

What about time? Examining chronological and subjective age and their relation to work motivation

Examining
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and subjective
age

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Abstract

Purpose – The aging workforce is becoming an increasingly important topic in today's labor market. However, most scientific research and organizational policies focus on chronological age as the main determinant of successful aging. Based on life span developmental theories – primarily socioemotional selectivity theory and motivational theory of life span development – the purpose of this paper is to test the added value of using subjective age – in terms of remaining opportunities and remaining time – over and above chronological age in their associations with motivation at work and motivation to work.

Design/methodology/approach – Workers from five different divisions throughout the Netherlands ($n = 186$) from a taxi company participated in the survey study.

Findings – The results from the regression analyses and structural equation modeling analyses support the hypotheses: when subjective age was included in the models, chronological age was virtually unrelated to workers' intrinsic motivation, extrinsic motivation, and motivation to continue to work for one's organization. Moreover, subjective age was strongly related to work motivation. Specifically, workers who perceived many remaining opportunities were more intrinsically and extrinsically motivated, and those who perceived a lot of remaining time were more motivated across the board.

Originality/value – The findings indicate that subjective age is an important concept to include in studies focussing on successful aging, thereby contributing to life span developmental theories. Further implications for research and practice are discussed.

Keywords Age, Work motivation, Future time perspective, Remaining opportunities, Remaining time

Paper type Research paper



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Organizations are facing a graying workforce. The percentage of people in Europe aged 60 or older is expected to increase from 24 percent currently to 34 percent in 2050 (United Nations, 2015). For the Netherlands, these percentages are 24.5-33.2 percent, respectively. In addition, the Dutch government is gradually increasing the retirement age from 65 to 67, and even further after several years. As a result, the average retirement age has already markedly increased (Central Bureau for Statistics, 2015). Because workforces are aging, a topical question organizations are currently confronted with is how to better understand and intervene on factors that can enhance their older workers' motivation as a basis for their sustainable employability. This is especially important because older workers are needed to continue working longer in order to prevent the Dutch workforce from shrinking (Central Bureau for Statistics, 2012), and hence ensure that organizations will not face labor shortages.

Virtually all of the literature on aging and work motivation, and on age-related policies and practices implemented by organizations predominantly focus on individual's chronological age (e.g. Inceoglu *et al.*, 2009). However, research thus far indicates that the traditional stereotypical view about work motivation declining with age is actually not true (Posthuma and Campion, 2009). Contrary to the traditional notion that employees respond to declining capabilities over time with reduced work motivation, the contemporary perspective argues that the relationship between age and motivation is far more complex (Kanfer and Ackerman, 2004; Kochoian *et al.*, 2016). More specifically, since age serves as a general proxy for age-related changes that influence work motivation, the age variable, as such, is an empty variable and other conceptualizations of age are more relevant (Kooij *et al.*, 2008). As a result, it is not surprising that scholars (e.g. Baltes *et al.*, 2014; Kooij *et al.*, 2008) have already suggested that more theory-based research should be conducted on relations between different age conceptualizations, underlying age-related processes, and work motivation. In line with this reasoning, recent studies have started to explore conceptualizations of age that might be better suited for explaining employees' motivation (e.g. Kooij *et al.*, 2013). In addition, several scholars (e.g. Baltes *et al.*, 2014; Kanfer and Ackerman, 2004) have argued that the relationship between age and work motivation may also differ depending on the specific type of work motivation that is taken into account, herewith stressing the need to examine different types of work motivation as correlates of different types of age-related phenomena.

Based on the outline given above, we will both incorporate multiple conceptualizations of age (i.e. chronological and subjective age) and multiple conceptualizations of work motivation (i.e. intrinsic and extrinsic motivation, and motivation to continue to work in one's current organization). This leads us to formulate the following central research question:

RQ1. What are the relationships between chronological and subjective age on the one hand, and intrinsic work motivation, extrinsic work motivation, and motivation to continue working for one's organization on the other hand?

As such, this paper contributes to the existing literature by studying different conceptualizations of age and work motivation in tandem, thereby allowing us to examine the relative importance of each dimension of age in relation to different facets of work motivation. Providing a better understanding of the role of different conceptualizations of age in light of work motivation will advance theory in this field, which has rarely incorporated age-related changes up to now, and as such has not really captured yet the work motivation of aging workers (Kanfer and Ackerman, 2004).

In the following, we will first present an overview of different conceptualizations of age and of work motivation. Next, we will formulate hypotheses regarding the relationships between (chronological and subjective) age, on the one hand, and intrinsic work motivation, extrinsic work motivation, and motivation to continue working for one's organization, on the other hand. Subsequently, we will present our methods and design, our results, and our theoretical and practical implications.

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Conceptualization of age

According to life span developmental theories, ageing refers to changes that occur in biological, psychological, and social functioning over time and, therefore, affect each individual at the personal, organizational, and societal level (De Lange *et al.*, 2006; Sterns and Miklos, 1995). In line with earlier work of De Lange *et al.* (2006) and McCarthy *et al.* (2014), we will use two approaches to examine the impact of age: a chronological approach, based on one's chronological age, and a subjective approach, based on one's subjective or self-perceived age, and which might be more important than chronological age as it is depending on the work context (Cleveland and Shore, 1992). More specifically, in this study, we will examine remaining opportunities (RO; i.e. perception of how many opportunities are left) and remaining time (RT; i.e. perception of how much time is left) (Zacher and Frese, 2009). Although Zacher and Frese focus on remaining opportunities and remaining time at work, in line with the life span theories we use, we include RO and RT in life (i.e. a more general focus).

