

Age and work-related motives: Results of a meta-analysis

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Summary

An updated literature review was conducted and a meta-analysis was performed to investigate the relationship between age and work-related motives. Building on theorizing in life span psychology, we hypothesized the existence of age-related differences in work-related motives. Specifically, we proposed an age-related increase in the strength of security and social motives, and an age-related decrease in the strength of growth motives. To investigate life span developmental theory predictions about age-related differences in control strategies, we also examined the relationship between age and intrinsic and extrinsic motives. Consistent with our predictions, meta-analytic results showed a significant positive relationship between age and intrinsic motives, and a significant negative relationship between age and strength of growth and extrinsic motives. The predicted positive relation between age and strength of social and security motives was only found among certain subgroups. Implications of these findings for work motivation and life span theories and future research are discussed. Copyright © 2010 John Wiley & Sons, Ltd.

Introduction

As evidence for the aging and dejuvenation of workforces across the developed world grows (OECD, 2005), organizational researchers and practitioners have focused greater attention on the characteristics, expectations, needs, and performance of mature, or older workers (Kanfer & Ackerman, 2004; Peterson & Spiker, 2005; Warr, 2001). Research on the relationship between age and dimensions of performance (Ng & Feldman, 2008), on age-stereotyping (Barnes-Farrell, 1993; Cleveland & Landy, 1983; Van der Heijden, 2006; Van der Heijden, De Lange, Demerouti, & Van der Heijde, 2009), on the person and situation determinants of older worker decisions on bridge employment (Wang, Zhan, Liu, & Shultz, 2008), and on successful aging at work (Abraham & Hansson, 1995) represent only a few of the many

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approaches that have been taken to understanding the complex effects of adult development on workplace behaviors (also see, Greller & Stroh, 1995; Kooij, De Lange, Jansen, & Dijkers, 2008; Warr, 2007).

For human resource managers, the influence of aging on employee motivation represents one of the most pressing challenges to arise in this decade. In many occupational sectors, ranging from nursing to engineering, the aging workforce portends a potential perfect workforce storm over the next decade. As a growing number of senior employees (that form part of the Baby Boomer cohort) retire from their jobs, organizations face strong challenges in terms of finding sufficient replacement workers and preventing knowledge loss. Recognizing this problem, several large organizations have implemented incentive and work redesign plans to discourage retirement-related turnover among older workers (see, e.g., Dychtwald, Erickson, & Morison, 2006). To date, however, most interventions have been based on informal surveys and economically-guided assumptions about the primacy of compensation as the key determinant of work motivation among older workers. Although compensation and health clearly represent two key influences on the employee decision to remain on the job, scattered survey results and empirical findings also suggest that other factors, such as motives, play a non-trivial role in retirement-related turnover (Hansson, DeKoekkoek, Neece, & Patterson, 1997; Rau & Adams, 2005; Zappalà, Depolo, Fraccaroli, Guglielmi, & Sarchielli, 2008). The purpose of this study is to begin to address this gap in the literature by organizing and empirically evaluating the scientific evidence on the relationship between age and work-related motives.

Age and Motive-related Factors

Most organizational scientists agree that needs, motives and values are importantly influenced by adult development and work experiences across the life span. What is less clear, however, is whether and how these determinants of work behavior differ in strength across the life span. One of the earliest systematic attempts to address this question in the organizational literature was provided by Rhodes, in her 1983 review of age-related differences in work attitudes and behavior. Of the 185 studies she identified that explicitly addressed age, only ten studies directly examined the relationship between age and needs (e.g., Hall & Mansfield, 1975; Porter, 1963). Based on these studies, Rhodes (1983) concluded that security and affiliation need strength tends to increase with age, and that there was some support for a decrease in the strength of self-actualization and growth needs. Rhodes (1983) also reported four studies investigating the relationship between age and changing work values (e.g., Wright & Hamilton, 1978). Results of these studies indicated that preferences for extrinsic job characteristics, such as good pay, and having friendly co-workers and supervisors increased with age, whereas preferences for opportunities for growth decreased with age. Although Rhodes' review revealed important insights about the relation between age, needs, and work values, the few studies conducted through the 1980s were largely descriptive and difficult to interpret in the absence of an overarching theoretical framework.

In the 25 years since Rhodes' (1983) review, significant progress has been made in the psychology of aging (see, e.g., Baltes, Reese, & Lipsitt, 1980; Ebner, Freund, & Baltes, 2006). Several prominent theories of adult development have emerged, including Selection, Optimization, and Compensation (SOC) theory (Baltes, Staudinger, & Lindenberger, 1999), Socio-Emotional Selectivity Theory (Carstensen, 1995), and the Life Span Theory of Control (Heckhausen & Schulz, 1995). Building upon these theoretical models, Kanfer and Ackerman (2004) and Warr (2001) have recently proposed complementary work-specific formulations for how age-related changes in motives influence work motivation (see also Baltes & Dickson, 2001). In this paper, we employ these work-oriented models to

organize the empirical literature and conduct an updated, theory-driven meta-analytic review of the relationship between age and work-related motives.

