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What Effect Do Motivation and
Job Tasks Have on the Formal
and Informal Learning
Participation of Older Workers?

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Abstract:

This paper addresses the question whether three distinguished types of motivation influence workers' participation in formal and informal learning at work. We particularly focus on the differential effect of motivation on younger and older workers' participation in learning activities. In terms of human capital formation, we account for workers' job tasks as a potential mediating factor between motivation and participation in learning activities. Results show that younger workers are mainly motivated by intrinsic motivation or self-regulation, while older workers are mainly motivated by intrinsic motivation. Results suggest that creative, difficult job tasks are related to younger workers' participation in both formal and informal learning, while for older workers job tasks are only related to informal learning participation. Furthermore, the mediating effect of job tasks is for younger workers strong for both formal and informal learning, while for older workers this effect only exists for informal learning. This suggests that the self-selection into jobs which require formal and informal learning, mostly occurs among younger workers, while the self-selection into jobs which require only informal learning occurs among both younger and older workers.

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1. Introduction

Several major economic changes have been occurring in the Netherlands (Euwals, de Mooij & van Vuuren, 2009). An important trend is the ageing workforce, which results in a higher percentage of retirees on the total population, leading to higher pension costs for the entire Dutch society. Especially the age group 55-64 is important to consider, since this group of workers is almost reaching the retirement age and has been found to be less motivated to stay in the workforce. Compared to several years ago, participation of older workers has been increasing (Euwals, de Mooij & van Vuuren, 2009), partly due to actions by the Dutch government to make it less attractive to retire early and partly due to an increase of older workers' educational level (van Vuuren & Deelen, 2009).

However, even if these older workers stay in the workforce, their skills depreciate with age which results in wages that are higher than productivity. This is a problem for the employer, but also for the worker, because the workers' employability decreases. A solution to maintain the productivity of older workers and increase their employability, is increasing their human capital. Research shows that investing in the human capital of workers through training and development can keep them productive and retain them in the labor force (Armstrong-Stassen & Templer, 2005). This effect has also been found for older workers (Fouarge & Schils, 2009; Picchio & van Ours, 2011). However, older workers' participation in learning at work is considerably lower than that of younger workers (Fouarge, de Grip & Nelen, 2009). This thesis focuses on whether motivation can explain older and younger workers' participation in learning, and to what extent this relation is mediated by job tasks. While most studies focus only on formal learning, this study focuses on both formal and informal learning.

An explanation for the difference in learning participation between younger and older workers may reside in the cost-benefit evaluation of training investments. According to the human capital theory people will only invest in their human capital if the benefits outweigh the costs of the investment (Becker, 1962). Since older workers have less time to reap the benefits of investing time and money in training and development, they will be less inclined to participate in learning at work. However, studies suggest that another factor plays a role as well, which is personality (e.g. Tharenou, 2001; Tikkanen et al., 2002; Carey, Neal & Collins, 2004; Borghans et al., 2009).

Within personality the willingness or motivation to learn has been found to be a strong indicator of training participation (Fletcher, 1991; Bates, 2001; Carey, Neal & Collins, 2004; Gaillard & Desmette, 2012; Fouarge, Schils & de Grip, 2013). Motivation can be subdivided into 1) intrinsic motivation, which means that a person is motivated by intrinsic rewards, such as enjoyment and internal satisfaction, 2) extrinsic motivation, which refers to a person who is motivated by immediate extrinsic rewards, and 3) self-regulation, which means that a person is able to regulate behavior so as to achieve desired long-term outcomes.

A persons' extrinsic motivation and self-regulation can be expected to affect the cost-benefit analysis of investing in human capital. Extrinsic motivation suggests that people expect an extrinsic reward on their investment on the short- to medium-term, while self-regulation implies that people are aware of possible benefits from their investment on the long term. Younger workers who score high on extrinsic motivation and self-regulation are expected to invest more in training since they are more aware of possible future benefits, such as wage increases or higher employability (Fouarge, de Grip & Nelen, 2009). However, it can be expected that older workers who score high on extrinsic motivation and self-regulation, will be less inclined to participate in learning at work, since the pay-back period of their investment is shorter than for younger workers. Intrinsic motivation is also expected to be positively related to participation in learning activities. However, being intrinsic, this motivation is not expected to affect the cost-benefit analysis of learning. Intrinsically motivated people are not interested in the costs or benefits of learning. Rather, they learn because they like it, so the benefits are internal satisfaction and enjoyment. Therefore, the way intrinsic motivation affects participation in learning is expected to less crucially depend on age. These expectations of motivation on participation in learning are captured as hypothesis 1 (H1) in Figure 1.

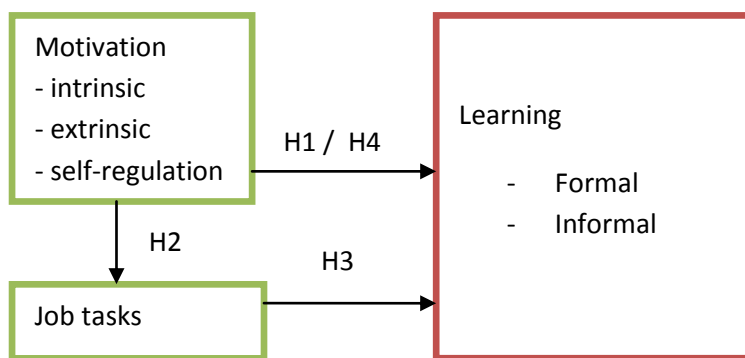
Another aspect that has been found to influence participation in training is the type of tasks that people perform in their job (Tharenou, 1997; Renaud, Lakhdari & Morin, 2004; Gorlitz & Tamm, 2012). It has been argued that jobs that entail intellectually demanding job tasks, require regular updating of the knowledge and would therefore result in a higher learning participation (Tharenou, 1997). This direct effect is reflected in hypothesis 3 (H3) in Figure 1. However, it can be expected that workers' motivation to learn induces self-selection into occupations with specific job tasks (H2) (Heckman & Sedlacek, 1985; Leuchinger, Stutzer &

Winkelmann, 2010). This is why job tasks will be evaluated as a mediating factor between motivation to learn and learning participation (H4). It is expected that especially older workers have had the time to think about what they want in a job, and may have self-selected into positions which do or do not require further learning. It is expected that for younger workers such selection mechanisms are relatively less strong because they have had less time to self-select in jobs. Moreover, especially at the start of their career workers are not always free in choosing their job.

The research question that has been formulated is:

What effect do motivation and job tasks have on the formal and informal learning participation of workers? Is there a difference between younger and older workers?

Figure 1: Visualization of the research question



Results in this thesis show that for both younger and older workers intrinsic motivation is a strong predictor of learning participation. Younger workers are mainly motivated by intrinsic motivation or self-regulation, while older workers are mainly motivated by intrinsic motivation. It is shown that creative, difficult job tasks are related to younger workers' participation in both formal and informal learning, while for older workers job tasks are only related to informal learning participation. Furthermore, the mediating effect of job tasks is for younger workers strong for both formal and informal learning, while for older workers this effect only exists for informal learning. This suggests that the self-selection into jobs which require formal and informal learning, mostly occurs among younger workers, while the self-selection into jobs which require only informal learning occurs among both younger and older workers.

This paper will start with a concise literature review, from which the different hypotheses are derived. Subsequently, a description of the data and measures that were used in this research is presented. In the results part, the outcomes of the analyses are reviewed and discussed. Finally, in the conclusion & implications part, a conclusion is provided with an answer to the research question and implications for different stakeholders are presented.

2. Literature review

In order to create an understanding about the context in which this research has been conducted, the next section will discuss related literature in the fields of formal and informal learning. Furthermore, previous literature on relations between intrinsic and extrinsic motivation, self-regulation, and job tasks on learning participation of workers is presented. Moreover, empirical differences between younger and older workers' learning participation in relation to motivation and job tasks are discussed. Additionally, more specific visualizations of the hypotheses are presented, in order to explain the different expectations according to age group.

2.1. Learning

Workplace learning is described as directly relevant to a workers' specific needs and generally leads to an increased productivity and a more competitive position on the labor market (Collin, 2006). It is important to realize that investing in human capital through formal and informal learning has both costs and benefits.

In the field of economics a frequently cited theory that was first proposed by Becker (1962), is the Human Capital theory. Within his theory, investments in human capital are defined as "activities that influence future real income through the imbedding of resources in people" (Becker, 1962, p.9). According to Becker, people can invest in different kinds of human capital, such as on- and off-the-job learning, education and training. Becker argues that most investments in human capital raise observed earnings at older ages, because returns are added to earnings then, while at younger ages investments lower earnings, because costs are deducted from earnings then (Becker, 1962). By taking this perspective of human capital, Becker (1962) provides a rationale for why it is less attractive for older workers to continue to invest in their human capital, since older workers have a shorter pay-back period compared to younger workers. Hence, older workers will only invest in human capital if their initial costs of the investment are lower than the benefits. The evaluation of the costs and benefits will depend on how long older workers expect to stay employed, on the subjective future discount factor, and on their motivation.

