



Age-related differences in work motivation

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This paper examines age-related differences in work motivation in two samples of 9,388 and 2,512 individuals who completed a comprehensive motivation questionnaire for selection or development purposes. In the first sample, age differences were examined by controlling for gender and investigating whether relationships between age and motivation were non-linear. Statistically significant relationships between motivation and age were found for most motivation scales, explaining up to 12% of the variance in specific scales. The second sample was used to confirm these results and to determine whether differences on these motivation scales could be explained by additional demographic variables, which were not available in the first sample. When controlling for demographic variables, such as gender, managerial experience, and university education, the pattern of results was similar in the second data set although effects were smaller. Results generally support propositions from the literature, which suggest a shift in people's motives rather than a general decline in motivation with age: older employees were less motivated by extrinsically but more by intrinsically rewarding job features.

In many European and other developed countries, workforces are aging (e.g., Taylor, 2006; Kinsella & Phillips, 2005), while at the same time labour forces are shrinking (OECD, 1998, 2000). In member states of the European Union, an average increase of 12% in the proportion of the 50–59 age group has been predicted over the next 10 years (Taylor, 2006). One prevailing stereotype is that older employees are less motivated. For example, they are perceived to lack energy and to be less interested in training (Noack & Staudinger, 2009). These stereotypes might be reflected in the fact that age discrimination in vocational training is widespread and that unemployment rates of older workers in many EU states exceed unemployment rates of all workers (Taylor, 2006).

While a growing body of research has examined age differences in ability (e.g., Cavanaugh & Blanchard-Fields, 2006; Schaie, 1996, 2005), very few studies have focused on age differences in personality traits and particularly motives. Kanfer and Ackerman (2004) point out that research on career stages 'suggests that age-related changes in motivational variables, rather than chronological age or cognitive abilities per se, play a key role in successful work outcomes for middle-aged and older workers'

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(p. 440). To date, there are, however, very few empirical studies, especially with larger samples, investigating the direction in which older and younger employees are either less or more motivated (Kooij, de Lange, Jansen, Kanfer, Dijkers, 2011; Warr, 2001).

The aim of this paper is to investigate whether employees of different age groups are motivated by different outcomes and features at work. Motivation is defined here as stable trait-like tendencies to be motivated by specific aspects of the work environment or outcomes (cf. 'motive tendencies': Kanfer, 2009; Scheffer & Heckhausen, 2006). Examples include being motivated to work by challenging targets (Atkinson & Litwin, 1960; McClelland, 1987), by the prospect of failing on a task (Atkinson & Litwin, 1960), by financial rewards (extrinsic motivation, e.g., Deci & Ryan, 2000), or having autonomy over one's own work (intrinsic motivation, Deci & Ryan, 2000). Two studies based on 9,388 and 2,512 individuals, respectively, are presented in which a comprehensive motivation questionnaire (MQ, SHL, 1992) was used that measures 18 motivators in the work environment. We first review the literature and then formulate specific hypotheses for these 18 scales.

Propositions and empirical findings from the literature on age-related changes in motivation

Research from the life-span development and occupational/organizational psychology literature suggests that certain psychological processes and attributes undergo changes at different stages of the life cycle, which are likely to affect the extent to which individuals are motivated by different job features and work outcomes. Factors outside the individual such as the work environment, societal culture, and norms can also have an impact on employees' motives. Psychological processes that are likely to affect work motivation can be summarized as follows:

- (1) Changes in personal resources, fluid, and crystallized ability (loss and growth themes: Kanfer & Ackerman, 2004; Baltes, Staudinger, & Lindenberger, 1999) that affect exerted effort and may lead to compensation strategies.
- (2) Changes in the perceived utility of specific work-related outcomes (e.g., Kanfer & Ackerman, 2004). The availability of personal resources, habituation, opportunities for external rewards (e.g., pay rises), career progression (e.g., promotion), and development can have an effect on the perceived utility or valence of specific goals and outcomes (Warr, 2001).
- (3) Moving through different stages of the life cycle (e.g., raising a family, grown-up children leaving home), experiencing changes in self-concept (e.g., stronger desire to affirm self-concept), and life goals (e.g., contributing to society: Erikson, 1964). These are suggested to result in a shift in motives (Kanfer & Ackerman, 2004: change of motive strength, reorganization of motives) and changes in the importance of preferred job features (Warr, 2001).
- (4) Social comparisons and social pressures (e.g., van Dam, van der Vorst, & van der Heijden, 2009; Warr, 2001), societal norms (e.g., Veroff, Depner, Kulka, & Douvan, 1980), and employment practices (e.g., Hult & Edlund, 2008).

Changes in personal resources, fluid, and crystallized ability

Kanfer and Ackerman (2004) identified four themes that help to understand how age-related changes in adult development may affect work motivation: loss, growth,

reorganization, and exchange. The loss and growth themes are characterized by a decline in fluid intelligence (e.g., working memory, processing of new information) with older age (Cavanaugh & Blanchard-Fields, 2006; Lee *et al.*, 2005; Schaie, 1996, 2005) and an increase in crystallized intelligence (educational or experiential knowledge), while reorganization and exchange concern changes in personality, emotion, and affect. Work demands that require a high level of fluid ability involve more effort with older age, and are likely to be demotivating, especially in maximum performance work conditions, where this demand cannot be compensated by growth in expertise (crystallized intelligence) and effort (Kanfer & Ackerman, 2004).

The decline in fluid ability may also affect older worker's motivation to participate in ongoing development activities. Warr and Fay (2001) found that older adults were less likely to engage in education initiatives (e.g., participating in continuing education, future self-development intentions), which the authors attribute to potentially greater anxiety about learning difficulties. The often observed decline in learning activities in older employees can also be accounted for by lower self-confidence (self-efficacy) in learning (Guerrero & Sire, 2001; Maurer, 2001). As Maurer, Weiss, and Barbeite (2003) report, older workers were more likely to believe that their cognitive functioning was less efficient than it once was and that they did not possess the qualities needed to learn. These perceived learning qualities in turn were related to self-efficacy for development, which - mediated through attitudes towards development - impacted actual participation in learning activities. Education can, however, moderate the relationship between age and continuing education, as adults with higher levels of education are more likely to pursue self-development (Warr & Birdi, 1998). With increased crystallized intelligence, older employees need to exert less effort in an area of their expertise to reach the same performance outcome as younger novices (Kanfer & Ackerman, 2004). Hence, acquiring new knowledge is easier if it fits in with an existing framework of relevant education and experience.

Crystallized intelligence also increases in other areas in life with age that go beyond the work domain, as reflected in the concept of wisdom, defined as 'expert knowledge system concerning the fundamental pragmatics of life' (Baltes & Staudinger 2000, p. 122). This expert knowledge also includes relativism of values and life priorities and is likely to influence how much importance is placed on specific job features throughout the life cycle.

Linked to the loss and growth themes, older adults are more likely to adopt specific strategies for minimising losses and maximising gains using available personal resources (selective optimization with compensation: SOC theory: Baltes, Staudinger, & Lindenberger, 1999). These include focusing on fewer goals (selection), allocating resources more strongly towards these fewer goals (optimization), and making use of strategies that compensate for losses (compensation) 'in order to maintain success or desired levels of functioning (outcomes)' (Baltes *et al.*, 1999, p. 484). Implications are that in goal choice, potential losses and gains are weighed up and targets that require a high level of personal resource may become less attractive (Warr, 2001). Work motives may change by selecting and focusing on fewer goals.

We, therefore, predict that older workers are less likely to be motivated by job features that require a high level of personal resource such as working under pressure, long working hours, challenging targets, competition, and having to cope with multiple demands. Because of the observed decline in fluid intelligence and related learning anxieties, we also expect that further training and development and the acquisition of new skills will be less motivating for older workers.

Changes in the perceived utility (valence) of job features and performance outcomes

As discussed above, a decline in fluid intelligence and less personal resource will result in lower expectations of successfully accomplishing tasks that appear to be more demanding with increasing age. As a consequence, certain job features are likely to vary in importance (valence) for different ages (Warr, 2001). Tasks that involve high levels of personal resource are likely to have decreased perceived utility (valence) for older workers compared to younger ones when approaching retirement. Self-development activities, for example, may not pay off, which is reflected in findings that age is negatively associated with voluntary job-related learning and career planning activities (e.g., Birdi, Allan, & Warr, 1997). Older employees also tend to perceive the extrinsic instrumentality (e.g., salary increase, professional advancement) of training activities to be lower (Guerrero & Sire, 2001) and are less likely to see the need to improve work-related skills (Maurer *et al.*, 2003).

Habituation can also change the valence of certain outcomes (Warr, 2001): rewards that have already been obtained such as wealth and status may seem less attractive later in one's career and the life outside work domain. Based on the above, we predict that older employees will be less motivated by training and development activities, career progression, and extrinsic rewards such as status and income compared to younger employees.

A shift in motives because of changes in life-goals and self-concept

Research on life-span development suggests that although relatively stable, an individual's motives can change over the life cycle in terms of rank ordering, absolute levels, and motive strength as changes in life-goals and self-concept occur (e.g., Fleeson & Heckhausen, 1997). Affirming one's self-concept and directing one's energies onto outcomes that lead to positive affect become more important (Kanfer & Ackerman, 2004).