Aging refers to all possible changes that occur in biological, psychological, social, and even societal functioning at various points in the life cycle (Baltes et al., 1999; De Lange, Taris, Jansen, Smulders, Houtman, & Kompier, 2006; Sterns & Doverspike, 1989). Although other important indicators of age may be useful, most organizational studies of age-related influences on work behavior have used chronological age. The use of chronological age also facilitates translation of findings to the organizational environment, where chronological age is the principal indicator of aging in the workplace. Consequently, we focus our review of the literature on the relationships between work-related motives and chronological age.

In the following section, we address three issues that provide the foundation for our meta-analytic review. First, we discuss the conceptual rationale for extending our review to include need and value measures as well as motive measures. Second, we discuss the rationale for the taxonomic structure of motives used in the meta-analysis. Third, we present the theoretical rationale for each of our hypotheses about the relationship between age and work-related motive class.

The scope and content of work-related motives

The first foundational issue to be confronted in our analysis of age-related differences in motives pertains to how motives are conceptualized and measured. At the broadest level, motives refer to an individual's propensity or preference for a particular class of outcomes, such as high performance, high pay, and friendly co-workers (Sagie, Elizur, & Koslowsky, 1996). Individual differences in motives are typically assessed by asking persons to indicate the importance or value they attach to attainment of specific work outcomes, such as pay, promotions, and interesting work (Hattrup, Mueller, & Aguirre, 2007). Within individuals, motive structures indicate the relative prominence or salience of different classes of motives. Age-related changes in motive structures are thus reflected in age-related changes in salient or preferred work conditions or job characteristics.

In organizational psychology, individual differences in motives have been measured in a number of ways. Although most motive measures are self-report and thus presume explicit knowledge of preferred work characteristics and outcomes, motives may also arise from non-conscious sources and influence preferences without explicit awareness (Baard, Deci, & Ryan, 2004). Early work motivation theories and research (e.g., Alderfer, 1969; Maslow, 1943) emphasized needs, or the partially non-conscious drivers of preferences for particular job characteristics and work outcomes. However, the self-report measures used to assess work-related needs are closely related and often share item content with measures used to assess consciously-mediated motives and values (e.g., compare the Growth need strength scale by Hackman and Oldham (1974) and the Minnesota Importance Questionnaire by Rounds et al. (1981)). As such, work-related measures of needs, motives, and values tend to be used interchangeably in the work motivation literature.

Nonetheless, as Baard et al. (2004), Dose (1997), Macnab and Fitzsimmons (1987), Pryor (1982), and others have noted, work-related needs and values can be distinguished conceptually. In contrast to needs, work values operate as secondary drivers of action that are determined by needs as well as socialization, cognition, and experience (Kalleberg, 1977; Latham & Pinder, 2005; Ronen, 1994; Steel & Konig, 2006). As such, work values, representing in part the expression of needs, are closely related to but not identical to needs (Ronen, 1994). In the organizational psychology literature, the conceptual distinction between needs as unconscious forces that promote preferences for particular job conditions and outcomes, and values as secondary drivers of those preferences, is often blurred by the use of need

and value measures that contain the same items (e.g., Mesner Andolsek & Stebe, 2004 and Phillips & Bedeian, 1994).

Needs and values have also been studied independently for different purposes. Work values, for example, may refer to importance of work outcomes (e.g., Super, 1973) or to a system of ethics, which determines what is good or what ought to be done (e.g., Wollack, Goodale, Witjing, & Smith, 1971). Dose (1997) proposed that work values be conceptualized in two dimensions: (1) whether the values are held personally or socially; and (2) whether the values represent a preference or a moral element. From a motivational perspective, work values that relate to motives pertain to personally held preferences for job characteristics or work outcomes (e.g., Loscocco & Kalleberg, 1988; Sagie et al., 1996).

Modern approaches tend to emphasize individual differences in motives that encompass the strength of unconscious needs, motivational orientations, and conscious values that an individual maintains with respect to particular job characteristics and work outcomes (e.g., see Latham & Pinder, 2005; Sagie et al., 1996). Consistent with this perspective, we include all studies in our meta-analysis that assess the relationship between age and work-related needs, personally-held work values, and work-related motives.

