table 6 shows the estimates for the interaction of the provision of training with the age of the employee. The provision of training has a significant effect. If the company provides more training to older employees (increase of 1 on the scale), then it is also 4%-points more likely to allocate a task to an older employee over the age of 55 than to his counterpart aged between 26 and 35. This effect does not account for the level effect of training which is generally negative. The interaction effect with the workers over the age of 55 dominates however. Figure 3 which shows a margins plot illustrates the dominance of the interaction effect. The difference between employers who don't provide training and those who provide training to all older workers is over 10%-points when it comes to allocating tasks to older workers.

This provides support in favor of my fourth hypothesis and underlines the general importance of training.

Table 6

Allocation of tasks interacted with HR-instruments

Likelihood of being allocated to a task	
36-45 years (26-35 years = ref.)	-0.050
	(0.043)
46-55 years	-0.011
	(0.044)
56-65 years	-0.197***
	(0.044)
Provision of training to older workers	-0.021*
	(0.011)
36-45 years* provision of training to older workers	0.025
	(0.017)
46-55 years* provision of training to older workers	0.011
	(0.017)
56-65 years* provision of training to older workers	0.038**
	(0.017)
10 years of experience (5 years = ref.)	-0.090***
	(0.016)
15 years of experience	-0.024
	(0.017)
32 hours per week (16 hours = ref.)	0.198***
	(0.018)
40 hours per week	0.193***
	(0.020)
Gender of employee (female = 1)	0.041***

	(0.015)
MBO (HBO = ref.)	-0.434***
	(0.019)
WO	-0.117***
	(0.019)
Constant	0.639***
	(0.035)
Observations	6,406
R-squared	0.189

OLS estimates including robust standard errors corrected for clustering on the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 3

Likelihood of being allocated to a task depending on the provision of training (95% CIs)
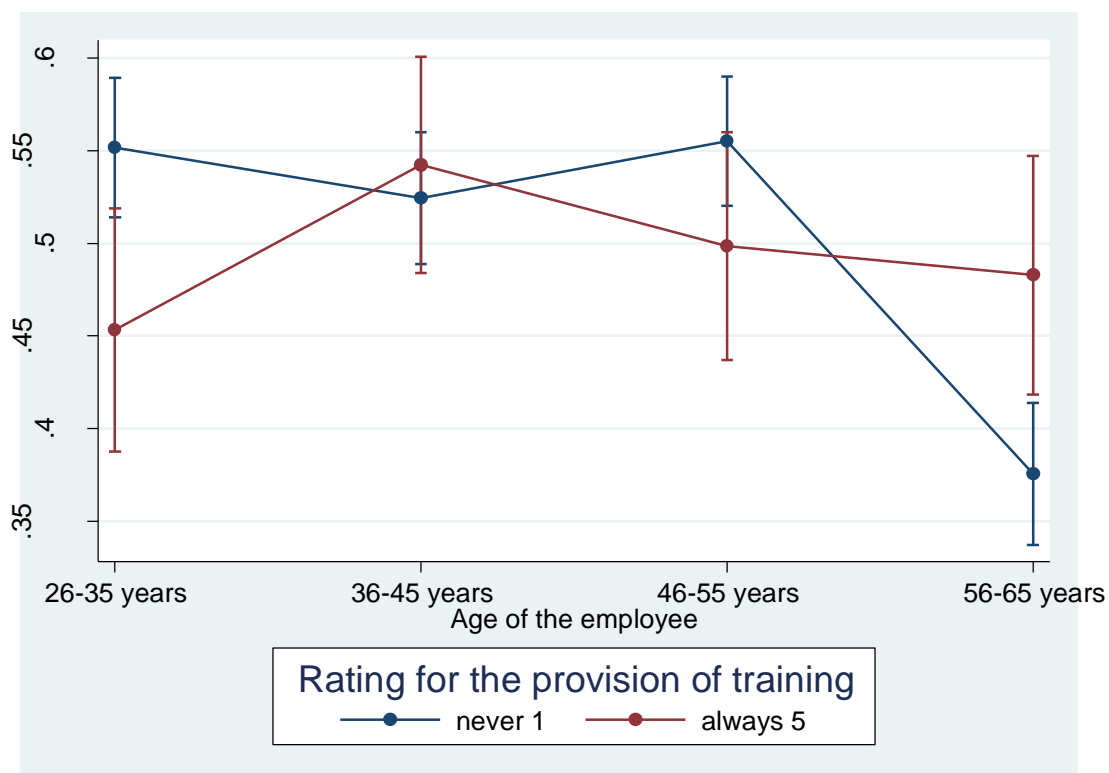
4.5.   The Absenteeism Rate and the Likelihood of being allocated to a Task

