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Training Opportunities for Older Workers

The Effect of Age on the Propensity to Offer Training to Employees

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Training Opportunities for Older Workers.

The Effect of Age on the Propensity to Offer Training to Employees

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Abstract

Training Opportunities for Older Workers. The Effect of Age on the Propensity to Offer Training to Employees.

Purpose – The aim of this thesis is to examine age discrimination by employers in their training provision. Furthermore, I examined if the type of training (i.e., the subject of training) and the employer's personal & organizational characteristics influence older worker's probability to receive training offerings.

Design/methodology/approach – I use unique survey data from the Dutch public sector, collected by the Research Centre of Education and Labor Market (ROA). The survey contained a stated preference experiment, which relies on a vignette study, and additional questions regarding employer's personal and organizational characteristics. The final estimations are based of 6,342 observations. Estimation analyses where done by OLS regressions and fixed effects and conditional logit models when necessary.

Findings – I found evidence for a negative significant relation between employee's age and the likelihood to receive training opportunities. I found no support for the influence of training aim, nor for employer's personal characteristics. The interaction between employee's age and share of permanent contracts within the employer's firm was, however, positively significant. This implies that even though older workers are less likely to receive training opportunities, this effect is less big when the organization employs many workers with a permanent contract.

Practical implications – Even though training is a key factor in facing an ageing workforce, this thesis shows that employers are still less willing to invest in training opportunities for older workers. Employers need to be made aware of the fact that older workers are faced with an extension of their working lives and consequently will be in the organization for additional amount of time. Creating policy measures that increase this awareness could mitigate the negative age effect on training opportunities. Moreover, policy measures could be developed that enhance the attractiveness of long-term employment relationships, as the result show a smaller negative age effect on training opportunities in organizations with a large share of permanent contracts.

Contribution –Research on age discrimination focuses almost exclusively on hiring decisions and is conducted by using field experiments that lack information about the individual who offers the job or training to employees. This is problematic as the employability of older people on the labor market is most likely not only affected when being unemployed, but is also affected during working life. Using data from a survey that combines a vignette study with items regarding the employer's personal and organizational characteristics fills this gap. The experimental character of the vignette study allows me to causally investigate whether age discrimination is present at the work place. Moreover, the link with survey data allows me to investigate several drivers behind the age discrimination behavior of employers.

Keywords – Training opportunities, age discrimination, older employees

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I. Introduction

1.1 Problem statement

Providing organizational training to employees has become an essential instrument to enhance a firm's competitive advantage and is considered an essential solution when facing an ageing workforce (Argote & Ingram, 2000; Lazazzara, Karpinska & Henkens, 2013). It is considered a main source of lifelong learning, which not only aids employees in acquiring job related knowledge and skills and benefits their employer, it also improves their self-confidence and self-perception (OECD, 2000; Becker, 1975; Lazazzara et al., 2013). The importance of training is also confirmed by the vast amount of literature that, among others, focuses on its effectiveness (Cromwell & Kolb, 2004; Aguinis & Kraiger, 2009). Despite its importance, studies show that training participation is not equally divided among employees and mostly older workers do not engage in these learning activities (Hanson, 2008; Maurer, 2001; Chiu, Chan, Snape & Redman, 2001).

The factors that influence this lower participation rate remain unclear. Employers often cite lacking engagement and a diminished motivation to learn as reasons why older employees refrain from participating in training (Ng & Feldman, 2012). However, the extension of the working life of older workers due to changing retirement policies, leads also to that they are more inclined to participate in training (Montizaan, Cörvers & de Grip, 2010). Revealed training participation rates are thus likely to be influenced by employer as well as employee preferences and choices. To gain more insight into what actually underlies the lack of participation in training among older workers, I will focus in this thesis on the factors that influence the employer's decision to abstain from offering training opportunities to older workers, while holding employee behavior constant. To this end, I will make use of a stated preference experiment which allows me to isolate the impact of employer preferences on training investments. The core research questions in this thesis will

concentrate on the influence of the employee's age, the type of training offered and the employer's personal characteristics as well as the organization's characteristics on the likelihood that employees are offered a training course.

1.2 Predicting Training Participation of Older Workers

Low training participation could be explained from two different avenues. The first one is more focused on the employee and their demand for training, the second concentrates on the employers and how much training they offer their older workers. In literature the main focus lies on the first avenue, as many studies argue that older employees are less motivated to participate in training (Ng & Feldman, 2012). An explanation could be that older employees don't strive for development and gaining new skills anymore (Stamov-Roßnagel & Hertel, 2010) or that they don't feel they have to learn new skills since they survived this long without those skills (Canduela et al., 2012). However, a meta-analysis using data from 25 years of adult education literature shows that age is positively related to motivation to learn (Gegenfurtner & Vauras, 2012), implying that there must be other explanations for the low training participation rate of older workers. An explanation for a low demand of training from older workers could come from human capital theory. This theory examines the investments in human capital based on rates of return to training and education (Becker, 1975) and conjectures that employees who are close to retirement and need to pay for training themselves will probably be less inclined to participate in or ask for training as they would receive less returns on their investment due to a shorter time in which they can reap the benefits of these new skills.

However, as most training is paid for by the employer (Booth & Bryan, 2002), it is likely that the low training participation of older workers is also affected by employer behavior. The

lower participation rates can be explained by, similar to the earlier argument discussed for employee behavior, human capital theory: employers can be reluctant to invest in training for older workers, since these employees are closer to retirement and the expected return on investment will be limited. Another reason could be that older workers in general have more tenure and probably also a more senior position within their company. As a consequence, they are also likely to receive higher wages. As most training is often followed during working hours (Booth & Bryan, 2002), employers may be more concerned with the forfeited productivity of older employees due to the high wage costs and their key position within their organization. A third reason is that older employees probably take longer to learn new skills, increasing the costs of training. Besides the economic perspective, employers could also be less willing to offer training opportunities to older workers due to discriminative behavior. In the economic literature, there is a distinction between two types of discrimination, taste-based and statistical discrimination (Becker, 1957; Phelps, 1972). In both types individuals consciously discriminate, however for different reasons (Bertrand et al., 2005).In both types of discrimination, stereotyping plays an important role. Several studies show that age stereotypes are often suggested as the main reason for excluding older workers as employers see them as inflexible, resistant to change, in worse health, costlier and less productive than their younger colleagues (Finkelstein et al., 1995; Posthuma & Campion, 2009; van Dalen et al., 2010).

Although there is a large body of research that focuses on the hiring of older workers (Montizaan & Fouarge, 2018), research on training opportunities for older workers is still limited. There are, however, some research results that suggest that the lack of training participation of older workers is due to the absence of training opportunities as a consequence of that their age negatively influences an employer's decision to offer them training. For example, Lazazzara et al.

(2013) studied the views of HR professionals and the key variables that influence their decision to allow or deny access to training. They suggest that an employee's age plays an important role in determining practices in regard to older workers. In their study participants were asked to make training decisions based on hypothetical workers and their results show that access to training is negatively influenced by an employee's age. Moreover, they find that a productive older worker has more chance to receive training, suggesting that training for older workers is more used as a reward than to enhance productivity. Karpinska et al. (2015) also study the effect of age on training opportunities for workers. Managers were asked to make a decision regarding specific or general training. Age was shown to have a negative effect on the training opportunities workers received, moreover they also found that older workers who already performed well received more training opportunities than their less productive and less motivated peers. These studies give reason to believe that employers can be less willing to offer training opportunities to older workers, to further assess this assumption the first research question is formulated as follows:

1) *To what extend does an employee's age affect the allocation of training across workers?*

1.3 The Role of Skills in Predicting Training Opportunities for Older Workers

The importance of cognitive skills for success in the workplace is documented in several studies (Salthouse, 2012). The question is to what extent employers belief their older employees may have a comparative advantage with regard to specific skills and whether these beliefs have an impact on their human capital investment behavior. In their research on hiring decisions, Montizaan and Fouarge (2018) distinguish five types of skills which can change substantially during a worker's life cycle: learning and coping with change, problem solving, experience, supervision and communication skills. These skills cannot only influence the hiring decision of an employer, but

also their willingness to invest in certain training for older workers. The first two skills can be defined as fluid abilities, which decrease with age (Horn & Cattell, 1967; Wrenn & Maurer, 2004). The latter three can be identified as crystalized abilities that improve through life experiences, education and training (Salthouse, 2012; Wrenn & Maurer, 2004). As employers tend to invest in training when they foresee high returns, they are less likely to invest when training is aimed at skills that rely on fluid abilities. For these skills decrease with age and older workers' productivity will not rise as much as the productivity of their younger colleagues would. While, if training is aimed at crystalized abilities, older employees will have a better comparative advantage as they have more life and work experience thus making them more eligible for this type of training. Moreover, training aimed at increasing crystalized abilities will probably be more complementary to existing skills for older workers. Consequently, older workers are likely to have to spend less time to master the skills learned in the training, which in turn will lower the costs of investment and add to the employers' willingness to invest in training opportunities for their older workers. Therefore, the second research question is:

2) *To what extend does the training aim affect the allocation of training across workers?*

1.4 The Role of Employer's Personal and Organizational Characteristics

Decisions people make and the beliefs they hold are often affected by their own individual characteristics such as age, gender, and level of education, amongst others (Chiu et al., 2001; Bruine de Bruin et al., 2007). Several studies such as those by Chiu et al. (2001), Rupp et al. (2005) and Kunze et al. (2011) researched how individual differences, but also organizational characteristics, can influence the beliefs people hold about older workers. Chiu et al. (2001) expected, and found, that an individual's age can positively influence the beliefs they hold about

older workers, which is also supported by Rupp et al. (2005) who find similar results for age in their study across undergraduate students. The influence of organizational characteristics, such as diversity, is reported by Kunze et al. (2011), who find that a high age diverse organization is negatively related to the beliefs employers hold about older workers. Based on aforementioned studies, I assume individual and organizational factors will influence the beliefs employers hold about older workers and consequently their decision to which employees they offer training opportunities.

As beliefs about older workers can be influenced by individual and organizational characteristics, I conjecture that training opportunities for older workers subsequently will be influenced by this. Only two other studies researched this topic and found different results. Lazazzara et al. (2013) predicted, and found, a positive relation between an employer's age and the training opportunities older workers receive. For organizational characteristics they find significant negative effects for company size and strong positive effects for labor force shortage on the likelihood older workers receive training opportunities. The other study by Karpinska et al. (2015) found, opposite to Lazazzara et al. (2013), a negative effect for the manager's age on training opportunities for older workers. This difference can be explained by the fact that the Dutch participants were all managers, while the Italian participants were HR professionals and the fact that managers are prone to be more negative towards older workers because of an out-group bias[1] (Finkelstein et al., 1995; Chiu et al., 2001). The results from this thesis can be important as they will provide more support for the argument that an employer's age can positively or negatively affect beliefs about older workers. Therefore, due to these mixed results and based on the

[1]An out-group bias refers to an individual who identifies his or her own group as superior and perceives the differences between themselves and members of another group as greater than they actually are.

assumption that organizational and individual characteristics can influence the decisions people make and beliefs they hold, I add the following and final research question:

3) *To what extend do employer's personal and organizational characteristics affect the allocation of training across workers?*

1.5 Data, Design and Findings

To analyze the likelihood of older workers receiving training opportunities, I use unique survey data[2] from the Dutch public sector. The survey, used to obtain this data, consists of a stated preferences experiment and a questionnaire, which was send out to all employers from these sectors by the Research center of Education and Labor Market (ROA) via e-mail. The purpose of the stated preferences experiment was to study employer's preferences in allocating training across workers. The questionnaire was further aimed at obtaining detailed information about HR- and retirement practices in the employer's organization[3].