Conceptualization of time perspective

Sonnentag (2012) argues that new conceptualizations of time are necessary because it is an important variable in organizational research that is rarely examined properly. The socioemotional selectivity theory (SST; Carstensen, 2006) focusses on the motivational consequences of a changing "temporal horizon." SST hypothesizes that individuals will select goals in accordance with their perceptions of the future as being either limited or open-ended (Lang and Carstensen, 2002). This future time perspective (FTP) can be defined as "individual's perceptions of his or her remaining time to live and/or the opportunities and goals available within that time" (Lang and Carstensen, 2002, p. 125). In line with our conceptualization of subjective age, FTP can be either measured as an opportunity-focussed variable (i.e. RO), or as a time-focussed variable (i.e. RT) (Zacher and Frese, 2009). An open focus on things to come (i.e. open-ended FTP) refers to beliefs that one has a long future time full of new goals, plans, and possibilities. A focus on limitations (i.e. limited FTP) refers to one's beliefs of having a short future time characterized by constraints and limited possibilities (Zacher and De Lange, 2011). This open-ended and limited perspective can apply to both the opportunity and the time dimension of FTP. As such, individual employees can perceive they have a lot of remaining time vs that their time is running out, and they can perceive that their future is full of opportunities vs that their future is characterized by constraints.

Carstensen (2006) points out that chronological age becomes less important than subjective sense of time when one grows older. In addition, this subjective sense (i.e. FTP) is the main driver of goal selection and goal pursuit. According to SST, younger people perceive time as open-ended – holding a "time since birth" perspective – and will therefore be especially motivated by growth or knowledge-related goals (e.g. new information) that may be useful in the more distant future. In contrast, older people perceive time as limited – holding a "time until death" perspective – and

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will, therefore, be especially motivated by achieving short-term emotion-related goals, such as deepening one's existing relations. However, Carstensen (2006) notes that the subjective time horizon is an independent construct that can develop separately from chronological age. SST has received strong empirical support in many studies, demonstrating that open-ended vs limited time perspectives can significantly influence worker outcomes such as motivation and engagement (cf. Carstensen, 2006; Carstensen *et al.*, 2003; Huxhold *et al.*, 2013; Kooij *et al.* 2016). In addition, several studies (e.g. De Bilde *et al.*, 2011; Kooij *et al.*, 2014) have demonstrated the importance of studying the motivating effect of FTP on work behavior up and above chronological age, which is in line with the SST (Carstensen, 2006). Based on the above, we conclude that one's subjective age (i.e. remaining opportunities and remaining time) may be a more important predictor of work motivation than chronological age.

Conceptualization of work motivation

Work motivation can be conceptualized in several ways. In light of the aging workforce, Kanfer *et al.* (2013, p. 255) distinguished motivation at work, pertaining to "cognitions, affect, and behaviors directed toward job accomplishments" and motivation to work, pertaining to "cognitions, affect, and behaviors related to participation in an observable work arrangement." Here, we will focus on intrinsic and extrinsic work motivation at work, and motivation to continue to work in one's current organization. In terms of motivation to work, Deci (1972) argues that a person is intrinsically motivated if (s)he performs an activity for no apparent reward, except for performing the activity itself. The person likes to engage in the activity, since (s)he gets a good feeling from it (Ryan and Deci, 2000). In addition, extrinsic motivation, on the other hand, comprises the motivation that is determined by outcomes that are external of the task itself (Ryan and Deci, 2000). An example of extrinsic motivation is a manifest reward or avoidance of punishment. As an indicator of motivation at work, motivation to continue to work in one's current organization can be described as the motivation to work and to keep working in one's current organization. According to Higgs *et al.* (2003), a traditional work ethic, enjoying the work, and financial grounds are examples of reasons for older workers to be motivated to continue to work. In addition, Kooij *et al.* (2014) demonstrated that motivation to continue working can indeed be influenced by having an expansive FTP.

Connecting age to intrinsic work motivation

Based on the life span theory of control (Heckhausen and Schulz, 1995), which preceded the motivational theory of life span development (MTLD; Heckhausen *et al.*, 2010), we argue that there is a positive relationship between chronological age and intrinsic work-related motives. MTLD proposes that individuals change the strategies they use to control their situation over the life span. Specifically, during young adulthood, individuals rely more on externally oriented primary control strategies (e.g. persistence in goal striving) that emphasize extrinsic outcomes, whereas during later adulthood, they appear to rely more on secondary control strategies (e.g. positive reappraisal) that involve self-directed cognitive processing, and thus emphasize intrinsic outcomes. In addition, Kanfer and Ackerman (2004) proposed that the strength of intrinsic motives related to promoting positive affect and protecting self-concept increases over the life span. Moreover, they argued that age-related shifts in the perceived utility of performance increase the salience of intrinsic job features related to the work itself.

In line with these propositions, Rhodes (1983) found in her review that chronological age was positively correlated to intrinsic motivation. Although the relationship appeared to be weak, only 7 percent of the total variance in motivation was explained by chronological age, recent meta-analyses (Kooij *et al.*, 2011; Ng and Feldman, 2010) confirmed this positive relationship.

The SST (Carstensen, 1995) proposes that the aforementioned relations between age and intrinsic work motivation may be explained by the change in the perception of time, rather than by chronological age. More specifically, according to SST, individuals select goals in accordance with their perceptions of the future as being either open-ended or limited. When remaining opportunities and time are perceived as more open, the main goal is knowledge acquisition through experiencing novelty, gathering information, and expanding one's breadth of knowledge. When time is perceived as limited, though, the main goal is emotion regulation, characterized by goals aimed at deriving emotional meaning, which are sometimes realizable in their very pursuit (Carstensen, 2006). Thus, individuals who perceive expansive opportunities and time will be primarily guided by instrumental, external goals (e.g. getting a promotion), and less so by intrinsic goals (e.g. finding meaning) (Carstensen, 2006). Contrarily, individuals who perceive limited remaining opportunities and time will likely be led by intrinsic goals such as doing meaningful tasks, in order to fulfill their emotional needs (Kooij and Van de Voorde, 2011).