I argue that companies which suffer from higher absentee rates are more likely to allocate tasks to older workers as they expect them to be more reliable and be less frequently absent from work.

Table 7 provides the results with the interaction of the absenteeism and the allocation of tasks. In fact, the interaction effect with employees over the age of 55 is significant at the 1% level. Hence, the higher the absentee rate, the higher the likelihood that older workers are assigned to a task. Figure 4 shows us the marginal plots. With the help of the figure the results become even clearer. The absentee rate does not play a major role for the allocation of tasks for workers aged between 26 and 36 years. Neither is it a major determinant for the categories of workers aged between 36 and 45 years and between 46 and 55 years. The only category for which it does play a key role is for workers between the age of 56 and 65. If the company has an absentee rate of 15%, then employees over the age of 55 are more than 30%-points more likely to receive the tasks than if the company does not have any absenteeism (which is very unlikely). I therefore conjecture that the planning security is indeed extremely important to employers and if they are faced with high rates of absenteeism then they rather trust older workers than younger workers. Whether planning security and the difference between prolonged sick leave and frequent sick leave are the only channels explaining the results is questionable, further investigations into this question are necessary. Nevertheless, my Hypothesis 5 is clearly confirmed.

Table 7

**Allocation of tasks interacted with the provision of training**

Likelihood of being allocated to a task	
36-45 years (26-35 years = ref.)	0.051
	(0.046)
46-55 years	0.051
	(0.049)
56-65 years	-0.241***
	(0.050)
Absentee rate	-0.001
	(0.005)
36-45 years* Absentee rate	-0.008
	(0.008)
46-55 years* Absentee rate	-0.007
	(0.009)
56-65 years* Absentee rate	0.025***
	(0.009)
10 years of experience (5 years = ref.)	0.065***
	(0.018)
15 years of experience	0.094***

	(0.016)
32 hours per week (16 hours = ref.)	0.203***
	(0.019)
40 hours per week	0.197***
	(0.020)
Gender of employee (female = 1)	0.043***
	(0.015)
MBO (HBO = ref.)	-0.430***
	(0.019)
WO	-0.118***
	(0.019)
Constant	0.496***
	(0.037)
Observations	6,380
R-squared	0.191

OLS estimates including robust standard errors corrected for clustering on the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure 4