With older age, emotion regulation improves: positive emotionality increases while negative emotionality decreases (Helson & Soto, 2005). Linked to that, emotional stability (e.g., McCrae *et al.*, 2000), levels of agreeableness (Fleeson & Heckhausen, 1997; McCrae *et al.*, 2000), positive relations with others, autonomy and self-acceptance (Fleeson & Heckhausen, 1997), and work attitudes (Kacmar & Ferris, 1989; Ng & Feldman, 2010; Rhodes, 1983) are on average higher in older adults. As proposed by Carstensen's socio-emotional theory (1998), with older age, social interactions are pursued and maintained for obtaining affective rewards (emotional satisfaction) and supporting one's identity rather than the instrumental value they can provide. In an experimental study by Charles and Carstensen (2008), for example, older adults felt less distress in response to interpersonal conflicts, in particular less anger, but the same levels of sadness compared to younger adults, suggesting that with older age, emotion regulation processes are increasingly applied that promote attention to positive stimuli and disengagement from offending situations. Employees of different ages should, hence, be motivated by social interaction to the same extent, as the quality but not absolute levels are expected to change.

An unpleasant work environment and low job security are linked to worry and negative affect and older employees indicate that they find it more difficult to find employment (Näswall & De Witte, 2003). Because of the increased focus on positive emotion regulation, we, therefore, predict that pleasant working conditions and job security will be more motivating for older individuals.

With older age changes in goal orientation are observed that are closely linked to the use of different control strategies. As physical and cognitive development plateaus and then declines during adulthood, 'more extrinsic, competitive patterns of achievement give way with age to more intrinsic, task-oriented patterns' (Maehr & Kleiber, 1981, p. 787). Younger adults tend to rely more on primary control strategies, which are defined by 'bringing the environment into line with one's wishes' (Rothbaum *et al.*, 1982, p. 5), whereas older adults more frequently apply secondary control strategies, 'bringing oneself in line with the environment' (Heckhausen & Schulz, 1995, p. 285). The shift in goal orientation, hence, reflects an adaptive mechanism to manage changing opportunities and constraints across adulthood (Ebner, Freund, & Baltes, 2006), which is also related to changes in available personal resources and the valence of goals as discussed earlier. Older adults have a stronger orientation towards maintenance and loss prevention, whereas younger adults emphasize growth orientation in their goals (Ebner *et al.*, 2006; Freund, 2006). As Freund (2006) observes, '... time left to live restricts the future time extension of developmental goals and life plans. Whatever is to be accomplished must be done within a specific and relatively finite period of time. A case in point is career planning near retirement age'. (p. 290). The emphasis on maintenance has been positively associated with well-being in older adults, whereas in younger adults, this has been found to correlate negatively with well-being (Freund, 2006).

Generativity theory suggests that with increasing age parenting, helping the broader society, and future generations becomes more important (McAdams & de St. Aubin, 1998; Erikson, 1964) and cooperation is emphasized rather than competition. In line with this, Kanfer and Ackerman (2000) found mean scores of under 30-year olds to be higher on achievement and competitive excellence-orientated scales compared to over 30-year olds. Measuring motives with thematic apperceptive content, Veroff *et al.* (1980) showed that middle-aged men scored higher on the construct 'hope of power' than younger and older men, and that women showed lower affiliation motivation in older age groups, especially after age 55.

Warr (2001) reviewed previously collated data (Warr, 1997) and suggested a decrease in the perceived importance of high job demands, variety, and feedback with age. Concerns for job security and physical security on the other hand were proposed to increase, whereas role clarity and status were predicted to remain stable. Non-linear relationships with age were predicted for the perceived value of opportunities to apply one's skills (increasing then decreasing) and the availability of money (increasing then decreasing). A meta-analysis of work-related motives and values in relation to age (Kooij *et al.*, 2011) concluded that age was positively related to intrinsic motives and negatively related with strength of growth motives (valuing opportunities for advancement and continuous learning) and extrinsic motives.

Building on the above, we hypothesize that extrinsically rewarding job features such as material rewards, career progression, and status will be less motivating in older age groups. The opportunity to obtain material rewards is predicted to show a non-linear relationship with age as having a good salary may increase in importance when people are raising a family and then decline when the children have moved out and financial pressures are lower. Intrinsically rewarding and self-concept affirming job features such as personal principles, having the freedom to decide how to do one's work, and linked to that, not being constrained by pre-defined structures (i.e., having high flexibility) are predicted to be more motivating for older age groups. Interesting tasks, which provide variety and intellectual stimulation, are expected to cross-sectionally increase with age but then, with a potential loss of confidence in one's own abilities, to decrease.

Social comparisons and social pressures

Social comparisons and social pressures can affect the valence of certain outcomes at different ages (Warr, 2001). People tend to compare themselves and their own goal attainments to those of others and may view the perceived utility of specific outcomes in relation to other people's views. Social pressure may lead older employees to internalize beliefs about themselves that society implicitly (or explicitly through retirement policies for example) holds; for example having to retire at a certain age (e.g., van Dam *et al.*, 2009) and, therefore, being less likely to experience prospects for progression in later career life as organizations may not see such opportunities as a worthwhile investment. As a result, older employees may be less motivated to seek such opportunities or to even feel entitled to ask for them. Maurer *et al.*'s (2003) study showed that older employees had less perceived work support (e.g., support by supervisors, co-workers, and subordinates, availability of learning resources) and non-work support (e.g., encouragement by family and friends) for development. Both types of support were positively related to perceived intrinsic and extrinsic benefits, indicating that the valence of engaging in development activities is likely to decline with less organizational and social support. In Birdi *et al.*'s (1997) study, the negative relationship between voluntary job-related learning and career planning activities and age disappeared when affective (learning motivation) and environmental (management support) variables were accounted for.

Based on these findings, we expect that older employees will find, in particular, career progression and development opportunities less motivating than younger employees, because of less support outside and at work to pursue career enhancing and developmental activities.

Gender and other group differences

The extent to which job features are perceived as motivating can also vary by gender as evident in the Veroff *et al.* (1980) and several other studies. For example, men place more importance on achievement (e.g., Kanfer & Ackerman, 2000; Warr, 2008), power (Page & Baron, 1995), the opportunity to use initiative, a responsible job, and good chances of promotion, while women value more pleasant people to work with, good hours, and meeting people (Warr, 2008). Gender differences may be observed in relation to changes in the life span: for example, when women have the main responsibilities in raising a family; priorities may change when taking a career break, working part-time, or experiencing conflict between family and work roles (Greenhaus & Beutell, 1985). Note from a role-theory perspective (Bakan, 1966) that gender differences are characterized by two types of attitudinal preferences: concern for others (communal dimensions) and a focus on independence (agentic behaviour). In work settings, men tend to be viewed as more agentic and women as more communal in the roles they are drawn to (Williams & Best, 1990). Citing work by Gutmann (1981), argue, however, that these attitudinal preferences change with maturation as 'men become more concerned with others, mentoring at work and in the community' (p. 32), as suggested by generativity theory, while women tend to become more independent and assertive. To take such potential patterns into account, we will control for gender differences when examining age-related differences in motives. In study 2, we will also control for other demographic variables such as managerial level and education. Education, for example, has been linked to work values (Warr, 2008) and may influence the relationship between age and motives.

Table 1. The X indicates where differences in work motivation are primarily predicted for different age groups in relation to hypothesized themes from the literature

Themes in the literature	Emphasis of job features and outcomes		
	Energy related (personal resources)	Intrinsically rewarding	Extrinsically rewarding
Changes in personal resources, fluid, and crystallized intelligence	X	X	
Perceived utility	X	X	X
Changes in self-concept and life goals		X	X
Social comparisons and social pressures			X

Study and hypotheses

We grouped the 18 scales of the MQ used in this study under three themes to structure the hypotheses and results:

- (1) Stronger emphasis on personal resources (energy related): work aspects and outcomes that require a lot of personal resource, such as working in a competitive environment, having challenging targets, having to focus on financial outcomes, the acquisition of new skills, and having to work beyond normal working hours.
- (2) Stronger emphasis on intrinsic rewards: work aspects that are in themselves rewarding and will, therefore, directly result in positive affect, such as interesting tasks, working with other people, and having autonomy over one's own tasks.
- (3) Stronger emphasis on extrinsic rewards: status, financial rewards, praise and outward signs of recognition, and a pleasant work environment.

These three themes are not intended to represent universal motive groups and they are not based on the factorial structure of the MQ used in this study. They are derived from propositions from the literature focusing on how age-related changes in adulthood can be linked to preferences for work outcomes and job features (i.e., specific motivators) as summarized in Table 1. Some motivators are likely to be related across the three suggested themes. For example, individuals who are motivated by challenging targets (Achievement¹) might also be more likely to be motivated by high pay and status.

The above hypotheses are summarized under these three motivational themes as follows (Table 2):

Hypothesis 1: Mean scores for motivational constructs that depend on a high level of personal resources are predicted to be lower in older age groups.

¹ Some conceptualizations of achievement motivation emphasize the intrinsically satisfying feeling when, for example, mastering a difficult task (Ryan & Deci, 2000). This is contrasted with extrinsic rewards such as financial ones. The achievement scale used in this study measures the extent to which an individual is motivated by challenging tasks. We are focusing on the energy-related aspect of this scale here as personal resource is required to tackle challenging goals, and someone who is highly motivated by challenging goals will need high levels of sustained effort.