The taxonomy of work-related motives in terms of content

The taxonomic structure of motives has long been a topic of lively controversy in work motivation (see Campbell & Pritchard, 1976; Kanfer, 1990). Different work motivation theories posit different motive structures, such as Maslow's (1943) five motive classes, Alderfer's (1969) three motive classes, Deci's (1975) two motive classes, and Barrick, Stewart, and Piotrowski's (2002) three motivational orientation classes. Similarly, Ronen (1994) has found that work values can be grouped to reflect many of these same motive classes. In their review of the work motivation literature, Campbell and Pritchard (1976) argued for a basic distinction between lower-order and higher-order motives. Lower order motives refer to activated concerns regarding features of the work environment that affect the individual's welfare, including for example job security, pay, and safe working conditions. In contrast, higher-order motives pertain to activated concerns for features of the work environment that affect the individual's attainment of psychological needs, such as achievement and affiliation.

Recent conceptualizations of motive organization tend to decompose higher-level motives into two categories; namely, motives related to opportunities in the workplace for personal growth and motives related to affiliation and communion with others (e.g., Barrick et al., 2002). Consistent with theories of aging described below, we organize work-related motive measures into three broad categories: Growth-related motives, social/affiliative motives, and security/maintenance motives. According to humanistic work motivation theories and theories of achievement motivation, growth-related motive measures assess the perceived importance or preference for job characteristics and work outcomes that relate broadly to achievement and mastery (Dweck, 1999). However, consistent with theories of aging, growth-related motives in this study are more narrowly defined in terms of measures that assess growth motives pertaining to the self and attainment of higher levels of functioning. Social motive measures assess the importance or preference for job characteristics and work outcomes that pertain to affiliation and collaboration with others in the workplace, including co-workers, subordinates, and clients. The third motive category, security motives, includes measures that assess the importance or preference for job features and work outcomes that satisfy material and physiological desires related to one's general welfare, such as pay and security.

The taxonomy of work-related motives in terms of locus

A second prominent organization of motives in the work motivation literature distinguishes between intrinsic and extrinsic motives (Deci, 1975). Intrinsic motives refer to job characteristics and work

outcomes that provide expression and attainment of psychological motives, such as accomplishment, connection with others, and autonomy. In contrast, extrinsic motives refer to the strength of preferences for job features and outcomes that occur as a consequence of work, rather than as an integral part of the work process. Examples of extrinsic motives include compensation, benefits, and promotion (see Chang, Choi, & Kim, 2008; Johnson, 2001; Taris, Fey, & Van Vianen, 2005; Van der Velde, Fey, & Van Emmerik, 1998).

Although the intrinsic/extrinsic motive scheme exhibits partial overlap with the growth, social, security motive structure described previously, it may be that age is differentially related to motives as organized by each scheme. For example, Rhodes (1983) found that age was positively related to internal motivation, but found support for a decrease in strength of growth motives (largely an intrinsic motive) as well. Hence, it may be that age is positively related to other intrinsic motives such as affiliation or job autonomy. To investigate the impact of motive organization on the relationship between work-related motives and age, we conduct the meta-analyses using both motivation structures (i.e., growth, social, and security motives and intrinsic and extrinsic motives).

Growth and intrinsic work-related motives and age

One of the most controversial notions about age and work pertains to the popular belief that there is a normative age-related decline in work-related growth motivation and intrinsic motivation. In other words, older workers are less interested in learning and less concerned about job enjoyment than younger workers. Indeed, developmental life span theories, such as SOC theory provide a theoretical account that supports the notion of normative age-related decline in growth related motives over the life course. In SOC theory (Baltes et al., 1999), successful development is defined as the conjoint maximization of gains and the minimization of losses. Across the life span, Baltes et al. (1999) suggest that maximization is achieved by a process of selecting viable outcomes, optimizing resources, and compensating for resource losses. As individuals age, this regulation process will change to accommodate age-related changes in resource gains and losses. Specifically, as individuals enter late adulthood, SOC theory predicts that growth-related work motives (i.e., aimed at reaching higher levels of functioning) will decline and motives related to maintenance and regulation of work-related losses (i.e., security) will increase.

Research findings by Freund (2006), investigating age-related differences in life goal focus, provide empirical support for this prediction. Freund (2006) found that during young adulthood the dominant goal focus was on optimization, but that older adults showed a stronger focus on compensation goals directed toward prevention of further resource loss (see also Ebner et al., 2006). Consistent findings were also obtained in a cross-sectional study of work-related motives by Kanfer and Ackerman (2000). They found that desire to learn was significantly lower among older adults compared to younger adults. Extending SOC to the work context, and based on prior findings, we thus propose the following.

Hypothesis 1a: Age will be negatively related to the strength of growth motives related to work features and outcomes aimed at reaching higher levels of functioning, such as those that provide opportunities for advancement and continuous learning.

