Chapter 10
Aging Workers' Learning and Employability

Isabel Raemdonck, Simon Beausaert, Dominik Fröhlich, Nané Kochoian, and Caroline Meurant

10.1 The Importance of Learning for Aging Workers

Workforces across the world are aging, and governments are taking more and more policy actions to encourage aging workers to extend their working lives beyond the usual retirement age. In addition, employers are stimulated to retain older workers and act accordingly to sustain their employability (Dymock, Billett, Klieve, Johnson, & Martin, 2012). However, in general, the employment prospects of older workers remain weak. People above the age of 50 are often the first to be fired and the last to be recruited. If our aging societies are to continue to prosper, aging workers need to stay active in the labor market. Moreover, the demand for labor and skills is exceeding supply across diverse economic sectors (Armstrong-Stassen & Schlosser, 2008). Employers need to realize that the recruitment pool of the future will be disproportionately composed of aging workers, who are confronted with changing job requirements (Pillay, Kelly, & Tones, 2006). Therefore, it is important to facilitate the learning and development of aging workers. If aging workers do not learn, their job-related knowledge and skills can become outdated or obsolete. Consequently,

I. Raemdonck (✉) • N. Kochoian • C. Meurant
Faculty of Psychology and Educational Sciences, Université catholique de Louvain, Louvain-la-Neuve, Belgium
e-mail: Isabel.Raemdonck@uclouvain.be

S. Beausaert
Department of Educational Research and Development, Maastricht University, Maastricht, The Netherlands

Faculty of Psychology and Educational Sciences, Université catholique de Louvain, Louvain-la-Neuve, Belgium

D. Fröhlich
Department of Educational Research and Development, Maastricht University, Maastricht, The Netherlands

P.M. Bal et al. (eds.), *Aging Workers and the Employee-Employer Relationship*,
DOI 10.1007/978-3-319-08007-9_10

these workers are most likely to leave the labor market early, either voluntarily or involuntarily (Armstrong-Stassen & Schlosser). Furthermore, as traditional careers with long-term employment in a single organization are disappearing, greater self-direction in learning is encouraged (Raemdonck, 2006).

In this chapter we will first focus upon the concept of age and how it relates to employability. Based upon previous research we will discuss the link between formal as well as informal learning activities and older workers' employability. We will demonstrate that age as such is not always the strongest predictor of learning and employability. Moreover, we will identify age-related individual and organizational obstacles for work-related learning. Two of the most prominent individual obstacles are motivation to learn and capability to learn. Organizational barriers are due to negative stereotypes about elderly people at the workplace and by a lack of supportive learning climate for older workers. Finally, we formulate conclusions and recommendations for research and Human Resource Development practices.

10.2 Age-Related Changes in Learning and Employability

10.2.1 Age

The demographic shift warrants increased attention to age-related changes – especially in the workplace (Ilmarinen, 2001). However, the previous academic debate mostly lacks consideration of how such changes affect employability and learning (Fröhlich, Beausaert, & Segers, 2013a). Research on this topic also gets hampered by the fact that age is a very broad concept that may be viewed from different perspectives (De Lange et al., 2006; Schalk et al., 2010; Sterns & Miklos, 1995); for instance:

- functional age, which is based on the ability of a person to perform certain tasks on a daily basis (Sharkey, 1987),
- psychological age, which refers to how old a person feels subjectively (Stephan, Demulier, & Terracciano, 2012; Symons, 2011),
- organizational age, which is based on the tenure in an organization,
- life-span age, which considers biological and societal factors in an integrative way and focuses on the roles people take during their lives (R. Schulz & Heckhausen, 1996; Super, 1980), or
- chronological age, which is a measure of time passed since birth.

These different perspectives make findings less comparable with each other. Both in research and practice, however, chronological age is used most prominently and it is this conceptualization we will use in the rest of this chapter.

10.2.2 Employability

Employability is the ability to acquire and maintain employment (Hillage & Pollard, 1998; Van der Heijde & Van der Heijden, 2006). In other words, employable employees recognize and realize career opportunities more easily (Fugate, Kinicki, & Ashforth, 2004). While the concept of employability dates back to the mid of the last century, the recent changes in the workplace, such as the trend towards inter-organizational careers (Briscoe, Hall, & Frautschy DeMuth, 2006; Brown & Hesketh, 2004; D. T. Hall, 2004; McDonald, Brown, & Bradley, 2005), the fast pace of organizational and environmental changes, and increasingly self-managed careers (Hall, 2004), have increased interest in this topic. Since definitions of employability based on job descriptions can hardly keep up with the rapidly changing job requirements and labor market demands, competences seem a more stable and reliable base for them. To address the requirements of today's fast changing business environment, a broad package of competences (Wright & Snell, 1998), that includes social and adaptive competences (Rodriguez, Patel, Bright, Gregory, & Gowing, 2002) on top of technical domain knowledge, needs to be considered. Van der Heijde and Van der Heijden include *occupational expertise* as an important prerequisite for employability, but note that also other factors weigh heavily. Proactive, self-initiated screening and preparation for potential changes in job and career requirements and conditions (*anticipation and optimization*) and reactive adaptation and resilience to them (*personal flexibility*) are needed in today's fast moving business world. Furthermore, identification with the organization's goals and the ability to work together with others are important (*corporate sense*). Last, *balance*, i.e., appropriately weighing employer's interests against one's own interests, was identified as a key competence of employability.

One factor that is often found in the popular discussion of employability is chronological age. Stereotypically, it is often proclaimed that older employees are less likely to adapt to change or have out of date knowledge. Empirical studies, however, do not provide consistent evidence for this. While many studies find negative relationships between age and employability (e.g. Berntson, Näswall, & Sverke, 2008; Raemdonck, Tillema, Grip, Valcke, & Segers, 2012; Rothwell & Arnold, 2007; Van der Heijden, 2002; Wittekind, Raeder, & Grote, 2010) and related concepts, such as workability (Nielsen, 1999), career opportunities, and proactivity towards development (Van Veldhoven & Dorenbosch, 2008), some other studies present positive or insignificant effects of age on employability. For example, Van der Heijden, Boon, Van der Klink, and Meijs (2009) reported age to be positively related to corporate sense. Fröhlich, Beausaert, and Segers (2013b), too, found positive relations of chronological age with occupational expertise and personal flexibility among the 780 respondents of their intersectoral study in Austria and the Netherlands. In sum, the empirical evidence is far less clear than common stereo - types would suggest.

One hypothesis for the inconsistent effects could be that the relative importance of the competences changes with increasing age or career stage. Previous research

indicates that employees at a later stage of their career and life value generativity more than younger employees (Lang & Carstensen, 2002; Mor-Barak, 1995; M. J. Sanders & McCready, 2010), i.e., the process of passing along values and knowledge to the next generation (Erikson, 1997). Van der Heijden and colleagues (2009) indeed reported chronological age to be positively related to corporate sense, which arguably incorporates parts of the generativity concept.

The inconsistent findings presented above may also hint at conceptual weaknesses of chronological age as a measure, which are often ignored. One such weakness is the difficulty to disentangle age effects from cohort and period effects (B. H. Hall, Mairesse, & Turner, 2007; Hobcraft, Menken, & Preston, 1982; Palmore, 1978). Moreover, since people become more heterogeneous the older they get (Carstensen, 2006; Staudinger & Bowen, 2011), the less suitable age is as predictor.