Table 2. Overview of MQ scales and hypotheses

MQ Scale (alpha sample 1, sample 2) with definition	Example item	Hypothesis
Energy-related		
Level of activity (0.73, 0.67) (Working under pressure, coping with multiple demands)	Being required to do several things at once.	Linear decrease
Achievement (0.73, 0.69) (Challenging targets, feeling that abilities are stretched)	Having a job that challenges my abilities.	Linear decrease
Competition (0.74, 0.76) (Working in competitive environment)	Knowing if I work hard, I can be the best in the department.	Linear decrease
Fear of failure (0.88, 0.83) (Fear of failing on a task, being exposed to criticism, and negative judgements by others)	Fear of being seen to fall down on the job.	Linear decrease
Power (0.71, 0.74) (Exercising authority, taking responsibility, negotiating, and influencing others)	Having to decide about another employee's future.	Linear decrease
Immersion (0.74, 0.74) (Work that requires commitment way beyond 'normal' working hours)	Having to take work home.	Linear decrease
Commercial outlook (0.73, 0.74) (The extent to which work is commercially or profits orientated)	Working for a profit-making organization.	Linear decrease
Personal growth (0.71, 0.69) (Opportunities for further training and development and the acquisition of new skills)	Having to learn a new skill.	Linear decrease
Intrinsically rewarding		
Affiliation (0.71, 0.69) (Opportunities for interaction with other people at work, helping others at work)	Meeting many people through work.	Stable
Personal principles (0.69, 0.61) (The ability to uphold ideals and conform to high ethical and quality standards)	Knowing that what the organization does is ethically correct.	Linear increase
Interest (0.70, 0.66) (Variety, interest, and stimulation)	Working where there is always something of interest going on.	Non-linear: increase then decrease

Table 2. (Continued)

MQ Scale (alpha sample 1, sample 2) with definition	Example item	Hypothesis
Flexibility (0.67, 0.66) (The absence of clearly defined structures and procedures for managing tasks)	Working in a fluid, unstructured environment.	Linear increase
Autonomy (0.74, 0.68) (Being given scope for organizing work as one sees fit)	Being free to organize my own work.	Linear increase
Extrinsically rewarding Material reward (0.75, 0.74) (Financial reward)	Being able to earn more money by working harder.	Non-linear: increase then decrease
Progression (0.70, 0.72) (Having good promotion prospects)	Having good prospects for advancement.	Linear decrease
Status (0.69, 0.67) (Outward signs of position and status)	Having a job title that reflects my status in the organization.	Linear decrease
Recognition (0.73, 0.69) (Praise and other outward signs of recognition for achievements)	Being congratulated on a job well done.	Linear decrease
Ease and security (0.70, .67) (Contextual factors, such as pleasant working conditions and job security)	Having a secure position in the company.	Linear increase

Hypothesis 2a: Scores on intrinsically rewarding job features that provide the opportunity to adhere to high ethical standards, to have flexibility, and autonomy will be higher in older age groups.

Hypothesis 2b: The opportunity for variety, interesting work, and stimulation is expected to increase and then decrease as a motivator with age.

Hypothesis 2c: Opportunities for social interaction will be equally motivating for all age groups.

Hypothesis 3a: Extrinsically rewarding job features such as having good promotion prospects, status, and outward signs of recognition for achievements are predicted to be less motivating for older age groups.

Hypothesis 3b: For financial rewards, a non-linear relationship with age is predicted.

Hypothesis 3c: Pleasant working conditions and job security will be positively related to age.

Variability of motivator within age groups

Our hypotheses predict general mean differences across age groups on a range of motivators. However, inter-individual (or between-individual) differences within each

age group are likely to be greater than between group differences; that is, within older age groups there will always be individuals who are highly achievement-motivated and more so than some individuals in younger age groups. This raises the question of variability or homogeneity within age groups: are between-group differences greater than within-group differences in relation to age? Cognitive ability scores vary significantly more in older ages groups (Morse, 1993). This is likely to be related to varying levels of declining health that can affect cognitive functioning.

Similarly, higher variability in motivation scores could be expected as energy levels may vary more in older age for health reasons. If personal resources, for example, diverge to a great extent, this may affect the perceived utility of work outcomes such as working in a highly competitive job. Variability of cognitive ability (specifically fluid intelligence) may also have an impact on the extent to which older employees are motivated by development opportunities or stimulating tasks. Hence, we will examine whether greater individual differences exist within older age groups compared to younger age groups.

Method

Relationships between motivation and age were investigated by using two samples of 9,388 and 2,512 individuals. Data were collected with the same MQ (SHL, 1992) described below. As the first data set was considerably larger, the distribution of individuals in different age groups was more evenly spread compared to the second data set. For the first data set, only gender and ethnicity data were available, whereas in the second data set, additional information was collected on demographic variables including managerial experience and university education. Therefore, the first data set served as the main data source to test the above hypotheses, while the second data set was used to confirm the main results of the first data set when controlling for demographic variables such as gender, managerial level, and education.

Study 1

Sample

The data were based on 9,388 individuals who completed the SHL MQ (SHL, 1992, 2002) online between January 2003 and April 2007 for selection or development purposes in UK English and were retrieved from the SHL online systems in 2007. As information on the purpose of the assessments was not recorded, it was not possible to control for this variable. SHL Group Ltd. is an international provider of psychometric assessment tools that develops, implements, and sells products and services that are grounded in scientific research to major corporations, public sector organizations, and small and medium sized businesses.

Of the participants, 43% were women and the ethnic origin was spread as follows: 83% White, 7.9% Asian, 2.3% Black, 0.8% Chinese, 1.9% Mixed, and 3.7% preferred not to answer. Respondents' age was recorded using 11 age bands ranging from '20 or under' to 'over 65'. As fewer participants were found at the extreme ends for younger and older ages, the age bands were collapsed into the following five groups to allow for sufficient sample sizes within each age band when analysing the data separately by gender: 16-25, 26-35, 36-45, 46-55, and 56+ years. The average sample size for each age band when splitting groups by gender was 938.10 ($SD = 514.17$) ranging from 156 to 1,667.

Instruments

The MQ measures stable, trait-like work motivation by focusing on a range of motives that are relevant in a work context. These are assessed through 18 scales and 144 items (eight items per scale) that are outlined in Table 2. Respondents are asked to rate each statement as to how it would affect their motivation to work. The MQ response scale consists of a five-point rating scale with the following response options: 1 = 'greatly reduces my motivation to work', 2 = 'tends to reduce my motivation to work', 3 = 'has no effect on my motivation to work', 4 = 'tends to increase my motivation to work', 5 = 'greatly increases my motivation to work'. Scale scores were produced by computing the mean of the eight items for each scale. Example items are provided in Table 2.

The construct validity of the MQ has been established through a number of studies; for example, MQ scales that overlap in content with Thematic Apperception Test measures of motivation have been shown to be related (SHL, 2002). The MQ correlates moderately highly with measures of personality in an occupational context (OPQ32, SHL, 1999) with correlation coefficients of predicted relationships exceeding those of unpredicted relationships, thereby demonstrating convergent and divergent validity (Inceoglu, Warr, & Bartram, 2007; SHL, 1992). The MQ's criterion validity has also been supported by showing that specific scales predict line-manager ratings of competencies (Inceoglu *et al.*, 2007; SHL, 1992). The MQ is proprietary but can be obtained for research purposes by contacting the first author after signing a non-disclosure form that protects commercially confidential information and intellectual property related to the instrument.

For sample 1, alpha coefficients of the scales ranged from .67 to .88 (mean: 0.73, median: 0.72). MQ scale means, standard deviations, and intercorrelations are presented in Table 3.

Analytical procedures

Table 4 provides MQ mean scale scores and standard deviations by gender and mean scores for each age band and gender separately. Table 4 also contains the standardized difference scores (effect sizes) for comparing scale scores by gender and age, correlations of linear relationships with age (r values), and non-linear relationships with age (partial correlations: R values) for men and women separately, which are described in more detail further below. Figures 1–3 present mean z -scores by age band for energy-related, intrinsically, and extrinsically rewarding motivators. For the energy-related theme, only those three job features with the highest effect sizes are presented.