The proposed age-related decline in growth motives, however, does not necessarily mean that aging is negatively related to all intrinsic motives. The Life Span Theory of Control (Heckhausen & Schulz, 1995), for example, proposes that aging brings about a shift from the strategies an individual uses to control their situation. Specifically, during young adulthood, individuals are proposed to rely more heavily on externally oriented primary control strategies that emphasize extrinsic outcomes. In contrast, older individuals are posited to employ secondary control strategies that involve self-directed

cognitive processing more frequently. The greater reliance on secondary control strategies, in turn, can be expected to amplify preferences for intrinsically rewarding features of the job, such as enjoyment and interest. Similarly, Kanfer and Ackerman (2004) propose that age-related shifts in the perceived utility of performance operate to increase the salience of intrinsic job features related to the work itself relative to extrinsic job characteristics. Findings by Rhodes (1983) provide tentative support for this notion as they indicated an age-related increase in internal work motivation. Accordingly, we propose.

Hypothesis 1b: Age will be positively related to the strength of intrinsic motives for work features and outcomes that provide for attainment of attractive outcomes (e.g., enjoyment and achievement).

Social work-related motives and age

Although resources for job-related growth may decrease with age, older adults may still experience room for growth in other life domains, such as social relations (Freund, 2006). Socio-Emotional Selectivity Theory is a life span theory of social motivation (Carstensen, 1995) that proposes an age-related increase in selected social relationships as a compensatory strategy for coping with age-related physical and cognitive losses. Specifically, age-related changes in the perception of time are proposed to concomitant changes in social “goals” or “motives” that shift the motive for social interaction away from gaining resources (instrumental) and toward the receipt of affective rewards (emotional satisfaction) and support for one’s identity. According to the theory, as older people perceive their future time as more limited than younger people, they give higher priority to emotionally meaningful social interactions and goals, such as generativity, emotional intimacy, and social embeddedness (see Lang & Carstensen, 2002). Findings by Carstensen and her colleagues (1999) provide support for age-related prioritization of social interaction goals, and findings by McAdams, de St. Aubin, and their colleagues (1998) provide support for an age-related increase in social interactions for the purpose of generative and knowledge transmission to others.

Building on these findings, Kanfer and Ackerman (2004) proposed a similar age-related shift in the primacy of work-related motives for social interaction. They suggest that generativity motives and the importance of protecting one’s work self-concept increases with age. Consistent with these expectations, Warr (2001, 2007) also found that older individuals were more agreeable than younger individuals and Maehr and Kleiber (1981) found evidence for age-related increases in generativity and affiliation motives. These findings provide the foundation for the following hypothesis.

Hypothesis 2: Age will show a positive relation to work-related social motives.

Security and extrinsic work-related motives and age

SOC theory posits that, as individuals age, there is greater attention to compensation for age-related losses and maintenance of remaining resources. Kanfer and Ackerman (2004) posit a similar age-related shift toward motives that support positive affect and protection of the self-concept. Similarly, Warr (1997) found that older workers showed high levels of interest in security and monetary outcomes of work. In line with this reasoning and descriptive evidence, we propose the following hypothesis.

Hypothesis 3: Age will be positively related to security motives.

The Life Span Theory of Control (Heckhausen & Schulz, 1995) posits an age-related shift in control strategies toward lesser use of primary control strategies (i.e., directed toward actions that modify external circumstances, such as job resignation). Since older individuals are more dependent on the external world for the satisfaction of extrinsic motives, extrinsic motives are likely to decrease with age.

Similarly, Kanfer and Ackerman (2004) posit an age-related decline in the salience of extrinsic work-related outcomes, such as pay increases and promotion. They suggest that the age-related shift in temporal perspective reduces the salience and attractiveness of these job features among older workers. This line of reasoning leads to our fourth and final hypothesis.

Hypothesis 4: Age will be negatively related to extrinsic work-related motives.

In sum, we propose that psychological theories and related research on age-related changes in motive orientations may be extended to the work context and permit differential predictions of the relations between work-related motives and age.

Moderator analyses

In addition, we seek to extend these predictions and update Rhodes' (1983) review by performing moderator analyses to differentiate among cohorts, occupations, age groups, age dispersion, and gender. As Kanfer and Ackerman (2004) note, job demands and occupation, gender, and cohort effects may also influence the relationship of age to different work-related motives. For example, earlier studies (Hall & Nougaim, 1968; Rhodes, 1983; Smola & Sutton, 2002) found that the higher order needs of scientists and engineers do not change with age, while self-actualization needs of managers increase with age, and that Generation Xers have a stronger desire to be promoted more quickly than Baby Boomers. Furthermore, similar to Ng and Feldman (2008), we include age groups as a moderator to examine possible curvilinear effects of age, and age dispersion to examine whether the age–motive relationship varies across samples with different degrees of age homogeneity. Consequently, we will examine the influence of occupation, mean age, age dispersion, gender, and cohort as potential moderators of the age and work-related motive relationship. However, we offer no formal hypotheses regarding the impact these moderating variables may have on the relation between age and work-related motives.