As an example of a cost-benefit analysis with respect to time to retirement, a study by Fouarge and Schils (2009) showed that indeed when older workers were offered a generous early retirement scheme, the workers were discouraged to take part in training. This was due

to the fact that the net returns on such investments would be lower. However, when older workers were offered a flexible retirement scheme, they were actually encouraged to take part in training. In their research a flexible retirement scheme refers to the freedom of choice an individual has in deciding upon the timing of retirement and the easiness or difficulty of meeting the entitlement conditions of the early retirement schemes (Fouarge & Schils, 2009). Montizaan, Cörvers and de Grip (2010) found a similar result. They used a natural experiment approach where civil servants who were born after 1949 were subjected to a major pension reform which diminished their pension rights. Due to this shock the expected retirement was postponed and the participation in training courses increased among older workers. Hence, these studies show that when it is harder to retire early, older workers are more encouraged to stay longer in the labor force and take part in training.

According to the literature, two types of learning in which workers can invest are formal and informal learning. The costs of formal learning are typically direct monetary costs and indirect opportunity costs, which refers to the costs of not working during the learning activity. The costs of informal learning are typically only indirect opportunity costs. However, often informal learning happens accidentally during work, in that case there are no costs involved. The benefits for both types of learning can be intrinsic or extrinsic, such as internal satisfaction or enjoyment, and increases in wage or employability (Fouarge, de Grip & Nelen, 2009). Research showed that these benefits from learning are derived for both younger and older workers (Fouarge & Schils, 2009; Picchio & van Ours, 2011).

Formal learning

Formal learning is defined as taking place in a setting which is structured for learning. This allows for people to learn intentionally and makes sure that there are clear learning outcomes. It often involves a teacher and can lead to some kind of certification (Eraut, 2004).

McGuire and Gubbins (2010) argue that formal learning is critical for the deepening of an individual's functional and general knowledge. It is stated that formal learning can be perceived as the foundation for learning at work (Collins, 2002). It provides basic tools for fostering an understanding of theoretical principles and issues (McGuire and Gubbins, 2010).

Informal learning

Informal learning is defined as taking place during daily activities related to work or other spheres of life. It is mainly invisible and usually leads to tacit knowledge, which is not always

intentionally acquired. Therefore, it can be characterized as implicit, unintended, opportunistic and unstructured learning (Eraut, 2004).

Typically, informal learning is not structured in terms of learning outcomes, learning time and learning support. Moreover, it does not lead to a certification. In the workplace it can occur during teamwork, meetings, interactions with customers, peer-to-peer communication and observing others, and happens spontaneously within the context of real work (Marsick & Volpe, 1999). Multiple studies found evidence that new knowledge in the workplace is more frequently acquired through informal learning activities, rather than from formal training methods (Eraut, 2007; Berg & Chyung, 2008). Although there does not seem to exist one best way to support, encourage and develop informal learning (Marsick & Volpe, 1999), several authors have tried to identify basic organizational conditions that induce informal learning at the workplace (Skule, 2004; Marsick, 2009). Besides, it has been argued that formal and informal learning are complementary instead of substitutes (Eraut, 2007; Borghans et al., 2009; Marsick, 2009).

Formal and informal learning and older workers

It can be expected that older workers prefer informal learning over formal learning because, according to the human capital theory, older workers do not have the time to earn back their investment in formal learning. This expectation is empirically supported by both Berg and Chyung (2008) and Tikkanen (2002) who found that older workers tended to engage more in informal learning than younger workers. This may be explained by the fact that during learning informally no direct monetary costs are made, hence there is less need to earn back the investment. Furthermore, research shows that often older workers do not participate in formal learning due to fear of taking exams or the feeling that they cannot learn anything new anymore (Borghans et al., 2009; Kindt et al., 2011). Moreover, one of the greatest learning challenges for older employees has been found to be the introduction of Information Technology (IT) (Tikkanen, 2002). However, there is evidence that older workers' participation in learning increases their labor market opportunities substantially (Jonasson, 2007; Picchio & van Ours, 2011).

2.2. Intrinsic motivation, extrinsic motivation and self-regulation

There is evidence that the personality of workers influences the decision to take part in learning at work (e.g. Carey et al., 2004; Borghans et al., 2009; Fouarge, Schils & de Grip,

2013). Personality consists of many different facets and there is no one agreed upon measurement for personality. Facets of personality that have most been analyzed in relation to learning are the Big 5 and locus of control (Digman, 1990; Major, Turner & Fletcher, 2006; Görlitz & Tamm, 2012; Fouarge et al., 2013). The big five consists of five personality traits which are: 1) openness to experience, 2) conscientiousness, 3) extraversion, 4) agreeableness, and 5) neuroticism (Digman, 1990). Relating to learning participation, Fouarge et al. (2013) found a positive relation between openness to experience and training participation, while Görlitz and Tamm (2012) found a slight negative effect between openness and on the job training. Major et al. (2006) found that openness, extraversion and conscientiousness predicted the motivation to learn of workers. Naquin and Holton (2002) found that especially extraversion predicted the motivation to train. This shows that the results with respect to learning are diverse. Also the results for locus of control and training participation are different among researchers. Fouarge et al. (2013) found that worker with a stronger internal locus of control were more willing to train, while Görlitz and Tamm (2012) found no significant relationship between locus of control and training participation. Hence, also with respect to locus of control and learning, different results have been found. In this thesis the focus lies on a more specific aspect of personality, which is the motivation to learn. The willingness or motivation to learn can be subdivided into intrinsic motivation and extrinsic motivation. This division proposes that workers can gain different types of benefits from investing in learning (Tharenou, 2001). Another measure to assess the motivation to learn is self-regulation, which considers yet another benefit of investing in learning activities (Carey et al., 2004).

Intrinsic motivation, extrinsic motivation and self-regulation

In literature, intrinsic and extrinsic motivation are measured in multiple ways. Frequently cited authors who use the concepts of intrinsic and extrinsic motivation are Ryan and Deci (2000). They define intrinsic motivation as “the inherent tendency to seek out novelty and challenges, to extend and exercise one’s capacities, to explore, and to learn” (Ryan & Deci, 2000, p.70). In other words, intrinsic motivation refers to doing something because it is inherently interesting or enjoyable, while extrinsic motivation means doing something because it leads to a separable desired outcome (Ryan & Deci, 2000). According to Ryan and Deci (2000) there is a continuum of self-determination which shows peoples’ motivation from amotivation, which means not motivated at all, through extrinsic motivation, to intrinsic

motivation (see appendix 1). They argue that self-regulation, extrinsic motivation and intrinsic motivation are related concepts which may partially overlap.

In the amotivated type of behavior the person is nonself-determined, which means that the person is not trying to regulate oneself. This results in non valuing and impersonal behavior, which corresponds with a very low score on the concept of self-regulation (Carey et al., 2004). Next, extrinsic motivation implies that the person is initially motivated by extrinsic rewards, however moving down the continuum the person will become increasingly aware of the value of the training. Finally, when a person is intrinsically motivated, he or she feels like the rewards are internal, leading to interest, enjoyment and inherent satisfaction. In this continuum, the intrinsically motivated person also scores very high on self-regulation.

According to Ryan and Deci (2000) the move from extrinsic motivation to intrinsic motivation is facilitated through three innate psychological needs:

- *Relatedness*: the need to feel belongingness and connectedness with others.
- *Perceived Competence*: people are more likely to adopt activities that relevant social groups value highly.
- *Autonomy*: the experience of autonomy facilitates internalization and is a critical element for a regulation to be integrated.

The authors argue that autonomous regulation (the process of moving from external to internal motivation) can only occur when these three psychological needs are satisfied.

However, for this research the aim is to separate self-regulation, intrinsic motivation and extrinsic motivation. By separating different types of motivation, a better insight can be gained into how workers are actually motivated to participate in learning. An author who does that with respect to learning is Tharenou (2001). She describes learning motivation in two ways: 1) *motivation to learn* as an intrinsic motivation and 2) *motivation through expectation* as motivation through the expectation that the acquired knowledge and skills will lead to valuable outcomes (Tharenou, 2001). In her research she found that both types of motivation explained participation in training and development activities. Extrinsic motivation influences the short-term expectation that an investment will lead to a certain benefit (extrinsic reward), which outweighs the costs of the initial investment. Intrinsic motivation is seen as part of a

person's personality. People who are intrinsically motivated learn for their own personal enjoyment. Therefore, intrinsic motivation is not expected to affect the cost-benefit analysis.

Self-regulation has also been researched as a separate concept and is defined by Brown (1998) as "the capacity to plan, guide, and monitor one's behavior flexibly in the face of changing circumstances" (p.62). It represents goal-directed behavior, and allows a person to delay gratification in the short term to achieve desired outcomes in the future (Carey et al., 2004). This suggests that people are willing to invest in learning today, in terms of time and money, because they are aware of possible benefits in the future. These benefits can be either intrinsic or extrinsic, but self-regulation ensures a person's ability to identify opportunities and their perseverance when undertaking action. Self-regulation is a concept that is predominantly focused on the long-term benefits of investing in learning today, and how people discount these benefits to their present value. Therefore, it can be expected that it affects the cost-benefit analysis of workers, as the pay-back period decreases with age.