Thus, based on MTLT, Kanfer and Ackerman's (2004) proposition, and SST, we expect that chronological age will be positively associated with intrinsic motivation to work. Furthermore, we expect that subjective age in terms of an open-ended perception of remaining opportunities and remaining time, will be negatively associated with intrinsic motivation to work. In addition, following De Bilde *et al.* (2011), Kooij *et al.* (2014), and Sonnentag (2012), we expect subjective age to have a stronger relation to intrinsic motivation than chronological age. Therefore, we have formulated the following hypothesis:

- H1a.* Chronological age will be positively related to intrinsic work motivation, whereas subjective age in terms of RO and RT will be negatively related to intrinsic work motivation.
- H1b.* Subjective age in terms of RO and RT will explain more variance in intrinsic work motivation than chronological age.

Connecting age to extrinsic work motivation

Chronological age and extrinsic work motivation (e.g. financial reward or promotion) have often been found to be negatively correlated (Judge and Locke, 1993; Kooij *et al.*, 2011). As mentioned, the MTLT (Heckhausen *et al.*, 2010) proposes an age-related shift in control strategies, that is, a lesser use of primary control strategies directed toward actions that modify external circumstances. Thus, older individuals are less dependent on the external world for the satisfaction of extrinsic motives, and, therefore, extrinsic motivation is likely to decrease with chronological age. Indeed, SST predicts that younger people are more driven by extrinsic motivation and less by intrinsic motivation (Carstensen, 2006). Similarly, Kanfer and Ackerman (2004) stated that extrinsic motivators, such as incentive pay, will have a diminished effect on older adults compared to younger adults. Related to this, Kanfer and Ackerman (2004) proposed that the strength of extrinsic achievement motives, such as demonstration of mastery and excellence compared to others, and openness to experience, declines when time is more limited.

According to SST, individuals who have a more expansive, and thus open-ended, time perspective typically focus on external goals (e.g. experiencing novelty) and feel that they have a large amount of time available to reach those goals (Carstensen, 2006). Indeed, according to SST, an open-ended view on remaining opportunities and time is associated with making use of primary control strategies directed toward actions that modify external circumstances and, thereby, increased levels of extrinsic motivation (Heckhausen and Schulz, 1995). Thus, if individuals have an open-ended perception of their remaining opportunities and their remaining time, they will be more likely to be affected by extrinsic motivational factors, such as striving toward a job-related promotion.

In sum, we expect that the value of extrinsic motivators at work decreases with chronological age. In addition, a more expansive view of remaining opportunities and remaining time should be related to more extrinsic motivation. Once again, we also expect subjective age to be more important in predicting work motivation. Thus:

H2a. Chronological age will be negatively related to extrinsic work motivation, whereas subjective age in terms of RO and RT will be positively related to extrinsic work motivation.

H2b. Subjective age in terms of RO and RT will explain more variance in extrinsic work motivation than chronological age.

Connecting age to motivation to continue working

Kooij *et al.* (2008), in their literature review of 33 studies, found that most age-related factors (i.e. chronological age, biological age, subjective age, and life span age) have a negative effect on motivation to continue to work. However, the underlying processes leading to the effects of each age-related factor differed. For example, chronological age had a negative influence on motivation to continue to work, since it may be associated with eligibility for retirement, financially attractive exit arrangements, or reduced workloads, which can give older workers a sense of being “redundant.” On the other hand, age norms and stereotypes, appear to have a negative influence on motivation to continue to work by influencing management decisions, resulting in limited opportunities for promotion, training, and development, which reduces the relevant skills and the employability of older workers (see also Van der Heijden *et al.*, 2009).

Furthermore, Kooij *et al.* (2008) concluded from their literature review that a self-perception of ageing is likely to have a negative impact on motivation to continue to work, because a self-perception of being “old” has a negative effect on motivation to act and perform, on motivation to perform new tasks, and on the utility of effort. Similarly, Desmette and Gaillard (2008) found that older workers who categorized themselves as an “older worker” had higher intentions to retire early. Following similar reasoning, Van Solinge and Henkens (2009) found that older employees with longer time horizons intend to retire later. Thus, those with an open-ended view on their remaining opportunities and remaining time will likely be more motivated to continue working. This leads to our final hypotheses:

H3a. Chronological age is negatively related to motivation to continue working, whereas subjective age in terms of RO and RT is positively related to motivation to continue working.

H3b. Subjective age in terms of RO and RT will explain more variance in motivation to continue working for one’s organization than chronological age.

Method

Participants and procedure

Workers from five different divisions throughout the Netherlands from a taxi company participated in a cross-sectional on-line survey. The taxi drivers' main duties are transporting children with disabilities to school and grownups with physical and/or mental handicaps. They earn a below average salary. Of the total sample of invited persons ($n = 1,117$), 207 respondents (response rate 18.5 percent) completed the survey. We deleted 39 of them because they did not complete the items on work motivation, which resulted in a final sample size of 168. Although taxi drivers have rarely been used as a target group in empirical research, especially within social and business sciences, and response rates are often not provided, the few studies that have focussed on this category of employees appeared to have similar low response rates (e.g. Dalziel and Soames Job, 1997; Sullman *et al.*, 2013). For example, Zagury *et al.* (2000) reported a 14.3 percent response rate among Parisian taxi drivers. As regards our specific study, despite the low response rate and small sample size, our sample is representative of the general taxi driver population in this company; the respondents consisted of 50 women (29.8 percent, compared to 34.7 percent in the general population of the taxi company) and the percentage of employees older than 55 years was 51.8 percent (compared to 47.5 percent in the total population of the taxi company). The mean age of participants was 55.01 years, ranging between 21 and 70 years. The number of hours worked per week was 26.7 hours ($SD = 10.3$), which again is comparable to 22.6 weekly work hours ($SD = 14.0$) for the total population of the company.