Method

Literature search

We used multiple search strategies to identify relevant published and unpublished studies. Since the first relevant work-related need questionnaire was developed in 1961 (i.e., the Porter Need Satisfaction Questionnaire, 1961), we choose 1961 as the starting date for our literature search, and reviewed the literature from the period 1961–2009. To identify relevant studies, we began by performing database searches using the keywords: *Need(s)*, *work value(s)*, *valence*, and using keywords *importance*, *preference* or *desirability* together with *work outcomes*, *job characteristics* or *job attributes*, using the Academic ProQuest (which includes dissertation abstracts), Blackwell Synergy, Emerald fulltext, IngentaConnect, Psychinfo, Science Direct, Web of Science, and Wiley Interscience databases. These searches yielded 70 studies. Second, we identified 3 additional studies by reviewing the references for all studies found in the database searches and through review of all references reported in review and meta-analytic articles. Third, we identified 1 additional, unpublished study with two samples through our review of all papers presented at the Annual Society for Industrial and Organizational Psychology (SIOP) Conference and the Annual Meeting of the Academy of Management from the period 2000–

2008 (except for the years 2001 and 2005, for which we were unable to obtain the Academy of Management conference schedule). Fourth, we emailed the authors of all relevant studies obtained that did not report correlations and were published less than ten or fewer years ago, and requested these correlations and copies of correlations from any additional unpublished studies that assessed age and work-related motives. This resulted in the inclusion of an additional 8 published studies, 2 unpublished studies, and 1 study that was in press at the time of our search.

For study findings to be included in the meta-analysis, the study had to meet all of the following criteria: (a) Include work-related motives that fit our conceptualization; namely that included the measurement of motives related to an individual's propensity or preference for a particular class of outcomes (i.e., the protestant work ethic, intrinsic or internal motivation, and the Survey of Work Values (Wollack et al., 1971) are not included), and that fell within one of our 11 motive classes, (b) report results of an empirical study, (c) report the raw correlation between age and at least one work-related motive, (d) employ a field sample (employees working either full or part time), (e) report findings in the English language. Our search yielded a final total of $k = 86$ studies (samples) from 66 articles (denoted with * in the literature references)¹, with a total of 230 effect sizes and a total sample size of $N = 48\,447$ respondents. The 86 studies consisted primarily of empirical peer-reviewed articles (96.5 per cent) published between 1970 and 2009 (51 per cent after 2000). Fifty-six per cent of all studies included in the meta-analysis were conducted in the United States, 27 per cent in Europe, 3 per cent in Asia, and 14 per cent in other parts of the world. The study sites included a range of venues, including government departments (in 15 per cent of the samples), manufacturing plants (13 per cent), professional service companies (11 per cent), and health care companies (in 6 per cent of the samples). Fifty-five per cent of the samples included miscellaneous companies or did not report study site. The mean age of the total sample was 38.2 (based on 73 studies that reported mean age, $SD = 6.2$), with a standard deviation of 9.4 (based on 52 studies that reported the standard deviation of age, $SD = 2.3$), and with *mean* age ranging from 18.7 to 62.3. In the 22 studies that reported age range, age ranged from 17 to 77.

Work-related motive measures

Table 1 displays a list of the 10 work-related motive measures used in the studies that were included in the meta-analysis, including for each measure their average reliability coefficient and example items. Overall, the two most frequent work-related motive measures used were the Manifest Needs Questionnaire (MNQ; Steers & Braunstein, 1976) and the Growth Need Strength scale (GNS; Hackman & Oldham, 1974). With the exception of the MNQ ($\alpha = 0.58$), the reliability of all other motive measures were acceptable (α ranging from 0.69 to 0.86).

Table 2 displays the categorization of motives according to motive class with the number of studies including this single motive and the average reliability coefficient. Three researchers were responsible for the coding of the motive measures into one of the 11 motive classes. The coders agreed upon the 11 motive classes as presented in this meta-analysis. The first author coded all 86 studies, and the third and fifth author each coded 20 different studies. Interrater agreement between the coders was 92–98 per cent. In the few (1 to 3) instances in which there was disagreement, discussion between the coders was used to reach consensus.