To determine whether any relationships existed between the 18 MQ scales and age, multivariate analyses of variance (MANOVA) were performed with the five age bands as the between-factor variable and the 18 MQ scales as the dependent variables in one analysis. Next, multivariate covariance analysis (MANCOVA) was applied to control for the potential effect of gender on relationships between age and the MQ scales. The five age bands were the between-factor variable, gender the covariate, and the 18 MQ scales served as the dependent variables. Subsequently, 18 separate regression analyses were conducted to examine non-linear relationships and control for potential effects of gender on the relationship between age and work motivation for individual scales. Non-linearity was tested with the following hierarchical procedures recommended by Cohen and Cohen (1983): in step 1, age was entered into the regression analysis, in step 2, age squared, thereby first controlling for a linear relationship. In a second set of regression analyses, gender was controlled for in step 1, followed by age in step 2, and age squared in step 3. Effect sizes were computed [$f^2 = R^2 / (1 - R^2)$] to determine

Table 3. MQ scale means, standard deviations, and intercorrelations for sample 1 ($N = 9,388$)

MQ scales	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Level of activity	3.36 (0.51)																	
Achievement	4.24 (0.42)	0.49																
Competition	3.67 (0.48)	0.31	0.37															
Fear of failure	2.93 (0.92)	0.35	0.11	0.28														
Power	3.75 (0.44)	0.40	0.54	0.42	0.14													
Immersion	2.69 (0.47)	0.48	0.18	0.24	0.29	0.22												
Commercial outlook	3.55 (0.52)	0.30	0.38	0.55	0.10	0.44	0.22											
Personal growth	4.15 (0.41)	0.15	0.52	0.22	-0.12	0.29	-0.05	0.21										
Affiliation	3.93 (0.42)	0.07	0.32	0.09	-0.15	0.27	-0.13	0.13	0.46									
Personal principles	3.97 (0.45)	0.04	0.35	-0.02	-0.12	0.22	-0.16	0.02	0.40	0.37								
Interest	4.11 (0.43)	0.30	0.59	0.11	-0.01	0.45	-0.04	0.13	0.48	0.39	0.45							
Flexibility	2.8 (0.47)	0.22	0.11	-0.07	0.21	0.24	0.15	-0.04	-0.05	-0.03	-0.02	0.32						
Autonomy	3.87 (0.49)	0.09	0.32	-0.06	-0.11	0.36	-0.12	0.03	0.24	0.20	0.34	0.56	0.40					
Material reward	3.93 (0.46)	-0.10	0.17	0.32	-0.15	0.18	-0.27	0.33	0.27	0.16	0.10	0.18	-0.12	0.14				
Progression	4.04 (0.46)	0.12	0.44	0.39	-0.07	0.37	-0.06	0.33	0.52	0.29	0.26	0.39	-0.04	0.22	0.54			
Status	3.66 (0.44)	-0.15	0.17	0.22	-0.24	0.26	-0.19	0.19	0.25	0.23	0.21	0.20	-0.14	0.20	0.50	0.47		
Recognition	4.01 (0.44)	-0.07	0.24	0.20	-0.26	0.15	-0.25	0.12	0.38	0.37	0.26	0.28	-0.18	0.18	0.44	0.45	0.52	
Ease and security	3.91 (0.45)	-0.26	0.06	0.03	-0.40	-0.02	-0.37	0.06	0.31	0.31	0.28	0.10	-0.35	0.07	0.45	0.33	0.45	0.44

Table 4. Means and standard deviations for different age groups, effect sizes for differences between the highest and lowest scoring age group, and results of the regression analysis testing linearity for each gender (sample 1: N = 9,388)

MQ scale	Sub-sample	Overall means (SD)					46–55 years n = 1,463	56 + years n = 356	r with age (linear)	R with age squared (non-linear, controlling for age)	Effect size age	Effect size gender
		16–25 years n = 2,029	26–35 years n = 2,874	36–45 years n = 2,659	46–55 years n = 1,463	56 + years n = 356						
Energy related												
Level of activity	Men	3.36 (0.50)	3.25 (0.5)	3.37 (0.48)	3.42 (0.48)	3.42 (0.48)	3.39 (0.50)	3.28 (0.55)	.08*	-.11*	.36*	.00
	Women	3.36 (0.53)	3.28 (0.49)	3.42 (0.52)	3.42 (0.51)	3.42 (0.51)	3.38 (0.55)	3.09 (0.65)	.01	-.15*	-.62*	
Achievement	Men	4.26 (0.41)	4.17 (0.43)	4.26 (0.40)	4.32 (0.39)	4.32 (0.39)	4.30 (0.40)	4.18 (0.46)	.08*	-.10*	.35*	-.13*
	Women	4.21 (0.43)	4.16 (0.43)	4.25 (0.43)	4.24 (0.42)	4.24 (0.42)	4.18 (0.45)	4.13 (0.46)	.01	-.09*	-.26*	
Competition	Men	3.73 (0.47)	3.85 (0.46)	3.77 (0.47)	3.70 (0.45)	3.70 (0.45)	3.60 (0.46)	3.59 (0.48)	-.18*	.01	-.57*	-.31*
	Women	3.58 (0.49)	3.73 (0.46)	3.62 (0.47)	3.51 (0.48)	3.51 (0.48)	3.44 (0.49)	3.36 (0.5)	-.23*	.03	-.79*	
Fear of failure	Men	3.05 (0.89)	3.10 (0.96)	3.07 (0.91)	3.02 (0.86)	3.02 (0.86)	3.05 (0.86)	2.96 (0.84)	-.03	.01	-.14	-.32*
	Women	2.76 (0.94)	2.83 (0.99)	2.74 (0.94)	2.73 (0.9)	2.73 (0.9)	2.72 (0.90)	2.75 (0.93)	-.03	.03	-.11	
Power	Men	3.82 (0.43)	3.66 (0.41)	3.79 (0.42)	3.91 (0.41)	3.91 (0.41)	3.91 (0.44)	3.77 (0.45)	.17*	-.14*	.62*	-.39*
	Women	3.65 (0.44)	3.56 (0.39)	3.67 (0.42)	3.71 (0.45)	3.71 (0.45)	3.68 (0.50)	3.64 (0.51)	.09*	-.09*	.36*	
Immersion	Men	2.72 (0.45)	2.69 (0.48)	2.71 (0.46)	2.74 (0.46)	2.74 (0.45)	2.76 (0.42)	2.75 (0.46)	.05*	-.01	-.15	-.16*
	Women	2.65 (0.50)	2.65 (0.51)	2.63 (0.5)	2.65 (0.48)	2.65 (0.48)	2.66 (0.48)	2.62 (0.54)	-.00	.00	-.08	
Commercial outlook	Men	3.64 (0.51)	3.58 (0.47)	3.65 (0.51)	3.72 (0.51)	3.72 (0.51)	3.60 (0.53)	3.52 (0.53)	.01	-.11*	-.39*	-.42*
	Women	3.43 (0.51)	3.49 (0.49)	3.48 (0.49)	3.43 (0.51)	3.43 (0.51)	3.30 (0.52)	3.16 (0.52)	-.15*	-.07*	-.67*	
Personal growth	Men	4.11 (0.39)	4.14 (0.41)	4.18 (0.39)	4.09 (0.37)	4.09 (0.37)	4.03 (0.39)	3.95 (0.42)	-.14*	-.06	-.60*	.20*
	Women	4.19 (0.42)	4.22 (0.41)	4.24 (0.40)	4.18 (0.41)	4.18 (0.41)	4.09 (0.43)	4.12 (0.44)	-.10*	-.04	-.36*	
Intrinsically rewarding												
Affiliation	Men	3.92 (0.41)	3.94 (0.42)	3.91 (0.40)	3.92 (0.40)	3.92 (0.40)	3.9 (0.41)	3.86 (0.41)	-.03	-.00	-.18	.10*
	Women	3.96 (0.43)	4.03 (0.42)	3.97 (0.41)	3.92 (0.44)	3.92 (0.44)	3.91 (0.42)	3.79 (0.45)	-.13*	-.00	-.56*	
Personal principles	Men	3.95 (0.44)	3.80 (0.45)	3.9 (0.43)	3.99 (0.42)	3.99 (0.42)	4.09 (0.41)	4.13 (0.42)	.22*	-.02	.73*	.12*
	Women	4.00 (0.46)	3.89 (0.45)	3.96 (0.44)	4.06 (0.44)	4.06 (0.44)	4.15 (0.47)	4.20 (0.52)	.21*	-.00	.68*	
Interest	Men	4.11 (0.43)	3.96 (0.44)	4.07 (0.43)	4.18 (0.40)	4.18 (0.40)	4.21 (0.41)	4.13 (0.45)	.18*	-.09*	.57*	.01
	Women	4.11 (0.44)	3.99 (0.43)	4.11 (0.42)	4.18 (0.44)	4.18 (0.44)	4.19 (0.45)	4.18 (0.50)	.16*	-.08*	.47*	

Table 4. (Continued)