Measures

Age-related factors. Chronological age was measured as the number of years since birth. Remaining opportunities and remaining time were both measured with a Dutch version of the questionnaire constructed by Zacher and Frese (2009); based on Carstensen and Lang (1996), both consisting of three five-point scale items each, ranging from 1 (absolutely not) to 5 (absolutely). Items were slightly adapted by deleting "in my occupational future." An example item of the former was: "Many opportunities await me in my future." ($\alpha = 0.93$). An example item of the latter was "Most of my life lies ahead of me" ($\alpha = 0.72$).

Work-related motivation. Intrinsic work motivation and extrinsic work motivation were both measured with a Dutch version of the questionnaire developed by Vallerand (1997). Both measures consisted of 12 seven-point scale items each, ranging from 1 (strongly disagree) to 7 (strongly agree). An example item of the former was: "I conduct this work for the satisfaction that I experience when I overcome certain difficulties in my work" ($\alpha = 0.88$). An example item of the latter was: "Because of the status obtained by this work" ($\alpha = 0.83$). Motivation to continue to work in one's current organization was measured with a Dutch version of the questionnaire from Armstrong-Stassen and Schlosser (2008); see also Kooij *et al.* (2014). The measure consisted of three five-point scale items ranging from 1 (strongly disagree) to 5 (strongly agree). An example item was: "Barring unforeseen circumstances, I would remain in this organization indefinitely" ($\alpha = 0.83$).

Covariates. In this study, we controlled for the covariates gender, level of education, hours worked per week, and health since they appeared to be significantly associated with motivation-related variables in previous scholarly work (Addison and Brundrett, 2008; Manolopoulos, 2008; Martin, 2009; Vallerand *et al.*, 1995).

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Strategy of analysis

Descriptive statistics and correlations were calculated using the SPSS 22 software package. In addition, we performed confirmatory factor analyses with Lisrel 8.80 (Jöreskog and Sörbom, 2007) to examine whether the factor structure was satisfactory, and also to check for potential common method bias. To test the hypothesized model, we first used stepwise regression analyses in SPSS 22, in which we introduced the control variables (i.e. gender, educational level, weekly working hours, and subjective health) in the first step, chronological age in the second step, and finally RO and RT in the third step. We used this setup to examine whether subjective age would add variance up and above chronological age. Finally, we performed an additional test of our model using structural equation modeling in Lisrel 8.8, to test all the study variables – including the control variables – in one model, thereby controlling for potential shared variance, especially among the dependent variables, since regression analyses in SPSS cannot account for that.

Results*Preliminary analyses*

Table I shows that, as we expected, chronological age was negatively correlated with extrinsic work motivation ($r = -0.15$, $p < 0.05$) and motivation to continue working ($r = -0.17$, $p < 0.05$). Contrary to expectations, chronological age was negatively, though only marginally significantly, related to intrinsic work motivation ($r = -0.14$, $p = 0.06$). As expected, a perception of having many remaining opportunities was positively correlated to extrinsic work motivation ($r = 0.31$, $p < 0.01$), and motivation to continue working ($r = 0.27$, $p < 0.01$). Perceiving a lot of remaining time was, as expected, positively correlated with extrinsic work motivation ($r = 0.30$, $p < 0.01$), and motivation to continue working ($r = 0.36$, $p < 0.01$). Contrary to our expectations, perceiving many remaining opportunities and time were also both positively correlated to intrinsic work motivation ($r = 0.40$, $p < 0.01$ and $r = 0.40$, $p < 0.01$, respectively). These correlations are mostly in line with our hypothesized relationships, and they also provide a first indication that subjective age is more strongly related to work motivation than chronological age.

To check for artificial correlations, a confirmatory factor analysis was conducted on the five study variables. The proposed five-factor model reached acceptable fit ($\chi^2 = 1,310.3$, $p < 0.001$, $df = 3$, NNFI = 0.91, CFI = 0.91, RMSEA = 0.11). Moreover, this five-factor model fitted significantly better than a one-factor model, with all items loading on one factor ($\Delta\chi^2 = 673.7$, $\Delta df = 10$, $p < 0.001$), and also fitted better than a six-factor model, including the five proposed factors with paths from the five factors to an unmeasured latent factor to test for common method bias ($\Delta\chi^2 = 68.96$, $\Delta df = 5$, $p < 0.001$; Podsakoff *et al.*, 2003). Therefore, it can be concluded that the factor structure is valid, and there was no indication of common method threat to validity.

The control variables gender and subjective health were both unrelated to any of the outcome variables. The amount of hours worked per week was only related to extrinsic motivation ($\beta = 0.21$, $p < 0.01$), and educational level was negatively related to both intrinsic motivation ($\beta = -0.17$, $p = 0.02$) and extrinsic motivation ($\beta = -0.24$, $p < 0.01$).