Motivation and workers' learning participation

In the literature, several authors have found relations between different motivational factors and learning participation.

For example, Fouarge, Schils and de Grip (2013) found that the difference in training participation between lower- and higher educated workers, could be explained by the fact that lower educated workers are less willing to train. The authors showed that willingness to train was driven by workers' economic preferences (future orientation and preference for leisure), and personality traits based on the locus of control and the big five as discussed above. This suggests that motivation to learn can explain differences in training participation between different groups of workers.

Furthermore, Tharenou (2001) showed that workers with a higher motivation to learn, participated more in training and development activities in the next 12 months. As explained above, Tharenou (2001) measured learning motivation as 'motivation to learn' and 'motivation through expectation', and found that both types similarly explained participation in training and development. This implies that both intrinsic and extrinsic motivation influence workers' learning participation. This relation was also supported by Maurer, Weiss and Barbeite (2003) who found that, among others, workers who had an insight into their career, who believed in the need for development, and who felt that they would receive

intrinsic benefits from participating, were more inclined to participate in learning and development activities.

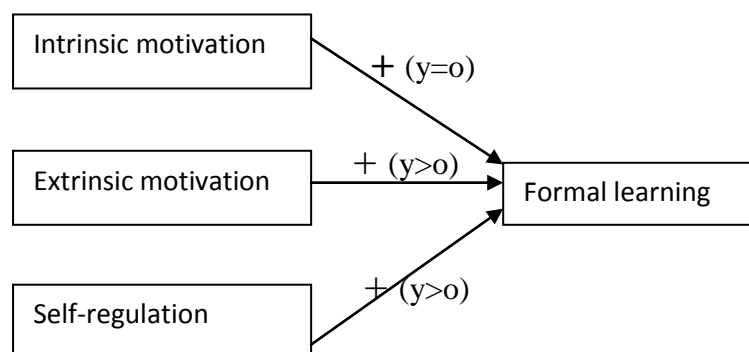
Related research on older workers' learning motivation by Gaillard and Desmette (2010) found that the availability of positive stereotypical information about older workers' ability also influences the willingness of older workers to stay in the workforce and keep on learning and developing. The researchers found that older workers who were exposed to positive age-related information about ability had lower early-retirement intentions and a higher willingness to learn and develop, as opposed to older workers that were exposed to negative or no age-related information. This suggests that a tool to stimulate the intrinsic motivation of older workers to stay in the workforce and stay motivated to learn, is to expose them to positive age-related information about abilities of older workers. Baldwin et al. (1991) found that if workers had a choice in which training they wanted to follow, they were more inclined to participate and the training outcomes were better as well.

The literature described above provides evidence for a relationship between learning motivation and participation in learning. Based on this literature, the first hypothesis is:

Hypothesis 1a: Workers who score high on intrinsic motivation, extrinsic motivation, and self-regulation will invest more in learning activities. (Figure 2a+b)

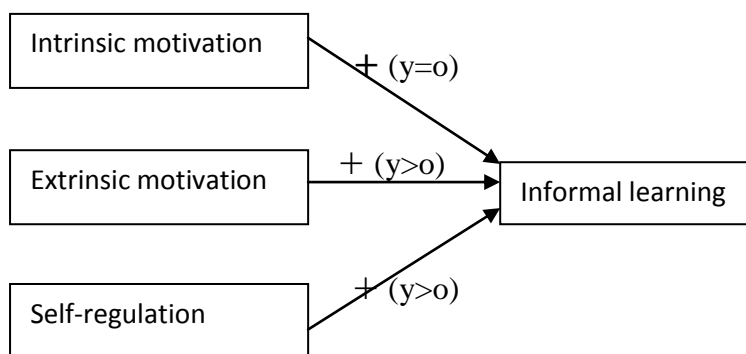
Hypothesis 1b: The relation between extrinsic motivation, self-regulation and learning is weaker for older workers. (Figure 2a+b)

Figure 2a: The relation between intrinsic motivation, extrinsic motivation, self-regulation and formal learning



It is expected that intrinsic motivation will lead to an increase in formal learning participation, due to the inherent satisfaction that workers experience when acquiring new knowledge. The perceived benefits of formal learning for extrinsic motivation and self-regulation are the possibility of wage increase and higher employability. The expected smaller effect for older workers of extrinsic motivation and self-regulation results from the fact that older workers have a shorter pay-back period compared to younger workers. Therefore, the costs for older workers of investing in formal learning, are higher than the benefits of the time that they are able to use the acquired new knowledge at work. These costs include both direct monetary costs and indirect opportunity costs, which are the costs of not working at the time of the training.

Figure 2b: The relation between intrinsic motivation, extrinsic motivation, self-regulation and informal learning



Concerning informal learning, it is expected that all types of motivation will lead to a higher participation. This is due to the expectation of receiving a possible wage increase in the future, or the inherent satisfaction of learning. While learning informally does not include direct costs, it does involve time investments and thus an opportunity cost. Therefore, the positive effect of extrinsic motivation and self-regulation may be less strong for older workers than for younger workers, because they have a shorter pay-back period.

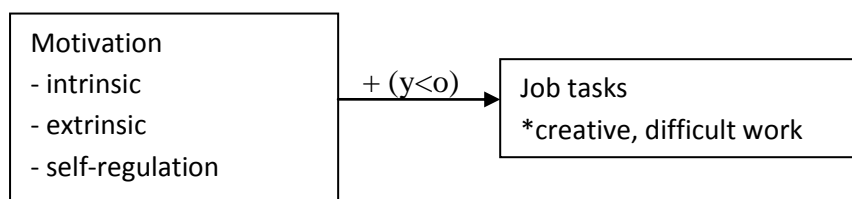
2.3. Influence of motivation on job tasks through self-selection

An important topic to consider in this research is the possibility of self-selection (Heckman & Sedlacek, 1985). Previous research has shown that workers tend to self-select into jobs that correspond with their personality (Leuchinger, Stutzer & Winkelmann, 2010). Therefore a possibility exists that people who have a high motivation to learn, select themselves into jobs which require learning, such as managerial positions with complex and nonroutine tasks.

Moreover, this effect is expected to be stronger for older workers, since they have had the time to find out what they like and do not like. Young workers are expected to be less affected, since they have had less time to think about their job preferences, and often do not have a choice in the type of their first job. This mechanism is reflected in hypothesis 2:

Hypothesis 2: Workers who have a high score on motivation, self-select into job tasks which require learning. This effect is stronger for older workers compared to younger workers. (Figure 3)

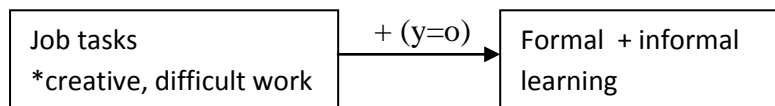
Figure 3: The relation between intrinsic motivation, extrinsic motivation, self-regulation and job tasks



2.4 Job tasks

In literature, different factors are considered which can influence training participation. Kyndt et al. (2011) categorized the different factors as individual characteristics, organizational factors and characteristics of the formal learning activity. However, a limited amount of literature describes the influence of specific job tasks on training participation. Tharenou (1997), found a positive relationship between higher managerial level and participation in training. It is argued that the effect of higher managerial level can be explained by the fact that for this occupation higher skill levels are required. Similarly, Renaud, Lakhdari and Morin (2004) found that the probability to participate in training increased with the hierarchical position occupied. Görlitz and Tamm (2012) found strong evidence that job complexity and nonroutine tasks results in a higher average training probability. However, none of these researchers differentiated their analyses by age. It can be expected that workers in more complex occupations also tend to participate more in learning, since in this type of occupations regular updating of knowledge is usually required. Therefore hypothesis 3 is:

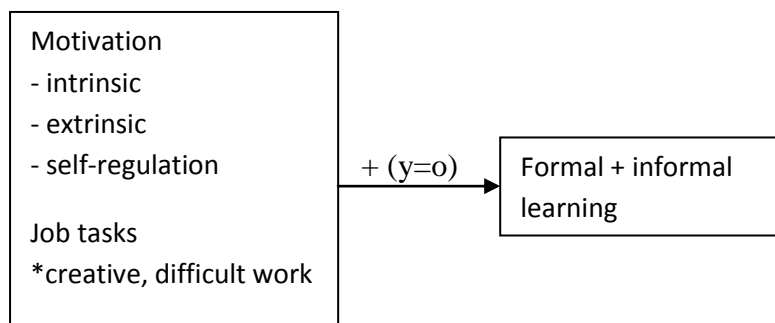
Hypothesis 3: Workers with creative and difficult job tasks, participate more in learning activities. (Figure 4)

Figure 4: The relation between job tasks and learning participation

It is assumed that for jobs that entail creative, difficult job tasks, the relation to participation in both formal and informal learning is positive. This is due to the fact that this type of jobs require people to continuously learn in order to stay up to date in their field. Therefore, it is expected that this effect is positive for both younger and older workers.