Likelihood of being allocated to a task depending on the absentee rate (95% CIs)
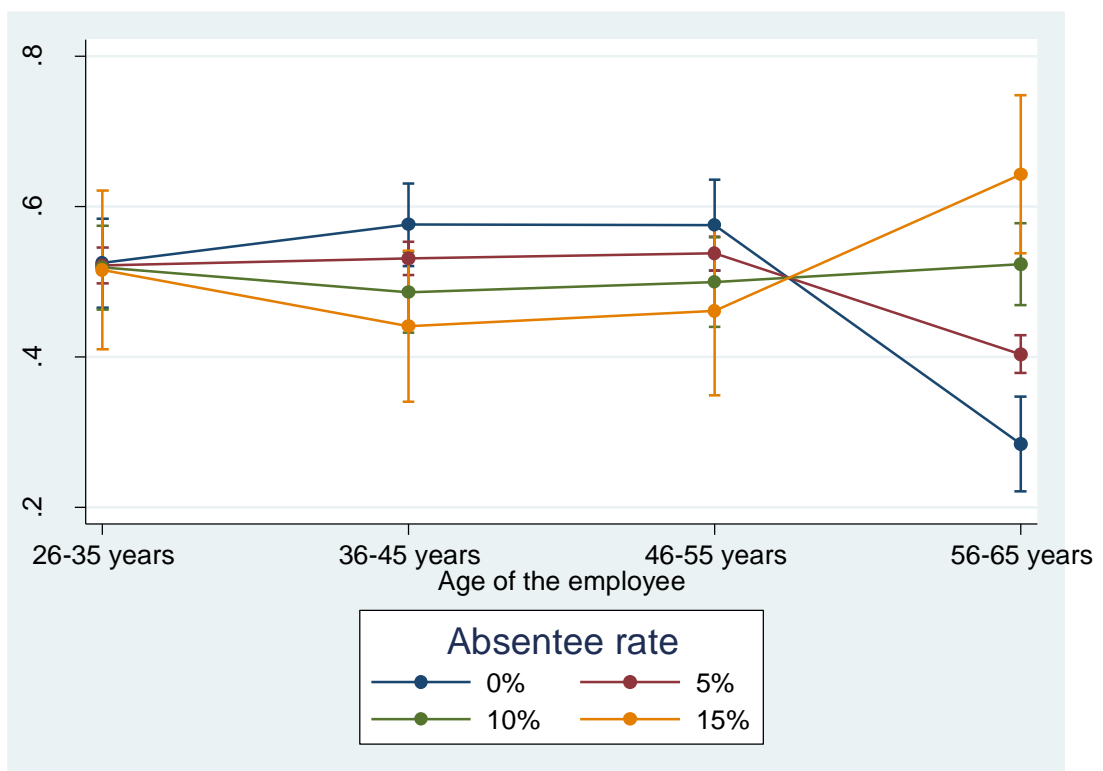
5. Conclusion

5.1.   Summarizing the results

This paper uses a vignette experiment to examine the relationship between the age of employees and the likelihood that they are allocated to a task. The investigation extends to the role which the type of task, the age of the employer, the level of training provided to older workers and the absentee rate plays when it comes to the allocation of tasks.

My results show that the older workers are indeed less likely to be allocated to a task. An employee who is between 56 and 65 years old is 11%-points less likely to be assigned to a task than his 26 to 35 years old counterpart. A higher number of years of experience alleviates the level of discrimination, but it cannot completely compensate the disadvantage. An employee with 10 years of related work experience is 7%-points more likely and an employee with 15 years of experience is 9%-points more likely to be allocated a task than an employee with 5 years of experience.

Whether the employee is allocated to a task further depends on the type of task. For each task with the exception of "managing employees", workers over the age of 55 are less likely to be allocated to it than their younger counterparts. Even for "managing employees", they are only similarly likely and not more likely to be allocated to it. However for "managing employees", there is an increase of propensity if the employee is between 46 and 55 years old. This is contrasting with the results for the tasks "gathering and processing of information" and "using verbal and communicative skills". For both of these tasks the propensity to be allocated to them already drops for employees who are between 46 and 55 years old.

My hypothesis concerning "in-group" bias is not confirmed. The age of the employer is not a determining factor at the level of task allocation. Older employers are not significantly more likely to allocate tasks to older employees than to their younger counterparts.

The provision of training to older employees does have a certain predictive power for the allocation of tasks. Companies in which training is available for all older employees are 5%-points more likely to allocate older workers to a task than companies which do not provide any training to older workers. This result may reflect the high regard in which older workers are held in these companies.

Lastly, the absentee rate also has an influence on the allocation of tasks. Companies which suffer from an absentee rate of around 15% are more than 30% more likely to allocate

a task to workers who are between 56 and 65 years old than companies without any absenteeism.

5.2.   Implications for Research

Discrimination against older workers exists at the level of task allocation. Employers are more likely to assign tasks to younger workers. This is the main revelation of this stated preference experiment. The randomization of the employee's characterization in the vignette allows me to draw this conclusion. The usage of a vignette has proven to be extremely helpful and I believe that it can be used in many additional areas for future research.