10.2.3 Formal and Informal Learning Activities

One needs to learn in order to improve one's own employability (Fröhlich et al., 2013b; Fröhlich, Beausaert, & Segers, 2013c; Van der Heijden et al., 2009). Learning may happen either formally, i.e., inside a structure deliberately created for that purpose, or informally. Informal learning is less pre-structured, more in control of the learner, embedded in daily working activities of the employee and therefore often a by-product of some other activity, and may happen unconsciously (cf. Livingstone, 2001; Marsick & Watkins, 2001) or in implicit, reactive, or deliberate ways (Eraut, 2007). Eraut and Van der Heijden and colleagues suggested that informal learning is needed to optimize overall learning efficiency, while Cross (2007) found that informal learning was superior in terms of efficiency and effectiveness. However, as formal and informal learning can be seen as opposing ends on a continuum (Eraut, 2004), both need to be taken into account.

Formal learning means "learning that occurs in an organized and structured environment […] and is explicitly designated as learning" (CEDEFOP, 2008, p. 85). It received the majority of attention in past human resource development practice and research, but is increasingly challenged for its often insufficient transfer to the workplace (Blume, Ford, Baldwin, & Huang, 2010; Ford & Weissbein, 1997). Nevertheless, it is an important measure for human resource development, since it is arguably easier to plan and observe than informal learning.

In the domain of informal learning, Eraut (2004) distinguishes implicit, reactive, and deliberative informal learning. *Implicit learning* is unconscious and not recognized by the learners themselves. He argues that learning from experience mostly has such an implicit component – for example during the process for (workplace) socialization. *Reactive learning* is more conscious. This learning is intended and has a component of reflection. However, it happens in midst of some other activity, and therefore may receive only partial attention. *Deliberate learning* happens in work situations where time is specifically allotted for learning (Tynjälä, 2012).

Eraut (2007) identifies encounters and relationships at work and opportunities for receiving feedback and support as important factors for learning at work. Additionally, he mentions participation in group activities, work alongside others, and consultations among the activities most conducive for learning.

10.2.4 Learning Activities and Employability

Empirical research shows that formal learning contributes to one's employability. For instance, Groot and van den Brink (2000) studied the effects of education and training on employability among Dutch employees and found positive effects. Sanders and de Grip's (2004) study among low-skilled workers showed a positive effect of formal training on intra-firm employability, but did not find any effect of training on external employability. In their sample of 215 Dutch non-academic university staff members, Van der Heijden and colleagues (2009) found positive relationships between formal learning and three sub-dimensions of employability, i.e., occupational expertise, anticipation and optimization, and corporate sense. Fröhlich et al., (2013b) found that the number of hours spent in formal learning activities positively affects anticipation and optimization. Van Loo's (2005) study among administration employees showed that employees' investment in a vocational training to counter skill deficiencies raised their chance of remaining employed. These consistent findings suggest that formal learning positively affects employability.

Informal learning is important to consider, as many studies found a link to employability. Van der Heijden et al. (2009) found networking within and outside the own organization (Bozionelos, 2003) to positively affect all five dimensions of employability. Moreover, interaction with one's supervisor had positive effects on balance and corporate sense. Van der Rijt, Van den Bossche, van de Wiel, Segers, and Gijselaers (2012) found feedback seeking to affect perceived career development positively among employees in the financial sector in an early career stage. Especially the quality of feedback had a positive impact on perceived career development – and not the mere frequency of feedback. Fröhlich et al., (2013b) found several forms of informal learning – e.g. information seeking, feedback seeking, and help seeking – to positively affect occupational expertise, anticipation and optimization, and personal flexibility. A longitudinal study by Raemdonck, Tillema and colleagues (2012) examined the relation between self-directed learning and employability in low-qualified employees working in different industry sectors. They found that self-directed learning did not predict job retention or horizontal job mobility. However, higher levels of self-directed learning did predict higher chances for vertical job mobility.

In sum, it is important to note that while both formal and informal learning may be functional to improve overall employability, there still might be differences in terms of specific learning contents. For instance, the finding that formal learning

affects anticipation and optimization only – but not occupational expertise or personal flexibility (Fröhlich et al., 2013b) – might indicate that formal learning activities are especially well suited to learn about new domains. Informal learning, for which also effects on occupational expertise and personal flexibility were found (Fröhlich et al.), may subsequently be efficient for further developing knowledge, skills, and abilities.

10.2.5 Learning Activities and Age

Previous research indicates that older people are less interested in formal training (Kanfer & Ackerman, 2004; Livingstone, 1999; Warr, 2001; Warr & Birdi, 1998) and are offered fewer opportunities to attend them (Grima, 2011; Van Vianen, Dalhoeven, & de Pater, 2011). When older employees eventually participate in such training, their training performance is on average weaker compared to their younger colleagues (Colquitt, LePine, & Noe, 2000; Kubeck, Delp, Haslett, & McDaniel, 1996). These consistent findings suggest a negative relationship between chronological age and formal learning activity. Contrarily, Van der Heijden et al. (2009) found a positive relationship between chronological age and formal learning activities outside the current job's domain. Koller and Plath (2000) found no age-related differences in terms of attendance of formal learning activities.

Findings of studies researching a link between age and informal learning (and related concepts) are inconclusive: some studies find a decrease in informal learning with higher age (Gupta, Govindarajan, & Malhotra, 1999; Tikkanen, 2002; Van der Heijden et al., 2009), some found no effect (Livingstone, 1999; M. Schulz & Stamov-Roßnagel, 2010), and some found even positive relationships (Berg & Chyung, 2008; Kyndt, Dochy, & Nijs, 2009).

These inconsistent findings suggest that other factors than chronological age are more important when it comes to informal learning (Fröhlich et al., 2013a, 2013c). Individuals may be more in control of their own learning effort (Marsick & Watkins, 2001) and less dependent on employers' resources or others' stereotypes. This higher independence from the employer's budget is especially important for older employees, who are rarely sent to (often costly) trainings and workshops. Even negative self-perceptions may be circumvented, as informal learning is often not even perceived as learning by the learners themselves (Eraut, 2004, p. 249).

In conclusion, the relationships between chronological age, work-related learning, and employability are high on the agendas of both human resource development practitioners and researchers. However, especially the evidence for effects of chronological age is inconclusive. While this may be attributed to conceptual shortcomings of chronological age, research on other factors – e.g. individual and organizational obstacles – might provide more satisfying answers.

10.3 Individual Obstacles Related to the Learning of Aging Workers

Two of the most investigated individual factors influencing learning are the motivation and capability to learn. Both factors might explain age-related changes in learning behavior and employability.

10.3.1 Motivation to Learn

Motivation is a crucial factor in the process of learning. Noe (1986, p. 734) defines motivation to learn as a "*specific desire of the trainee to learn the content of the training program*". Motivation to learn is an important predictor of learning initiative and cognitive, emotional and behavioral engagement in learning (Eccles & Wigfield, 2002). In the literature it is often maintained that motivation to learn changes when aging: aging workers themselves often see little benefit of investing their time and effort in learning. They can harbor negative attitudes regarding the value of learning (Tikkanen, 2002), lack self-confidence (Kanfer & Ackerman, 2004), and have low self-efficacy or expectations of success of their engagement and persistence in the training (Maurer, 2001).