MQ scale	Sub-sample	Overall means (SD)	16–25 years <i>n</i> = 2,029	26–35 years <i>n</i> = 2,874	36–45 years <i>n</i> = 2,659	46–55 years <i>n</i> = 1,463	56+ years <i>n</i> = 356	<i>r</i> with age (linear)	R with age squared (non-linear, controlling for age)	Effect size age	Effect size gender	
Flexibility	Men	2.83 (0.46)	2.71 (0.41)	2.79 (0.45)	2.9 (0.47)	2.93 (0.47)	2.89 (0.47)	.16*	-.06*	.49*	-.19*	
	Women	2.74 (0.47)	2.58 (0.39)	2.71 (0.45)	2.85 (0.49)	2.87 (0.49)	2.90 (0.53)	.23*	-.07*	.77*		
Autonomy	Men	3.86 (0.47)	3.57 (0.43)	3.77 (0.46)	4.00 (0.42)	4.07 (0.42)	4.01 (0.45)	.36*	-.12*	1.16*	.03	
	Women	3.88 (0.51)	3.59 (0.43)	3.86 (0.47)	4.03 (0.48)	4.08 (0.50)	4.12 (0.53)	.35*	-.13*	1.20*		
Extrinsically rewarding												
Material reward	Men	3.95 (0.45)	4.01 (0.44)	4.01 (0.47)	3.93 (0.44)	3.84 (0.43)	3.78 (0.41)	-.14*	-.05*	-.49*	-.09*	
	Women	3.91 (0.47)	4.00 (0.46)	3.97 (0.46)	3.84 (0.46)	3.74 (0.43)	3.77 (0.43)	-.20*	.00	-.58*		
Progression	Men	4.07 (0.46)	4.11 (0.46)	4.16 (0.46)	4.06 (0.44)	3.91 (0.42)	3.78 (0.41)	-.18*	-.11*	-.84*	-.12*	
	Women	4.01 (0.46)	4.09 (0.46)	4.10 (0.45)	3.95 (0.43)	3.82 (0.43)	3.84 (0.46)	-.21*	-.04	-.62*		
Status	Men	3.67 (0.43)	3.69 (0.43)	3.66 (0.45)	3.67 (0.42)	3.64 (0.42)	3.65 (0.42)	-.03	-.00	-.13	-.02	
	Women	3.66 (0.44)	3.71 (0.45)	3.66 (0.44)	3.63 (0.43)	3.59 (0.44)	3.73 (0.5)	-.07*	.06*	.31*		
Recognition	Men	3.97 (0.43)	4.00 (0.44)	4.00 (0.43)	3.96 (0.42)	3.92 (0.42)	3.93 (0.43)	-.06*	-.01	-.18*	.21*	
	Women	4.06 (0.44)	4.13 (0.45)	4.11 (0.44)	4.01 (0.42)	3.97 (0.44)	3.98 (0.45)	-.14*	.01	-.35*		
Ease and security	Men	3.87 (0.44)	3.97 (0.45)	3.91 (0.45)	3.82 (0.42)	3.81 (0.41)	3.85 (0.43)	-.12*	.05*	-.37*	.21*	
	Women	3.97 (0.45)	4.07 (0.44)	4.00 (0.44)	3.90 (0.44)	3.87 (0.45)	3.88 (0.44)	-.16*	.04	-.44*	.17	
Mean absolute values												
	Men							.12	.05	.46		
	Women							.14	.05	.51		
Sample size	Men	5350	1014	1617	1667	852	200					
	Women	4031	1015	1257	992	611	156					

Note. Underscored values represent the lowest values and *italics* the highest values used for computing effect sizes for differences between these age groups. * $p \leq .001$. Some of the values in the table appear to be the same due to rounding to two decimal places.

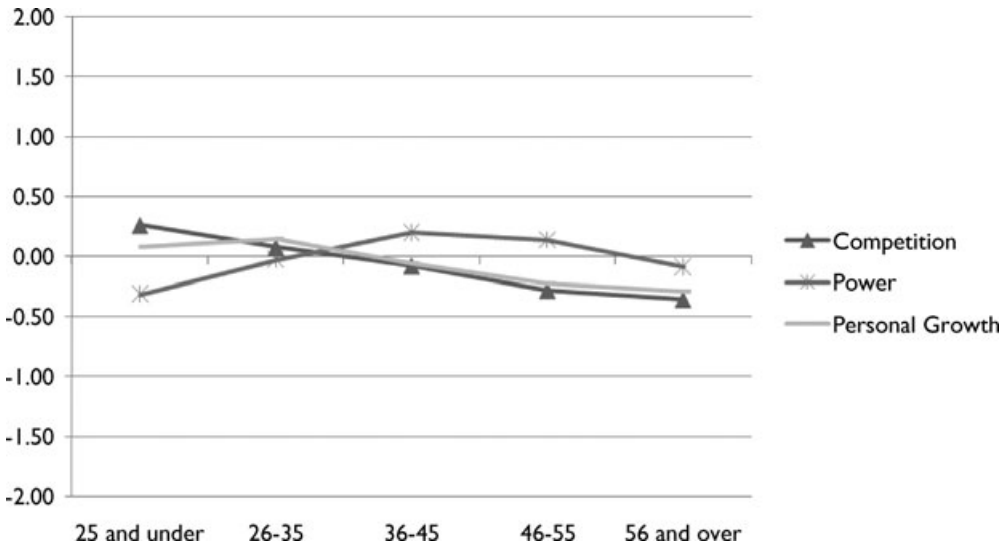


Figure 1. Standardized age differences (z-scores) across the five age bands on three energy-related MQ scales for sample I ($N = 9,388$).

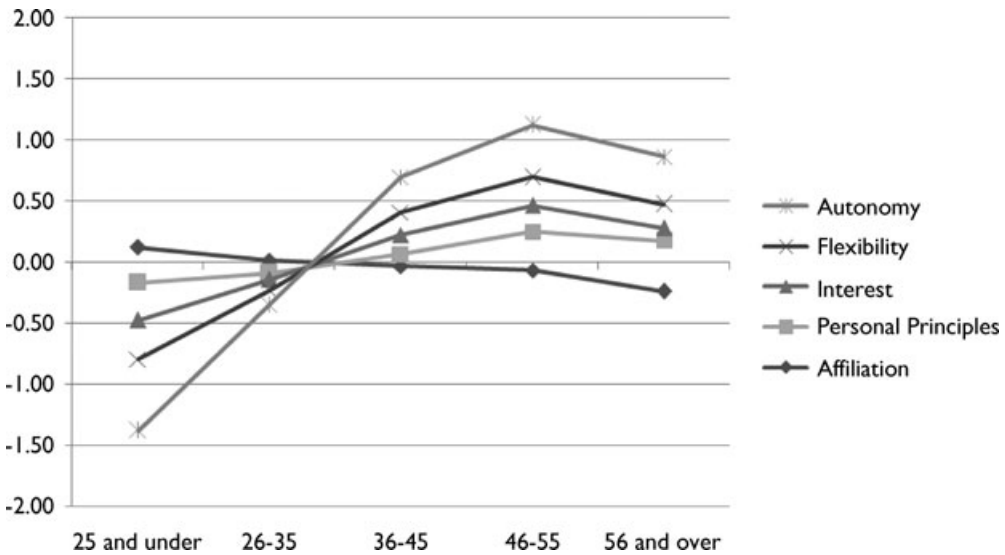


Figure 2. Standardized age differences (z-scores) across the five age bands on the five intrinsically motivating MQ scales for sample I ($N = 9,388$).

the variance accounted for by age and age squared (Cohen, 1988). By convention, f^2 effect sizes of 0.02, 0.15, and 0.35 are considered small, medium, and large, respectively (Cohen, 1988).

To illustrate the pattern of results for individual age groups, mean scores of the highest and lowest scoring age groups were compared for men and women separately using effect sizes (standardized age differences; Cohen, 1988) and t -tests (Table 4). Effect sizes and t -tests were also computed for gender differences independently of

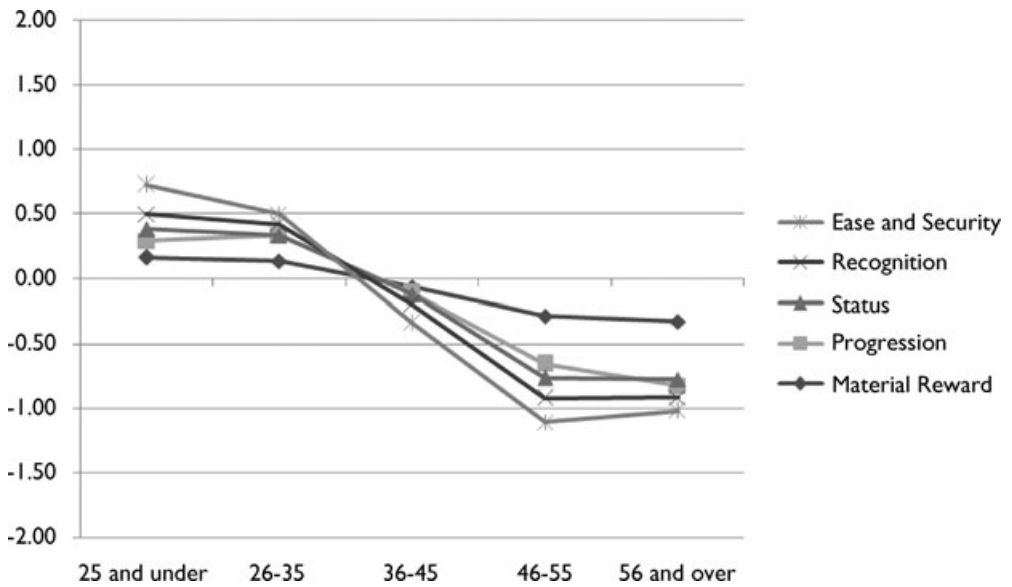


Figure 3. Standardized age differences (z-scores) across the five age bands on the five extrinsically motivating MQ scales for sample 1 ($N = 9,388$).

age to compare the magnitude of age differences to those found for gender differences (also Table 4). Non-linear relationships refer to the partial correlation coefficient of age squared after controlling for age. As gender did have a statistically significant effect on most MQ scales, both linear and non-linear relationships between age and the respective MQ scale were also carried out separately by gender, which are presented further to the right in Table 4. When relationships between age and MQ scales were linear, the youngest and the oldest group were compared (using effect sizes and *t*-tests) as those have the logical extreme scores (older minus younger age groups; negative *d*-values indicate lower scores at older ages). When a statistically significant non-linear pattern was found, standardized age differences and *t*-tests were calculated for the two most discrepant groups. As sample size was large, significance levels were set at 0.001 for all analyses.