Associations between age and intrinsic work motivation

Regression analyses (see Table II) show that chronological age was only marginally related to intrinsic work motivation ($\beta = 0.18$, $p = 0.06$). Perceiving many

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Chronological age	54.22	9.32	1									
2. Focus on opportunities	2.33	1.10	-0.40**	1								
3. Focus on remaining time	2.66	0.96	-0.47**	0.58**	1							
4. Intrinsic work motivation	4.77	1.10	-0.14	0.40**	0.40**	1						
5. Extrinsic work motivation	4.17	1.02	-0.15*	0.31**	0.30**	0.69**	1					
6. Motivation to continue to work	3.43	0.98	-0.17*	0.27**	0.36**	0.62**	0.44**	1				
7. Gender	1.33	0.47	-0.43**	0.080	0.31**	0.11	-0.001	-0.16*	1			
8. Level of education	2.03	0.69	0.19**	0.006	-0.17*	-0.19*	-0.26**	0.13	-0.23**	1		
9. Hours worked per week	27.21	10.16	-0.27**	0.23**	0.13	0.16*	0.28**	-0.089	-0.022	-0.083	1	
10. Health	3.15	0.73	-0.15*	0.087	0.17*	0.077	-0.001	-0.073	0.021	0.096	0.069	1

Notes: *n* = 168. Both age and tenure have been measured in years. Gender (1 = female, 2 = male); level of education (1 = lower (vocational) education, 4 = university). *, **Significant at the 0.05 and 0.01 levels, respectively

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Table I.
Means, standard
deviations, and
correlations of the
study variables

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Table II.
Results of regression
analysis for intrinsic
work motivation

Predictor	Intrinsic work motivation as the dependent		
	β 's step one	β 's step two	β 's step three
<i>Step 1</i>			
Gender	0.066	0.046	0.047
Education	-0.17*	-0.17*	-0.17*
Hours worked per week	0.14	0.13	0.077
Health	-0.076	0.074	0.047
<i>Step 2</i>			
Chronological age		-0.044	0.18
<i>Step 3</i>			
Focus on opportunities			0.30**
Focus on remaining time			0.24*
<i>Model summary</i>			
ΔR^2	0.067*	0.001	0.17**
Full model R^2	0.067*	0.069	0.24**
Overall F	2.94*	0.23	18.26**
Notes: * $p < 0.05$; ** $p < 0.01$			

remaining opportunities ($\beta = 0.30$, $p < 0.01$) and a lot of remaining time ($\beta = 0.24$, $p < 0.05$) were both positively related to intrinsic work motivation. The amount of explained variance increased only 0.1 percent ($p > 0.05$) when adding chronological age, and then increased by 17 percent ($p < 0.01$) when adding subjective age. These results do not support *H1a* by showing that an open-ended view of remaining opportunities and time are actually positively related to intrinsic motivation, whereas chronological age is unrelated. The findings do support *H1b* by showing that subjective age explained considerably more variance in intrinsic motivation than chronological age.

Associations between age and extrinsic work motivation

Partially in line with *H2a*, perceiving a lot of remaining time was positively related to extrinsic work motivation ($\beta = 0.19$, $p < 0.05$, see Table III) but perceiving many remaining opportunities was only marginally related to extrinsic work motivation ($\beta = 0.18$, $p = 0.06$). Finally, chronological age was unrelated to extrinsic motivation ($\beta = 0.08$, $p = 0.41$). Perceiving many remaining opportunities and time explained an additional 8 percent ($p < 0.01$) of the variance in extrinsic work motivation up and above chronological age, which by itself added less than 1 percent variance ($p > 0.05$). Thus, we found partial support for *H2a*, and full support for *H2b* by showing that subjective age was considerably more strongly related to extrinsic work motivation than chronological age.

Associations between age and motivation to continue working

Contrary to *H3a*, chronological age was not related to motivation to continue working in one's current organization ($\beta = 0.07$, $p = 0.45$), and perceiving many remaining opportunities was also unrelated to motivation to continue working ($\beta = 0.10$, $p = 0.30$). However, in line with *H3a*, perceiving a lot of remaining time was positively related to motivation to continue working ($\beta = 0.30$, $p < 0.01$). Table IV shows that subjective age

Predictor	Extrinsic work motivation as the dependent variable			Examining chronological and subjective age
	β 's step one	β 's step two	β 's step three	
<i>Step 1</i>				
Gender	-0.056	-0.089	-0.093	
Education	-0.25**	-0.25**	-0.24**	
Hours worked per week	0.26**	0.24**	0.21**	
Health	-0.002	-0.004	-0.027	
<i>Step 2</i>				
Chronological age		-0.074	0.076	
<i>Step 3</i>				
Focus on opportunities			0.18	
Focus on remaining time			0.19*	
<i>Model summary</i>				
ΔR^2	0.14**	0.004	0.081**	
Full model R^2	0.14	0.14	0.22	
Overall F	6.48	0.71	8.32**	
Notes: * $p < 0.05$; ** $p < 0.01$				Table III. Results of regression analysis for extrinsic work motivation

Predictor	Motivation to continue to work as the dependent variable			
	β 's step one	β 's step two	β 's step three	
<i>Step 1</i>				
Gender	0.134	0.10	0.082	
Education	-0.10	-0.091	-0.077	
Hours worked per week	0.079	0.057	0.035	
Health	0.069	0.067	0.032	
<i>Step 2</i>				
Chronological age		-0.083	0.073	
<i>Step 3</i>				
Focus on opportunities			0.10	
Focus on remaining time			0.28**	
<i>Model summary</i>				
ΔR^2	0.047	0.005	0.094**	
Full model R^2	0.047	0.052	0.15	
Overall F	2.02	0.81	8.76**	
Notes: * $p < 0.05$; ** $p < 0.01$				Table IV. Results of regression analysis for motivation to continue to work in one's organization

added 9.4 percent ($p < 0.01$) of explained variance in motivation to continue working, whereas chronological age only added 0.5 percent ($p > 0.05$). These findings provide partial support for *H3a* and full support for *H3b*.