"In-group" bias is not present at the level of task allocation, at least not to the extent that it favors older workers to be assigned to tasks. Possibly, older employers actively try to avoid giving many tasks to older workers as they know that the tasks are more strenuous for them (Zaniboni et al. 2014). However, the results do not indicate that older employers assign significantly fewer tasks to older workers nor that they assign them in a higher proportion to tasks which are physically less demanding. Another possibility is that hierarchy plays a certain role and that "in-group" bias solely exists if there is repeated interaction between the two individuals which might not be the case if an employer assigns an individual task to a worker.

The importance of training has been confirmed in my experiment. Not only do people learn from training, but the provision of training may also be a proxy for the value which the company attributes to a worker. Human resource measures may propagate a positive working climate towards older workers or any other category of workers and hereby contribute to a decline of discrimination.

The absentee rate has so far rarely been analyzed as a factor in the context of discrimination. My results show, however, that the absentee rate does have an influence on the allocation of tasks. I believe that the absentee rate should be considered more often in future research.

5.3.   Implications for Policy

The fact that older workers are significantly less often assigned to tasks hurts their employability. They do not benefit from the indirect learning effect which occurs during the execution of tasks and which increases their human capital. Hence, not only is it more difficult

for an older worker to re-enter the job market, if he has been laid off, but his employability is also more at risk due to the fact that employers invest less in older employees by providing them with new tasks. A higher sensibility for this issue can, for example, be achieved by a media campaign or by workshops to managers of companies, in particular providing them information on the comparative advantages of older workers.

The problem with the lower employability of older workers is not limited to the individual worker and company; it creates a macroeconomic problem as well, especially in times of an aging population. Although many industrialized nations need an increasing percentage of older people to work in order to sustain their generous pension schemes, the discrimination which the latter experience creates barriers to the extension of their working life. So far most governmental reforms relating to public pension schemes have been supply-side reforms - either governments cut the pension benefits, or they have raised the age at which workers receive a pension (Van Soest and Vonkova 2013). The success of these measures is doomed to be limited, if older workers are generally willing to work longer, but cannot because there is only a weak demand for them.

Policy makers ought to finance programs which increase the skills of older workers. A possibility would be to offer employers training funds for older employees. An important characteristic of these funds is that training should not only be carried out in a formal manner, but it should also enhance informal learning by assigning older workers to tasks. The company would also profit from the new skills of the older workers.

5.4. Limitations and suggestions for future research

The study has several limitations. First of all, we do not know exactly how the results from a vignette study transmit to real-life situations. I can imagine that in many companies, especially smaller ones, managers are not faced with a situation in which they can actually choose between two employees. Instead, they only have one who is qualified to execute the task. Second, it can be questioned whether HR-managers are the right target audience for my vignette experiment. Possibly other managers who are not in HR-departments are more involved in the day-to-day decision of assigning tasks. With both of these concerns it is not clear whether my results are more likely to under- or overestimate the amount of discrimination. Third, I am still unable to distinguish between the different reasons for

discrimination. I cannot identify whether employers allocate fewer tasks to older workers due to statistical discrimination, taste-based discrimination, or because of human capital theory which favors investments in younger employees.

For future research it would be interesting to know what older employees are doing when they are not allocated to the task mentioned in the vignette. To investigate this matter, the vignette design must be improved. I can imagine adding a second task to the vignette so that the participant of the study has to allocate two tasks between two employees of different age.

Regarding the results for the task "using verbal and communicative skills", a potential explanation why older workers are not favored by their employers, despite having higher crystallized intelligence which should help with the execution of these tasks, is that communicative skills may be associated with newer technologies for the use e-mail or social media. It is therefore necessary to clearly separate the two channels of communication - the verbal one and the written one. An additional area of research could be to include more physically challenging tasks in order to investigate whether older workers suffer from higher discrimination in these tasks and to add an interaction effect between the provision of training and the allocation to physically challenging tasks.

I believe that the potential of the absentee rate has not fully been exhausted so far. If it plays a role in the allocation of tasks, it is easily imaginable that it is also a determining factor during the hiring process.

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First and last name: *Michel Wirth*

Study programme: *Economics*

Course/skill: *Master*

ID number: *6171492*

Signature: *Michel Wirth*

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