Results

Overall relationships between motivation and age

The MANOVA that was carried out with all 18 scales as the dependent variables showed significant overall differences between the five age groups, with the Wilks Lambda multivariate test being significant [$F(0.65) = 58.50, df = 72$] and partial eta squared indicating a medium effect (0.10). MANCOVAs confirmed the above results but indicated that gender had a statistically significant effect on the MQ scales, too. Across all 18 scales, gender showed an overall medium effect [$F(0.87) = 78.91, df = 18, \text{partial eta squared} = 0.13$] and so did age after controlling for gender [$F(0.65) = 58.39, df = 72, \text{partial eta squared} = 0.10$]. Examining the tests' between-subjects effects for separate scales indicated that relationships between age and the MQ scales were larger than between gender and the MQ. The mean effect size across all 18 scales (absolute values) was

$d = 0.46$ for men and $d = 0.51$ for women, respectively, which exceeds the mean effect size for gender differences ($d = 0.17$, all based on absolute mean scores, see Table 4).

Regression analyses, carried out separately for each of the 18 MQ scales, showed that results were very similar when controlling for gender, so only results including gender are presented (Table 5). Sixteen statistically significant linear relationships between age and the MQ scales were found, of which 10 were non-linear. The largest effect sizes, found for six scales, were small but *Autonomy* approached a medium effect size ($f^2 = 0.14$). None of the non-linear relationships exceeded the effect size of 0.02.

Relationships of the 18 motivation scales with age

Hypothesis 1 was partly confirmed, as six out of eight energy-related work outcomes were significantly related to age (Table 5). The highest effect sizes ($f^2 \geq 0.02$) were found for Competition and Power. Comparing means and non-linear relationships across the five age bands, all MQ scales showed either a cross-sectional linear decline from younger to older age (Competition), an increase until the ages 36 to 45 and then a decline (Level of Activity, Achievement, Power), or an increase that peaked between the ages of 26 and 35 and then declined (Personal Growth). Standardized differences (z -scores) between the most extreme age groups were of small to medium effect size on these scales (Table 4). These are plotted in Figure 1 for Competition, Power, and Personal Growth, where the highest effect sizes were found.

Hypothesis 2a was also supported: within the intrinsically rewarding motivators, scores on *Personal Principles*, *Interest*, *Flexibility*, and *Autonomy* were positively related to age (Figure 2). For *Personal Principles* and *Autonomy*, the largest effects were found across all 18 MQ scales ($f^2 = 0.042$ and 0.142 , respectively), which was also reflected in the mean score differences of the highest and lowest scoring age bands for men and women (Table 4). For *Autonomy*, these reached a large effect size (men: $d = 1.16$, women: $d = 1.20$). As predicted by Hypothesis 2b, *Interest* showed a non-linear relationship with age ($f^2 = 0.007$) with a cross-sectional increase up to ages 46–55 followed by a decline. Small non-linear relationships were also found for *Autonomy* and *Flexibility*. Affiliation showed a small negative association with age when controlling for gender. Examining the r and the standardized differences separately by gender (Table 4), this relationship is only significant for women, but the effect size is small ($d = -0.13$). Hypothesis 2c is, therefore, only partially supported.

Within the extrinsically rewarding motivators, scores on *Material Reward*, *Progression*, *Status*, and *Recognition* were negatively related to age as predicted by Hypothesis 3a. The largest effect sizes were found for *Material Reward* and *Progression* ($f^2 = 0.029$ and $f^2 = 0.040$, respectively). A small but statistically significant non-linear relationship was observed for *Status* but only for women, showing a cross-sectional decrease with the lowest score for ages 46–55 and the highest for 56 years and older ($d = .31$, Table 4).

Contrary to hypothesis 3b, no statistically significant non-linear relationship was found for *Material Reward* and age. *Progression*, however, showed a very small but statistically significant non-linear association with age ($f^2 = 0.006$), with scores increasing up to the ages 26 to 35 and then declining. Hypothesis 3c was not supported: pleasant working conditions and job security (*Ease and Security*) were less motivating for older age groups. A statistically significant but very small ($f^2 = 0.002$) non-linear association indicated that beyond ages 46–55, *Ease and Security* were perceived as more motivating (see also Figure 3).

Table 5. Results of the regression analyses when controlling for gender in step 1, entering age in step 2, and testing non-linearity in step 3 (sample 1, $N = 9,388$)

DV	Step 1 Gender			Step 2 Age			Step 3 AgeSqu			
	R ²	Sig. F Δ	R ²	R ² Δ	Sig. F Δ	R ²	R ² Δ	Sig. F Δ	Std. Beta	f ² ageSQ
Energy related										
Level of activity	0.00	0.972	0.00	0.00	0.000	0.05	0.02	0.000	-0.56	0.02
Achievement	0.00	0.000	0.01	0.00	0.000	0.05	0.02	0.000	-0.43	0.01
Competition	0.02	0.000	0.06	0.04	0.000	-0.20	0.06	0.079	0.08	0.00
Fear of failure	0.02	0.000	0.03	0.00	0.002	-0.03	0.03	0.113	0.07	0.00
Power	0.04	0.000	0.05	0.02	0.000	0.13	0.07	0.000	-0.50	0.01
Immersion	0.01	0.000	0.01	0.00	0.011	0.03	0.01	0.753	-0.01	0.00
Commercial outlook	0.04	0.000	0.04	0.00	0.000	-0.06	0.05	0.000	-0.39	0.01
Personal growth	0.01	0.000	0.02	0.01	0.000	-0.12	0.03	0.000	-0.23	0.00
Intrinsic										
Affiliation	0.00	0.000	0.01	0.01	0.000	-0.07	0.01	0.939	0.00	0.00
Personal principles	0.00	0.000	0.05	0.05	0.000	0.22	0.05	0.292	-0.05	0.00
Interest	0.00	0.808	0.03	0.03	0.000	0.17	0.04	0.000	-0.36	0.01
Flexibility	0.01	0.000	0.05	0.04	0.000	0.19	0.05	0.000	-0.28	0.00
Autonomy	0.00	0.123	0.12	0.12	0.000	0.35	0.14	0.000	-0.54	0.02
Extrinsic										
Material reward	0.00	0.000	0.03	0.03	0.000	-0.17	0.03	0.019	-0.11	0.00
Progression	0.00	0.000	0.04	0.04	0.000	-0.20	0.05	0.000	-0.34	0.01
Status	0.00	0.245	0.00	0.00	0.000	-0.05	0.00	0.015	0.11	0.00
Recognition	0.01	0.000	0.02	0.01	0.000	-0.10	0.02	0.947	0.00	0.00
Ease and security	0.01	0.000	0.03	0.02	0.000	-0.14	0.03	0.000	0.20	0.00

Note. When only one predictor is added to a regression equation, the p -value of the delta-F is the same as the p -value of beta. Therefore, values for age and age squared beta values are not included.

To determine whether variability on motivation scales was greater in specific age bands, first the standard deviations of the scores of the youngest and the oldest group were compared (Morse, 1993). In a second step, the ratio of the standard deviation compared to its mean was computed because the mean value, on which the variance partly depends, can differ as a function of age (Morse, 1993). This analysis was conducted separately for men and women. The mean coefficient of variability was non-significant indicating that variability of scores is stable across age bands.

Study 2

Sample

The second sample was based on 2,512 individuals (33.44% female) who completed the MQ in UK English for selection or development purposes between 2002 and 2008. Data were collected for organizations from industry sectors including consulting, internet/new technologies, marketing, sales, telecommunication, and manufacturing. As a lot of this data were collected with international companies whose workforces were located in different countries (either permanently or as part of expatriate assignments), participants' country of residence spanned 12 European countries (United Kingdom, Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Norway, Portugal, Sweden, Switzerland) and the United States. Age was recorded as a continuous variable, with a mean of 38.20 ($SD = 8.13$) ranging from 18 to 65 years. To compare the age distributions of sample 2 to sample 1, frequencies for the same age bands are presented as follows: 25 or under ($n = 112$), 26-35 ($n = 908$), 36-45 ($n = 1,008$), 46-55 ($n = 424$), over 56 ($n = 60$). Most participants had a university degree (62.2%) and more than 10 years work experience (64.62%), followed by 20.90% who had at least 6-10 years work experience. A total of 68.47% had managerial experience, with 38.22% having managerial responsibility for 5 years and more.

Instrument

The MQ (SHL, 1992) was also used for the second study, which respondents completed in English. For sample 2, Cronbach's alpha ranged from .61 to .83 (mean: 0.70, median: 0.69). MQ scale intercorrelations are presented in Table 6. The correlation pattern of the scales was very similar across the two samples as indicated by $r = .98$, when correlating the two matrices.

Analytical procedures

As age was recorded as a continuous variable,² individual regression analyses were carried out with the 18 scales as the dependent variables to confirm the results of sample 1. Demographic variables were controlled by entering managerial experience, university education, country of residence, and gender in the first step, followed by age in step 2 and age squared in step 3 (Table 7). University education and managerial experience were

²To compare the magnitude of age difference in motivation between different age groups, the same analysis as conducted with study 1 was performed. The continuous age variable was split into five bands, and the same procedure comparing the highest and lowest scoring age groups as for study 1 was applied. The table displaying results as in study 1 can be provided on request by contacting the first author.