I find that training opportunities of older workers significantly decrease with age. Moreover, I find that other employee characteristics such as working hours and experience do not compensate this strong age effect. I further find that the training aim does not significantly affect the difference in training offer probabilities for older workers, suggesting that employee's skills / comparative advantages are not taken into account during the employers' decision making process. I also find no support for an ingroup bias, nor do I find a positive interaction between employee's age and the employer's expected retirement age. Finally, I do find that one organizational characteristic (i.e., share of permanent contracts in their organization) does interact positively with

[2] From the ROA Public Sector Employer Survey 2012
[3] A full explanation of the strategy will be addressed in the method section.

employees' age. Although the probability to receive training always decreases with age, the positive interaction effect implies that this decrease is less big for workers in organizations in which the majority of the workers has a permanent contract.

1.6 Contributions to Research

This study contributes to research and practice in several ways. First, although discrimination in the workplace is widely researched, the focus of these studies lies mainly on race or gender (Deitch, Barsky, Butz, Chan, Brief & Bradley, 2003; van Laer & Janssens, 2011) and not on age. Nonetheless there is some evidence in economic literature that shows age discrimination exist, but these results are mainly based on self-reports or field experiments and are focusing on hiring decisions (Hutchens, 1986; Johnson & Neumark, 1996; Bendick, Jackson, Romero, 1996; Bendick, Brown & Wall, 1999; Lahey, 2008). These field experiments concerning ageing related topics in general send out pairs of resumes to organizations. These resumes contain credentials that make both of the applicants equally qualified, with the exception that they only differ with age. In a next step they measure age discrimination by analyzing how many applicants received an invitation to an interview (Bendick et al., 1999; Lahey, 2008). With these field experiments it was possible to prove age discrimination exists in hiring decisions, but they did not give any information about the thoughts behind the decision process nor did they gave insights on who made the final decision. This study fills this gap by using data from a vignette experiment. Vignettes are concrete and detailed descriptions of fictive, yet realistic, situations or scenarios that need to be judged by a respondent and are believed to influence decisions (Hainmueller et al., 2014) and are proven to generate data that resembles real life behavior, they are arguably a good substitute for field experiments (Telser & Zweifel, 2007; Hainmueller, Hangartner & Yamamoto, 2015). The

randomization process of the characteristics of the employees who are eligible to training makes it possible to interpret the results from the vignette study in a causal way. Also, a great benefit is that the vignette experiment is part of a survey. This enables me to look into more detail which employer characteristics are responsible for the age discrimination in the training allocation process compared to the existing field experiments.

Second, as mentioned before, research on age discrimination is mainly focused on the hiring process of older employees and not on training opportunities (Hutchens, 1986; Bendick et al., 1997; Bendick et al., 1999; Hirsch, McPherson & Hardy, 2000; Lahey, 2008). One could argue that hiring decisions differ considerably from decisions on training opportunities. For example, an employer is not sure of the capabilities and productivity of an individual when he hires him or her, nor is it certain that this information will reveal itself immediately after hiring (Spence, 1973). So taken into account that it takes time to fully know an employee and their skills and capabilities, one could argue that a hiring decision involves a considerably more uncertain investment decision which may lead to statistical age discrimination (Connelly et al., 2011). In the decision making process with regard to training offerings, one could argue that the employer already has this information. The access to this information, probably results most likely in less statistical age discrimination. When differential treatment of older employees is present, it is more likely that it concerns taste based discrimination.

1.7 Policy Relevance

It is important to map the factors that can influence the employer's decision to offer training to older workers, since insights in what drives (HR-) manager's decisions is quite limited even though they play a large role in offering training opportunities. Also, due to the pension reforms of

the past years, employees' working lives are extended substantially. This means employees need to find ways to stay employable and training is a key practice to ensure older worker's labor market participation (OECD, 2006). This thesis' results are therefore of importance as they can help understand which factors can positively influence employers' decision to offer training to older employees. Moreover, the results from this thesis can be used to change or improve policies within organizations as for example the share of permanent contracts can play a key role in securing training opportunities for older workers. Moreover, this thesis could be seen as a warning for policy makers who currently intend to modernize and increase the flexibility of the labor market. For the results of this thesis suggest that not flexibility but a focus on stable long-term employment relationships is crucial for maintaining skills investments at older ages.

Also, this thesis shows that age discrimination in training offerings by employers is still present. This knowledge can be used to create more awareness of this (unintended) behavior. Helping employers realize this, could decrease the emergence of age discrimination in training opportunities and consequently increase older worker's propensity to receive training offers.

1.8 Outline

This thesis is organized as follows; the three research questions form the basis of the theoretical framework that is presented in section II. Here, also relevant literature will be discussed and hypotheses are formed subsequently. Section III offers an overview of the data, an explanation of the stated preference experiment and the empirical strategy. Section IV presents the estimation results. And finally in the last section V the results will be discussed, conclusions are drawn and limitations and implications for practice and future research are provided.

II. Theoretical Framework and Hypotheses

Organizations are often characterized as goal oriented systems that aim to reach high levels of continuity and profit to maintain a competitive market position (Karpinska et al., 2011). An important way to achieve these goals is by continuously improving the skills and knowledge of employees by giving them the opportunities to learn and develop through for example, letting them participate in training courses throughout their career (Torraco, 2000). Training can be defined as the acquisition of skills, concepts, or attitudes that results in improved performance in an on-the-job environment (Goldstein, 1980 p.230). Training for employees can range from formal organized activities, which are characterized by a curriculum, diploma or certificate and clear learning goals, to more informal processes such as learning from experience (Mincer, 1962). As the majority of training is paid for by the employer (Booth & Bryan, 2002) and older employees are proven to participate less in training (Armstrong□Stassen & Ursel, 2009), this thesis will focus on which factors can influence the willingness of the employer to invest in training opportunities for older workers. I propose several factors that can influence how positive or negative employers think about the benefits they reap from investing in training older workers compared to the costs associated with the training, which will consequently influence their decision to offer training opportunities. I expect the age of the employee to influence the training opportunities they get offered, as employers are probably less willing to invest in training if they don't have sufficient time to receive returns on this investment. Also, the employee's skillset will presumably affect whether they get a training offer. Training aimed at fluid abilities can be seen as a worse investment then training aimed at crystalized abilities. Finally, I expect factors such as employer's personal and organizational characteristics to influence the training opportunities older workers get offered.

Below I derive corresponding hypotheses based on the current literatures on age discrimination, human capital investments and skills development.

2.1 The Role of Age in Predicting Training Opportunities

A worker's age can have a considerable influence on the willingness of employers to offer a training course (Lazazzara et al., 2013). Several studies show that companies begin investing less in employees when they reach the age of 45, as this age is viewed as the beginning of employees' final stage of their careers (Maurer, 2001; van Vianen, de Pater & Preenen, 2009). Several explanations can be given for the lower training participation rate amongst older workers (see Table 1 for an overview).

The decision to grant older workers less training opportunities can be explained by human capital theory. Human capital can be characterized as the unique set of abilities and skills a person brings into the labor market (Borjas, 2013). According to human capital theory, investing in human capital is only appealing when there will be a high rate of return on investment in education and training compared to the costs (Becker, 1964). As such, employers will base the decision whether or not to let employees train, on information that shows high expectations of future benefits and rises in productivity. Older workers are therefore often seen as a bad investment, as they are closer to retirement and employers will only have a limited period of time to receive a return on this investment and this trade-off is too small to justify the decision to offer them training (Finkelstein & Burke, 1998). Also, human capital depreciation can play a role in considering which employee gets offered training opportunities. Human capital depreciation can be caused by two types of skill obsolescence, economic and technical. Economic skill obsolescence is a decrease in the value of a worker's human capital as their skills for a certain job become obsolete due to technological

developments or a shift in sectors. Technical obsolescence affects the stock of human capital as the actual skills of the employee get lost due to atrophy or wear caused by the aging process (de Grip & van Loo, 2002). Economic as well as technical obsolescence can affect both young and older workers. However, at mastering, for example, new computer software due to the use of new technology in their organization, older workers often exhibit less success than their younger colleagues (Gist, Rosen & Schwoerer, 1988). Perhaps, because skills obsolescence in certain professions might increase with age. Consequently, this could mean that teaching older workers new skills after their current skills have become obsolete, could be costlier and therefore a less beneficial investment. Furthermore, economic skill obsolescence can also be found when there is a change or shift in the sector structure of employment. This means that even though a worker's skillset is still adequate for his or her job, the demand for their occupation is declining (de Grip & van Loo, 2002). As older workers are often employed in dying industries (Hutchens, 1988; Lahey, 2008), employers could assess the possibility to offer them training as a bad investment and thus refrain from offering these workers training opportunities.

Both types of obsolescence imply that workers need to learn new skills to stay employable. However, it is also observed that the speed in which workers learn new skills also decreases over time (Wrenn & Maurer, 2004). Consequently, it will take them longer to become more proficient. Moreover, as older workers often have often a more senior position within their organization and receive generally more salary then their younger colleagues, the opportunity costs of training participation for them is higher than for their younger counterparts. Thus besides the shorter period in which training costs can be recouped, and the potentially higher levels of skills obsolescence, training costs and opportunity costs might be higher for older workers. All these factors might lower the employer's willingness to invest in training.

Table 1. *Overview theoretical explanations*

Theoretical explanation	Corresponding empirical studies		
Older employees receive less training opportunities because…	**Title**	**Author(s)**	**Year**
There is a limited period of time employers receive a return on investment.	Investment in human capital: A theoretical analysis	Becker, G. S	1962
	Age stereotyping at work: The role of rater and contextual factors on evaluations of job applicants	Finkelstein, L. M., & Burke, M. J.	1998
The returns for training are lower due to human capital depreciation	On the effects of schooling vintage on experience-earnings profiles: theory and evidence	Neuman, S., & Weiss, A.	1995
	The economics of skills obsolescence: a review	De Grip, A., & van Loo	2002
Formal learning (e.g., training) is not a suitable or preferred learning activity for older workers	Adults' Informal Learning: Definitions, Findings, Gaps, and Future Research	Livingstone, D. W.	2001
	Factors that influence informal learning in the workplace	Berg, S. A., & Chyung, S. Y.	2008
Employer's decision are influenced by stereotypes resulting in age discriminative behavior	Age-ism, another form of bigotry	Butler, R.	1969
	Ageism: Negative and positive	Palmore, E.	1999
	Occupational age structure and access for older workers	Hirsch, B. T et al.	2000
	Age stereotypes and discriminatory attitudes towards older workers: An East-West comparison	Chiu, C. K. et al.	2001
	The recruitment of early retirees: a vignette study of the factors that affect managers' decisions	Karpinska, K. et al.	2011
	What factors influence training opportunities for older workers?	Lazazzara, A. et al	2013
	Training opportunities for older workers in the Netherlands: A Vignette Study	Karpinska, K. et al.	2015

Lastly, the way of learning can influence the employer's decision to invest in training opportunities for older workers as well. Livingstone (2001) in his meta-analysis focused among others on adult's informal learning and found that older employees are more engaged in informal learning activities. This is be supported by Berg and Chyung (2008) who studied the factors that can influence learning in the workplace and found that older employees are more engaged in informal learning such as reading published articles. As older workers are proven to engage in more informal learning activities such as searching the web and reading printed journals, one could assume that formal learning (e.g., training) would not be suitable for them. Consequently, employers could feel that investing in formal training opportunities for older workers would not be economically beneficial as they would be less engaged in this type of learning and probably will not learn as much or take longer to master the content of the training resulting in the costs outweighing the benefits. It might be more beneficial to invest in the informal learning of older employees.