Additional test of research model

When testing a structural path model with latent variables in which chronological age and both indicators of subjective age predicted the three forms of motivation – while also controlling for gender, educational level, hours worked per week, and subjective

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health – model fit was acceptable ($\chi^2 = 1489.5$, $p < 0.001$, $df = 160$, $NNFI = 0.90$, $CFI = 0.91$, $RMSEA = 0.10$). The effects of the control variables were identical to the regression analyses. The SEM analyses replicated the findings of the regression analyses. Specifically, chronological age was marginally related to intrinsic motivation ($\beta = 0.19$, $p < 0.10$), and unrelated to extrinsic motivation ($\beta = 0.16$, $p > 0.10$) and motivation to continue working ($\beta = 0.14$, $p > 0.10$). Perceiving many remaining opportunities was significantly related to intrinsic motivation ($\beta = 0.32$, $p < 0.01$), marginally related to extrinsic motivation ($\beta = 0.17$, $p < 0.10$), and unrelated to motivation to continue working ($\beta = 0.05$, $p > 0.10$). Finally, perceiving a lot of remaining time was marginally related to intrinsic motivation ($\beta = 0.20$, $p < 0.10$), and positively related to extrinsic motivation ($\beta = 0.30$, $p < 0.05$) and motivation to continue working ($\beta = 0.35$, $p < 0.01$). Taken together, these results mirrored the SPSS analyses in showing that subjective age was more strongly related to the outcome variables than chronological age, that an expansive view on one's remaining time was most strongly related to the outcome variables, and that the relative standardized regression coefficients (i.e. how strongly the different types of age were related to the different types of motivation) were also equal to the regression analyses.

Discussion

Although the aging workforce has become an increasingly prominent topic in scientific research, the measurement of “age” is still predominantly done by using one's chronological age. In this study, we followed the suggestions of several scholars (e.g. Kooij *et al.*, 2013; Sonnentag, 2012) by examining both chronological and subjective age (i.e. open-ended perception of remaining opportunities and remaining time), and their relationships with motivation at work (i.e. intrinsic and extrinsic motivation) and motivation to work (i.e. motivation to continue working). Overall, we found that chronological age was virtually unrelated to all types of motivation when combined with subjective age. In addition, chronological age only explained a minimal percentage of variance. Subjective age, on the other hand, was strongly related to work motivation. An open-ended perception of remaining opportunities was related to intrinsic and extrinsic work motivation, although the latter associations were only marginally significant. An open-ended perception of remaining time was positively related to all three types of work motivation. In addition, subjective age added a significant amount of variance, ranging between 8 and 17 percent, of the three types of work motivation. Thus, our expectations that subjective age would be a much more important predictor compared to chronological age, were supported. Indeed, subjective age was more strongly related to work motivation than chronological age in all cases.

Theoretical implications

Several scholars (e.g. Baltes *et al.*, 2014; Kooij *et al.*, 2008, 2013) have argued that we need a more fine-grained understanding of age-related factors that influence worker outcomes across their careers, because chronological age is limited in predicting these outcomes. More specifically, concepts such as psychological, organizational, and subjective age have been brought forward to provide better explanations of how age can influence important outcomes such as employee motivation (De Lange *et al.*, 2006). This study adds to this growing body of literature by showing that when studied in tandem, the effect of subjective age – operationalized as a focus on remaining opportunities and time – on work motivation is much stronger than the effect of

chronological age. In addition, whereas previous studies (e.g. Kooij and Van de Voorde, 2011; Kooij *et al.*, 2013) already looked at the role of chronological and subjective age in growth, esteem, and generativity motives, our results indicate that subjective age, and particularly remaining time, is positively related to intrinsic motivation, extrinsic motivation, and motivation to continue working for one's organization.

We should note that although the associations between subjective age and extrinsic work motivation and motivation to continue working were in the expected positive direction, the association between subjective age and intrinsic work motivation was contrary to our expectations. Whereas individuals with an open-ended or expansive time perspective were assumed to be primarily led by extrinsic motivators (Carstensen, 2006; Heckhausen and Schulz, 1995), we found that their intrinsic motivation actually increased with open-ended time perspective. Thus, our results indicate that an open-ended time perspective with regard to remaining opportunities and remaining time are both beneficial to enhance motivation at work and to work. These findings may be in line with current theorizing about sustainable careers (De Vos and Van der Heijden, 2015), in which the organization has been brought back into the definition of careers. Nowadays, there are many different types of organizations – with many different needs – implying that sustainability of the individual's career is highly dependent upon the ability one has to align individual needs with the needs of the specific type of organization one is employed with over time. In our study, the taxi drivers may face increasing pressure to log all of their travel times as efficiently as possible – an organizational need – whereas they feel the need for high-quality contact with their passengers – an individual need. Relating this to our findings, it could be that individuals need to constantly align their wishes and needs (i.e. intrinsic determinants of motivation such as spending time with passengers) with their long-term career plans (e.g. needing to retain employment and thus meet the needs of the taxi company). Consequently, an expansive perception of remaining opportunities and time would then be associated with higher extrinsic motivation (e.g. promotions because of following organizational policies) and intrinsic motivation (e.g. need fulfillment by means of having high-quality contact with customers).