Next, we rationally categorized the 11 motives into three broad groups on the basis of motive content; namely growth, social, and security motives as indicated on the rows in Table 2. As mentioned, Baltes et al. (1999) defined growth as behaviors aimed at reaching higher levels of functioning.

¹A table containing further details of these studies can be obtained from the first author.

Table 1. Motive measures

Measurement instruments measuring needs and work values	Example item(s)
Adjective check list (Gough & Heilbrun, 1965) ($N = 1$)	Check relevant adjectives.
Growth need strength (Hackman & Oldham, 1974) ($N = 12$; $\alpha = 0.73$)	“Indicate the extent to which you prefer one or the other of a pair of jobs” (one relevant to fulfilment of needs for achievement, recognition or growth, the others to fulfilment of pay, security, supervision, or working conditions).
Higher order need strength (Warr, Cook, & Wall, 1979) ($N = 3$; $\alpha = 0.86$)	“How important is each job characteristic, such as using your skills to the maximum or challenging work, when you think about jobs you would like to have.”
Manifest Needs Questionnaire (Steers & Braunstein, 1976) ($N = 21$; $\alpha = 0.58$)	“I do my best work when my job assignments are fairly difficult,” “When I have a choice, I try to work in a group instead of by myself,” “I seek an active role in the leadership of a group.”
Minnesota Importance Questionnaire (Rounds et al., 1981) ($N = 1$)	“Choose the statement, such as “on my ideal job I could plan my work with little supervision,” from each pair that best describes your “ideal” job.”
Porter’s Need Satisfaction Questionnaire (Porter, 1961) ($N = 6$; $\alpha = 0.73$)	“How important is this position characteristic to you?”
Valence (Vroom, 1964) ($N = 6$; $\alpha = 0.73$)	“What importance do you give to your fixed pay?”
Meaning of work scale (Mor-Barak, 1995) ($N = 1$, $\alpha = 0.86$)	“For me, paid work gives me a feeling of pride in my work and in myself.”
Motivational Trait Questionnaire (Kanfer & Ackerman, 2000) ($N = 2$, $\alpha = 0.81$)	“I prefer activities that provide me the opportunity to learn something new,” “I set high standards for myself and work toward achieving them.”
Other scales measuring importance of outcomes and desirability ($N = 33$; $\alpha = 0.69$)	

Therefore, development or challenge (including the construct Growth Need Strength) and advancement or promotion motives that also refer to action propensities with respect to reaching higher levels of functioning were all classified as growth motives. Building upon Barrick et al. (2002), who identified communion striving (i.e., working with or helping people) and status striving (i.e., prestige and status) as broad goals associated with social interactions, we categorized these motives as social motives (see also Chiaburu, Marinova, & Lim, 2007; Wiggins 1979). Finally, following Ronen’s (1994) recommendation, we categorized motives related to job security, benefits, and earnings as existence or security motives.

The columns in Table 2 refer to motive categories in terms of their locus of effect (i.e., intrinsic and extrinsic motives). Intrinsic motives refer to job characteristics and work outcomes that provide expression and attainment of psychological motives, such as accomplishment, connection with others, and autonomy. In contrast, extrinsic motives refer to the strength of preferences for job features and outcomes that occur as a consequence of work, rather than as an integral part of the work process (Deci, 1975). Based on this distinction and the motive organization schemes used by Chang et al. (2008), Johnson (2001), Taris et al. (2005), and Van der Velde et al. (1998), we operationalized intrinsic work motives as including motives for autonomy, achievement, development or challenging work assignments, interesting work, working with or helping people, and job security. We operationalized extrinsic motives as motives for factors such as salary, benefits, career advancement, recognition, and organizational status.

Table 2. Operationalization of dependent variables

Content of work-related motives	Locus	
	Intrinsic	Extrinsic
Growth (aimed at higher levels of functioning)	Development or challenge (including growth need strength) ($N = 26$, $\alpha = 0.76$)	Advancement or promotion ($N = 13$, $\alpha = 0.71$)
Social	Working with people (including need for affiliation) ($N = 25$, $\alpha = 0.53$) Helping people or contributing to society ($N = 15$, $\alpha = 0.72$)	Recognition ($N = 9$, $\alpha = 0.68$) Prestige and status ($N = 12$, $\alpha = 0.70$)
Security	Job security (including need for security) ($N = 17$, $\alpha = 0.90$) Accomplishment or achievement (including need for achievement) ($N = 41$, $\alpha = 0.64$) Use of skills, interesting work (including need for self-actualization) ($N = 14$, $\alpha = 0.70$) Autonomy (including need for autonomy) ($N = 34$, $\alpha = 0.68$)	Compensation and benefits ($N = 24$, $\alpha = 0.78$)

Moderator variables

Gender

Gender was operationalized as the percentage of male workers in each sample. Gender was reported in 71 studies, yielding a mean of 55 per cent across studies.