The decision not to invest in training for older workers could also be the result of discrimination. Discrimination can be divided into two types, namely statistical and taste based discrimination (Phelps, 1972; Schwab, 1986). Statistical discrimination is based on easily observable characteristics such as gender, race, age or education. When there is a lack of full information, employers make a distinction between individuals based on statistical regularities, because their group membership can provide relevant information such as productivity (Phelps, 1972; Altonji & Pierret, 2001; Betrand et al., 2005). Taste base discrimination is an individual's desire to avoid members of certain groups based on personal reasons and is not based on other factors such as performance or productivity (Shwab, 1986). An underlying factor of discrimination is ageism. Ageism was first introduced by Robert Butler in 1969 as another form of intolerance,

similar to racism and sexism. Butler later defines ageism as 'the process of systematic stereotyping and discrimination against people because they are old' (Palmore, 1999 p.4). Stereotypes are often negative or inaccurate opinions about people based on their membership in a particular group (see Posthuma & Campion, 2009 for a complete overview of age stereotypes). An example of a stereotype could be that older workers only think about their retirement. If employers believe this stereotype, this could influence their decision to invest in training for older workers. For, this stereotype could imply that older workers want to leave the organization as soon as possible, consequently lowering the time employers can receive return on investments. So, stereotyping (i.e., what the employer beliefs to be true about older workers), can lead to an act of age discrimination (i.e., not investing in training for older employees because of their age) even if the belief is false (Hirsch, MacPherson & Hardy, 2000; Chiu et al., 2001; Karpinska et al., 2011; Lazazzara et al., 2013; Karpinska et al., 2015, among others)[4].

Aforementioned studies all show that an employee's age can affect the employer's willingness to invest in training workers. Even though the reasoning behind it can differ, all result in the fact that the older an employee is, the more likely it is that an employer will refrain from offering them training opportunities, accordingly I predict that:

Hypothesis 1 (H1): Training opportunities will decrease with worker's age

2.2 The Role of Skills

Organizations provide training to raise productivity, however this future productivity can only be improved at a cost. These costs can include time and effort of trainees, but also the teaching effort

[4]Hirsch, MacPherson & Hardy, 2000, Chiu et al., 2001 and Karpinska et al., 2011 found evidence for age discrimination in hiring decisions. Lazazzara et al. (2013) and Karpinska et al. (2015) found evidence for age discrimination in the allocation of training across workers.

provided by a trainer and the equipment and materials necessary (Borjas, 2013). As workers are not always well suited for all types of training (Barron, Black & Loewenstein, 1989), employers presumably will only invest in training if it maximizes the returns but keeps the costs at a minimum. I therefore assume that training opportunities for older workers can be influenced by the specific skills at which the training is focused. Training investments in skills that will take relatively more time to learn for older workers will most likely be relatively costly and consequently might be seen as a bad investment.

We can divide skills into two types of abilities, fluid and crystalized[5]. Several scholars suggest that fluid abilities are skills that decline with age. For example, Salthouse (1996) analyzed the speed of processing information amongst learners and found that age is associated with a decrease in speed in processing. Verhaegen and Salthouse (1997) in their meta-analysis on the relation between age and cognition also concluded that fluid abilities such as reasoning and episodic memory decline significantly after the age of 50. Results found by Skirbekk (2004) , also showed a decrease in productivity across workers over age 50 when tasks demanded skills such as problem solving, speed and learning. Finally, Westerman et al. (2007) found in their research on computerized retrieval information, that older individuals performed significantly slower. These studies all indicate that older individuals' fluid cognitive abilities are weaker compared to those of younger individuals as they decrease over age.

However, as fluid abilities decrease over time, crystalized abilities are said to improve with age and experience. For example, Horn and Cattell (1967) find that crystalized abilities are systematically higher for older adults in reference to younger adults. So taken into account that

[5] Fluid abilities include skills such as processing speed, reasoning, and long term memory. Crystalized abilities are skills such as oral presentation, supervising, communication and fact finding

crystalized abilities can improve with experience and expertise, which takes years to achieve (Ericsson, 2008), skills such as oral presentation, communication and fact finding can improve with age (Maurer & Weiss, 2004; Skirbekk, 2004). This is also supported by Kanfer and Ackermann (2004) who analyzed age-related development changes in workers. They find that abilities associated with general knowledge and verbal understanding tend to advance with age. Also, abilities such as integrity and leadership increase the most after the age of 50 (Maurer & Weiss, 2004). So, it is possible to assume that when training is aimed at crystalized abilities, older workers have a comparative advantage as they had the opportunity to gain more knowledge over the years and have more life experience than their younger colleagues.

Employers invest in training provided that they have multiple years to receive returns on this investment for example through increased productivity (Borjas, 2013). So it makes sense employers would invest in training skills that maximize returns and minimizes costs. Consequently, I presume that employers are more willing to invest in training older workers when this training is aimed at skills that improve or stabilize over time and in which aging workers have a comparative advantage. I therefore predict the following:

> *Hypothesis 2 (H2): Training opportunities for older workers will increase when training is aimed at skills where they have a comparative advantage such as leadership and (verbal-) communication.*

2.3 The Role of Employer's Personal and Organizational Characteristics

The willingness to invest in training opportunities for older workers may vary between different employers. To test this, I will analyze if employers' personal characteristics (e.g., age and expected

retirement age) and their organization's characteristics (e.g., the amount of stable employment relationships) affect their willingness to invest in training older workers.

2.3.1 Personal Characteristics

In several studies, a person's age has been identified as a factor that strongly influences the beliefs individuals hold about older workers. Kalavar (2001) for example analyzed how students rate the preferred age for service providers (e.g., doctor, pilot, lawyer and school bus driver among others) to see if the graying work population changes younger individual's perception of older workers. The results of the study show that the majority of the respondents identified the 30-49 age group as the preferred age group for their service providers and none of them mentioned the age group that contained workers over 60 years old. The results also show that the older the individual respondent is, the more their age preferences for service providers increase which could suggest that beliefs about older workers improve with an individual's age. Rupp et al. (2005) found similar results in their research. They investigated the age and gender differences in ageism scores and found that younger individuals received higher ageism scores than older respondents. These results show that discriminatory attitudes toward older individuals decrease with respondent's age and beliefs about older individuals or older workers become more positive. Finally, Van Dalen et al. (2005) investigated how employers and employees rated the skills and capabilities of younger and older workers. They find, similar to aforementioned studies, that the perception of skills and capabilities of older workers improve with the employer's age.

The difference in the evaluation of older workers by young and older individuals can be explained in several ways. Firstly, they can be the product of an out-group bias. An out-group bias refers to an individual who perceives the differences between themselves and members of another

group as greater than they actually are (van Dalen et al., 2005). For example, younger employers who believe that older workers differ significantly in a negative way from younger workers in regard to their learning capabilities or willingness to change or stay employed. This would then decrease their willingness to invest in older workers' training opportunities as they could assume training these workers would take more time, be costlier and the time to receive returns on these investments would be shorter than when they would invest in younger workers. Secondly, younger employers can assess older workers more negatively due to taste based discrimination, where they avoid or exclude older workers because of a variety of personal reasons regardless of the individual's productivity (Schwab, 1986; Betrand et al., 2005). This means that, for example, younger employers are more willing to invest in younger workers because they like them better as they are the same age. Similarly, this could also work the other way around leading to older employers investing in older workers because they feel better connected to them, simply like them better or because of an in-group bias project their willingness to stay in the firm for a longer time on them.

So, based on previous research I assume that younger employers hold more negative beliefs about older workers due to an out-group bias or taste based discrimination. Consequently, this will affect their decision to offer older workers training in a negative way. Vice versa, older employers will probably assess older workers more positive and be more willing to offer them training, therefore I hypothesize the following:

Hypothesis 3 (H3): Training opportunities for older workers will increase with the age of the employer.

Several studies show that a higher retirement age increases training participation. Using the European Community Household Panel (ECHP), Fouarge and Schils (2009) measured the effect

of early retirement incentives on training participation[6]. Their results show that early retirement incentives discourage older workers from participating in training. In their research on the effect of pension rights and retirement age on training participation, Montizaan, Corvers and de Grip (2010) find evidence that an increase of the statutory pension age postpones the expected retirement age which increases training participation. This increase in training participation could be explained by the fact that employers foresee a longer period in which they can receive returns on investments. However, not only a postponed retirement age of the employee signals a longer opportunity to receive return on investments for the employer, but also the expected retirement age of the employer can influence their willingness to invest in training older workers. Several studies show that people have the tendency to expect similarities between them and others, so when, for example, an employer expects to retire at a late age he or she could project this expectation on his or her employees. This phenomenon is defined as social projection (Robins & Krueger, 2005) and although the strength of projection can vary, no individual fails to show projection regardless of the information they have about the other individual and even when asked not to (Clement & Krueger, 2002). So, when employers believe they will retire at a later age, there is a possibility they expect their workers to feel the same which gives incentive to also invest in training older workers as it is possible to forecast a longer time to receive return on investments. I therefore expect the following:

> *Hypothesis 4 (H4): Training opportunities for older workers will increase with the expected retirement age of the employer.*

[6] They created a panel data set (i.e. repeated measurements over time among the same sample of individuals) concerning information from 13 European countries regarding the period 1994-2001. For their analysis they only included datafiles of people aged 25-63 (i.e., working age).

2.3.2 Stable Employment Relationships

Finally, I assume that the amount of stable employment relationships (i.e., the share of workers with a permanent contract within the employer's organization) could also positively affect the access to training opportunities of older workers. I believe this can be explained in two different ways; based on human capital theory and discrimination. Firstly, according to the human capital theory, employers are more inclined to invest in training if they have a substantial amount of time to receive returns on the training investment (Borjas, 2013). Since permanent contracts lead to that workers are likely to stay longer at the same employer, we can expect training investments to be positively related to the provision of permanent contracts.

This assumption can be supported with several studies. For example, by Forrier and Sels (2003) who in their study research if there are significant differences between training opportunities employees receive based on their contract (e.g., permanent or temporary). In their survey they measured the amount of training workers had to pay themselves and how much is financed by their employer. Their results show that employers are significantly more willing to pay for training when their workers have a permanent contract. Moreover, 57.1% of the workers with a permanent contract and a tenure exceeding the one year mark, stated that their employer payed for more than 75% of their training. Virtanen et al. (2003) find somewhat similar results in their study on training participation between permanent and contingent workers in a hospital. In this study workers with a temporary contract participated significantly less in training then their colleagues with a permanent contract. Finally, Finegold, Levenson and van Buren (2005) researched the question if temporary workers are also provided with a way to improve their skill levels and find that among the 4000 employees who have a temporary contract only 40% stated they received training from their employer. So, we can assume that a permanent contract can increase the possibility to receive

training opportunities substantially. As a permanent contract often goes hand in hand with tenure and older workers tend to be more loyal towards their company and often have more tenure within the organization (Kunreuther, 2003), it could be possible that a firm with a large share of employees with a permanent contract, is also an organization that employs mainly older workers. Consequently, this increases the likelihood to receive training opportunities for older workers, as they are then often the employees with permanent contracts, which signals future tenure and therefore a longer time for employers to receive returns on investment.

Secondly, the share of workers with a permanent contract could also affect training opportunities for older workers based solely on discriminative behavior. For, when an organization's workforce mainly consists of older workers, beliefs employers hold about these workers are more positive due to a decrease in age discriminative behavior (Kunze et al., 2011). So, we cannot rule out that a larger share of permanent contracts may also be the consequence of less age discrimination, which in turn also affects training offers. Based on both arguments I expect the following hypothesis:

> *Hypothesis 5 (H5): Training opportunities for older workers increase if the organization employs a large share of workers with a permanent contract.*

2.4 Overview Theoretical Framework

Figure 1 provides a schematic overview of the formed hypothesized relationships and will act as a guideline throughout this thesis. Firstly, I expect the employee's age to have a negative relation with the training opportunities a worker gets offered (H1). Secondly, I propose a positive interaction if training is aimed at skills where older workers have a comparative advantage such as leadership and (verbal-) communication (H2). The third hypothesis (H3) also presents a positive interaction where training opportunities for older workers increase with the age of the employer. Fourthly, I expect employers to project their expected retirement age on their employees. So, when employers expect to retire at a late age, they will expect the same from their employees and consequently be more willing to offer them training (H4). Finally, I expect the share of permanent workers in an employer's firm also to have a positive interaction with employee's age and increase the training opportunities older workers get offered (H5).