10.3.1.1 Two Perspectives of Age-Related Changes in Motivation to Learn

Two perspectives of age-related changes in motivation to learn can be found in literature (Gegenfurthner & Vauras, 2012). In the first perspective, a decline in motivation to learn with age is put forward while in the second perspective, a motivational maintenance is assumed.

Two age-related theories of motivation are relevant to explain why some authors assume a decrease of motivation to learn among aging workers. These theories are the expectancy theory in a life-span context (Kanfer & Ackerman, 2004) and the socio-emotional selectivity theory (Carstensen, 2006). Kanfer and Ackerman's theory is based on the cognitive changes related to the process of aging. The capacity related to the fluid intelligence (=cognitive processes underlying reasoning skills) decreases because of limited neuronal plasticity while the capacity related to the crystallized intelligence (=knowledge that comes from prior learning and past experiences) increases because of accumulated experience (see Sect. 10.3.2). According to the expectancy theory in a life-span context these cognitive changes impact work motivation. As motivation is a function of effort, performance and utility, aging workers need to expose much more effort in order to reach the same performance level as their younger colleagues. Lower effort-performance expectations due to cognitive retardation, will result in an age-related motivational decrease (Gegenfurtner & Vauras, 2012). Moreover, aging workers often attained the highest possible career level which

influences their perception of the utility of high performance and external rewards which go along with high performance (promotion, bonus etc.). Finally, these researchers also assume less effort for high performance because of a decrease in vocational interest with age. This life-span approach of expectancy theory leads to the conclusion that motivation to learn declines with age (Gegenfurtner & Vauras, 2012).

The perspective of age-related decrease in motivation to learn is also present in Carstensen's socio-emotional selectivity theory. In line with the expectancy theory, this theory also represents a lifespan theory of motivation. The socioemotional selectivity theory focuses on the role of people's time perspective in the pursuit of their goals. Carstensen (2006) and Mather and Carstensen (2005) state that when people perceive the time available in future as limited, they pursue goals directed towards psychological well-being and short-term benefits. Conversely, when people perceive time as open-ended, they prioritize goals related to knowledge acquisition, experiencing novelty and information gathering (Carstensen, 2006; Fröchlich et al., 2013a). When workers are thus approaching retirement age, they perceive their time at work as "time left" and will therefore focus on work goals related to the maintenance and optimization of emotional states instead of goals related to work-related learning and development (Gegenfurtner & Vauras, 2012). The reorganization of goals among aging workers is not caused by increased age as such, but rather by a shift in future time perspective (Meurant & Raemdonck, 2014). Several empirical studies have indeed demonstrated that increased chronological age is positively related to a narrow future time perspective which explains why older workers undertake fewer learning activities (e.g. De Lange, Bal, Van der Heijden, De Jong, & Schaufeli, 2011; Frohlich et al., 2013a; Zacher & Frese, 2009).

Contrary to the expectancy theory and the socioemotional selectivity theory (first perspective), the second perspective assumes an *age-related motivational maintenance*. In this perspective, motivation to learn remains constant across the working life. According to Gegenfurtner and Vauras (2012) this perspective is not represented by specific theories in educational psychology but is well supported in adult education literature (Knowles, 1975; Mackeracher, 2004; Tough, 1971 and in research on interest (Krapp, 2005), psychosocial research on aging (Atchley, 1989) and workplace curiosity (Reio & Choi, 2006). When Knowles introduced the term 'andragogy' in adult education literature, he described the adult learner as someone who (1) has an independent self-concept and who directs his or her own learning and (2) who is motivated to learn but rather by internal than by external factors. Tough found out that older adult learners engage yearly in several self-directed learning projects initiated by these adults themselves as a response to their daily needs and problems. In the research on interest, Krapp stated in his person-object theory of interest that the relation between an object and personal interest increases with time. Consequently, motivation to learn new content related to the object of interest would also increase with age as learners strive toward deepening their knowledge in relation to the object of interest (Gegenfurtner & Vauras). In psychosocial research on aging, Atchley (1989) states in his continuity theory of normal aging that, in making adaptive choices, middle-aged and older adults attempt to preserve and maintain existing internal (such as personality, beliefs) and external

(such as relationships, social roles) structures; and they prefer to accomplish this objective by using strategies tied to their past experiences of themselves and their social world. Continuity is thus an adaptive strategy that is promoted by both individual preference and social approval. Middle-aged and older adults will usually continue the same activities, behaviors, personalities, beliefs and relationships as they did in their earlier years of life. Motivation to learn is therefore consistent throughout the life course. At last, the perspective of age-related motivational maintenance is also found in the research on workplace curiosity. Curiosity positively influences socialization-related learning (Reio & Wiswell, 2000) and cognitive novelty seeking (Reio & Choi, 2006) among aging workers. As learning motivation is associated with curiosity, Gegenfurtner and Vauras conclude that motivation to learn continues over the course of a working life.

10.3.1.2 An Exemplary Empirical Study on Motivation to Learn

Research on motivation to learn and more specific on goal pursuit and the content of occupational goals in relation to age is still very limited. Differences in occupational goals should, however, be taken into account in order to motivate employees at work. Meurant, Raemdonck, Zacher, and Frenay (2012) surveyed 562 employees from different age groups and professions in Belgium. The researchers investigated employees' most important occupational goals and the relative importance of training and development goals. The results showed that employees who put forward goals in the area of organizational citizenship, team work and cooperation, and adjustable work hours were significantly older. Employees who prioritized goals from the areas of training and development, pay/career progression and new challenges were significantly younger. No age differences were found concerning goals related to employment security and well-being; both types of goals were equally important to all age groups. These results were partly in line with a research done by Zacher, Degner, Seevaldt, Frese, and Lüdde (2009) in a German sample of 150 employees working in the service sector. Zacher and colleagues also found that goals from the area of organizational citizenship were more important for older employees and goals from the area of training and pay/career more important to younger employees. After controlling for gender, education and work characteristics, no age-differences were found in the goal areas job security and well-being but, different than our results, also in the goal areas teamwork, working time, and new challenges. Furthermore, Meurant et al. (2012) also investigated the personal factors that explain the variation in importance attributed to training and development goals and in learning intention. Consistent with the theoretical framework developed by Carstensen (2006) and Kanfer and Ackerman (2004), the results showed that chronological age was a significant negative predictor of the importance assigned to training and development goals. As employees get older, they ascribe less importance to training and development goals. However, when the authors controlled for educational level and job tenure, the effect of age disappeared. More specifically, the lower the educational level and the more years working in the

same job, the less employees put forward training and development goals. The study also revealed that perceiving opportunities at work (one of the two dimensions of future time perspective) was mediating the relationships between age and importance of training and development goals and between job tenure and importance of training and development goals. In other words, these results indicate that increased age/job tenure leads to fewer perceived opportunities at work and in turn the employee pays less attention to training and development goals. This finding suggests that the extent to which individuals perceive learning opportunities in their work environment is a better proximal predictor of the workers' willingness to emphasize training and development goals than chronological age. Furthermore, the study by Meurant et al. showed that work centrality and learning self-efficacy were stronger predictors of importance assigned to training and development goals and that work centrality, learning self-efficacy and proactive personality were better predictors of intention to learn than chronological age. Finally, the results showed that importance attributed to training and development goals was positively related to intention to learn at work.