Since motivation is expected to explain the sorting into jobs and jobs tasks are expected to be related to learning in the job, it is possible that the relation between motivation and learning is mediated by job tasks. The last hypothesis reflects this potential mediating effect:

Hypothesis 4: *Younger and older workers who have a high score on motivation to learn and have creative, difficult job tasks, participate more in learning. (Figure 5)*

Figure 5: The relation between job tasks and informal learning

3. Data & Method

Data

The data that was used for this research is the Life-Long learning survey 2010, provided by ROA. The data was gathered by Centerdata by means of a webbased questionnaire among its representative sample of the Dutch population. Individuals aged 25-64 who were in paid employment, were selected for this research. The number of observations equals 986, from which 271 were aged 55-64 and 715 were aged 25-54. Table 1 gives some descriptive information about the sample.

Table 1: *Age in CBS-categories and % of men/women*

Age category	% man	% woman	Total # of respondents
25-34 years	40,46 %	59,54 %	131 (13,29 %)
35-44 years	50,70 %	49,30 %	286 (29,01 %)
45-54 years	59,40 %	40,60 %	298 (30,22 %)
55-64 years	63,84 %	36,16 %	271 (27,84 %)
Total	55,58 %	44,42 %	986 (100 %)

Table 1 shows that the sample included on average the same number of women and men, and that the smallest number of participants are in the youngest age group. In the analyses, the age category 55-64 is distinguished as the “older workers” and the age category 25-54 is considered as the “younger workers”.

Main variables

The following section provides additional information about the main variables that were used in this research. In appendix 2 the questions that have been used for the measurement of the different concepts can be found.

Table 2 shows that on average almost half of all workers did not participate in a training in the last two years. However, older workers are even less likely to have participated in training in the last two years. Also when looking at the separate age categories lower than 55-64, it was noticeable that specifically the age category 55-64 scored much lower on formal training

incidents compared to the other age categories. In fact, older workers participated 7 percentage points less in a training in the last two years, compared to younger workers. Moreover, from the people who did participate in training, older workers took part in averagely 0.05 less training incidents, compared to younger workers. Furthermore, Table 2 shows that the time spent on activities at work from which one can learn also decreases with age. Older workers spent 4.12 percentage points less time on activities from which they could learn, compared to younger workers.

Table 2: *Participation in learning*

	% of people participating in at least 1 training in last 2 years	Mean number of training incidents if training incidents > 0	% of time spent on activities at work from which one can learn
25-54	57,63 %	2,86	27,56 %
55-64	50,60 %	2,81	23,44 %

For both formal and informal learning the continuous variables are used in order to find linear relations (see appendix 2). Since almost 50% of the workers did not follow any training in the last two years, formal learning could be transformed into a variable where no training equals 0 and having followed at least one training equals 1, which would result in a logistic regression. However, since a difference was found between younger and older workers in the number of training incidents, it is interesting to analyze whether this difference is significant. Furthermore, in literature most research refers to training (0/1) (e.g. Picchio & van Ours, 2011; Görlitz & Tamm, 2012), while the intensity of training has not yet been analyzed within this context. Therefore, formal learning is analyzed as a continuous variable. However, the analyses have also been run with a depended variable “train” (0/1), which is discussed in footnotes when these results deviate from the presented results.

Intrinsic motivation is measured by five statements adapted from Tharenou (2001) (e.g. “*I am willing to put effort into a course in order to improve my knowledge and skills*”). A new variable was computed (see appendix 2 for full question). To construct intrinsic motivation a factor analysis was performed on the five statements, indicating a Kaiser-Meyer-Olkin (KMO) measure of 0.854 (Sig. 0.000) and a Cronbach’s Alpha of 0.858, suggesting that the

variables used are valid measures of the underlying concept of intrinsic motivation. The factor measuring intrinsic motivation is normalized to have the mean equal to 0 and a standard deviation equal to 1, in order to be able to compare this variable with the equally normalized variables of extrinsic motivation and self-regulation.

Extrinsic motivation is measured with five statements on “valence” adapted from Tharenou (2001) (e.g. *“Following a course can contribute to receiving a higher salary”*) (see appendix 2 for full question). A factor analysis indicated a KMO of 0.880 (Sig. 0.000) and a Cronbach’s Alpha of 0.900. This implies that the variables used are valid measures of the underlying concept of extrinsic motivation. Also this factor measuring extrinsic motivation is normalized to have a mean of 0 and a standard deviation equal to 1.

Self-regulation is measured based on fourteen statements adapted from Carey, Neal and Collins (2004). Also for self regulation a new variable was computed, excluding five from the fourteen statements that were unrelated to learning, in order to make the construct stronger (see appendix 2 for full question). After removing them, a factor analysis based on the nine remaining statements indicated a KMO of 0.795 (Sig. 0.000) and a Cronbach’s Alpha of 0.689. This suggests that these variables are valid measures of the underlying concept of self-regulation. This factor is also normalized to have a mean of 0 and a standard deviation of 1.

Lastly, for job tasks also a new variable was constructed, based on two questions from the questionnaire. In the first question, people had to select on a 5-point continuum ranging from routine to creative tasks, what was more applicable to their work. In the second question, people had to indicate on a 5-point continuum ranging from easy to difficult tasks, what was more applicable to their work (see appendix 2 for full questions). A factor analysis indicated a KMO of 0.500 (Sig. 0.000). This was a bit lower than for self regulation and intrinsic motivation, but still acceptable. The Cronbach’s Alpha was lower (0.523), but still acceptable. In order to find relations between job tasks and formal and informal learning, the new variable is normalized to have a mean 0 and a standard deviation equal to 1.

Tables 3a+b show correlation matrices of the main variables for younger (Table 3a) and older (Table 3b) workers. Table 3a shows that intrinsic motivation and extrinsic motivation of younger workers have a correlation of 0.482, which suggests that these two variables partially measure the same underlying concept. This suggests that Ryan and Deci’s (2000) theory may

be somewhat valid in suggesting that extrinsic and intrinsic motivation lie on a continuum. However, self-regulation has almost no correlation with extrinsic and intrinsic motivation, which suggests that the inclusion of self-regulation by Ryan and Deci (2000) is not validated in this research.

Table 3b shows that for older workers the correlation between extrinsic and intrinsic motivation decreases to 0.260, and increases the correlation between job tasks and informal learning (0.349). This suggests that for older workers, extrinsic and intrinsic motivation are more different concepts than for younger workers, and the job tasks that older people perform are more resembling the participation in informal learning activities.

Overall, it can be concluded that it is relevant to separate the different concepts since they are measuring different underlying constructs. The decrease of the correlation between extrinsic and intrinsic motivation for older workers may be explained by the decreasing importance of the cost-benefit analysis for older workers, due to a shorter pay-back period. This suggests that the importance of intrinsic motivation increases, while the importance of extrinsic motivation decreases. This could explain the bigger gap between extrinsic and intrinsic motivation.

Table 3a: *Correlation matrix of main variables for younger workers*

	Formal learning	Informal learning	Intrinsic motivation	Extrinsic motivation	Self-regulation	Job tasks
Formal learning	1	x	x	x	x	x
Informal learning	0,082**	1	x	x	x	x
Intrinsic motivation	0,144***	0,110***	1	x	x	x
Extrinsic motivation	0,093**	0,109***	0,482***	1	x	x
Self-regulation	0,071*	0,113***	0,147***	0,074*	1	x
Job tasks	0,152***	0,289***	0,193***	0,054	0,191***	1

*<0,1 **<0,05 ***<0,01

Table 3b: Correlation matrix of main variables for older workers

	Formal learning	Informal learning	Intrinsic motivation	Extrinsic motivation	Self-regulation	Job tasks
Formal learning	1	x	x	x	x	x
Informal learning	0,039	1	x	x	x	x
Intrinsic motivation	0,186***	0,204***	1	x	x	x
Extrinsic motivation	0,033	0,100	0,260***	1	x	x
Self-regulation	0,031	0,114*	0,097	0,043	1	x
Job tasks	0,046	0,349***	0,199***	-0,003	0,124**	1

*<0,1 **<0,05 ***<0,01

Control variables

In this research several control variables will be used which have been found to have an effect on learning (Picchio & van Ours, 2011; Görlitz & Tamm, 2012; Fouarge, Schils & de Grip, 2013). It has been found that workers with a higher education, participate more in training than workers with a lower education (Fouarge et al., 2013). Therefore, in the analyses educational level will be controlled for. Furthermore, previous studies have shown that there are differences between men and women with respect to personality and therefore gender will be controlled for as well (Schmitt et al., 2008). Additionally, industry sector may influence learning participation as well through the same self-selection mechanism as the previously discussed job tasks. It can be expected that in certain industry sectors the need for continuous learning is higher and therefore workers will participate more in learning activities. To control for this aspect, it is indicated in the analyses whether the industry sector was significantly related to the depended variable. It was measured by computing eight dummies for different sectors and if a sector is significant, it will be mentioned in the discussion part (see appendix 2 for the full industry sectors).