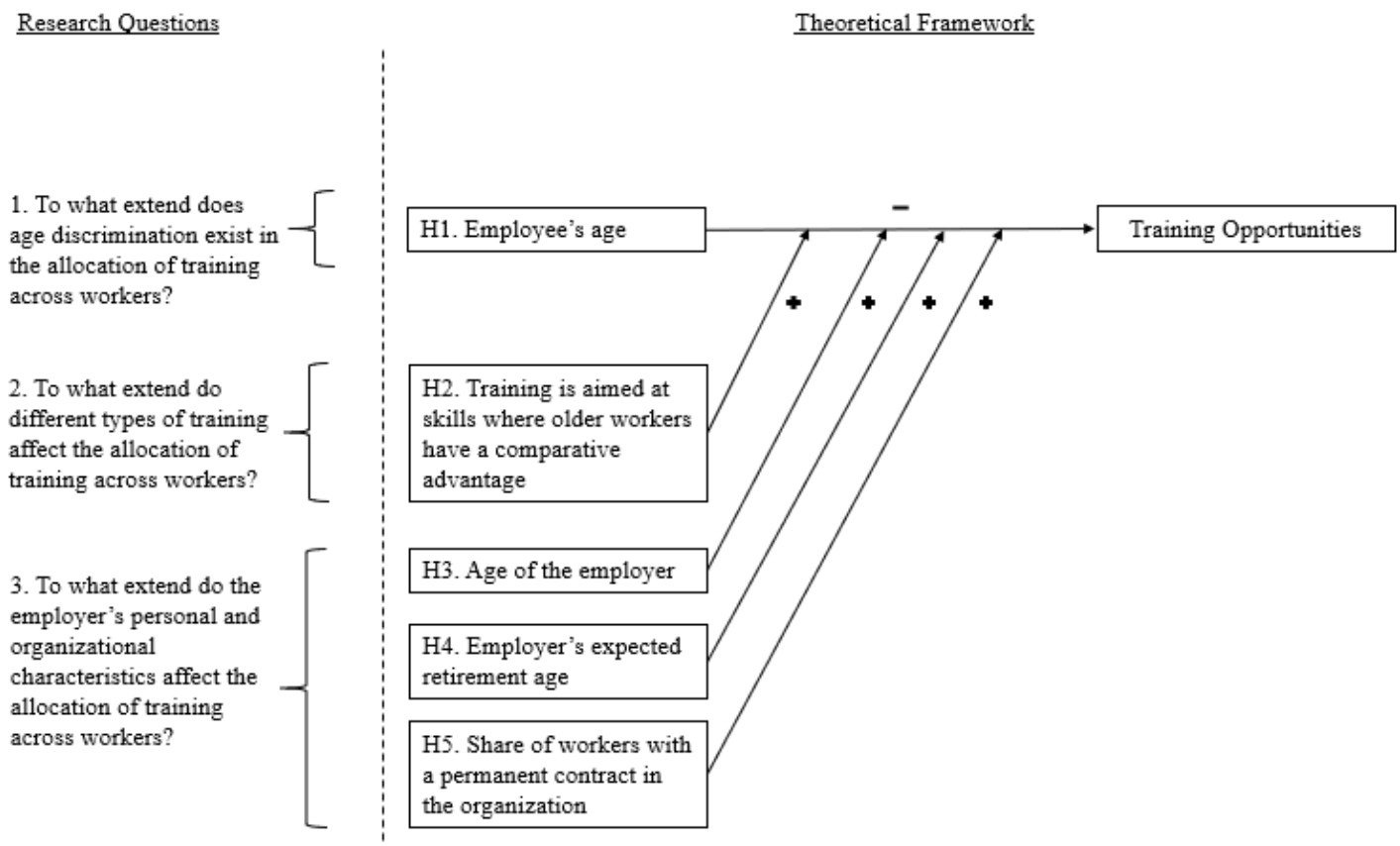

Figure 1. Theoretical Framework

III. Method

3.1 Data

Data collection was conducted by the Research Centre of Education and Labor Market (ROA) and started April 2011. E-mails[7] with a link to a web-based survey were sent to all public sector employers from the Dutch labor market[8], and 1,057 employers answered the survey. The survey contained a stated preference experiment which relied on a vignette study where employers were asked provide training to one of two hypothesized workers. The additional questions in the study include items regarding the employer's personal characteristics (e.g., age, gender, tenure and education level among others) and detailed questions about organizational characteristics (size, sector, HR-practices and retirement practices among others).

3.2 The Vignette Study

The stated preference experiment in the ROA survey is built on a vignette study. Vignettes are concrete and detailed descriptions of fictive, but realistic, scenarios constructed from practice, knowledge, previous research or exploratory studies (Taylor, 2005). In this vignette experiment employers were given the hypothetical situation that their organization had created a budget to offer training at a higher professional educational level to its employees. The vignette was build up as follows: one out of the four types of training was presented:

1. supervising
2. verbal & communication skills
3. design & development
4. information seeking & processing

[7] The e-mail addresses were provided by het Algemeen Burgerlijk Pensioenfonds (ABP), the pension fund for government and education.
[8] E-mails were received by HR-managers and managing directors who are responsible for HR practices and retirement issues.

Then there were two descriptions of hypothetical employees to whom the employer could offer the training to. The descriptions of the employees differed on five levels:

1. **Their age**
    - 26-35 years
    - 36-45 years
    - 46-55 years
    - 56-65 years
2. **Their gender**
    - Male
    - Female
3. **Their education level**
    - Vocational
    - Higher professional education
    - University
4. **The amount of hours they worked per week**
    - 16 hours
    - 32 hours
    - 40 hours
5. **Their tenure in years**
    - 5 years
    - 10 years
    - 15 years

See Appendix B for an example of the vignette respondents received. Given all variables and their levels, 864 possible vignette combinations were created (i.e., $4 \times 4 \times 2 \times 3 \times 3 \times 3$). Each respondent had to choose six times between two employees. The characteristics were randomly assigned, as was the offered type of training. Also the ordering in which the characteristics were presented differed[9].

The advantage of using vignettes is that this technique allows the researcher to present hypothetical descriptions of situations, while at the same time randomize the offered key characteristics. Moreover, stated preference experiments often reduce or even close the gap

[9] To avoid confusion respondents always see the characteristics in the same order. The randomization was across respondents.

between a survey and the real world, as they mirror real decisions (Louvier, Hensher & Swait, 2000). Survey experiments such as vignette studies are very common in social sciences and are rapidly gaining ground across a range of other disciplines such as economics. Although originally designed to asses norms, vignette experiments are also very useful to study various concepts such as decision making behavior and ageing-related topics as these experiments generate data that closely resembles data from field experiments[10] (Lawrence, Ganong & Coleman, 2006; Telser & Zweifel, 2007; Henkens, van Solinge & Cozijnsen, 2009; Karpinska et al., 2011). Aforementioned field experiments were mainly centralized around hiring decisions and did not give any information about the person responsible for the hiring. The benefit of using a vignette experiment is that it is a "hybrid" of the traditional survey and experimental methods providing high internal validity of experiments but also high external validity of survey research, while examining the predictors of decision making behavior (Spencer et al., 2015). Also, as the survey entails questions about the participant, this offers more information about the person behind the decision, which is often missing in field experiments.

In this study, the vignettes are based on five characteristics namely; age, gender, education level working hours per week and tenure. These characteristics are chosen as they, based on human capital theory, could be considered by employers as easily measurable factors that signal a possible return on investments. Moreover, as employers normally have more time to assess an employee's

[10] A drawback of using written vignettes is that they, in comparison to videotaped or real life events, do not require participants to draw their own meaning from observation. For example, a student can rate a professor as an effective teacher when the vignette reads that this professor gave an engaging lecture, but could belief otherwise if he or she would see the teacher wearing old fashioned clothes. Another difficulty is that vignettes can create a relative distance between the respondent (e.g., in this case the employer) and the hypothetical worker, influencing how they assess this worker in such a way their response would not match their real world reaction. The first drawback is mitigated by using only descriptions of workers that don't contain any value. The second drawback could be mitigated if the vignette appears both relevant and real to the participant (i.e., employer). The hypothetical situation in this study, offering training to workers, can be seen as such.

eligibility for training, they are now placed in a situation that requires quick decision making. Research has shown that individuals are limited in their capacity to process stimuli, and cannot comprehend more than seven items (Huitt, 2003; Marois & Ivanoff, 2005). Therefore, the employers are presented with only five employee characteristics in the vignette study.

3.3 Survey Questions

Besides the vignettes the survey also entailed several items used to gain information about the employers who completed the survey such as their age, tenure, and education level among others. The employer's tenure was measured by the question "When did you start working for your current organization" which they could answer by choosing a year from the dropdown menu ranging from 1940 or earlier to 2011. To assess the highest level of education completed by the employer, they were given seven options ranging from primary school to post doctorate[11]. To answer the question "at what age do you expect to retire", employers could again choose from a drop down menu where they had the option to choose an age ranging from 55 years or earlier to 70 years or later.

The survey also included items regarding the characteristics of the employer's organization. To measure the share of workers with a permanent contract, the employer was asked to give the percentage of workers in their organization with a permanent contract. If they were unable to answer this question, they were asked to give an estimation.

[11] The seven options for education level were; primary school, VMBO, HAVO/VWO, vocational, higher professional education, university or post doctorate.

3.4 Descriptives and Correlations

Table 2 presents the descriptive information of the personal and organizational characteristics of the employers who responded to the survey. On average, the employer is 51 years old, more often male (58%), has been in the organization for almost 14 years and prefers to retire at age 66. Furthermore, it can be observed that the average employer is highly educated as 65% of all employers have a higher professional education degree and 19.5% have an university degree, which enlarges the external validity as the majority of Dutch employers from the public sector are often highly educated. 33% of the employers are based in the governmental sector, 49% in education and 18% work in the privatized sector. In regard to their organization, absenteeism- and turnover rates are 5% and 6% respectively and 88% of their workers hold a permanent contract. The percentage of workers who are employed with a permanent contract is a bit higher than the national average (Central Bureau of Statistics, 2018). CBS state that at the end of 2012 77.95% of workers in the Netherlands was employed with a permanent contract[12]. This is due to the fact that the public sector provides more permanent contracts than the private sector.

[12] The CBS numbers show that in 2012 approximately 7.1 million workers were employed within an organization and 5.5 million of these workers obtained a permanent contract (Statline, 2018).

Table 2. *Descriptive statistics: Organizational and personal characteristics of employers*

Employers characteristics	Mean	SD	Min	Max
Personal characteristics				
Age	51.221	8.514	26	69
Gender (Male)	.577	.494	0	1
Tenure	13.950	10.993	1	42
Education level				
High school	.035	.185	0	1
Vocational level	.058	.234	0	1
Higher professional education level	.648	.478	0	1
University	.195	.397	0	1
Post-doctorate	.062	.242	0	1
Expected retirement age	65.547	2.475	55	70
Organizational characteristics				
Government sector	.330	.470	0	1
Education sector	.486	.500	0	1
Privatized sector	.184	.387	0	1
Share of workers with permanent contract	87.649	13.963	0	100

Table 3 presents the correlation matrix of the employee (i.e., vignette) characteristics. The employee's age is highly negatively correlated to training opportunities. Gender (i.e., female) has a positive correlation with training opportunities, as does 5 years' experience. I observe a negative correlation between 15 years' experience and training opportunities. The education levels vocational education and university also show a negative correlation with training opportunities. Higher professional education, on the other hand, correlates positively with training opportunities. In regard to working hours, I observe a positive correlation between training opportunities and 32 and 40 hours per week and a negative correlation with 16 hours per week.

Table 4 displays the employers' personal and organizational characteristics. I did not include these characteristics in Table 3 as it is unnecessary to look for correlations between employer/employee characteristics because all vignettes were presented to the employer in a randomized order. The employer's personal and organizational characteristics all correlate with each other. This, however, does not affect their reliability as a predictor as the correlations are not very high.