Table 6. MQ scale means, standard deviations, and inter-correlations for sample 2 (N = 2,512)

MQ scales	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Level of activity	3.34 (0.47)																	
Achievement	4.39 (0.38)	0.42																
Competition	3.70 (0.49)	0.35	0.43															
Fear of failure	2.66 (0.74)	0.27	0.11	0.25														
Power	3.85 (0.44)	0.39	0.48	0.50	0.16													
Immersion	2.65 (0.46)	0.40	0.11	0.23	0.26	0.28												
Commercial outlook	3.77 (0.48)	0.35	0.41	0.55	0.12	0.50	0.18											
Personal growth	4.26 (0.37)	0.14	0.53	0.23	-0.08	0.27	-0.07	0.20										
Affiliation	2.95 (0.46)	0.10	0.32	0.10	-0.13	0.23	-0.12	0.19	0.47									
Personal principles	3.96 (0.43)	0.04	0.31	0.05	-0.17	0.13	-0.16	0.13	0.36	0.36								
Interest	4.01 (0.38)	0.30	0.58	0.22	-0.03	0.39	-0.01	0.24	0.52	0.40	0.33							
Flexibility	4.04 (0.39)	0.27	0.21	0.13	0.15	0.30	0.19	0.09	0.07	0.03	-0.09	0.32						
Autonomy	3.99 (0.38)	0.15	0.31	0.08	-0.15	0.29	-0.07	0.19	0.25	0.20	0.26	0.45	0.39					
Material reward	3.86 (0.41)	0.00	0.18	0.35	-0.05	0.24	-0.11	0.37	0.20	0.09	0.11	0.19	-0.02	0.18				
Progression	4.27 (0.37)	0.15	0.36	0.45	0.01	0.37	0.01	0.32	0.40	0.22	0.16	0.31	0.04	0.16	0.54			
Status	4.01 (0.41)	-0.09	0.14	0.24	-0.15	0.24	-0.06	0.15	0.19	0.15	0.17	0.16	-0.07	0.15	0.45	0.46		
Recognition	4.01 (0.44)	-0.07	0.19	0.17	-0.25	0.10	-0.17	0.13	0.32	0.33	0.28	0.26	-0.10	0.18	0.33	0.38	0.44	
Ease and Security	3.72 (0.40)	-0.22	0.02	-0.05	-0.34	-0.08	-0.33	0.02	0.21	0.24	0.32	0.09	-0.31	0.10	0.32	0.24	0.41	0.40

Table 7. Results of the regression analyses when controlling for demographic variables in step 1, entering age in step 2, and testing non-linearity in step 3 (sample 2, N = 2,512)

DV	Step 1 Demographics			Step 2 Age			Step 3 AgsSqu					
	R ²	Sig. F Δ	R ²	R ² Δ	Sig. F Δ	Beta	f ² age	R ²	R ² Δ	sig F Δ	Std. Beta	f ² ageSQ
Energy related												
Level of activity	0.03	0.000	0.03	0.00	0.065	-0.04	0.00	0.03	0.00	0.719	0.06	0.00
Achievement	0.04	0.000	0.05	0.01	0.000	-0.08	0.01	0.05	0.00	0.464	-0.12	0.00
Competition	0.05	0.000	0.07	0.02	0.000	-0.15	0.02	0.07	0.00	0.451	-0.12	0.00
Fear of failure	0.02	0.000	0.03	0.01	0.000	-0.10	0.01	0.03	0.00	0.013	0.40	0.00
Power	0.13	0.000	0.13	0.00	0.160	-0.03	0.00	0.13	0.01	0.000	-0.77	0.01
Immersion	0.03	0.000	0.03	0.00	0.103	-0.03	0.00	0.03	0.00	0.142	0.24	0.00
Commercial outlook	0.07	0.000	0.07	0.00	0.783	0.01	0.00	0.08	0.00	0.000	-0.56	0.01
Personal growth	0.04	0.000	0.07	0.03	0.000	-0.18	0.03	0.07	0.00	0.087	-0.27	0.00
Intrinsic												
Affiliation	0.01	0.000	0.02	0.00	0.020	-0.05	0.00	0.02	0.00	0.528	-0.10	0.00
Personal Principles	0.03	0.000	0.05	0.02	0.000	0.15	0.02	0.05	0.00	0.908	0.02	0.00
Interest	0.04	0.000	0.04	0.00	0.606	0.01	0.00	0.04	0.00	0.738	0.05	0.00
Flexibility	0.04	0.000	0.04	0.00	0.017	0.05	0.00	0.05	0.00	0.035	-0.34	0.00
Autonomy	0.04	0.000	0.08	0.04	0.000	0.22	0.04	0.08	0.01	0.000	-0.65	0.01
Extrinsic												
Material reward	0.05	0.000	0.05	0.00	0.022	-0.05	0.00	0.05	0.00	0.006	-0.44	0.00
Progression	0.03	0.000	0.10	0.07	0.000	-0.28	0.08	0.10	0.00	0.341	-0.15	0.00
Status	0.01	0.002	0.01	0.00	0.465	0.02	0.00	0.01	0.00	0.612	-0.08	0.00
Recognition	0.02	0.000	0.03	0.00	0.004	-0.06	0.00	0.03	0.00	0.883	-0.02	0.00
Ease and security	0.02	0.000	0.02	0.00	0.667	0.01	0.00	0.02	0.00	0.301	0.17	0.00

Note. When only one predictor is added to a regression equation, the p-value of the delta-F is the same as the p-value of beta. Therefore, values for age and age squared beta values are not included.

coded as binary variables (i.e., university education yes/no). Country of residence was coded into a dummy variable (United Kingdom yes/no). Work experience was excluded from the analyses as it correlated highly with age and would, therefore, have resulted in multi-collinearity between predictors, not leaving sufficient variance to be explained by age alone. Significance levels were set to 0.001 as before.

Results

Controlling for university education, managerial level, gender, and country of residence,³ statistically significant relationships emerged for the following seven MQ scales and age: *Achievement*, *Competition*, *Fear of Failure*, *Personal Growth*, *Personal Principles*, *Autonomy*, and *Progression* (Table 7). *Autonomy* was the only scale that also showed a non-linear association with age. Effect sizes (f^2) ≥ 0.02 were observed for five scales: *Competition*, *Personal Growth*, *Autonomy*, *Personal Principles*, and *Progression*. Hypothesis 1 was partly supported, as four of the energy-related work outcomes (*Achievement*, *Competition*, *Fear of Failure*, and *Personal Growth*) were perceived as less motivating with older age.

Hypothesis 2a was also partly supported, as *Personal Principles*, *Autonomy* were positively related to age. This effect was not found for *Interest* and *Flexibility*, however. Affiliation was not significantly related to age, as predicted by hypothesis 2c. Hypothesis 3a was partially confirmed: *Progression* was negatively related to age in the extrinsically rewarding group ($p < .001$). No significant relationship was found for *Recognition*, *Status*, and *Material Reward*. Hypothesis 3b, which predicted that *Material Reward* will have a non-linear relationship with age, was not supported. Hypothesis 3c was not confirmed either, as *Easy and Security* were not significantly related to age.

Analyses comparing study 1 and 2

To test to what extent the pattern of results overlapped between the two studies, the R^2 change, standardized beta values, and effect sizes for age and age squared obtained from the regression analyses for each scale were correlated across the two studies ($N = 18$). When correlating these results from study 1 and study 2 after controlling for demographics (only gender in study 1), for age, the correlation was .57 for the R^2 change value, .56 for the f^2 values, and for the standardized betas, it was .79. For non-linear relationships (age squared), R^2 change values correlated .52, f^2 values .55, and beta values .58.

Overall, the effect sizes were smaller in study 2 compared to study 1 but the pattern was generally the same. It could be argued that effect sizes were smaller in study 2 as more demographics were controlled for. To test this possibility, regression analyses were carried out with sample 2 without controlling for demographics. The average effect size for f^2 age remained the same (0.012) when demographics were not controlled for in study 2. Furthermore, effect sizes (f^2 values) across the two sets of regression analyses in study 2 (controlling for demographics vs. not controlling) correlated highly for age (.94).

³Readers can obtain a full table containing all details of the regression analyses including beta weights for all control variables on request.

Therefore, it seems unlikely that effect sizes were smaller in study 2 because additional demographics were controlled for.⁴

There are two more plausible explanations for the differences in effect size: firstly, the spread of the data across different age groups were more limited in the second data set, especially with regard to the extreme ends of the distribution (youngest and oldest), where often the largest differences were observed, as shown in study 1 (Table 4). While in the first data set, 2,029 individuals (21.63%) were between 16 and 25 years, there were only 112 individuals (4.52%) under 25 in the second data set. In the first data set, 356 people were 56 years and older (3.79%), whereas in the second data set it was only 60 (2.32%). Secondly, data in study 2 may have been quite sample specific with the majority of people having managerial experience and university degrees. We can, however, only assume this without having the same demographic information available in study 1.

Discussion

This paper investigated whether employees of different ages are motivated by different job features and work outcomes in a large UK sample of working adults. Potential effects of gender were also taken into account, and using the same instrument, analyses were repeated with a smaller sample of English-speaking working adults, where it was possible to control for gender, managerial experience, and university education. This study contributes to existing research by supporting developmental approaches related to motivation in the literature by using large samples and examining a comprehensive range of work motivators. It also shows that although some gender differences are found in the relationships between age and work motivators, the overall pattern of results is very similar when controlling for a range of demographic variables. Moreover, results indicate that some small, non-linear relationships between age and some work motivators exist.