A last variable that is interesting to control for with respect to learning participation, is job history. Traditional career paths assumed workers to stay with their first company for their

whole working life and only change jobs hierarchically (Hall & Mirvis, 1995; Currie et al., 2006). However, current career paths can be described as ‘boundaryless’. Workers change employers more often and even change occupations during their career, which requires people to continuously learn throughout their working lives (Currie et al., 2006; Dokko et al., 2009; Joseph et al., 2012). According to Currie et al. (2006) skilled specialist employees and younger employees are the ‘winners’ of the boundaryless career concept, while workers with more generic skills and older workers are seen as the ‘losers’ in this respect. It is expected that older workers, especially in the age group 55-64, started their career under the old career path, and therefore have had less employers than younger workers. Consequently, older workers are expected to participate less in learning at work, since there was never the need for that. Besides, younger workers are expected to have had already more previous employers and planning their career with a mindset of lifelong learning, and therefore participate more in learning at work.

After running several regression analyses it became apparent that job history was not significantly related to participation in learning and made the models less strong (the F-values of the ANOVA’s raised after removing job history). Therefore, this variable is eliminated from the analyses and the tests are only run with the remaining control variables, which are education, gender and industry sector.

Method

In this research four different analyses have been conducted:

- 1) A regression analysis is conducted with extrinsic motivation, intrinsic motivation, and self-regulation on formal and informal learning participation using OLS models.
- 2) The second analysis includes a regression with extrinsic motivation, intrinsic motivation, and self-regulation on job tasks in order to investigate occupational sorting or self-selection into jobs with specific job tasks, also using OLS models.
- 3) The third analysis consists of a regression with job tasks on formal and informal learning, using OLS models, in order to study the effect of job tasks on learning participation.
- 4) The last analysis contains a regression with job tasks and the three types of motivation to learn on formal and informal learning participation, in order to assess the mediating role of job tasks. OLS models were used for this analysis as well.

4. Results & Discussion

In this section the results from the analyses are provided and discussed for each hypothesis. Furthermore, similarities and contradictions of the results with the existing literature are stated.

4.1. Motivation and participation in learning

In order to explore the relation between motivation and learning participation, the first hypothesis that was proposed is:

Hypothesis 1a: *Workers who score high on intrinsic motivation, extrinsic motivation, and self-regulation will invest more in learning activities.*

Hypothesis 1b: *The relation between extrinsic motivation, self-regulation and learning is weaker for older workers.*

Formal learning

The results in Table 4 show that intrinsic motivation plays a role for both younger and older workers with respect to formal learning¹. Also when controlling for other factors, intrinsic motivation stays significant at the 1% level for older workers and at the 5% level for younger workers. The coefficient of intrinsic motivation is larger for older workers (0,576) compared to younger workers (0,287), suggesting that one standard deviation increase of intrinsic motivation results in averagely a higher percentage point of increase in training participation of older workers. However, an analysis of the difference between the coefficients for younger and older workers, showed that this difference is not significant². This implies that intrinsic motivation is a positive factor for both younger and older workers' training participation.

Extrinsic motivation is not significant for both younger and older workers' training participation. When testing extrinsic motivation separately (i.e. when intrinsic motivation and self-regulation are not included), it is only significantly and positively related to younger workers' training participation at the 1% percent level and not for older workers. This could be explained by the fact that for younger workers extrinsic and intrinsic motivation are partially correlated, as shown in the correlation matrix (Table 3a). It seems that the influence

¹ When using the dummy variable for training as depended variable, the significances are higher. IM was still significant, and EM became significantly negatively related to older workers' training participation, and younger workers' training participation became significantly positively related by SR.

² This was tested by including the interaction between IM and a dummy for older workers in a model estimated on both younger and older workers.

of intrinsic motivation is stronger than extrinsic motivation, and that intrinsic motivation measures some of the extrinsic motivation as well. Table 3b showed that for older workers extrinsic motivation and intrinsic motivation have a lower correlation, which corresponds with the expectation that extrinsic motivation plays a weaker role for older workers than intrinsic motivation. This could be explained by the longer pay-back period that younger workers have, while older workers will not gain many future benefits on investing in training.

Self-regulation is not significantly related to training for both younger and older workers. When testing this variable separately (i.e. when intrinsic and extrinsic motivation are not included), results showed that for younger workers there is a significant positive relation at the 10% level, while for older workers there is no significant relation. Again the lack of future benefits for older workers could be an explanatory factor, while younger workers can invest in training now for a desired result in the future.

For younger workers' participation in formal learning, it seems that education plays a weak significant role (at 10% level), which is in line with previous research that found a positive relation between education and participation in training (Fouarge, Schils & de Grip, 2013). Furthermore, training is also significantly higher in the business and financial services, albeit only weakly (at 10% level). Older workers' training participation is not significantly influenced by any of the control factors.

Informal learning

Intrinsic motivation does not play a significant role in younger individuals' informal learning participation, while the effect is large and significant at the 1% level for older workers. This suggests that for younger workers to learn informally, intrinsic motivation is not important, while for older workers, intrinsic motivation is a very important factor. This could be related to the self-selection mechanism discussed previously, because older workers know better what they do and do not like in their work, which suggests that people who are more intrinsically motivated will select themselves into jobs which require learning.

For younger workers extrinsic motivation is positively and significantly related to informal learning at the 5% level, while not related at all for older workers. Moreover, self-regulation is also only positively significant for younger workers, and not for older workers. This suggests that younger workers are more influenced by the cost-benefit analysis than older workers. An explanation could be that again younger workers have a longer pay-back period

and are therefore able to reap benefits in the future from their investment in learning today, while older workers may be more stimulated by intrinsic motivation, which is not influencing the cost-benefit analysis.

In terms of control variables, younger workers' informal learning participation is significantly influenced by educational level, which is in line with previous research and could be explained by the fact that higher educated people will end up in more intellectually demanding jobs that require learning (Fouarge, Schils & de Grip, 2013). Furthermore, younger and older workers' informal learning participation is significantly influenced by various industry sectors. Younger workers' participation was significantly positively influenced by the industry, construction, public, and cultural sectors at the 5% level, while older workers' learning participation was significantly positively influenced by the catering and transport sector at the 1% level.

Table 4: OLS regression with intrinsic motivation (IM), extrinsic motivation (EM), and self-regulation (SR) on formal and informal learning by age category

	Formal learning				Informal learning			
	Model 1		Model 2		Model 1		Model 2	
	Young	Old	Young	Old	Young	Old	Young	Old
IM	0,331***	0,536***	0,287**	0,576***	1,624	4,563***	0,248	4,457***
EM	0,099	-0,079	0,094	-0,091	1,953	1,270	2,635**	0,945
SR	0,134	0,045	0,114	-0,025	2,616***	2,526	2,159**	1,664
Control:								
Education			0,142*	-0,016			2,570***	0,586
Female			0,360	-0,044			-1,140	-8,212**
Industry sector	No	No	Yes	Yes	No	No	Yes	Yes
R ²	0,024	0,032	0,042	0,067	0,025	0,053	0,063	0,147

*<0,1 **<0,05 ***<0,01

Model 1 = Intrinsic Motivation (IM), Extrinsic Motivation (EM), Self-Regulation (SR)

Model 2 = IM, EM, SR + control variables (education, female, industry sector)

Concluding, based on the results, hypotheses 1a+b cannot be fully rejected. The results show no evidence for a relationship between extrinsic motivation and self-regulation on formal learning for either younger or older workers. However, there seems to be a relationship between intrinsic motivation and formal learning for both younger and older workers. For informal learning differences have been found between younger and older workers. The results imply that there is a relationship between extrinsic motivation and self-regulation on

informal learning for younger workers, and for older workers that there is a relationship only between intrinsic motivation and informal learning.

This suggests that younger and older workers are equally motivated for formal learning, which is in line with previous research (Picchio & van Ours, 2011). However, the results show that for informal learning older and younger workers are motivated by different types of motivation. This distinction between formal and informal learning has not been researched before with respect to younger and older workers' learning motivation and is consequently a novel finding of this research.

4.2. Motivation and job sorting

As explained above, it is possible that not motivation per se affects learning participation, but that other processes are at play. In particular it could be the case that workers' challenging job tasks induces them to learn, because being employed in a challenging job is not random, but could result from self-selection on the basis of motivation. Therefore, the second hypothesis is:

Hypothesis 2: Younger and older workers who have a high score on motivation to learn, self-select into job tasks which require learning. This effect is stronger for older workers compared to younger workers.

Younger workers

Table 5 shows that for younger workers intrinsic motivation and self-regulation are strongly significantly related to the type of job tasks that workers perform. Younger people that are intrinsically motivated to learn and have a future career plan, self-select into creative and difficult jobs. Moreover, motivation alone explains 6 to 7% of the variation in job tasks. Besides intrinsic motivation and self-regulation, education and gender play an important role for the job tasks that young people perform. Extrinsic motivation does not play a significant role, which may be due to the fact that creative and difficult job tasks do not immediately result in visible extrinsic rewards. Therefore, extrinsic motivation is unrelated to the selection into job tasks. When controlling for other factors, a higher education relates significantly and positively to creative and difficult work. This could be explained by the fact that people with a higher education could choose for more creative and difficult work. The results also show that gender plays a significant role in the job tasks that younger workers perform. The results suggest that younger men are more likely to have creative and difficult job tasks. This may be

due to the fact that men are more competitive than women and therefore could select themselves into jobs which are challenging them to be the best (Schmitt et al., 2008). Moreover, industry sector also relates significantly to the type of job tasks that younger workers perform. Especially working in the public sector is positively significantly related to creative and difficult job tasks at the 5% level (see appendix 2 for more information about sectors).