In conclusion, we state that chronological age in itself may not be the most important factor explaining differences in occupational goal preferences and more specifically in predicting why employees prioritize training and development goals. Age has a more indirect effect. Variables such as remaining opportunities at work, self-efficacy for learning, and work centrality are stronger predictors of importance assigned to training and development goals or intentions to learn. Similar conclusions were reached by Maurer, Weiss, and Barbeite (2003) and Maurer, Lippstreu, and Judge (2008) when they proposed and tested a comprehensive model of employee involvement in learning and development activity.

10.3.2 Capability to Learn

In addition to the issue related to the aging workers' motivation to learn, some researchers have studied the learning capacities of aging workers. In the literature it is stated that aging workers have less capability to learn in comparison to their younger colleagues, especially because of the general cognitive and sensorial decline associated with age. Aging employees are slower in performing learning tasks and experience more difficulties to reach the same performance level as younger workers at the end of a training program (Billett, Dymock, Johnson, & Martin, 2011; Gaillard & Desmette, 2010). This belief is consistent with the idea, highlighted in developmental psychology, of a *deceleration of cognitive functioning* with increased age. According to some authors (e.g. Horn & Cattel, 1967), two types of intellectual capabilities can be distinguished, each one being affected differently by the process of aging. As indicated before, fluid intelligence abilities (Gf) refer to the cognitive processes underlying reasoning skills. Gf is often associated with working memory, abstract reasoning and novel problem resolution (Kanfer & Ackerman, 2004). This kind of intelligence ability is sensitive to the effect of age and begins to decrease from the age of 25 (e.g. Schaie, 1996). Crystallized intelligence

abilities (Gc) involve knowledge that comes from prior learning and past experiences and that individuals accumulate across the lifespan. Gc continues thus to increase during adulthood. Another type of decline that may affect the learning capacities of aging workers is the *sensorial system*, such as a decline in audition, vision and perceptual/motor skills that could affect aging workers' capacities to learn new knowledge and skills (Czaja & Sharit, 2009). For example, aging workers may experience difficulties to perceive and comprehend visual information or difficulties in following the exchanges in a group conversation during a workshop.

This general decline in cognitive and sensorial domains impact the way aging workers acquire new knowledge and skills. A meta-analysis of Kubeck et al., (1996) showed that, indeed, aging workers completed the training tasks slower than their younger colleagues. They also needed more time to complete the training program and to acquire new skills and had less mastery of the training content. Kubeck et al. however also pointed out that many of the studies included in the meta-analysis were experimental studies, in which individuals were removed from their actual work context. In such experimental designs, individuals are asked to learn non work-related materials (for example, a list of words) and may therefore not be able to use the strategies elaborated in their work setting. The effect of chronological age may thus be overestimated. Furthermore, Kubeck et al. and Callahan, Kiker and Cross (2003) showed that the type of training may have impacted the relationship between chronological age and training outcomes. For example, having the opportunity to learn on one's own pace would reduce performance differences between younger and older workers (Kubeck et al.). Research from Schulz and Stamov-Roßnagel (2010) also demonstrated that in learning settings where aging workers had little control over their learning (i.e., time and instructional constraints set by external person) and where molecular learning took place (learning of relatively isolated and novel information in single training sessions), learning outcomes (such as performance) were less favorable. No age differences in learning outcomes were found in learning situations where workers were able to learn at their own pace and for learning tasks which allowed the use of everyday experience and general knowledge ("molar learning"). Finally, Charness (2009) stressed the importance of experience when learning to use software. Age differences were found in the novice groups, but performances were equivalent for the experienced users at the end of the training.

One could argue that the research related to the learning capability of aging workers pays little attention to the different strategies aging workers apply in order to compensate for the age-related changes. Charness (2008) pointed out that despite the cognitive and physical changes, aging workers have some cognitive plasticity to rely on. Baltes and Baltes' (1990) Selection Compensation Optimization theory is a relevant model to understand why some older workers developed cognitive plasticity and therefore are still actively engaged in learning activities. In the face of diminishing capabilities, aging adults become more *selective* about their time investment and choose to focus their efforts on some goals and activities on basis of their own motivation and the environmental constraints (Charness, 2009). O*ptimization* is the process through which individuals develop new ways to improve

their functioning in order to reach the selected goals. Finally, *compensation* refers to the facilities that individuals will establish in order to compensate the loss of capacities and the obstacles they encounter in the pursuit of their goals. For example, in the work context, older workers can choose to focus on the development of computer skills and renounce to learn a new language (selection). In order to accomplish this goal, the person can decide to take a longer time period to accomplish the training and to learn at his/her own pace (optimization). Finally, the older worker may use a dictaphone during the training sessions. Recording allows him/her to cope with hearing loss and/or lack of speed when taking notes (compensation). Active use of SOC strategies can have positive effects on older workers' self-efficacy for learning and participation in learning activities at work. These strategies might thus also be important for motivation to learn.

10.4 Organizational Obstacles Related to the Learning of Aging Workers

Besides individual factors, learning of aging workers is also influenced by organizational obstacles such as the discriminating age stereotypes and the lack of a supportive learning culture. Below we will elaborate on both organizational obstacles.

10.4.1 Discriminating Age Related Stereotypes

Workplace age stereotypes are beliefs and expectations about workers based on their age (Hamilton & Sherman, 1994). These opinions are mostly negative and inaccurate (Fiske & Neuberg, 1990). In general, research on age stereotypes indicates that older workers are perceived as being less motivated and having less ability to work, learn, and develop. It is believed that older workers are waiting for their retirement, resistant to using innovative technologies and to be less employable. They are thought of as slower at information processing and consequently having difficulties remaining up to date. In addition, it is believed that they have difficulties with dealing with new challenges in a flexible and creative way (Gaillard & Desmette, 2010). More specifically, in relation to learning and development of older workers even more negative stereotypes are in place: First, employers expect a lower return on investment from sending older employees to training and in contrast they see more future possibilities and potential in the younger workers, therefore investing less in training for the older employees (Fouarge & Schils, 2009; Van Selm & Van der Heijden, 2013). Second, research found that supervisors often believe that older workers are not able to work with new technologies, and therefore they do not train them to work with the new technologies and machines (Maurer, 2001).

Because of these age-related stereotypes, older workers might behave accordingly and lose self-confidence in their ability to learn.

However, not all stereotypes on older workers are negative (see also Chapter 3 by Lisa Finkelstein). For example, older employees are perceived as having more verbal and interpersonal skills, better social judgment and emotional balance. They are warmer and more friendly, more reliable and experienced (Cuddy & Fiske, 2002; Cuddy, Norton, & Fiske, 2005; Gaillard & Desmette, 2010; Segal, Qualls, & Smyer, 2010).

How should an organization that puts the learning and development of their (older) employees high on the agenda deal with those stereotypes then? For example, Gaillard and Desmette (2010) found that employees showed less early retirement intentions when they were exposed to positive stereotypic information than to negative or no stereotypic information. In addition, the employees who were confronted with positive stereotypic information were more highly motivated to learn and develop. Another example is given by Levy (1996) who found that age stereotypes can influence judgments about oneself and cognitive performance. More specifically, activating negative age stereotypes tended to worsen memory performance, memory self-efficacy and views of aging in old people. These research findings seem to indicate that avoiding negative stereotypes about older workers might have a positive effect on their learning and development and in turn their performance.