Table 3. *Correlation matrix employee (vignette) and employer characteristics*

Variable name	1	2	3	4	5	6	7	8	9	10	11	12
Employee (vignette) characteristics												
1. Training opportunities	1.00											
2. Age	-.118***	1.00										
3. Gender (Female)	.038**	.023	1.00									
4. 5 years' experience	.056***	-.003	-.009	1.00								
5. 10 years' experience	-.013	.012	-.011	-.496***	1.00							
6. 15 years' experience	-.042***	-.009	.020	-.502***	-.502***	1.00						
7. Vocational education	-.052***	-.014	-.007	.003	-.012	.009	1.00					
8. Higher prof. Education	.130***	.015	.021*	.001	.009	-.009	-.498***	1.00				
9. University	-.078***	-.001	-.028**	-.003	.003	.000	-.499***	-.503***	1.00			
10. 16 working hours per week	-.200***	.013	-.025***	-.013	.030**	-.017	-.004	-.001	.004	1.00		
11. 32 working hours per week	.086***	.002	.031**	-.007	-.006	.012	.006	.010	-.016	-.512***	1.00	
12. 40 working hours per week	.115***	-.016	-.006	.020	-.025*	.005	-.003	-.009	.012	-.492***	-.497***	1.00

Note: ***p<0.01;** p<0.05

Table 4. *Correlation matrix employer characteristics*

Employer's personal & organizational characteristics	1	2	3	4
1. Age	1.00			
2. Gender	.374***	1.00		
3. Expected retirement age	-.140***	.027**	1.00	
4. Share of permanent workers	.185***	.059***	-.088***	1.00

Note: ***p<0.01;** p<0.05

3.5 Empirical Strategy

The theoretical framework (Figure 1) is divided into four parts. Firstly, I will estimate the ex to which an employee's age influences the likelihood to receive training opportunities. I expe negative relation and estimate this according the following equation:

$$TO_{it} = \alpha + \beta_1 VA_{it} + \delta X_{it} + \varepsilon_{it} \quad (1)$$

TO_{it} stands for the likelihood to receive training opportunities for an employee *i* in vignette *t*. V represents age of the employee. Coefficient β_1 is expected to be negative ($\beta_1 < 0$). X_{it} is a ve of control variables (e.g., remaining vignette characteristics such as gender, tenure and work hours among others) and ε_{it} is the error term.

Secondly, I expect the type of training to influence the likelihood to receive trai opportunities. I proposed that older workers have a comparative advantage in training crystal abilities, as these abilities increase with age. There are four different training subjects presente this vignette study. Two training subjects are aimed at fluid abilities (e.g., design & developm and information seeking & processing) and two are aimed at crystalized abilities (e.g., supervi & (verbal-) communication). I estimate the second hypothesis with the following equation:

$$TO_{it} = \alpha + \beta_1 VA_{it} + \beta_2 TA_{it} + \beta_3 VA_{it} \times TA_{it} + \delta X_{it} + \varepsilon_{it} \quad (2)$$

In this equation TO_{it} again stands for the likelihood to receive training opportunities for emplo *i* in vignette *t*. Similar as in equation 1, VA_{it} stands for the age of the employee and β_1 is expe to be negative. The type of training (i.e., aimed at fluid or crystalized abilities) per employee *i* vignette *t* is represented in the equation with TA_{it}. The term $\beta_3 VA_{it} \times TA_{it}$ is the expe interaction effect between the employee's age and the type of training, which I expect to be posi for training aimed at crystalized abilities ($\beta_3 > 0$).

Thirdly, I continue my analyses by estimating a model in which I research if employer's personal characteristics such as their age (i.e., hypothesis 3) and expected retirement age (i.e., hypothesis 4) influence the likelihood of older workers receiving training opportunities. The first equation (3) of the third model denotes the expected interaction between the employee's and the employer's age on the likelihood to receive training opportunities. The third hypothesis is estimated with the following equation:

$$TO_{it} = \alpha + \beta_1 VA_{it} + \beta_2 EA_i + \beta_3 VA_{it} \times EA_i + \delta X_{it} + \varepsilon_{it} \quad (3)$$

In this equation, TO_{it} and $\beta_1 VA_{it}$ are identical to equation 1 and 2 and represent the likelihood to receive training opportunities and the age of the employee, respectively. EA_i stands for the employer's own age and $\beta_3 VA_{it} \times EA_i$ models the interaction effect. I expect a positive interaction between the older employee's age and the older employers age group ($\beta_3 > 0$).

The second equation regarding employers personal characteristics (4) represents the fourth hypothesis which conjectures that employers' expected retirement age could positively affect the training opportunities for older workers. I estimate the third model with the following equation:

$$TO_{it} = \alpha + \beta_1 VA_{it} + \beta_2 ER_i + \beta_3 VA_{it} \times ER_i + \delta X_{it} + \varepsilon_{it} \quad (4)$$

Here, ER_istands for the expected retirement age of the employee *i*'s employer. The coefficient β_3 measures the interaction effect ($VA_{it} \times ER_i$) between the employee's age and the employer's expected retirement age and is conjectured to be positive ($\beta_3 > 0$)

Fourth and finally, I will analyze if the employer's organizational characteristics such as the share of workers with a permanent contract influence the likelihood of older workers receiving training opportunities. With the following, final, equation I estimate the interaction effect between the employer's organizational characteristic and the employee's age:

$$TO_{it} = \alpha + \beta_1 VA_{it} + \beta_2 PC_i + \beta_3 VA_{it} \times PC_i + \delta X_{it} + \varepsilon_{it} \quad (5)$$

In this equation, PC_i stands for the share of workers in an employer's organization with a permanent contract. I hypothesized that a higher share of permanent contracts in the workplace would increase the likelihood that older workers get offered training opportunities. This is represented by $\beta_3 VA_{it} \times PC_i$, where I expect the coefficient of interest β_3 to be positive ($\beta_3 > 0$).

I use ordinary least square regressions (OLS) to estimate the aforementioned regressions. As employers had to choose several times between employees, I categorized the vignettes and included dummy variables in the model to control for the ordering of the vignettes. Because employers choose six times between employees, the observations can be correlated in some unknown way. Consequently, the OLS estimates can be unbiased, but the standard errors are not independent and this can lead to incorrect assumptions. Therefore, I also use clustered standard errors to control for the multiple observations per employer.

I also estimate fixed effects and conditional logit models. Fixed effects are mainly used for panel data that has been collected over several years and controls for the unobserved changes within respondents. As employers were asked to choose six times between vignettes, it is possible to identify the data as a synthetic panel data set[13]. I use fixed effects to enlarge the efficiency of the model as it could control for unobserved employer specific confounding characteristics. Because all vignette characteristics were presented to the employer in a randomized matter, I expect no large differences between the OLS and fixed effects results.

[13] Panel data is normally collected over several years which results in several waves of observations, in this thesis every choice is seen as one observation resulting in 6 waves of observations per employer.

Conditional logit is used to control for the way the study is set up. Conditional logit regression is based on logistic regression except that instead of having individual characteristics, several characteristics of alternatives (i.e., vignette characteristics of the employees) are proposed to the employer and a binary variable indicates their choice (e.g., employee 1 or 2). Conditional logit thus specifically takes into account the fact that when the employer offers training to the first employee, the second one automatically is excluded.

IV. Estimation Results

4.1 The Role of Age in Predicting Training Opportunities

Table 5 presents the estimation results of the basic model in which I regress the employee characteristics as described in the vignette on the likelihood of receiving training opportunities. Column 1 presents the results of the OLS regression, Columns 2 and 3 present the results of the fixed effects analysis and the conditional logit model, respectively. The table shows that the likelihood to receive training opportunities differ substantially with age.

When I control for fixed effects and also in the conditional logit model I already observe an age effect for employees who are 46 to 55 years old. In comparison to their younger colleagues, these workers have 3.1%-points less chance when I control for fixed effects and 2.7%-points less chance when I use conditional logit. The strongest decline, however, is observed for the oldest age group. The OLS regression illustrates a 17.6%-points less chance to receive training opportunities when the employee is 56 years or older, in comparison to workers who are 35 years or younger. Columns 2 and 3 show that this result is robust as I also observe a strong significant age effect for the oldest group when controlling for fixed effects or estimating a conditional logit model (18.6%-points and 17%-points, respectively). These results confirm my expectations that training opportunities for workers decrease with age.

Work experience decreases the probability to receive training opportunities. Having 10 years of experience decreases the likelihood to receive training opportunities with 4.3%-points in comparison to having only 5 years of experience. This decline is even steeper for workers who have 15 years' experience (7%-points).

The amount of working hours strongly increases the chance to receive training opportunities. The results show that working 32 hours per week increases the likelihood for training with 19.3%-points compared to working 16 hours per week. Similar results are found for working 40 hours per week. The probability to receive training is 22.1%-points higher for workers who work 40 hours than for workers with a 16 hour work week. These results can be expected as the payback period for the employer increases with the amount of hours an employee works per week.

I further observe that women have a higher probability to receive training opportunities than men (3.4%-points in comparison), which is an interesting discovery. The finding that women are more likely to receive training offerings is consistent with Fritsche (2012), who also find that women have a higher probability to receive training than their male colleagues. This result could also explain why women often participate more in training than men (Tan, Ramos, Sheng and Sung, 2015; Cloutier, Renaud & Morin, 2008[14]).

Finally, I observe that workers who do not have a degree from higher professional education have less chance to receive training offers from an employer. Workers who finished vocational education have, compared to higher professional educated workers, 13%-points less chance to get offered training. Workers with an university degree seem even less attractive for employers as the propensity to receive training opportunities is 14.6%-points lower than for workers who finished higher professional education. This result however makes sense as the training offered in the vignette is also on a higher professional education level. These results could imply that employers believe that this training would be too difficult for lower educated workers and too easy for higher educated workers.

[14] I, however, do not differentiate between voluntary and mandatory training like Cloutier et al. (2008). Their study shows that women often participate more in voluntary training.

The differences between the OLS model in column 1 and the fixed effects and conditional logit model in Column 2 and 3 of Table 5 are not substantial, as already mentioned, indicating that the results are robust to the estimation technique used.

Table 5. *Basic results: employee's age on training opportunities*

Likelihood to receive training	**(1)** **OLS**	**(2)** **Fixed effects**	**(3)** **Conditional Logit**
36-45 years (26-35 years = ref.)	-0.025	-0.027	-0.023
	(0.020)	(0.018)	(0.016)
46-55 years	-0.028	-0.031*	-0.027*
	(0.021)	(0.018)	(0.016)
56-65 years	-0.176***	-0.186***	-0.170***
	(0.022)	(0.018)	(0.018)
10 years of experience (5 years = ref.)	-0.043**	-0.044***	-0.039***
	(0.017)	(0.016)	(0.014)
15 years of experience	-0.070***	-0.073***	-0.065***
	(0.019)	(0.016)	(0.014)
32 working hours p/w (16 hours = ref.)	0.193***	0.202***	0.185***
	(0.020)	(0.016)	(0.014)
40 working hours p/w	0.221***	0.230***	0.209***
	(0.020)	(0.016)	(0.014)
Female	0.034**	0.034***	0.031***
	(0.017)	(0.013)	(0.011)
Vocational education (Higher prof. education = ref.)	-0.130***	-0.134***	-0.124***
	(0.023)	(0.016)	(0.015)
University	-0.146***	-0.152***	-0.140***
	(0.019)	(0.016)	(0.014)
Constant	0.532***	0.535***	
	(0.025)	(0.021)	
Observations	6,344	6,344	6,344
R-squared	0.081	0.084	

OLS estimates including standard errors corrected for clustering on the individual level in parentheses are presented in column 1. Column 2 presents the fixed effects results and Column 3 shows the marginal effects from a conditional logit model *** p<0.01, ** p<0.05, * p<0.1. The independent variables (i.e., employee characteristics) are vignette characteristics.

Table 6 shows the analyses where I interact all employee characteristics with the employee's age. The results show almost no significant interaction effects, except for work experience and working hours. However, the interaction effect for experience is only found to be significant for the 46-55 years age group (ß = .069, $p < .1$). The same can be noted for the interaction effects between age 36-45 years, age 46-55 years and 40 working hours per week: the table does show a significant interaction effect (ß = .082, $p < .05$ and ß = .065, $p < .1$, respectively). However, for a proper interpretation of the significance of the interaction effects, we should also take into the account the level effects. Figure 2 presents, therefore, the margins plot, which shows overlapping confidence levels for all age groups (e.g., 36-45 years and 46-55 years). This overlap suggests there is no real effect (the same holds when I run the margins plot for the interaction effect between experience and age). The results in Table 6 thus indicate that the negative age effect on training opportunities remains the same for all employees regardless of their tenure, working hours, gender and education level.