Overall relationships between age and work motivators

In the first sample, age explained up to 12% of the variance in specific MQ scales. In the second sample, the effect of age was smaller with age explaining up to 7% of the variance on specific scales after controlling for demographic variables that on their own explained up to 13% of the variance in step one of the regression analyses. A total of 45% of the significant relationships between age and motivation scales in the first sample were non-linear after controlling for gender, which showed small effect sizes. In the second sample, only the *Autonomy* scale was found to have a non-linear relationship with age. Effect sizes of the non-linear relationships were very small in both studies, possibly because of a limited distribution of data in the youngest and oldest age groups, especially in the second sample. The pattern of results across the two data sets were generally similar, but fewer and smaller effects were found in the second sample in the regression analyses. Overall the effect of age on the motivation scales was small, but when comparing mean scores of the most extreme age bands for some scales, medium to large effect sizes emerged in the first sample, suggesting that individuals from specific age groups may differ to a larger extent in what motivates them at work.

⁴A table with the regression analyses excluding the demographic variables can be obtained from the first author upon request.

Variability of motivators within age groups

Variability of the 18 motivators within age groups did not vary significantly between age groups, indicating that although mean scores cross-sectionally changed for some motivators, variability remained stable. This is an interesting finding considering that health, perceived and actual personal resources are likely to show higher variability with older age and that cognitive ability varies more within older age groups (Morse, 1993). This study only involved individuals who were active in the employment market and may, therefore, have excluded people with poorer health. Higher variability in, for example, energy-related motivators might be observed in broader, non-working samples, and higher age groups (e.g., 65+), which were underrepresented here.

Age and energy-related motivators

As predicted by hypothesis 1, older age groups found several job features less motivating if they require a high level of personal resource, in particular *Competition* and *Power* (study 1). Most of these relationships were non-linear, showing an increase from younger to middle ages (*Power*, *Level of Activity*, *Achievement*, *Commercial Outlook*). The pattern of results was generally confirmed by study 2 after controlling for demographic variables such as gender, managerial responsibility, and university education. Results are in line with previous research (Heckhausen, 1997; Kanfer & Ackerman, 2000; Warr, 2008), supporting the argument that the attractiveness of job features that require a lot of personal resource is likely to decline with age as a result of changes in affect and interest, especially when workers reach middle age and beyond (Kanfer & Ackerman, 2004). Findings from the World Values Survey, for example, show that not having too much pressure in the job is more important for older employees (Warr, 2008).

Age and intrinsically rewarding motivators

Older age groups perceived intrinsically rewarding work features to be more motivating in both study 1 and 2, confirming hypothesis 2a. Here, the largest effect sizes were observed, particularly for *Autonomy* and *Personal Principles* (study 1), supporting propositions from generativity theory that caring for others and helping the broader society become more important with increasing age (McAdams & de St. Aubin, 1998).

No significant relationship with age was observed for *Affiliation* for men in study 1 and the whole sample in study 2, partially supporting the argument that the motivation to interact remains stable with age (i.e., absolute levels). This supports Carstensen's argument (1998) that the reasons for social interaction shift with older adults predominantly focusing on emotional satisfaction and support of their own identity, while younger adults place more importance on the instrumental value of social interactions. This qualitative shift could, however, not be addressed in this study.

In study 1, interesting work and stimulation cross-sectionally increased up to ages 46 to 55, after which it decreased but this relationship was not confirmed in sample 2. With increasing age, employees may favour more interesting work because of habituation, but in age groups older than 55, new stimulating tasks might be perceived as less attractive if fluid intelligence is declining. Overall, these results are in line with research by Wright and Hamilton (1978), Kalleberg and Loscocco (1983), Kooij *et al.* (2011) indicating that intrinsic rewards are valued more in older age groups.

Age and extrinsically rewarding motivators

Confirming hypothesis 3a, *Material Reward*, *Progression*, *Status*, and *Recognition* were negatively related to age in study 1. For *Progression*, this was also supported by study 2 after controlling for demographic variables. Results are consistent with results from the World Values Survey that fewer people in the older age groups rated good pay and good chances of promotion as important compared to the younger age groups (Warr, 2008) and meta-analytic findings that extrinsic motivators are negatively related to age (Kooij et al., in 2011).

Contrary to the hypothesis, older age groups (study 1) were also less motivated by pleasant working conditions and job security compared to younger age groups. A weak non-linear association with age in study 1, however, suggested that after 55 years, pleasant working conditions become more motivating. Some of the results might be sample specific as samples primarily included professionals from the United Kingdom and EU countries and may not hold on other populations from more constrained economic situations with less well-designed working conditions.

Warr (2001) suggested that the extent to which status motivates people would remain stable over age, which was found to be the case for men in study 1, but not for women. For women, status became slightly less important until 46 to 55 years, after which it was valued more, possibly reflecting the increase and later decrease of non-work commitments later in working life ('empty nest syndrome').

Conclusions

Taking the above findings together, a shift in work motivators is observed: job features and outcomes that involve a high level of personal resource (e.g., competition, power) and those that are predominantly extrinsically rewarding (e.g., career progression and materials rewards) are perceived as less motivating in older age groups, while intrinsic motivators (e.g., autonomy, personal principles) are valued more compared to younger individuals. More intrinsic motivators rise in importance with older age and replace extrinsic, competitive ones (Kanfer & Ackerman, 2004; Mahr & Kleiber, 1981). One can, therefore, conclude that older employees are not less motivated but - on average - motivated by different job features. Shifts in patterns of motivators could have consequences for performance, which may partially explain some of the age differences on specific dimensions of job performance reported in a meta-analysis by Ng and Feldmann (2008). While no differences on core task performance were observed, older workers demonstrated more citizenship behaviours, greater safety behaviours, and engaged less in counter-productive behaviours and workplace aggression. Organizational citizenship behaviours, especially those linked to helping, are less likely to result in direct extrinsic rewards and might stem from the increased importance that is placed on intrinsic rewards and personal principles.

In line with this thought, Barnes-Farrell and Matthews (2007) observed in their literature review on age and work attitudes that, in particular, intrinsic work satisfaction (the meaningfulness of work) and age appeared to be reliably positively related across a variety of samples and occupational groups. Similarly, Ng and Feldman (2010) report some weak but positive links between intrinsic work motivation and age in a meta-analysis on work attitudes and age. Studies on satisfaction with extrinsic facets of work (e.g., pay and promotion), on the other hand, do not demonstrate the same consistent link (Clark, Oswald, & Warr, 1996; Kacmar & Ferris, 1989).

Limitations

Although the results of study 1 are based on a large UK sample, they are not representative of the British working population. The second sample was very specific in its composition with a high proportion of highly educated people with managerial experience and data collected in different countries. It should also be noted that the first sample was not ethnically diverse and that information on ethnicity was not available for the second sample. Age patterns reported here might, therefore, not generalize across different ethnic groups and countries.

Furthermore, the data in this study were cross-sectional and, therefore, age differences reported here may not only reflect age-related changes in people's lives but also effects of completing the questionnaire at a particular time (contextual or period effects) or being born into a particular cohort (Rhodes, 1983). Previous studies have suggested cohort effects of motivational variables (e.g., Smola & Sutton, 2002; Veroff *et al.* 1980). A cohort would be regarded as a 'generational group if it exhibited separate and distinct values and attitudes because of its sharing of social, economic and political events, when contrasted to other cohorts' (Parry & Urwin, 2010). Age, contextual, and cohort effects cannot be disentangled unless controlled longitudinal designs are applied, by for example, combining cross-sequential and time-sequential designs, where cohort effects and age/time of measurement effects could be examined separately (Shultz & Morton, 2005). Parry and Urwin (2010) argue that the popular notion of generational differences is ambiguous and that 'it may not matter to practitioners whether differences in the values of different birth cohorts reflect true generational effects, providing that we can reliably demonstrate that these differences do exist' (p. 1).

Practical implications and future research

The overall effect sizes are small to medium but, as discussed earlier, for some individual scales, such as *Autonomy*, medium to large effect sizes emerged when comparing specific age groups. In practical terms, this means that employees may differ by more than what is considered to fall within the typical error band of plus or minus half a standard deviation. Job designs could compensate for the lower importance placed on extrinsic rewards such as progression and status by providing more intrinsically rewarding features such as autonomy. Our research is based on group mean differences, however, and within each age group, there are likely to be greater inter-individual differences that still need to be considered when recruiting or developing employees. HR professionals and line-managers may be aware that employees in older age groups are likely to value career progression less than younger employees but an employee's preference would still have to be explored individually. Some of the differences we found may also be due to socially endorsed stereotypes as discussed earlier (Warr, 2001). Early retirement policies for instance may discourage older employees to invest more energy into developing themselves, if they believe they are not entitled to training as it may not pay off for themselves and for the organization.

From a practical view point, employers and HR managers need to know how to best recruit from and manage a diverse workforce. Therefore, future research should first investigate how situational factors might influence relationships between age and work motivators such as different retirement policies, working in specific occupational groups, feelings of certainty to keep a job (e.g., working in an uncertain economic climate). Second, to what extent does the shift in worker's motives with age affect performance, retention, and well-being? We suggested that higher levels of organizational

citizenship behaviours in older workers (Ng & Feldmann, 2008) might stem from being more motivated by helping and contributing to the broader society. Third, which related age-differences in employees' motivators can be attributed to cohort or contextual effects and which stem from changes in the life and career cycle? Only longitudinal designs can provide insight into these questions. Fourth, future investigations should also consider the environment more strongly by taking into account the fit between employees' motivators and their work environment.

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