10.4.2 A Supportive Organizational Learning Climate for Aging Workers

In general, organizational support in terms of management, financial, technical or personnel support is a powerful lever to make employees learn. For example, it is important that organizations provide enough resources such as internet, books or financial aids because these means support employees in their daily work and learning efforts (Ellinger, 2005). However, most employers do not invest in older workers and older employees rarely receive on-the-job training (Pillay et al., 2006; Armstrong-Stassen, 2008). In contrast, employers prefer to invest in young potentials as they are perceived as being more productive, adaptable and open to change (Maurer, Barbeite, Weiss & Lippstreu, 2008). In general, until today 'the most prominent delivery method, with more than 60 % of organizations and companies implementing it, continues to be (traditional) instructor-led classrooms, where participants are considered as a container for a commodity called knowledge (Rehm, 2013, p. 2). U.S. organizations, for example, spent in 2009 approximately $125.88 billion on training and development activities (ASTD, 2010)', while older employees especially prefer more informal ways of learning (Schulz & Stamov-Roßnagel, 2010). In other words, when setting up learning and development programs organizations do not sufficiently take into account the preferences of older employees; they are not part of the organizational learning culture. Zwick (2011) concludes that the fact that firms do not offer the appropriate (informal) learning and development

programs might be seen as a reason for lower training effectiveness of older employees. Learning and development programs should pay more attention to training needs, interests and motivation of older employees. It is assumed that an organizational culture that incorporates these elements can strengthen the learning behavior of older workers (Marsick & Watkins, 2001). Moreover, it was argued that the learning culture is crucial for an employee's informal learning (Li et al., 2009; Marsick & Watkins, 2003). Knowing different people in the organization and having the possibility to ask questions as well as to seek for help, positively influenced an employee's informal learning. Next, it was found that open and active communication is crucial to facilitate informal learning (Jeon & Kim, 2012). However, Berg and Chyung (2008) did not find a significant relationship between organizational learning culture and informal learning. Choi and Jacobs (2011), also found no direct significant relationship with informal learning, but an indirect effect of the work environment on informal learning through formal learning was found.

Marsick and Watkins (2003) argue that an organizational learning culture is especially built by management who can influence employees' learning. They are in the position to set expectations and shape and support desired results. In turn these results can be measured and rewarded. Honey and Mumford (1996) indicate that a manager who wants to develop a learning culture needs to (1) model learning behavior and related practices, (2) plan and provide learning opportunities, (3) build in learning into the organizational processes and (4) act as a champion in learning. Employees need to be stimulated in practicing informal learning, have the resources in terms of time and space to experiment, exchange information and reflect upon that information (Ortenblad, 2004). In sum, an optimal learning culture knows mutual respect and trust, tolerant judgments, much collaboration and less competition and an eagerness to share what employees know and feel (Zarraga & Bonache, 2003).

10.5 Conclusions and Recommendations

Given the fast changing society and the aging workforce, practice and theory are paying more attention to the relationships between chronological age, work-related learning, and employability. However, research is not conclusive when it comes to effects of chronological age. One weakness is the difficulty to disentangle age effects from cohort effects (Hall et al., 2007; Hobcraft et al., 1982; Palmore, 1978). Furthermore, since people become more heterogeneous when they become older (Carstensen, 2006; Staudinger & Bowen, 2011), the less useful age is in predicting work-related learning. These effects may be attributed to conceptual shortcomings of chronological age. Moreover, in general a negative effect of age on learning and employability is found, however, when other variables such as tenure and future time perspective are taken into account in the same analysis, the effect of age is no longer significant. In addition, research on other individual and organizational factors might provide more satisfying answers. Examples of frequently researched

individual factors are motivation and capability to learn, which were both discussed in this chapter. The literature on motivation to learn reflects two perspectives. One the one hand, there is the expectancy value theory in a life-span context and the socio-emotional selectivity theory which argue for a decline in motivation to learn with age. On the other hand, there is a second perspective, building further on previous research streams such as the adult education literature which assumes a motivational maintenance. The literature on learning capabilities of older workers indicates a decline in cognitive and physical abilities. However, research indicated that older workers are able to develop strategies to compensate for those drawbacks. An organization may want to consider focusing on helping to train employees in selection, optimization and compensation strategy use (SOC). Next to individual obstacles, there are organizational obstacles that interfere in the learning and employability of older workers. First, we referred to stereotypes towards older workers and second we discussed the lack of a supportive learning culture as potential obstacle. With respect to the stereotypes towards aging workers, it can be concluded that negative stereotypes in general, as well as towards the learning and development of older workers, might prevent older workers from getting the support they need. In addition, a supportive organizational learning culture that takes into account the training needs, career expectations, interests, motivation and aspired work goals of older employees, might benefit their employability. In that way learning is more often done on a voluntary basis and one has more opportunities to pace learning in accordance with one's capabilities and needs. Therefore, learners might choose learning formats which suit better their particular learning needs and which increase opportunities for the use of experience-based strategies (crystalized intelligence) and professional knowledge (Schulz & Stamov-Roßnagel, 2010). Especially for older adult learners, informal self-directed learning in the workplace might offer more opportunities to compensate for cognitive aging effects, such as lower self-confidence (Schulz & Stamov-Roßnagel). For example, in order to deal with negative stereotypes towards older workers, Maurer, Wrenn, and Weiss (2003) suggest to set up coaching tracks in which an older employee coaches a younger employee in order to encourage younger employees to work and share expertise with older employees. Building further on research of Taylor, Crino, and Rubenfeld (1989) it could be expected that this will result in more positive impressions of job performance of aging workers. In sum, keeping up employability of all cohorts of employees not only depends upon personal learning initiatives, but also on adjusted public and organizational policies and related practices. The key to employability is the result of fruitful interaction between individuals and their environment.

10.5.1 Future Research Perspectives

Given the research reported above on age, learning and employability of older workers, various suggestions for future research can be formulated. First, concerning age, future research could look into different conceptualizations of age

(e.g. chronological age versus functional age) and their influence on learning and employability. Similarly, the concept of future time perspective as a proxy measure for age can contribute to a better insight into the relation between age, learning and employability. Second, making a distinction between groups of older workers, might give a more fine-grained view upon differences in their learning and employability. For example, a distinction could be made between workers based on their self-efficacy for learning or educational level. Especially lower educated older employees are a group at risk when it comes to learning and employability. Third, the formal and informal learning of aging employees and to which extent both contribute to employability should be studied in more detail. As reported above, it is suggested that older workers have a preference for informal learning situations, since it allows self-pacing. The question remains how to characterize their informal learning and how to support it. Intervention studies on the informal learning of aging workers could be set up, for example, by means of coaching trajectories in which older and younger workers collaborate and exchange expertise. Fourth, interventions could also be set up in order to test how stereotypes about older workers can be avoided or changed. For example, training could be organized in which supervisors reflect on their thinking towards older workers. By making supervisors aware of stereotypical thinking and its consequences, the intervention could change the way they approach and support older workers. Fifth, research on the use of compensation strategies in real learning situations is poorly investigated. Future research could focus on appropriateness of different strategies depending on the difficulty of the learning task (e.g. routine versus complex learning task). Finally, future research should look further into the relation between organizational learning culture, older employees learning and their employability, by combining quantitative and qualitative methods, and comparing characteristics of different organizational settings. For example, differences in culture could be expected between profit and non-profit organizations or a competitive or collaborative working environment.