Table 6. *Vignette characteristics interacted with employee's age*

Likelihood to receive training	(1)	(2)	(3)	(4)	(5)
36-45 years (26-35 years = ref.)	-0.032	-0.067**	-0.009	-0.020	-0.092**
	(0.031)	(0.031)	(0.025)	(0.028)	(0.044)
46-55 years	-0.054*	-0.045	-0.013	-0.034	-0.087*
	(0.033)	(0.030)	(0.026)	(0.031)	(0.048)
56-65 years	-0.205***	-0.157***	-0.174***	-0.201***	-0.220***
	(0.033)	(0.029)	(0.027)	(0.033)	(0.047)
10 years of experience (5 years = ref.)	-0.086***				-0.080***
	(0.031)				(0.030)
15 years of experience	-0.095***				-0.103***
	(0.031)				(0.030)
36-45 years * 10 years	0.035				0.027
	(0.040)				(0.039)
36-45 years * 15 years	0.024				0.028
	(0.039)				(0.037)
46-55 years * 10 years	0.062				0.069*
	(0.039)				(0.038)
46-55 years * 15 years	0.036				0.053
	(0.042)				(0.041)
56-65 years * 10 years	0.051				0.049
	(0.040)				(0.039)
56-65 years * 15 years	0.041				0.050
					(0.039)
32 working hours p/w (16 hours = ref.)		0.193***			0.203***
		(0.033)			(0.032)
40 working hours p/w		0.184***			0.189***
		(0.031)			(0.031)
36-45 years * 32 hours		0.048			0.028
		(0.041)			(0.040)
36-45 years * 40 hours		0.095**			0.082**
		(0.039)			(0.039)
46-55 years * 32 hours		0.002			-0.009
		(0.039)			(0.038)
46-55 years * 40 hours		0.064*			0.065*
		(0.036)			(0.036)
56-65 years * 32 hours		-0.037			-0.048
		(0.039)			(0.038)
56-65 years * 40 hours		-0.009			-0.014
		(0.038)			(0.038)
Female			0.047*		0.044*
			(0.026)		(0.025)
36-45 years * female			-0.005		-0.016
			(0.029)		(0.029)
46-55 years * female			-0.016		-0.024
			(0.030)		(0.029)
56-65 years * female			-0.002		-0.002
			(0.030)		(0.030)
Vocational (higher prof. = ref.)				-0.139***	-0.147***
				(0.033)	(0.033)
University				-0.167***	-0.174***
				(0.032)	(0.031)
36-45 years * vocational				0.003	0.025
				(0.040)	(0.039)
36-45 years * University				0.012	0.031
				(0.038)	(0.037)
46-55 years * vocational				-0.006	-0.005
				(0.040)	(0.040)
46-55 years * University				0.034	0.039
				(0.039)	(0.038)
56-65 years * vocational				0.042	0.049
				(0.040)	(0.040)
56-65 years * University				0.032	0.042
				(0.040)	(0.040)
Constant	0.612***	0.428***	0.528***	0.656***	0.574***
	(0.023)	(0.022)	(0.018)	(0.023)	(0.036)
Observations	6,344	6,344	6,344	6,344	6,344
R-squared	0.024	0.060	0.022	0.038	0.083

OLS estimates including standard errors corrected for clustering on the individual level in parentheses *** p<0.01, ** p<0.05, * p<0.1. All independent variables are vignette characteristics.

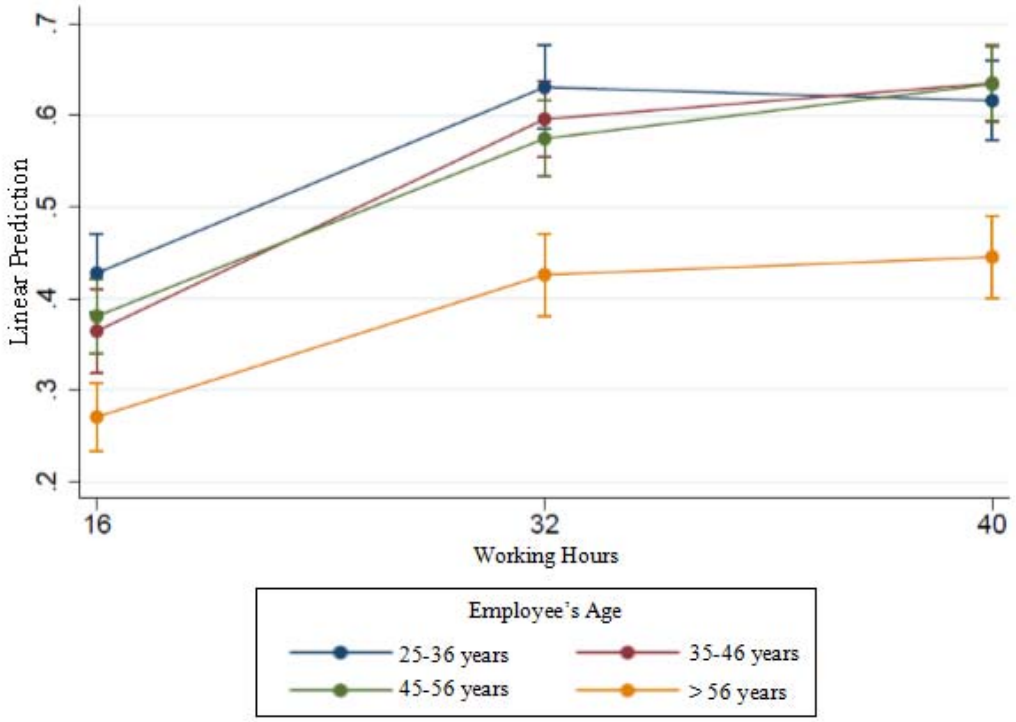

Figure 2. Predictive margins for employee's age and employee's working hours

4.2 The Role of Skills

I proposed that training aimed at crystalized abilities would increase the propensity to receive training opportunities for older workers, as they have a comparative advantage with regard to these skills. In the vignette experiment the employer was randomly presented with one of four types of training (e.g., supervising, verbal & communication skills, design and development or information seeking & processing). Based on research on fluid and crystalized abilities I divided the four types of training into two variables. The first, training aimed on crystalized abilities, includes training aimed at supervision and (verbal-) communication skills as these skills often increase with age. The second variable, training aimed at fluid abilities, includes design & development training and information seeking & processing, as these skills decline strongly with age.

As shown in Table 7 it is not possible to confirm the second hypothesis. The results show no positive interaction effect for training aimed at crystalized abilities and employee's age, nor do I find a positive main effect for training aimed at crystalized abilities, suggesting that employees' skills are not taken into account when offering training to workers.

To further support aforementioned assumption that training aimed at crystalized abilities does not increase the training propensity for older workers, I also estimated the interaction between the employee's age and the training subjects separately[15] (for the results see Table A1). Again I expect the two training subjects that are aimed at crystalized abilities (e.g., supervising and (verbal) communication) to show a positive interaction effect with employees age. However, I again find no significant results. I do observe a significant negative interaction between employees aged 46-55 years and the training subject information seeking & processing (ß = -.103, $p < .1$). However,

[15] To estimate the results in Table 7, I created two new variables (e.g., training aimed at crystalized abilities and training aimed at fluid abilities). For Table A1, I estimate the results by using the training types as four separate variables and use one training aimed at fluid abilities (e.g., design & development) as a reference.

the margins plot (Figure A2) displays an overlap in the confidence intervals, suggesting there is no real effect.

Table 7. *Training aim interacted with employee's age*

Likelihood to receive training	**(1)**	**(2)**
36-45 years (26-35 years = ref.)	-0.025	-0.036
	(0.020)	(0.029)
46-55 years	-0.028	-0.024
	(0.021)	(0.029)
56-65 years	-0.176***	-0.185***
	(0.022)	(0.029)
10 years of experience (5 years = ref.)	-0.043**	-0.043**
	(0.017)	(0.018)
15 years of experience	-0.070***	-0.070***
	(0.019)	(0.019)
32 working hours p/w (16 hours = ref.)	0.193***	0.194***
	(0.020)	(0.020)
40 working hours p/w	0.221***	0.221***
	(0.020)	(0.020)
Female	0.034**	0.034**
	(0.017)	(0.017)
Vocational education (Higher prof. education = ref.)	-0.130***	-0.130***
	(0.023)	(0.023)
University	-0.146***	-0.146***
	(0.019)	(0.019)
Training aimed at crystalized abilities (fluid abilities = ref.)		-0.005
		(0.025)
36-45 years * Training aimed at crystalized abilities		0.022
		(0.040)
46-55 years * Training aimed at crystalized abilities		-0.008
		(0.040)
56-65 years * Training aimed at crystalized abilities		0.019
		(0.039)
Constant	0.532***	0.534***
	(0.025)	(0.028)
Observations	6,344	6,344
R-squared	0.081	0.081

OLS estimates including standard errors corrected for clustering on the individual level in parentheses *** p<0.01, ** p<0.05, * p<0.1. Employee's age and training subject are both vignette characteristics.

4.3 The Role of Employer's Personal and Organizational Characteristics

4.3.1 Personal Characteristics

I expected employers' personal characteristics such as their current age and expected retirement age to have a significant effect on the training opportunities older workers receive. Firstly, I estimated the interaction between employee's and employer's age. Based on the existing literature I conjectured that older employers are more willing to offer their older workers training based on an ingroup bias. I estimated the results by interacting the employee's age with the employer's age[16] and found a negative interaction effect (ß = -.005, $p < .1$), which was not what I expected. Figure 3 illustrates the interaction effect graphically using a margins plot and shows, however, no real heterogeneity. Based on these results I cannot support the existence of an ingroup bias thus and reject the third hypothesis.

Secondly, the estimation results in which I interacted the expected retirement age of the employer with the employee are also found in Table 8. The results in Colum 3 show no interaction effects. Therefore the fourth hypothesis cannot be confirmed based on the estimation results.

[16] Earlier analyses to estimate the effect of employer's age on training opportunities for older workers using dummy variables showed no significant non-linear effects. I therefore conducted the final analysis with employer's age as a linear variable.

Table 8. *Employers' personal characteristics interacted with employee's age*

Likelihood to receive training	**(1)**	**(2)**	**(3)**	**(4)**
36-45 years (26-35 years = ref.)	-0.025	0.103	0.583	0.818
	(0.020)	(0.120)	(0.492)	(0.521)
46-55 years	-0.028	0.051	0.028	0.159
	(0.021)	(0.137)	(0.577)	(0.610)
56-65 years	-0.176***	0.087	-0.696	-0.292
	(0.022)	(0.139)	(0.582)	(0.614)
10 years of experience (5 years = ref.)	-0.043**	-0.043**	-0.041**	-0.041**
	(0.017)	(0.017)	(0.017)	(0.017)
15 years of experience	-0.070***	-0.070***	-0.068***	-0.068***
	(0.019)	(0.020)	(0.020)	(0.020)
32 working hours p/w (16 hours = ref.)	0.193***	0.194***	0.196***	0.197***
	(0.020)	(0.020)	(0.020)	(0.020)
40 working hours p/w	0.221***	0.220***	0.221***	0.221***
	(0.020)	(0.020)	(0.020)	(0.020)
Female	0.034**	0.034**	0.033**	0.033*
	(0.017)	(0.017)	(0.017)	(0.017)
Vocational education (Higher prof. education = ref.)	-0.130***	-0.130***	-0.133***	-0.133***
	(0.023)	(0.023)	(0.023)	(0.023)
University	-0.146***	-0.146***	-0.145***	-0.146***
	(0.019)	(0.019)	(0.019)	(0.019)
Employer's age		0.002		0.002
		(0.002)		(0.002)
36-45 years * Employer's age		-0.002		-0.003
		(0.002)		(0.002)
46-55 years * Employer's age		-0.002		-0.002
		(0.003)		(0.003)
56-65 years * Employer's age		-0.005*		-0.005*
		(0.003)		(0.003)
Expected retirement age			0.001	0.002
			(0.005)	(0.005)
36-45 years * Expected retirement age			-0.009	-0.011
			(0.007)	(0.008)
46-55 years * Expected retirement age			-0.001	-0.002
			(0.009)	(0.009)
56-65 years * Expected retirement age			0.008	0.006
			(0.009)	(0.009)
Constant	0.532***	0.418***	0.493	0.312
	(0.025)	(0.089)	(0.346)	(0.364)
Observations	6,344	6,344	6,320	6,320
R-squared	0.081	0.082	0.082	0.083

OLS estimates including standard errors corrected for clustering on the individual level in parentheses *** p<0.01, ** p<0.05, * p<0.1. Employee's age is a vignette characteristic, the employer's age is a linear variable and employer's expected retirement age linear as well. Both employer's age as their expected retirement age contain data regarding personal characteristics provided by the employers who completed the survey.