Older workers

Job tasks of older workers seem to be less influenced by motivational factors. Model 2 in Table 5 shows that only intrinsic motivation is significantly and positively related to creative and difficult job tasks at the 5% level. Similarly to the younger workers, extrinsic motivation is unrelated to job tasks for older workers. This might be due to the same reason as for younger workers, which is that there are no immediate extrinsic rewards for selecting into a creative and difficult job. Also self-regulation is unrelated to working in more demanding jobs. This could be explained by the fact that older workers have no future benefits that can be gained from performing creative and difficult tasks at work. The R^2 increases remarkably after including the control variables, where education is significantly and positively related at the 1% level and the industry and transport sectors at the 1% level. This indicates that a higher educational level and the type of industry sector strongly predicts more creative and difficult job tasks. Hence, apart from intrinsic motivation, other factors seem to play a role in the explanation of job tasks too.

Table 5: OLS regression with intrinsic motivation (IM), extrinsic motivation (EM), and self-regulation (SR) on job tasks by age category

	Job tasks			
	Model 1		Model 2	
	Young	Old	Young	Old
IM	0,205***	0,187***	0,120***	0,120**
EM	-0,054	-0,060	-0,001	-0,012
SR	0,169***	0,101*	0,146***	0,042
Control:				
Education			0,205***	0,152***
Female			-0,328***	-0,151
Industry sector	No	No	Yes	Yes
R^2	0,067	0,055	0,180	0,233

* $<0,1$ ** $<0,05$ *** $<0,01$

Model 1 = IM, EM, SR

Model 2 = IM, EM, SR + control variables (education, female, industry sector)

To sum up, the evidence in Table 5 suggests that workers who are more motivated to learn sort into jobs that are more challenging. This is in line with previous research (Leuchinger, Stutzer & Winkelmann, 2010). However, this especially holds for younger workers with high intrinsic motivation and self-regulation. For older workers the only factor that seems to influence this self-selection is intrinsic motivation. The reason for this difference may be that for older workers there is no point in looking at the future benefits of performing creative and difficult tasks, while for younger workers it could be a strategic part of their career plan.

4.3. The mediating effect of job tasks

In order to investigate whether the sorting into creative and difficult job tasks on the basis of motivation have a mediating effect on learning participation, the next hypotheses are analyzing whether motivation to learn or job tasks are more strongly related to formal and informal learning.

Hypothesis 3: *Workers with creative and difficult job tasks, participate more in learning activities.*

Hypothesis 4: *Workers who have a high score on motivation to learn and have creative, difficult job tasks, participate more in learning.*

Formal learning

Table 6 shows that for younger workers job tasks are a strong predictor formal learning participation at the 1% level, as was expected after the results from the previous hypothesis and the literature. However, job tasks are unrelated to formal learning of older workers. Furthermore, compared to Table 4, the coefficient of intrinsic motivation of young workers has decreased with 0.042 and the significance has declined to the 10% level. This suggests that job tasks are a mediator between motivation and formal learning participation for younger workers.

For older workers, Table 6 shows that job tasks are unrelated to formal learning participation. Only intrinsic motivation seems to be a strong predictor at the 1% level. Compared to Table 4, the coefficient even increased with 0.2. These results suggest that job tasks are no mediator between motivation and formal learning participation of older workers.

Based on these results, it can be concluded that hypothesis 3 cannot be rejected for younger workers, but that it can be rejected for older workers for formal learning. Similarly, hypothesis 4 cannot be rejected for younger workers, but can be rejected for older workers for formal learning. Younger workers seemed to have self-selected into creative and difficult job tasks which require formal learning, while older workers' participation in formal learning does not seem to be mediated by self-selection mechanisms. In other words, older workers' learning participation seems to depend exclusively on intrinsic motivation to learn. The reason for this may be that these kind of job tasks require continuous learning in order to progress in one's career, which for younger workers pays off in their future career. Older workers have a shorter pay-back period and therefore do not feel the need to continuously learn. Furthermore, it may be due to the fact that older workers are already in the highest position, and therefore do not feel the need to progress in their career, although this would contradict the existing empirical evidence, which suggests that a higher managerial level is positively related to training participation (Tharenou, 1997; Görlitz & Tamm, 2012). Another reason may be that older workers feel more ashamed to go to a training at a later age, because they feel that they should know everything already.

Informal learning

The results in Table 6 indicate that younger workers' participation in informal learning is highly significantly influenced by job tasks. When controlling for job tasks, only extrinsic motivation stays significant at the 5% level, but self-regulation loses its significance compared to model 2 in Table 4. Moreover, the coefficient of job tasks is higher than the coefficient of extrinsic motivation. This shows that one standard deviation increase in job tasks increases informal learning about 6.6 percentage points, while one standard deviation increase in extrinsic motivation only increases informal learning with 2.6 percentage points. The only control factor that is significant at 10% are the sectors industry and culture. These results show that job tasks do indeed mediate the relation between motivation and younger workers' participation in informal learning.

The results in Table 6 suggest that informal learning is also significantly and positively influenced by job tasks at the 1% level for older workers. Comparing this with the results in Table 4, indicates that the coefficient of intrinsic motivation decreased with 0.859 after including job tasks. The fact that older workers' job tasks are unrelated to formal learning but related to informal learning may suggest that older workers who are motivated to learn and

sorted into jobs with creative and difficult tasks, prefer to acquire new knowledge informally, which is in line with the expectations based on literature (Berg & Chyung, 2008; Tikkanen, 2002). These results show that job tasks do in fact partially mediate the effect of motivation on the informal learning participation of older workers, which suggests that intrinsically motivated older workers sort into jobs which are creative and difficult.

Table 6: OLS regression with intrinsic motivation (IM), extrinsic motivation (EM), self-regulation (SR), and job tasks on formal and informal learning by age category

	Formal learning				Informal learning			
	Model 1		Model 2		Model 1		Model 2	
	Young	Old	Young	Old	Young	Old	Young	Old
IM			0,245*	0,578***			-0,540	3,598**
EM			0,095	-0,092			2,642**	1,032
SR			0,062	-0,021			1,199	1,360
Job tasks	0,366***	0,004	0,356***	-0,087	6,813***	8,002***	6,571***	7,179***
Control:								
Education	0,108	0,092	0,069	-0,003	1,182	-0,124	1,222	-0,508
Female	0,524**	0,025	0,477*	-0,057	1,797	-6,956**	1,015	-7,124**
Industry sector	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0,040	0,035	0,057	0,067	0,104	0,171	0,115	0,197

*<0,1 **<0,05 ***<0,01

Model 1 = Job tasks + control variables (education, female, industry sector)

Model 2 = IM, EM, SR, Job tasks + control variables (education, female, industry sector)

Based on these results, hypothesis 3 and 4 cannot be rejected for informal learning. The results suggest that job tasks are a mediator between motivation and informal learning participation for both younger and older workers. Although the coefficient of job tasks of older workers (7.179) is higher than for younger workers (6.571), this difference is not significant³. This suggests that one standard deviation increase in job tasks leads to the same increase in informal learning participation of about 7 percentage points for younger and older workers.

From the overall results, it seems that the self-selection mechanism is only prevalent for younger workers with respect to formal learning, while it does hold for both younger and older workers regarding informal learning. The results have shown that formal and informal learning participation at work are influenced by different factors and that these factors differ

³ This was tested by including the interaction between JT and a dummy for older workers in a model estimated on both younger and older workers.

for younger and older workers. This suggests that in order to stimulate older workers to participate in learning, employers should consider different strategies. Most important seems to be the role of intrinsic motivation for older workers, which was prevalent in all models, while younger workers were less influenced by intrinsic motivation and more by self-regulation.

5. Conclusion & Implications

This thesis has analyzed the research question: *What effect do motivation and job tasks have on the formal and informal learning participation of workers? Is there a difference between younger and older workers?* It is apparent that in the existing literature, not much empirical evidence exists on this topic, especially regarding older workers. However, it has been widely recognized that the Dutch workforce is ageing and that older workers participate less in learning activities at work compared to younger workers. Therefore, this research has tried to find factors which may explain the fact that older workers participate less in learning at work than younger workers. Doing this, the focus was explicitly on the motivation to learn. We distinguish among three aspects of motivation: intrinsic motivation (IM), extrinsic motivation (EM), and self-regulation (SR). Furthermore, we investigated whether the relation between motivation to learn and participation in learning, is mediated by creative, difficult job tasks. Hence, whether people who are highly motivated to learn, sort themselves into jobs with tasks that require learning at work.