References

American Society of Training and Development. (2010). *State of the industry report*. Alexandria, VA: ASTD.

Armstrong-Stassen, M. (2008). Human resource practices for mature workers – And why aren't employers using them? *Asia Pacific Journal of Human Resources, 46*, 334–352.

Armstrong-Stassen, M., & Schlosser, F. (2008). Benefits of a supportive development climate for older workers. *Journal of Managerial Psychology, 23*(4), 419–437.

Atchley, R. C. (1989). A continuity theory of normal aging. *The Gerontologist, 29*(2), 183–190.

Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioural sciences* (pp. 1–34). NewYork: Cambridge University Press.

Berg, S. A., & Chyung, S. Y. (2008). Factors that influence informal learning in the workplace. *Journal of Workplace Learning, 20*(4), 229–244.

Berntson, E., Näswall, K., & Sverke, M. (2008). Investigating the relationship between employ - ability and self-efficacy: A cross-lagged analysis. *European Journal of Work and Organizational Psychology, 17*(4), 413–425.

Billett, S., Dymock, D., Johnson, G., & Martin, G. (2011). Overcoming the paradox of employers' views about older workers. *The International Journal of Human Resource Management, 22*, 1248–1261.

Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of training: A meta-analytic review. *Journal of Management, 36*(4), 1065–1105.

Bozionelos, N. (2003). Intra-organizational network resources: Relation to career success and personality. *International Journal of Organizational Analysis, 11*(1), 41–66.

Briscoe, J. P., Hall, D. T., & Frautschy DeMuth, R. L. (2006). Protean and boundaryless careers: An empirical exploration. *Journal of Vocational Behavior, 69*(1), 30–47.

Brown, P., & Hesketh, A. (2004). *The mismanagement of talent: Employability and jobs in the knowledge economy* (p. 288). Oxford, UK: Oxford University Press.

Callahan, J. S., Kiker, D. S., & Cross, T. (2003). Does method matter? A meta-analysis of the effects of training method on older learner training performance. *Journal of Management, 29*(5), 663–680.

Carstensen, L. L. (2006). The influence of a sense of time on human development. *Science, 312*(5782), 1913–1915.

CEDEFOP. (2008). *Terminology of European education and training policy*. Luxembourg, Luxembourg: Office for Official Publications of the European Communities.

Charness, N. (2008). Technology as multiplier effect for an aging work force. In K. W. Schaie & R. Abeles (Eds.), *Social structures and aging individuals: Continuing challenges* (pp. 167–192). New York: Springer.

Charness, N. (2009). Skill acquisition in older adults: Psychological mechanisms. In S. J. Czaja & J. Sharit (Eds.), *Aging and work: Issues and implications in a changing landscape* (pp. 232–258). Baltimore: Johns Hopkins University Press.

Choi, W., & Jacobs, R. L. (2011). Influences of formal learning, personal learning orientation, and supportive learning environment on informal learning. *Human Resource Development Quarterly, 22*, 239–257.

Colquitt, J. A., LePine, J. A., & Noe, R. A. (2000). Toward an integrative theory of training motiva- tion: A meta-analytic path analysis of 20 years of research. *Journal of Applied Psychology, 85*(5), 678–707.

Cross, J. (2007). *Informal learning: Rediscovering the natural pathways that inspire innovation and performance*. San Francisco: Pfeiffer.

Cuddy, A. J. C., & Fiske, S. T. (2002). Doddering, but dear: Process, content, and function in stereotyping of older persons. In T. Nelson (Ed.), *Ageism: Stereotyping and prejudice against older persons* (pp. 3–26). Cambridge, MA: MIT Press.

Cuddy, A. J., Norton, M. I., & Fiske, S. T. (2005). This old stereotype: The pervasiveness and persistence of the elderly stereotype. *Journal of Social Issues, 61*, 267–285.

Czaja, S. J., & Sharit, J. (2009). Preparing organizations and workers for current and future employment: Training and retraining. In S. J. Czaja & J. Sharit (Eds.), *Aging and work: Issues and implications in a changing landscape* (pp. 232–258). Baltimore: Johns Hopkins University Press.

De Lange, A. H., Bal, P. M., Van der Heijden, B. I. J. M., De Jong, N., & Schaufeli, W. B. (2011). When I'm 64: Psychological contract breach, work motivation and the moderating roles of future time perspective and regulatory focus. *Work & Stress, 25*, 338–354.

De Lange, A. H., Taris, T., Jansen, P., Smulders, P., Houtman, I., & Kompier, M. A. J. (2006). Age as factor in the relation between work and mental health: Results of the longitudinal TAS survey. In J. Houdmont & S. McIntyre (Eds.), *Occupational health psychology* (Vol. 1, pp. 21–45). Maia, Portugal: ISMAI Publications.

Dymock, D., Billett, S., Klieve, H., Johnson, G., & Martin, G. (2012). Mature age white collar workers training and employability. *International Journal of Lifelong Education, 31*(2), 171–186.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology, 53*(1), 109–132.

Ellinger, A. D. (2005). Contextual factors influencing informal learning in the workplace setting: The case of 'reinventing itself company'. *Human Resource Development Quarterly, 16*(3), 389–415.

Eraut, M. (2004). Informal learning in the workplace. *Studies in Continuing Education, 26*(2), 247–273.

Eraut, M. (2007). Learning from other people in the workplace. *Oxford Review of Education, 33*(4), 403–422.

Erikson, E. (1997). *The life cycle completed: Extended version*. New York: W. W. Norton & Company.

Fiske, S. T., & Neuberg, S. L. (1990). A continuum of impressions formation, from category-based to individuating processes: Influence of information on attention and interpretation. *Advances in Experimental Social Psychology, 23*, 1–63.

Ford, J. K., & Weissbein, D. A. (1997). Transfer of training: An updated review and analysis. *Performance Improvement Quarterly, 10*(2), 22–41.

Fouarge, D., & Schils, T. (2009). The effect of early retirement incentives on the training participation of older workers. *Labour, 23*, 85–109.

Fröhlich, D. E., Beausaert, S. A. J., & Segers, M. S. R. (2013a). *The 3-A model of employability: Age, attitudes, activities. Conceptualizing older employees' work-related learning for employability* (manuscript submitted for publication).

Fröhlich, D. E., Beausaert, S. A. J., & Segers, M. S. R. (2013b). *Learning to stay employable: The relationship between age, formal and informal learning, and employability*. Paper presented at the meeting of EARLI, Munich.

Fröhlich, D. E., Beausaert, S. A. J., & Segers, M. S. R. (2013c). *It's all about the attitudes, not the age: The role of future time perspective and goal orientation for older employees' employability*. Paper presented at the meeting of EARLI, Munich.

Fugate, M., Kinicki, A. J., & Ashforth, B. E. (2004). Employability: A psycho-social construct, its dimensions, and applications. *Journal of Vocational Behavior, 65*(1), 14–38.

Gaillard, M., & Desmette, D. (2010). (In)validating stereotypes about older workers influences their intentions to retire early and to learn and develop. *Basic and Applied Social Psychology, 32*, 86–98.