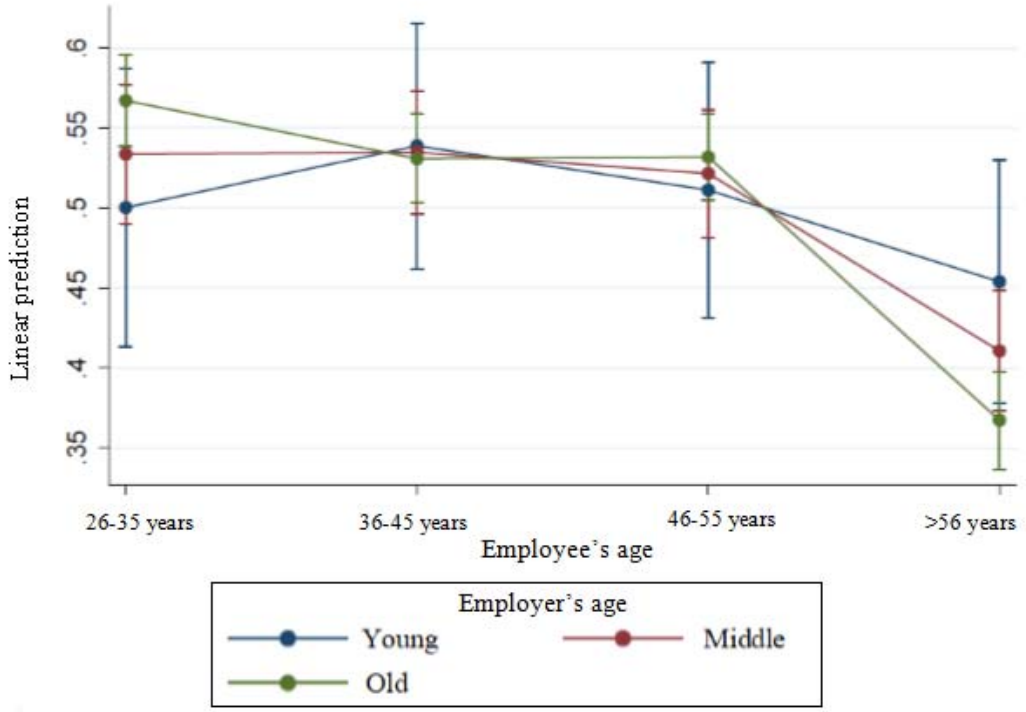

Figure 3. Predictive margins for employer's and employee's age[17]

[17] Employer's age is divided into three measuring points (e.g., young, middle and old) based on tertiles of the age distribution of the employers. This way, all three categories include roughly a similar amount of employers (see Figure A 1 for a visual representation of the distribution).

4.3.2 Stable Employment Relationships

The prospect of receiving training opportunities can also be positively influenced by how many permanent contracts (i.e., stable employment relationships) the employer's organization holds. Not only because a permanent contract signals more time to receive return on investments, but also because a larger share of permanent contracts can be the consequence of less age discrimination.

The estimation results of the OLS regression are shown in Table 9. As expected I observe a positive interaction effect between share of permanent contracts and employees aged 56 years and older (ß = .004, p <.05). Nevertheless, an older worker (i.e., an employee aged 56 years or older) is still less likely to receive training opportunities than a worker age 35 or younger. Figure 3 depicts this result graphically. The margins plot shows that the likelihood to receive training is roughly 20%-points higher for workers aged 56 and older when they work in organizations with only permanent contracts, compared to those who work in organizations without any permanent contracts.

Table 9. *Employers' organizational characteristics interacted with employee's age*

Likelihood to receive training	**(1)**	**(2)**
36-45 years (26-35 years = ref.)	-0.025	-0.248**
	(0.020)	(0.125)
46-55 years	-0.028	-0.210*
	(0.021)	(0.124)
56-65 years	-0.176***	-0.521***
	(0.022)	(0.136)
10 years of experience (5 years = ref.)	-0.043**	-0.044**
	(0.017)	(0.018)
15 years of experience	-0.070***	-0.069***
	(0.019)	(0.020)
32 working hours p/w (16 hours = ref.)	0.193***	0.192***
	(0.020)	(0.020)
40 working hours p/w	0.221***	0.219***
	(0.020)	(0.020)
Female	0.034**	0.032*
	(0.017)	(0.017)
Vocational education	-0.130***	-0.130***
(Higher prof. education = ref.)		
	(0.023)	(0.023)
University	-0.146***	-0.149***
	(0.019)	(0.019)
Share of permanent contracts		-0.002**
		(0.001)
36-45 years * share of permanent contracts		0.003*
		(0.001)
46-55 years * share of permanent contracts		0.002
		(0.001)
56-65 years * share of permanent contracts		0.004**
		(0.002)
Constant	0.532***	0.745***
	(0.025)	(0.086)
Observations	6,344	6,296
R-squared	0.081	0.082

OLS estimates including standard errors corrected for clustering on the individual level in parentheses *** p<0.01, ** p<0.05, * p<0.1. Employee's age is a vignette characteristic, the share of workers with a permanent contract is created with data provided by the employers who completed the survey.

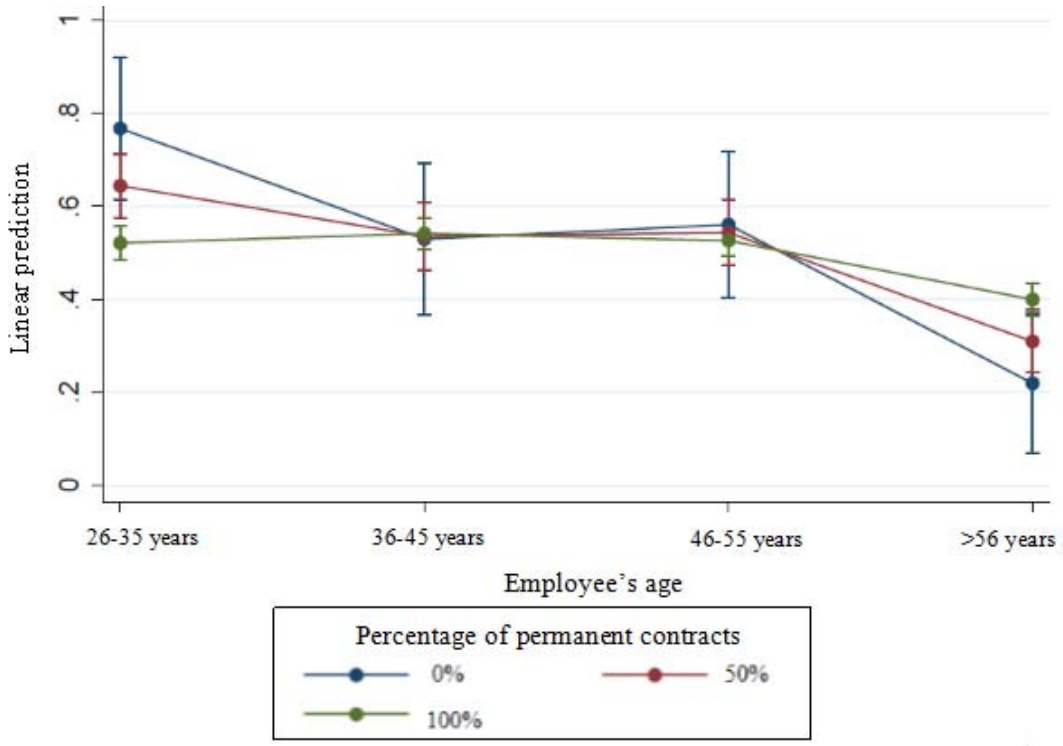

Figure 3. Predictive margins for the share of permanent contracts interacted with employee's age

V. Conclusion

Although training is often seen as a key solution to cope with an ageing workforce and to keep older workers employable, not much is known about the factors that influence employers' decisions to offer training opportunities to their employees. As training participation is considerably lower for older workers, even though previous research implies they are motivated to learn, this lack of participation could be due to the absence of training opportunities offered to older workers by their employer.

Therefore, the purpose of this thesis was to examine the relationship between the employee's age and the likelihood they get offered training opportunities. I also tested if the type of training, employers' personal characteristics and the share of permanent contracts in their organization could influence this relationship. For this reason, I made use of data from the vignette study conducted by the Research Centre of Education and the Labour Market (ROA) in 2012. I focused on the extent to which the likelihood to receive training opportunities is related to the worker's age. I also conducted analyses to examine if there are any interaction effects between the employee's age and the type of training they would get offered and the employee's age and employer's personal and organizational characteristics.

The results show that for employees age 46-55 years, the likelihood to receive training opportunities already decreases slightly, which is in line with studies on employers' investment decisions that also find employers begin investing less in workers when they reach the age of 45 (Maurer, 2001; van Vianen et al., 2009). The strongest decline in the chance to receive training opportunities is observed for the oldest employees who are 56 years or older. These workers have 17.6%-points lower probability to get offered training, than a worker aged 35 or younger. These results confirm my first hypothesis that training opportunities decline with age. Moreover, the

results show that older employees cannot compensate for this age effect with the amount of hours they work per week or their years of experience for example, as the estimates show no significant interaction effects. It is therefore possible to assume that the age effect is robust for all workers regardless of factors such as their gender, education level or work experience among others.

For the second hypothesis I estimated a positive interaction between training aimed at crystalized abilities and the employee's age. This analysis was to assess if older workers propensity to receive training opportunities increases when the training is aimed at skills where they have a comparative advantage. Therefore, I clustered the four training subjects into training aimed at crystalized abilities and fluid abilities. I found no significant interaction effect for training aimed at increasing crystalized abilities and employee's age, nor did I find a significant main effect for training, thus Hypothesis 2 cannot be supported. To analyze if perhaps one type of training could affect the training opportunities of older workers, I also interacted the types of training separately with employee's age. However, in this analysis too, I found no significant results. These outcomes indicate that age remains the strongest predictor when employers decide who they offer training to, and employers do not take their employee's skillset or comparative advantage into account.

The third and fourth hypothesis focused on the employer's personal characteristics (e.g., their age and expected retirement age, respectively) and how these characteristics could influence the probability of training opportunities offered to older employees. Firstly, I regressed the likelihood to receive training opportunities while interacting the employee's age with the employer's age. I found no significant interaction effect The coefficient of the interaction was even negative. Thus, the estimation results give no support for an ingroup bias and I reject the third hypothesis. Secondly, I interacted the employee's age with the employer's expected retirement age and found no significant results. So, I also reject the fourth hypothesis.

For Hypothesis 5, I expected the share of permanent contracts in the employer's organization to show a positive interaction with the employee's age. The results from the OLS regression support the final hypothesis, as I find a positive interaction effect. As the likelihood to receive training opportunities decreases with age, the results from the final analysis imply that this negative relation could be less strong for workers in organizations with mostly stable employment relationships.