Our findings also have implications for SST (Carstensen, 2006). This theory posits that when controlling for subjective time horizons, younger and older individuals act surprisingly similar. Our study provides support for this notion, as the effects of chronological age were virtually non-existent when the subjective time horizon (i.e. FTP) was also included as a predictor of work motivation. With this outcome we build on earlier findings by Kooij *et al.* (2013), who showed that an open-ended perspective on remaining opportunities and time were related to motivational outcomes over and above chronological age. Specifically, and in line with SST which emphasizes the role of time, we demonstrate that especially workers who have a more expansive perspective on their remaining time, are the ones with the highest levels of motivation. Thus, we add to SST by showing that subjective time horizons are strongly related to intrinsic and extrinsic motivation at work and also to motivation to work.

Furthermore, the MTLT (Heckhausen *et al.*, 2010) proposes that most adaptive development over one's life span occurs when primary control (i.e. bringing the environment in line with one's wishes) and secondary control (i.e. bringing oneself into line with environmental factors) are both maximized. According to MTLT, individuals' capacity for attaining primary control decreases with age and, as such, they need to invest more energy into this process. Our study demonstrated that when examining age through a subjective lens, this reduction of primary control may be buffered when

older individuals have a more expansive perspective on their remaining opportunities and remaining time. Thus, in addition to focussing on compensation strategies (i.e. secondary control) for older workers to remain motivated, we argue that a different conceptualization of age would be a valuable addition to MTLD.

Finally, our findings contribute to the literature on successful aging at work. Since maintaining or increasing motivation to or at work indicates successful aging at work (e.g. Kooij, 2015), our findings demonstrate that open-ended perceptions of remaining opportunities and time play an important role in successful aging at work. Likewise, and as mentioned earlier, De Vos and Van der Heijden (2015) have recently called for a better understanding of the elements defining a sustainable career. Building upon earlier work on the changing nature of careers (e.g. Arthur *et al.*, 1999), they differentiate between four elements in the definition of careers: time, social space, agency, and meaning. Longer careers with less predictable and often shorter-term career sequences call for reconsidering the traditional notion of a career (i.e. perception of time). Moreover, the amount of choices individuals have to make across life spheres has expanded, combined with an increasing amount of unpredictability and a decrease in job security (i.e. width of social space). And – although every employee needs a certain set of competencies for each job – we are not always the rational agents in “building our own careers” we believe ourselves to be (i.e. concept of agency). Finally, career meanings are much more idiosyncratic than they used to be (i.e. meaning of a career). Combined, De Vos and Van der Heijden (2015) paint a rather unpredictable and complex world of work, in which individuals are viewed as primarily responsible for their own career success, thereby using employability as an important condition. These four elements and this conclusion directly relate to our findings that subjective age as measured by open-ended perceptions of remaining opportunities and time is key in remaining motivated, both intrinsically and extrinsically, at work. We would therefore argue for integrating the concept of subjective age in studies testing the premises of sustainable careers in relation to individuals’ sustainable employability.

Limitations and suggestions for future research

A first limitation is that because this study was only conducted using a sample of Dutch taxi drivers, we cannot easily generalize the results to other professions or countries. Considering the nature of their profession, which is characterized by below average salaries and mostly providing service to a specific target group of disabled people, this could have impacted our results with regard to intrinsic and extrinsic motivation. Specifically, it would seem likely that intrinsic motivation may be especially important for these taxi drivers, as they mainly find meaning in their work through contact with their passengers. An additional limitation here is that we did not include any financial control variables (e.g. actual pay, potential bonuses). Therefore, we could not examine the potential influence of certain extrinsic motivators on the associations between age and motivating to continue working. Yet, we do believe that the theoretical rationale underlying our findings is important across professions. Furthermore, even though our participant group was quite unique, it was comparable to other professions, such as bus drivers and pilots. Therefore, we expect our results to be generalizable across those types of professions at the very least. Moreover, the measures that have been used in our approach may be influenced by the norms and values of a particular culture, such as items related to how long one should work in a life time (Inceoglu *et al.*, 2009). Therefore, to further confirm our findings, research using multinational samples including several professions would be an important next step.

Second, due to the self-rated nature of our data, common method bias may have been an issue. We tried to avoid response biases such as social desirability and acquiescence by telling participants there is no good or wrong answer, since the questions concern their personal situation and opinion. In addition, we tested a one-factor model to rule out major problems due to common method bias (Podsakoff *et al.*, 2003).

Third, the cross-sectional data used in this study limit our opportunities for interpretations about causality. Especially in research on aging, like our current study, longitudinal designs are necessary to fully grasp subjective time horizons and chronological age over time. Research using multi-wave designs can provide more specific information about the stability and change of the variables, and about cross-lagged relationships (De Lange, 2005; Taris and Kompier, 2003). Additionally, these longitudinal designs should ideally incorporate various age measures, covering the chronological, biological, subjective, life span, and organizational approach, to further enhance our knowledge of the relative value of different types of age conceptualizations.

Finally, although the differentiation between intrinsic and extrinsic work motivation is well-known and often applied (e.g. Cerasoli *et al.*, 2014), this distinction is not always as strict as formulated in common conceptualizations of the two variables. Moreover, according to self-determination theory (Ryan and Deci, 2000), extrinsic motivators can potentially turn into intrinsic motivators. In our study, the correlation between intrinsic motivation and extrinsic motivation was highly significant ($r = -0.69$), and were similarly associated to subjective age. Thus, in future research, more attention should be paid to better understanding the interplay between the two types of motivation.