Gegenfurtner, A., & Vauras, M. (2012). Age-related differences in the relation between motivation to learn and transfer of training in adult continuing education. *Contemporary Educational Psychology, 37*, 33–46.

Grima, F. (2011). The influence of age management policies on older employee work relationships with their company. *The International Journal of Human Resource Management, 22*(6), 1312–1332.

Groot, W., & van den Brink, H. M. (2000). Education, training and employability. *Applied Economics, 32*, 573–581.

Gupta, A. K., Govindarajan, V., & Malhotra, A. (1999). Feedback-seeking behavior within multinational corporations. *Strategic Management Journal, 20*, 205–222.

Hall, B. H., Mairesse, J., & Turner, L. (2007). Identifying age, cohort, and period effects in scientific research productivity: Discussion and illustration using simulated and actual data on French physicists. *Economics of Innovation and New Technology, 16*(2), 37–41.

Hall, D. T. (2004). The protean career: A quarter-century journey. *Journal of Vocational Behavior, 65*(1), 1–13.

Hamilton, D. L., & Sherman, J. W. (1994). Stereotypes. In R. S. Wyer Jr. & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed., Vol. 2, pp. 1–68). Hillsdale, NJ: Erlbaum.

Hillage, J., & Pollard, E. (1998). *Employability: Developing a framework for policy analysis*. London: Department for Education and Employment.

Hobcraft, J., Menken, J., & Preston, S. (1982). Age, period, and cohort effects in demography: A review. *Population Index, 48*(1), 4–43.

Honey, P., & Mumford, A. (1996). *How to manage your learning environment*. Maidenhead, UK: Peter Honey.

Horn, J. L., & Cattel, R. B. (1967). Age differences in fluid and crystallized intelligence. *Acta Psychologica, 26*, 107–129.

Ilmarinen, J. E. (2001). Aging workers. *Occupational and Environmental Medicine, 58*(8), 546–552.

Jeon, K. S., & Kim, K.-N. (2012). How do organizational and task factors influence informal learning in the workplace? *Human Resource Development International, 15*, 209–226.

Kanfer, R., & Ackerman, P. L. (2004). Aging, adult development, and work motivation. *Academy of Management Review, 29*(3), 440–458.

Knowles, M. S. (1975). *Self-directed learning. A guide for learners and teachers*. New York: Association Press.

Koller, B., & Plath, H.-E. (2000). Qualifikation und Qualifizierung älterer Arbeitnehmer [Qualification of older employees]. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, 33*(1), 112–125.

Krapp, A. (2005). Structural and dynamic aspects of interest development: Theoretical considerations from an ontogenetic perspective. *Learning and Instruction, 12*, 383–409.

Kubeck, J. E., Delp, N. D., Haslett, T. K., & McDaniel, M. A. (1996). Does job-related training performance decline with age? *Psychology and Aging, 11*(1), 92–107.

Kyndt, E., Dochy, F., & Nijs, H. (2009). Learning conditions for non-formal and informal work - place learning. *Journal of Workplace Learning, 21*(5), 369–383.

Lang, F. R., & Carstensen, L. L. (2002). Time counts: Future time perspective, goals, and social relationships. *Psychology and Aging, 17*(1), 125–139.

Levy, B. (1996). Improving memory in old age through implicit self-stereotyping. *Journal of Personality and Social Psychology, 71*, 1092–1107.

Li, J., Brake, G., Champion, A., Fuller, T., Gabel, S., & Hatcher-Busch, L. (2009). Workplace learning: The roles of knowledge accessibility and management. *Journal of Workplace Learning, 21*, 347–364.

Livingstone, D. W. (1999). Exploring the icebergs of adult learning: Findings of the first Canadian survey of informal learning practices. *Canadian Journal for the Study of Adult Education, 13*(2), 49–72.

Livingstone, D. W. (2001). *Adults' informal learning: Definitions, findings, gaps and future research*. Toronto, Canada: Centre for the Study of Education and Work.

MacKeracher, D. (2004). *Making sense of adult learning*. Toronto, Canada: University of Toronto Press.

Marsick, V. J., & Watkins, K. E. (2001). Informal and incidental learning. *New Directions for Adult and Continuing Education, 2001*(89), 25–34.

Marsick, V. J., & Watkins, K. E. (2003). Demonstrating the value of an organization's learning culture: The dimensions of the learning organization questionnaire. *Advances in Developing Human Resources, 5*(2), 132–151.

Mather, M., & Carstensen, L. L. (2005). Aging and motivated cognition: The positivity effect in attention and memory. *Trends in Cognitive Science, 9*, 496–502.

Maurer, T. (2001). Career-relevant learning and development, worker age, and beliefs about self-efficacy for development. *Journal of Management, 27*, 123–140.

Maurer, T., Weiss, M., & Barbeite, F. (2003). A model of involvement in work-related learning and development activity: The effects of individual, situational, motivational and age variables. *Journal of Applied Psychology, 88*(4), 707–724.

Maurer, T., Wrenn, K., & Weiss, E. (2003). Toward understanding and managing stereotypical beliefs about older workers' ability and desire for learning and development. *Research in Personnel and Human Resources Management, 22*, 253–285.

Maurer, T. J., Barbeite, F. G., Weiss, E. M., & Lippstreu, M. (2008). New measures of stereotypical beliefs about older workers' ability and desire for development. Exploration among employees age 40 and over. *Journal of Managerial Psychology, 23*, 395–418.

Maurer, T. J., Lippstreu, M., & Judge, T. A. (2008). Structural model of employee involvement in skill development activity: The role of individual differences. *Journal of Vocational Behavior, 72*, 336–350.

McDonald, P., Brown, K., & Bradley, L. (2005). Have traditional career paths given way to protean ones? Evidence from senior managers in the Australian public sector. *Career Development International, 10*(2), 109–129.

Meurant, C., & Raemdonck, I. (2014). Travailleur agé et apprentissage. In E. Bourgeois & S. Enlar (Eds.), *Apprendre dans l'entreprise* (Collection "Apprendre"). Paris: Presses Universitaires de France.

Meurant, C., Raemdonck, I, Zacher, H., & Frenay, M. (2012). *Antecedents of older workers' commitment in work-related learning goals*. Poster session presented at the meeting of EARLI SIG 14, Antwerp.

Mor-Barak, M. E. (1995). The meaning of work for older adults seeking employment: The generativity factor. *International Journal of Aging and Human Development, 41*(4), 325–344.

Nielsen, J. (1999). Employability and workability among Danish employees. *Experimental Aging Research, 25*(4), 393–397.

Noe, R. A. (1986). Trainees' attributes and attitudes: Neglected influences on training effective - ness. *Academy of Management Review, 11*, 736–749.

Ortenblad, A. (2004). The learning organization: Towards an integrated model. *The Learning Organization, 11*(2), 129–144.

Palmore, E. (1978). When can age, period, and cohort be separated? *Social Forces, 57*(1), 282–295.

Pillay, H., Kelly, K., & Tones, M. (2006). Career aspirations of older workers: An Australian study. *International Journal of Training and Development, 10*, 298–305.

Raemdonck, I. (2006). *Self-directedness in learning and career processes. A study in lower-qualified employees in Flanders*. Doctoral dissertation, Ghent University, Ghent, Belgium.