The results showed that there certainly exist differences, but also similarities in motivation to learn and learning participation between younger and older workers. With respect to formal learning, younger and older workers are mainly motivated by intrinsic motivation. It was also found that education and industry sector play a role for younger workers' formal learning participation, while for older workers no other variables included in our model seemed to influence their formal learning participation. This suggests that to stimulate older workers to participate in formal learning, only intrinsic motivation should be stimulated.

With respect to informal learning, the results showed that younger workers are mainly motivated by self-regulation and extrinsic motivation, but even more by education. This suggests that younger workers' expectations of returns to training in their future career are an important driving force behind their decision to learn informally. Older workers are only motivated by intrinsic motivation. Hence, it seems that older workers are not interested in the costs or benefits of investing in informal learning at work. Therefore, only if they are highly intrinsically motivated, thus feeling satisfaction and other intrinsic rewards from learning, they will be likely to participate in learning.

The influence of intrinsic motivation holds for both formal and informal learning, hence it can be recommended that employers should emphasize the internal rewards of learning to older workers. For example by providing courses that are perceived as ‘fun’ instead of very ‘strict and useful for the future career’. Younger workers can be stimulated by the expectation of career progress on the longer term and will therefore more easily participate in learning at work.

In the analysis of the role of motivation on job tasks, the results showed that for younger workers, intrinsic motivation and self-regulation were very strong predictors of creative and difficult job tasks that people performed. This suggests a mechanism of self-selection, although extrinsic motivation was not significantly related to job tasks. This may be explained by the expectation that on a shorter term creative and difficult job tasks do not provide direct extrinsic rewards. However, in terms of self-regulation, people can see a future career progress happening if they perform a more difficult task today. Also educational level and industry sector played significant roles for younger workers. Notwithstanding, for older workers this effect only exists for intrinsic motivation, and when controlling for other factors the effect decreased. Other factors such as industry sector and education influenced the type of job tasks as well. Further research should investigate these effects. It can be concluded that younger workers self-select into creative, difficult jobs that require continuous learning, due to intrinsic motivation and the expected future benefits in terms of career. While older workers may have ended up in creative, difficult jobs due to the intrinsic motivation to learn in their job and other reasons beyond to motivation to learn. For older workers the type of job tasks seems to depend more on the industry in which he or she works and the level of education that the worker has reached.

In the final analysis, the mediating effect of job tasks between motivation and learning participation was analyzed. The results showed that for younger workers, job tasks were a strong mediator and predictor of both formal and informal learning. This suggests that younger workers who are in jobs that are very creative and difficult, are more likely to participate in both formal and informal learning activities. Moreover, younger workers seem to have self-selected into jobs that correspond with their preference for learning. Whereas for older workers, job tasks did not have an influence on their formal learning participation. However, job tasks did have a very strong relationship with informal learning. This suggests

that older workers who are in highly creative, difficult jobs are not more likely to participate in formal learning activities, but are more likely to participate in informal learning activities. Moreover, it also suggests that older workers may have self-selected into creative and difficult job because they are willing and motivated to learn, only not in a formal way.

These are important conclusions, because they show that different factors influence younger and older workers' learning participation at work. Based on this research, employers who want their older workers to participate more in learning should emphasize more the intrinsic rewards that are to be gained by investing in learning, instead of the extrinsic rewards. Due to the fact that the pay-back period for older workers is shorter than for younger workers, extrinsic motivation and self-regulation are not of interest to older workers. Especially formal learning is a type of investment that older workers only participate in if they are intrinsically motivated. Furthermore, increasing the creativeness and difficulty of the job tasks of older workers may increase the participation in informal learning as well. Although there seems to be a self-selection mechanism present, in which motivated workers will choose jobs with creative and difficult job tasks, this effect seems to be strongest for younger workers. Hence, by stimulating older workers by including more creative and difficult tasks in their job, the likeliness that they will participate more in learning activities could increase. However, whether older workers can cope with changes in their job tasks should be investigated through further research, since previous research has shown that older workers experience more difficulty and anxiety when changes at work occur (Yaetts, Folts & Knapp, 2000; Currie et al., 2006).

Limitations

The scope of this thesis is one of the limitations. Excluded from the analysis was the concept of "employability", which could have been an additional depended variable, but due to time constraints it was impossible to analyze this variable as well. Furthermore, although there seemed to exist a relationship between industry sector and learning participation of older workers, this topic was only briefly touched upon. Hence, further research should investigate the possible role of industry sector in motivation to learn and learning participation. Another limitation is the fact that this survey was only conducted in the Netherlands, therefore it is impossible to generalize the results for other countries. Therefore, it is recommended to conduct a similar research in other countries, since the problem of the ageing workforce is a global issue (e.g. Ilmarinen, 2001; Avery, McKay & Wilson, 2007; Silverstein, 2008).

Implications

The results presented in this thesis have implications for multiple stakeholders. First of all, for older workers it has become clear that participating in learning at work increases the chances of staying in the workforce at a productive level (Fouarge & Schils, 2009; Picchio & van Ours, 2011). However, the results in this thesis show that because of the shorter pay-back period of older workers, they are less interested in the cost-benefit analysis of training. Older workers are only inclined to participate in learning at work when they get an intrinsic satisfaction out of the learning experience. Previous research has found that the earlier people start to learn, the more likely it is that they will develop a motivation to learn and this is also depended on the environment in which children grow up (Heckman, 2007). When a person grows up in an environment which stimulates learning, their learning fosters more learning, which is referred to as a capability multiplier (Heckman, 2007). This implies that at older ages, it is more difficult or even impossible to foster a liking for learning. That is a problem when older workers are only motivated by intrinsic motivation, because in that case it is virtually impossible to stimulate the older workers who are not intrinsically motivated, to participate in learning. Hence, it seems that the only way to stimulate the latter to participate in learning at work, is to extend the expected years to retirement (Fouarge & Schils, 2009; Montizaan, Cörvers and de Grip, 2010). When increasing the pay-back period, the cost-benefit analysis plays a role again. However, further research should investigate whether workers' intrinsic motivation to learn can be enhanced at older ages, because that would expectedly increase the learning participation of older workers the most.

Secondly, there are also implications for organizations. An especially important issue is whether it is worth for an organization to invest in older workers' learning. It has been argued that if an organization invests in training of workers, they will stay working for that same company due to the fact that trained workers do not get paid their full marginal product when they change jobs (Acemoglu & Pischke, 1999). However, for older workers the pay-back period may be too short in order for the organization to earn back their investment. Nevertheless, the costs of recruiting and hiring a new employee may be more expensive than investing in an older worker. Moreover, since informal learning seems to provide a big part of all workplace learning, and older workers seem to have a preference for this type of learning, organizations should try to focus on the stimulation of informal learning at the workplace (Eraut, 2007; Berg & Chyung, 2008). Several authors have presented suggestions on how to

accomplish this, such as the seven learning conditions by Skule (2004) or the framework by Marsick (2009). Commonly identified learning conditions are a supportive environment for learning, the availability of many professional contacts, and regular feedback and reflection cycles (Skule, 2004; Marsick, 2009). Furthermore, Gaillard and Desmette (2010) found that the availability of positive stereotypical information about older workers' ability also influenced the motivation of older workers to continue to participate in workplace learning, so this could be another means of stimulating older workers' learning participation. By investing more in informal learning support and stimulation, organizations simultaneously could save the costs of training, and support the type of learning that older workers prefer.

Finally, the implications of this thesis for society and specifically policymakers are important to consider as well. From the perspective of the Dutch government, it is very important to keep older workers in the labor force in order to cope with the ageing workforce. Therefore, it could be recommended to subsidize training of older workers, thereby stimulating employers to invest in their older workers. However, in order to stimulate the older workers that are not intrinsically motivated to learn, increasing the expected time to retirement might be a solution. By increasing the expected time to retirement, the pay-back period of the investment in learning will be larger as well, thereby ensuring that the benefits will outweigh the costs. By ensuring older workers' participation in learning at work, these workers will remain productive and employable, and the costs of the Dutch ageing workforce can be reduced.