Occupation

Most studies included in the meta-analysis provided a description of the occupational composition of the sample. Thirty-seven studies reported a sample comprised of a single occupational group. We classified each study that investigated a single occupational group into one of five broad occupational categories. Non-managerial white-collar workers composed the largest occupational category (i.e., 19 per cent of all study samples), and included engineers, accountants, government employees, scientists and politicians. The second largest occupational category represented was managers, including assembly line supervisors, and general managers (8 per cent of all study samples). The third occupational group consisted of studies using samples of persons engaged in sales (6 per cent). The fourth occupational category consisted of samples of persons engaged in health care services, and was comprised entirely of nurses (6 per cent of all study samples). The fifth occupational category was comprised of samples of persons engaged in traditionally blue-collar occupations, including tobacco packers, factory workers, and electricians (5 per cent of all study samples).

Chronological age groups

Following Ng and Feldman (2008), we categorized the chronological age of each sample into three groups based on the distribution of mean ages for all study samples included in the meta-analysis. Mean age less than 36 years (23 studies); mean age between 36–40 years (22 studies), and mean age over 40 years (28 studies).

Age dispersion

Age dispersion was operationalized as the standard deviation of age in each sample (Ng & Feldman, 2008). Standard deviations of age across samples ranged from 2.0 to 14.2.

Cohort

Since studies included in the meta-analysis span a period of nearly four decades, the organization of samples into cohort categories cannot be accomplished using the mean age of the sample alone, but must also take into account when the study was conducted. For example, a study conducted in 1985 and reporting a mean age of 50 years old for the sample would involve persons typically considered to be members of the Traditional cohort (born before 1945). In contrast, a study conducted in 2005 and reporting a mean age of 50 years old for the sample would involve persons typically considered members of the Baby Boomer cohort (born 1946–1964).

To establish the correct cohort group for each study sample, we calculated the mean year of birth for each sample by subtracting the mean age of the sample from the year of data collection of the study (i.e., $1985 - 50 = 1935$). For studies that did not report the year in which the data were collected, we calculated an estimated year of data collection by using the mean number of years between year of publication and year of data collection as calculated from the 21 studies that reported year of data collection. Using the typical boundaries established for age cohorts (see Kupperschmidt, 2000; Smola & Sutton, 2002), we then coded each study sample into one of three age cohorts on the basis of mean year of birth; (1) Traditionals (mean year of birth before 1945), (2) Baby Boomers (mean year of birth between 1946 and 1964), and (3) Generation Xers (mean year of birth after 1965). Eighteen samples (21 per cent of all samples) were classified as comprised of members belonging to the Traditional cohort (Mean age = 37.62; *SD* age = 8.4), 44 samples (51 per cent of all samples) were classified as comprised of members belonging to the Baby Boomer cohort (Mean age = 39.53; *SD* age = 10), and 11 samples (13 per cent of all samples) were classified as comprised of members belonging to the Generation \times cohort (Mean age = 33.69; *SD* age = 7.18).

Finally, we examined whether the moderator variables were interrelated. These analyses revealed that only gender and occupation were significantly related; the occupational category of nurses had a significantly lower proportion of male workers than the occupational category of sales agents.

Analyses

We used Hunter and Schmidt's (2004) meta-analytic techniques and related software (Schmidt & Le, 2004) to conduct our meta-analysis, with the correlation between age and work-related motives as effect size. We employed the following procedure: (1) Wherever correlations were not reported (e.g., Lord, 2004), correlations were computed using the meta-analysis calculator²; (2) correlations of work-related motives derived from one study that referred to the same category (e.g., growth motives) were aggregated since average correlations do not violate the assumption of independence (Hunter & Schmidt, 2004); (3) each correlation was corrected for the statistical artifact of measurement error. Since there is no theoretical reason to believe the measurement of age would contain measurement error, we only corrected for unreliability in the criterion and did not correct for measurement error of age (see also Ng & Feldman, 2008). Wherever reliability was not reported, the average reliability for that variable across all samples that were included in the meta-analysis was used; (4) each correlation was corrected for the statistical artifact of sampling error; (5) each correlation was corrected for range restriction, i.e., the standard deviation (*SD*) of age in the study relative to the *SD* of age in the working

²<http://www.lyonsmorris.com/lyons/metaAnalysis/index.cfm>

population (which was estimated at 11 based on the assumption that 95 per cent of the working population is between the ages of 18 and 62; Warr, 2008). This resulted in a mean true score correlation (ρ); (6) we used confidence intervals to interpret validity generalization results (see Cohen, 1993); that is, the confidence interval of a *significant* mean correlation does not include zero, and finally; (7) we interpreted the magnitude of the mean correlation based on the guidelines proposed by Cohen (1992): 0.1 is interpreted as a small effect, 0.3 as a medium effect, and 0.5 as a large effect.