Raemdonck, I., Tillema, H., Grip, A., Valcke, M., & Segers, M. (2012). Does self-directedness in learning and careers predict the employability of low-qualified employees? *Vocations and Learning, 5*(2), 137–151.

Raemdonck, I., Van der Leeden, R., Valcke, M., Segers, M. S. R., & Thijssen, J. (2012). Predictors of self-directed learning for low-qualified employees: a multi-level analysis. *Vocations and Learning, 36*(6), 572–591.

Rehm, M. (2013). *Unified yet separated: Empirical study on the impact of hierarchical positions within communities of learning.* Doctoral dissertation, Maastricht University, Maastricht, The Netherlands.

Reio, T. G., Jr., & Choi, N. (2006). Novelty seeking in adulthood: Increases accompany decline. *Journal of Genetic Psychology, 165*, 119–133.

Reio, T. G., Jr., & Wiswell, A. (2000). Field investigation of the relationship among adult curiosity, workplace learning, and job performance. *Human Resource Development Quarterly, 11*, 5–30.

Rodriguez, D., Patel, R., Bright, A., Gregory, D., & Gowing, M. K. (2002). Developing competency models to promote integrated human resource practices. *Human Resource Management, 41*(3), 309–324.

Rothwell, A., & Arnold, J. (2007). Self-perceived employability: Development and validation of a scale. *Personnel Review, 36*(1), 23–41.

Sanders, J., & de Grip, A. (2004). Training, task flexibility and low-skilled workers' employability. *International Journal of Manpower, 25*(1), 73–89.

Sanders, M. J., & McCready, J. W. (2010). Does work contribute to successful aging outcomes in older workers. *International Journal of Aging and Human Development, 71*(3), 209–229.

Schaie, K. W. (1996). *Intellectual development in adulthood: The Seattle longitudinal study*. New York: Cambridge University Press.

Schalk, R., van Veldhoven, M., De Lange, A. H., De Witte, H., Kraus, K., Stamov-Roßnagel, C., et al. (2010). Moving European research on work and aging forward: Overview and agenda. *European Journal of Work and Organizational Psychology, 19*(1), 76–101.

Schulz, M., & Stamov-Roßnagel, C. (2010). Informal workplace learning: An exploration of age differences in learning competence. *Learning and Instruction, 20*(5), 383–399.

Schulz, R., & Heckhausen, J. (1996). A life span model of successful aging. *The American Psychologist, 51*(7), 702–714.

Segal, D. L., Qualls, S. H., & Smyer, M. A. (2010). *Aging and mental health*. New York: Wiley.

Sharkey, B. J. (1987). Functional vs chronologic age. *Medicine and Science in Sports and Exercise, 19*(2), 174–178.

Staudinger, U. M., & Bowen, C. E. (2011). A systemic approach to aging in the work context. *Zeitschrift für ArbeitsmarktForschung, 44*(4), 295–306.

Stephan, Y., Demulier, V., & Terracciano, A. (2012). Personality, self-rated health, and subjective age in a life-span sample: The moderating role of chronological age. *Psychology and Aging, 27*(4), 875–880.

Sterns, H. L., & Miklos, S. M. (1995). The aging worker in a changing environment : Organizational and individual issues. *Journal of Vocational Behavior, 47*, 248–268.

Super, D. E. (1980). A life-span, life-space approach to career development. *Journal of Vocational Behavior, 16*, 282–298.

Symons, D. K. (2011). Psychological age. In S. Goldstein & J. A. Naglieri (Eds.), *Encyclopedia of child behavior and development* (p. 1180). New York: Springer.

Taylor, G. S., Crino, M. D., & Rubenfeld, S. (1989). Coworker attributes as potential correlates to the perceptions of older workers' job performance: An exploratory study. *Journal of Business and Psychology, 3*, 449–458.

Tikkanen, T. (2002). Learning at work in technology intensive environments. *Journal of Workplace Learning, 14*(3), 89–97.

Tough, A. M. (1971). *The adults' learning projects*. Toronto, Canada: Ontario Institute for Studies in Education.

Tynjälä, P. (2012). Toward a 3-P model of workplace learning: A literature review. *Vocations and Learning, 6*(1), 11–36.

Van der Heijde, C. M., & van der Heijden, B. I. J. M. (2006). A competence-based and multidimensional operationalization and measurement of employability. *Human Resource Management, 45*(3), 449–476.

Van der Heijden, B. I. J. M. (2002). Prerequisites to guarantee life-long employability. *Personnel Review, 31*(1), 44–61.

Van der Heijden, B. I. J. M., Boon, J., van der Klink, M. R., & Meijs, E. (2009). Employability enhancement through formal and informal learning: An empirical study among Dutch non-academic university staff members. *International Journal of Training and Development, 13*(1), 19–37.

Van der Rijt, J., Van den Bossche, P., van de Wiel, M. W. J., Segers, M. S. R., & Gijselaers, W. H. (2012). The role of individual and organizational characteristics in feedback-seeking behavior in the initial career stage. *Human Resource Development International, 15*(3), 283–301.

Van Loo, J. (2005). *Training, labor market outcomes, and self-management*. Doctoral dissertation, Utrecht University, Utrecht, The Netherlands.

Van Selm, M., & Van der Heijden, B. I. (2013). Communicating employability enhancement throughout the life-span: A national intervention program aimed at combating age-related stereotypes at the workplace. *Educational Gerontology, 39*, 259–272.

Van Veldhoven, M., & Dorenbosch, L. (2008). Age, proactivity and career development. *Career Development International, 13*(2), 112–131.

Van Vianen, A. E. M., Dalhoeven, B. A. G. W., & de Pater, I. E. (2011). Aging and training and development willingness: Employee and supervisor mindsets. *Journal of Organizational Behavior, 32*(2), 226–247.

Warr, P. (2001). Age and work behaviour: Physical attributes, cognitive abilities, knowledge, personality traits and motives. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology*. London: Wiley.

Warr, P., & Birdi, K. (1998). Employee age and voluntary development activity. *International Journal of Training and Development, 2*(3), 190–204.

Wittekind, A., Raeder, S., & Grote, G. (2010). A longitudinal study of determinants of perceived employability. *Journal of Organizational Behavior, 31*(4), 566–586.

Wright, P. M., & Snell, S. A. (1998). Toward a unifying framework for exploring fit and flexibility in strategic human resource management. *Academy of Management Review, 23*(4), 756–772.

Zacher, H., Degner, M., Seevaldt, R., Frese, M., & Lüdde, J.(2009). Was wollen jüngere und ältere Erwerbstätige erreichen? Altersbezogene Unterschiede in den Inhalten und Merkmalen beruflicher Ziele [What do younger and older workers want to accomplish? Age-related differences in content and characteristics of occupational goals]. *Zeitschrift für Personalpsychologie, 8*, 191–200.

Zacher, H., & Frese, M. (2009). Remaining time and opportunities at work: Relationships between age, work characteristics, and occupational future time perspective. *Psychology and Aging, 24*, 487–493.

Zarraga, C., & Bonache, J. (2003). Assessing the team environment for knowledge sharing: An empirical analysis. *The International Journal of Human Resource Management, 14*(7), 1227–1245.

Zwick, T. (2011). *Why training older employees is less effective* (ZEW Discussion Papers No. 11- 046). Retrieved from http://nbn-resolving.de/urn:nbn:de:bsz:180-madoc-32005