Practical implications

Our findings suggest that a subjective time horizon is more important in predicting work-related motivation than chronological age. Thus, in line with Carstensen (2006), it seems that chronological age-related differences may be much smaller than is often assumed. As motivation is increased when workers have an open perspective on opportunities and remaining time, it is important to actively stimulate this type of time perspective. Zacher and Frese (2009) already demonstrated that time perspectives are malleable, and Löckenhoff and Carstensen (2007) showed that age differences in FTP could be simulated by instructional manipulations, such as whether the participant had to be information-focussed or emotion-focussed. Thus, HR policies and practices could focus on stimulating an open-ended time perspective among employees as a means to enhance worker motivation.

Second, company policies that focus on older workers (e.g. pre-retirement planning, reduced workload, and additional leave) are frequently tied to chronological age (e.g. Remery *et al.*, 2001) and often stimulate a “time until death” perspective among aging employees (e.g. by offering opportunities to stop working) and thus a more limited time perspective. Our study shows that especially an open-ended perspective on remaining time is crucial for enhancing motivation, which means that policies for older workers should incorporate measures that are aimed at such an open perspective. For example, they could focus on employability enhancement in order to prevent premature leave from the labor market (e.g. Van der Heijden *et al.*, 2009). By focussing on employability rather than retirement, organizations could enhance open-ended perspectives related to opportunities and remaining time, thereby enhancing their aging workers’ motivation.

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Career implications

Our findings have some important implications for research and practice on career development. First, as mentioned earlier, our study closely connects to De Vos and Van der Heijden's (2015) work on sustainable careers. Although issues such as employability and successful aging in today's career landscape have often been studied from the perspective of chronological age, we would like to stress that future research examining the building blocks of sustainable careers should focus more on subjective indicators of age (e.g. FTP). One potential implication for career research could be that career phases, which have always been defined from the perspective of chronological age (e.g. O'Neil and Bilimoria, 2005), might need to be re-examined from the perspective of subjective age as well. For example, employees in the "45-60 years" age category might have a time perspective that allows them to focus on opportunities rather than on remaining time, thus potentially being more motivated at work and in their career in comparison with employees in the "33-45 years" age group who are mainly focussed on remaining time. This train of thought appears to be supported by a recent empirical study of Kochoian *et al.* (2016) who found that the relationship of age with learning self-efficacy and learning value were fully mediated by workers' occupational FTP. Focus on opportunities positively predicted a learning self-efficacy and a value attributed to learning and professional development, whereas constrained perceived remaining time predicted only learning self-efficacy but not learning value.

Second, our results indicate that it is important that HRM specialists who are responsible for developing policies for successful ageing at work should not focus primarily on developing employees based on their chronological age. Rather, they should focus more on enhancing (aging) employees' open-ended time perspectives. Posthuma and Campion (2009) already showed that many age-related stereotypes are not correct, for example showing that health and skills are more important in predicting employee performance than their chronological age. Building on this, we would like to suggest that the HRM policies that are developed by specialists in the field are carefully translated into concrete practices (measures and tools) that may be used by line managers and career counselors to focus not on employees' age – and the assumed accompanying disadvantages of aging employees – but rather focus on their time perspective, thereby helping them to remain motivated and productive in their (later) career.

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Appendix. Items used for the study

Chronological age

What is your age?

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Remaining opportunities

Zacher and Frese (2009) – seven-point Likert scale ranging from 1 (does not apply at all) to 7 (applies completely):

- (1) Many opportunities await me in my occupational future.
- (2) I expect that I will set many new goals in my occupational future.
- (3) My occupational future is filled with possibilities.

Remaining time

Zacher and Frese (2009) – seven-point Likert scale ranging from 1 (does not apply at all) to 7 (applies completely):

- (1) Most of my occupational life lies ahead of me.
- (2) My occupational future seems infinite to me.
- (3) As I get older, I begin to experience time in my occupational future as limited (reverse coded).

Intrinsic work motivation

Vallerand (1997) – seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree)
Why do you do this work?

- (1) Because I feel comfortable in my work.
- (2) For the pleasure I get from obtaining knowledge about my work.
- (3) Because I enjoy learning new things in my work.
- (4) Because it feels very satisfying to me when I master certain difficult skills that are needed for my work.
- (5) Because I feel satisfied when I improve my weak points in my work.
- (6) Because I get a “kick” from being absorbed in my work.
- (7) Because I feel satisfied when I optimize my skills at work.
- (8) Because I get a pleasant feeling when I am working on the interesting aspects of my work.
- (9) For the satisfaction I feel when I overcome certain difficulties in my work.
- (10) Because I enjoy learning new things in my work.
- (11) Because I love to fully focus on my work.
- (12) Because I like to learn new skills in my job.

Extrinsic work motivation

Vallerand (1997) – seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree)
Why do you do this work?

- (1) Because my work allows me to make a good impression on people I know.

-
- (2) Because work is good for building social contacts.
 - (3) Because it is absolutely necessary to work if one wants to live comfortably.
 - (4) Because of the status that my work provides me.
 - (5) Because this work enables me to further develop myself.
 - (6) Because I have to work anyway I want to have a positive feeling about myself.
 - (7) Because others in my direct surroundings feel that the work I do is important.
 - (8) Because my work teaches me new things that will also be beneficial in other areas.
 - (9) Because I would feel bad if I would not be working.
 - (10) Because I want to show others how good I am at this work.
 - (11) Because work is one of the best ways to maintain good relationships with others.
 - (12) Because I feel that I have to work.

Examining
chronological
and subjective
age

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Motivation to continue to work in one's organization

Armstrong-Stassen and Schlosser (2008) – five-point Likert scale ranging from 1 (strongly disagree) tot 5 (strongly agree):

- (1) I expect to continue working as long as I can.
- (2) Barring unforeseen circumstances, I would remain in this organization indefinitely.
- (3) If I were completely free to choose, I would prefer to continue working in this organization.

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