5.1 Discussion

This study builds upon the small amount of research that is conducted to analyze the effect of age on the likelihood to receive training within organizations. The results suggest that the older the employee is, the less chance they have to be offered training opportunities, which supports the two previous studies conducted by Lazazzara et al. (2013) and Karpinska et al. (2015). Also, I find that the effect of age on the likelihood to receive training opportunities cannot be compensated with factors such as work experience or the amount of working hours per week. Indicating that the employee's age is the strongest predictor for the propensity to receive training opportunities.

I also add to the small amount of studies on training opportunities for older workers, by assessing if the share of permanent contracts in the employer's organization affects their decision to whom they offer training to. The positive interaction effect shows that the age effect workers are subject to could be less strong when they are employed in organizations with a large share of permanent contracts. However, older workers are still less likely to get offered training than their younger colleagues.

Organizations today acknowledge the importance of training to increase their competitive advantage and to face an ageing workforce (Argote & Ingram, 2000). Still, the evidence provided in this thesis show that the chances to receive training opportunities are still low for older employees. As older employees' willingness to participate in training increases when retirement is postponed (Montizaan et al., 2009), organizations should consider their supply of training opportunities and the hint of age discrimination that accompanies it. To achieve such consideration, it is key to make employers aware that the postponement of workers' retirement means these workers will stay in the organization for additional years. Creating awareness could therefore decrease the, sometimes unconscious, negative bias employers hold towards older employees, in particular with respect to the cost-benefits assessments of training investments, and decrease age discriminative behavior when offering training opportunities to employees.

Also, in the current coalition agreement the Dutch government aims to modernize the current labour market by making it more flexible. They intend to do this by, for example, prolonging the amount of years workers receive a flexible contract before their employer needs to offer them a permanent one. The period in which the employee can work on the basis of temporary employment contracts is therefore considerably extended[18]. With the results of this thesis in mind, policy makers should be cautious to flexibilize the labour market as employers may become be less inclined to develop long-term relationships with their employees. This reluctancy to offer permanent contracts could consequently result in less training opportunities for older workers.

[18] The government wants to reduce the wedge between permanent and flexible work, by making the dismissal law simpler and fairer. Employers would then only have to offer a permanent contract after three years instead of two years.

5.2 Limitations and Avenues for Future Research

In spite of the strengths of the analyses, especially due to the large sample size, and the robustness of the results, this thesis is not without its limitations. First, although the sample size was very large, the employers who completed the survey were all from the public sector. This decreases the external validity as it is not possible to generalize the results to all sectors of employment in the Netherlands. Also, as the employers are all from the public sector, they are employed in organizations that, more often than not, have a large share of permanent contracts. For future research it would be interesting to also include employers from the private sector, not only to strengthen the external validity, but also to see if the share of permanent contracts differ across sectors and if this has any effect on the older workers' propensity to receive training opportunities.

Second, the data was only collected at one point in time, namely in 2012. As pension policies are still subject to change, this could also influence the decisions employers make in regard to whom they offer training to. Several surveys conducted over multiple periods of time, completed by the same participants, could give insight into how pension reforms and policy measures affect the choices employers make in regard to training opportunities for workers and if these decisions remain stable over time or change when retirement policy does.

Third and lastly, even though vignette studies are created to mimic real world decisions and the survey includes information about the employer, it is still not possible to identify the exact reasoning behind the decisions employers make. The fact that the likelihood to receive training decreases with age could be the result of a plain cost-benefit analysis, where employers expect less time to receive returns when investing in training for older workers and thus less benefits. To determine if the lack of training offerings to older employees is the result of a cost-benefit analysis or actual taste-based discrimination, more in-depth research is necessary. This thesis only touched

upon a few variables that could influence the decision making behaviour of employers. Therefore, future studies should focus on developing questionnaires that give more insight into the motives of employers when they offer training to employees and on new vignette experiments which incorporate cost benefits calculations.

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Appendix A

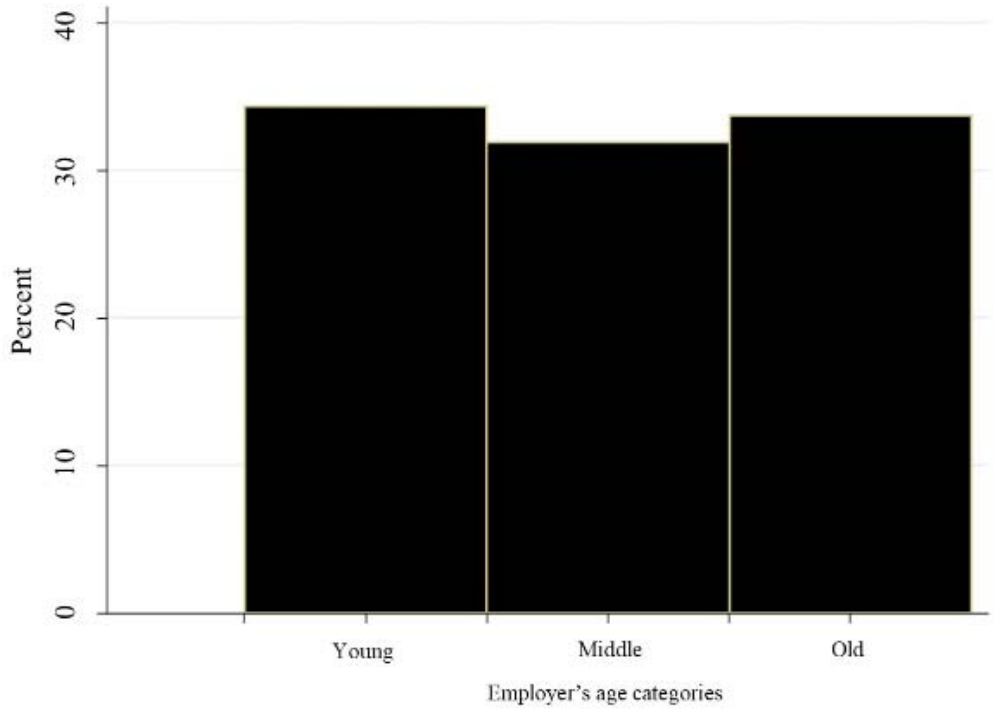

Figure A 1. Distribution of the employers' age groups

Table A 1. *Separate training subjects interacted with employee's age*

VARIABLES	(1)	(2)
36-45 years (26-35 years = ref.)	-0.025	-0.022
	(0.020)	(0.043)
46-55 years	-0.028	0.029
	(0.021)	(0.041)
56-65 years	-0.176***	-0.179***
	(0.022)	(0.042)
10 years of experience (5 years = ref.)	-0.043**	-0.043**
	(0.017)	(0.018)
15 years of experience	-0.070***	-0.070***
	(0.019)	(0.020)
32 working hours p/w (16 hours = ref.)	0.193***	0.193***
	(0.020)	(0.020)
40 working hours p/w	0.221***	0.220***
	(0.020)	(0.020)
Female	0.034**	0.035**
	(0.017)	(0.017)
Vocational education	-0.130***	-0.129***
(Higher prof. education = ref.)		
	(0.023)	(0.023)
University	-0.146***	-0.146***
	(0.019)	(0.019)
Supervising (design & development = ref.)		-0.010
		(0.037)
(Verbal-) communication		0.033
		(0.036)
Information seeking & processing		0.032
		(0.034)
36-45 years * Supervising		0.051
		(0.058)
36-45 years * (Verbal-) communication		-0.035
		(0.058)
36-45 years * Information seeking & processing		-0.027
		(0.055)
46-55 years * Supervising		-0.050
		(0.057)
46-55 years * (Verbal-) communication		-0.071
		(0.056)
46-55 years * Information seeking & processing		-0.103*
		(0.053)
56-65 years * Supervising		0.048
		(0.058)
56-65 years * (Verbal-) communication		-0.023
		(0.057)
56-65 years * Information seeking & processing		-0.011
		(0.056)
Constant	0.532***	0.518***
	(0.025)	(0.033)
Observations	6,344	6,344
R-squared	0.081	0.082

OLS estimates including standard errors corrected for clustering on the individual level in parentheses *** p<0.01, ** p<0.05, * p<0.1. Employee's age and training subject are vignette characteristics.

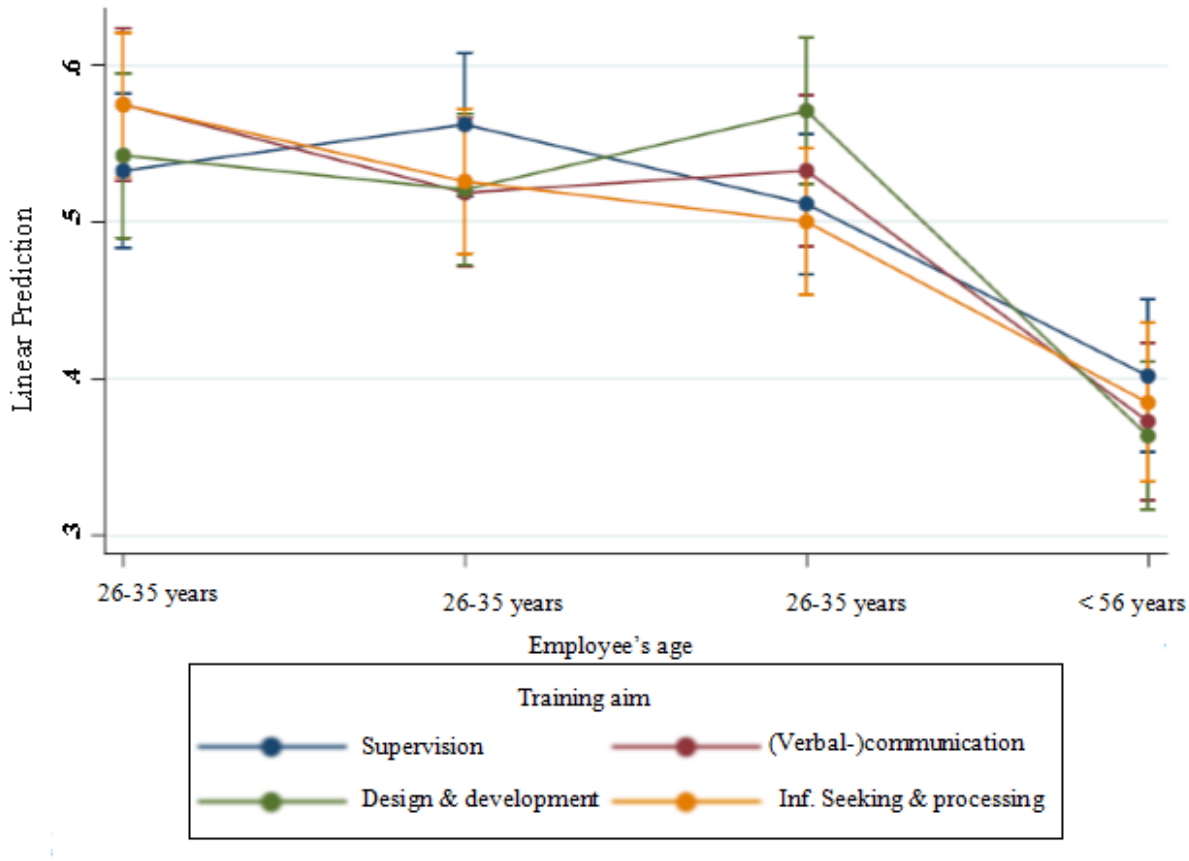

Figure A 2. *Predictive margins for training aim interacted with employee's age*

Appendix B

Imagine your organization offers training on a higher professional education level, aimed at the following subject:

Information seeking and processing

Below you find a description of two employees who are available to participate in this training. Suppose you have to offer the training to one of them, which employee do you prefer?

Employee A	**Employee B**
Age: 35 years	Age: 55 years
Gender: female	Gender: male
Work experience: 5 years	Work experience: 15 years
Working hours per week: 40 hours	Working hours per week: 32 hours
Education level: Vocational education	Education level: University

Figure B 1. Example Vignette