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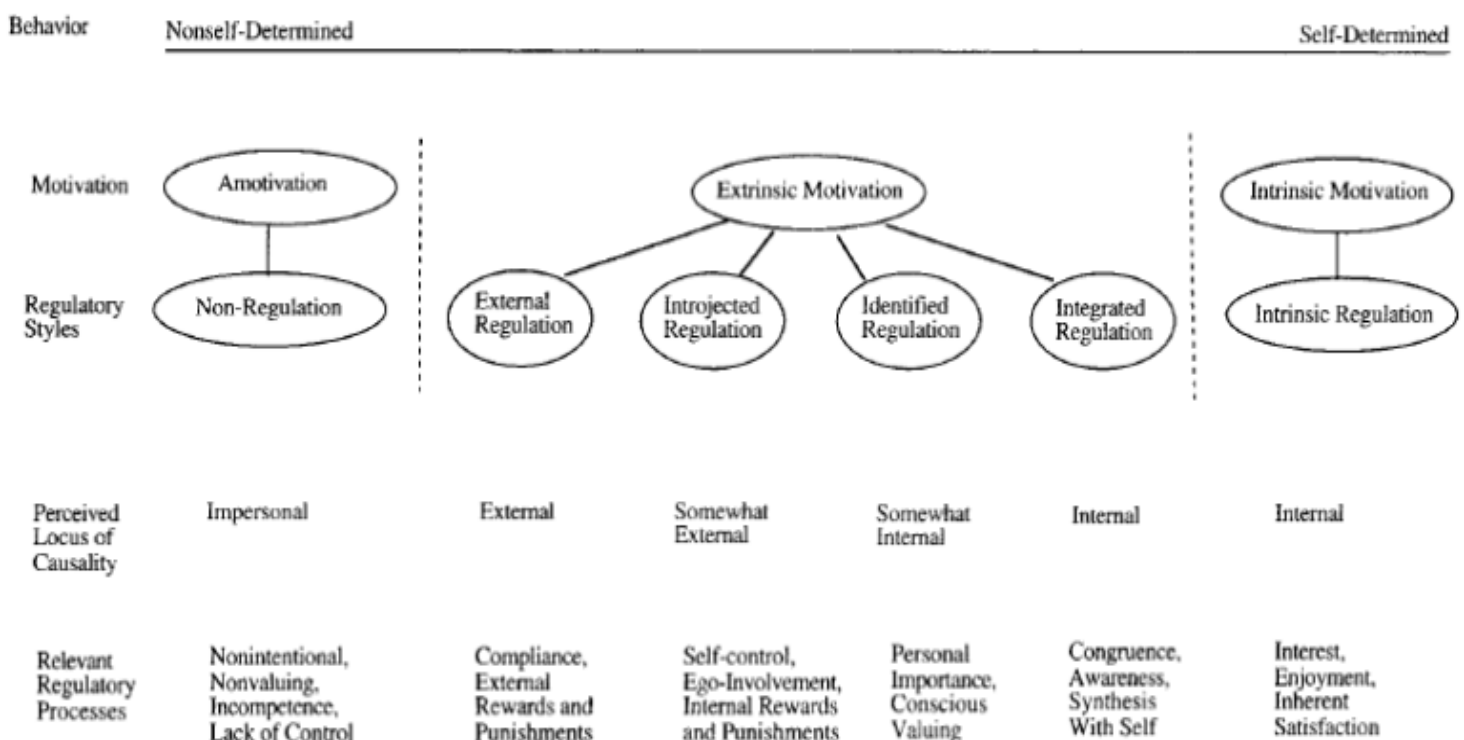
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Appendix

Appendix 1: Self-determination continuum from extrinsic to intrinsic motivation (Ryan & Deci, 2000, p.61)



Appendix 2: Questions used for analysis (adapted from “Lerend individu 2010”)

1. Informal learning: ‘What percentage of your work time do you spend on activities from which you can learn? 0-100%’ (in Dutch: ‘Hoeveel procent van de werktijd besteedt u aan taken waarvan u kunt leren? 0-100%’)

2. Formal learning: ‘How many courses and/or training have you completed in the last two years? 0-50 courses/training’ (in Dutch: ‘Hoeveel cursussen en/of trainingen hebt u de afgelopen twee jaar afgerond? 0-50 cursussen/training’)

3. Extrinsic motivation: ‘To what extent do you agree with the following statements?’

Following a course can contribute to:

- a. Reaching my career goals
- b. Receiving a higher salary
- c. Increasing my chances for a job
- d. Changes at work
- e. Increasing my chances for a promotion
- f. Being appreciated by my superior

Scale 1 (Not agree at all) – 5 (Totally agree)’

(in Dutch: ‘In welke mate bent u het eens met de volgende uitspraken?’)

Het volgen van een cursus kan bijdragen tot:

- a. Het bereiken van mijn loopbaandoelen*
- b. Het verkrijgen van een hoger salaris*
- c. Het vergroten van mijn kansen op een baan*
- d. Veranderingen op mijn werk*
- e. Het verhogen van mijn promotiekansen*
- f. Het krijgen van waardering van mijn leidinggevende*

Schaal 1 (helemaal niet mee eens) – 5 (helemaal mee eens)’

4. Intrinsic motivation: ‘Could you indicate to what extent the following expressions are applicable to you?’

- a.** I learn a lot from courses compared to my colleagues.
- b.** I would like to improve my skills.
- c.** I am willing to put effort into a course in order to improve my knowledge and skills.
- d.** Following a course gives me good ideas.
- e.** I think I can improve my knowledge and skills by following a course.

Scale 1 (not at all applicable) – 5 (completely applicable)’

(in Dutch: ‘Kunt u aangeven in welke mate de volgende uitspraken op u van toepassing zijn?’

- a.** *Ik leer veel van cursussen vergeleken met mijn collega's.*
- b.** *Ik zou graag mijn vaardigheden willen verbeteren.*
- c.** *Ik ben bereid om me in te spannen op een cursus om mijn kennis en vaardigheden te verbeteren.*
- d.** *Het volgen van een cursus geeft mij goede ideeën.*
- e.** *Ik denk dat ik mijn kennis en vaardigheden kan verbeteren door middel van een cursus.*

Schaal 1 (helemaal niet van toepassing) – 5 (helemaal van toepassing)’

5. Self regulation: ‘The following questions are concerned about how you are. Could you indicate to what extent the following expressions are applicable to you?’

- a.** I keep track of my improvements concerning achieving goals that I have set for myself.
- c.** People sometimes tell me that I worry too long about certain issues.
- d.** I don’t think I could change, even if I wanted to.
- e.** I find it difficult to control my own thoughts.
- f.** I am easily distracted from my goals.
- g.** I reward myself when I achieve a goal.
- h.** I comprehend the consequences from my actions only when it is too late.
- j.** I find it hard to see how I could change my behavior.
- k.** I can reach the goals that I have set for myself.

Scale 1 (not at all applicable) – 5 (completely applicable)’

(in Dutch: ‘Er volgen nu een paar vragen over hoe u bent. Kunt u aangeven in welke mate de volgende uitspraken op u van toepassing zijn?’

- a.** *Ik hou mijn vooruitgang bij als het gaat om het bereiken van doelen die ik mezelf heb gesteld.*
- c.** *Ik krijg wel eens te horen dat ik te lang met bepaalde zaken zit.*
- d.** *Ik denk niet dat ik zou kunnen veranderen ook al zou ik het willen.*
- e.** *Ik heb moeite om mijn gedachten te bepalen.*
- f.** *Ik raak gemakkelijk afgeleid van mijn doelen.*
- g.** *Ik beloon mezelf als ik een doel heb bereikt.*
- h.** *Ik realiseer mij de gevolgen van mijn daden pas als het te laat is.*
- j.** *Ik vind het moeilijk om in te zien hoe ik mijn manier van doen zou kunnen veranderen.*
- k.** *Ik kan de doelen bereiken die ik mezelf heb gesteld.*

Schaal 1 (zo ben ik echt niet) – 5 (zo ben ik echt)’

6. Job tasks: 'What is more applicable to your work?'

1. My work is a routine
- 2.
- 3.
- 4.
5. My work is creative

What is more applicable to your work?

1. My work is easy
- 2.
- 3.
- 4.
5. My work is difficult'

(in Dutch: 'Wat is meer van toepassing op uw werk?')

1. *Mijn werk is routinematig*
- 2.
- 3.
- 4.
5. *Mijn werk is creatief*

Wat is meer van toepassing op uw werk?

1. *Mijn werk is gemakkelijk*
- 2.
- 3.
- 4.
5. *Mijn werk is moeilijk)*

7. Job history: 'For how many employers have you worked since leaving your fulltime day education? 0-100 employers' (*in Dutch: 'Voor hoeveel werkgevers heeft u in totaal gewerkt sinds het verlaten van het voltijdse dagonderwijs? 0-100 werkgevers'*)

8. Education: 'Education in CBS-categories

1. Primary school
2. VMBO
3. HAVO/VWO
4. MBO
5. HBO
6. WO'

(in Dutch: 'Opleiding in CBS-categorieen

1. *basisonderwijs*
2. *VMBO*
3. *HAVO/VWO*
4. *MBO*
5. *HBO*
6. *WO'*

9. Industry sector (*Bedrijfstak*):

1.
 - 1) Agriculture or mining (*Landbouw of delfstofwinning*)
 - 2) Industry (*Industrie*)
 - 3) Energy- or water mining (*Energie- of waterwinning*)
2.
 - 4) Construction (*Bouwnijverheid*)
 - 5) Trade (*Handel*)
3.
 - 6) Catering (*Horeca*)
 - 7) Transport (*Vervoer*)
4.
 - 8) Financial institutions (*Financiële instellingen*)
 - 9) Business services (*Zakelijke dienstverlening*)
5.
 - 10) Public administration (*Openbaar bestuur (Rijk, provincie of gemeente)*)
6.
 - 11) Education (*Onderwijs*)
7.
 - 12) Health and welfare (*Gezondheid en welzijnszorg*)
8.
 - 13) Culture, sports and recreation (*Cultuur, sport en recreatie*)
 - 14) Idealistic and interest organizations (*Ideële en belangenorganisaties*)
 - 15) Other (*Iets anders*)