Moderator analyses

We used two approaches to perform moderator analyses. First, in accord with the recommendation by Aguinis, Sturman, and Pierce (2008) for analysis of the moderating effect of *categorical* variables in the absence of strong theory-based hypotheses, we used the Hunter and Schmidt (2004) procedure in which the mean effect sizes are compared across groups using a *t* statistic. We used this procedure to examine the potential moderating influence of occupation, age groups, and cohort group (based on reported mean age of the sample and year of data collection). When subgroups contained fewer than three original studies ($k < 3$), these subgroups were not reported.

We also tested for a moderating effect of the continuous variables age dispersion and proportion of male workers by performing a weighted least squared (WLS) multiple regression analysis, since this approach is seen as providing the most accurate results (Steel & Kammeyer-Mueller, 2002). In this analysis, age dispersion and proportion of male workers are the independent variables, and the correlation coefficient between age and work-related motives (corrected for measurement error and range restriction, transformed to Fisher's *Z*, and then weighted based on *N*, the criterion reliability and range restriction) is the dependent variable. We used Lipsey and Wilson's (2001) SPSS macros to perform these analyses.

Results

Meta-analytic results for the relations between age and work-related motives are presented in Table 3. As shown, the results provide support for Hypotheses 1a, 1b, and 4. Specifically, age was significantly negatively related to the strength of work-related growth motives (H1a; $\rho = -0.14$), but significantly, positively related to self-reported importance of work-related intrinsic motives (H1b; $\rho = 0.07$). Relative to younger workers, older workers reported lower motive strength for job characteristics

Table 3. Meta-analytic results for the hypothesized relationships between work-related motives and age

	Motives	<i>N</i>	<i>k</i>	<i>r</i>	ρ	<i>SD</i> ρ	95% LCI	95% UCI	Var. expl.
H1a	Growth motives ^a	31 469	31	-0.10	-0.14	0.13	-0.18	-0.09	9.80
H1b	Intrinsic motives ^a	48 141	84	0.05	0.07	0.10	0.05	0.09	26.59
H2	Social motives	29 300	35	-0.02	-0.02	0.10	-0.05	0.01	20.69
H3	Security motives ^a	35 233	31	-0.06	-0.08	0.12	-0.12	-0.03	9.23
H4	Extrinsic motives ^a	37 054	35	-0.07	-0.10	0.11	-0.13	-0.06	13.01

Note: *N* = the number of individuals in the *k* samples, *k* = the number of studies/samples, *r* = sample-size weighted uncorrected correlation, ρ = mean true score correlation, *SD* ρ = standard deviation of ρ , 95% LCI = lower bound of confidence interval, 95% UCI = upper bound of confidence interval, var. expl. = percentage variance in corrected correlations attributable to all artifacts.

^aSignificant mean correlation, interval does not include zero.

related to new learning and advancement, but higher motive strength for job characteristics and outcomes related to accomplishment, job enjoyment, and existing skill utilization.

In contrast to our Hypothesis 2 and 3, however, age was unrelated to social motives (the confidence interval includes zero), and age was significantly, but *negatively* related to work-related security motives ($\rho = -0.08$). Finally, as hypothesized (H4), age was significantly negatively related to work-related extrinsic motives ($\rho = -0.10$). Relative to younger workers, older workers reported lower motive strength for job characteristics related to prestige and financial compensation.

In addition, Table 4 provides information about specific work-related motives. This table reveals that the motive strength for job characteristics related to accomplishment or achievement ($\rho = 0.06$), use of skills or interesting work ($\rho = 0.10$), autonomy ($\rho = 0.27$), helping people or contributing to society ($\rho = 0.09$), and job security ($\rho = 0.06$) increased with age, that the motive strength for job characteristics related to development or challenge ($\rho = -0.07$), advancement or promotion ($\rho = -0.23$), working with people ($\rho = -0.07$), recognition ($\rho = -0.13$), and compensation and benefits ($\rho = -0.10$), decreased with age, and that the motive strength for job characteristics related to prestige or status was not significantly related to age. The effect sizes were small to medium (Cohen, 1992).

Moderator analyses

Since at least 25 per cent of the variance in the observed mean correlations remained unexplained after accounting for statistical artifacts (last column of Table 3), moderators or covariates may exist (Hunter & Schmidt, 2004). In fact, the large residual variances (the variances explained range from 9.23 per cent to 26.59 per cent) suggest that moderator analyses are an important element of our study. Therefore, we examined the moderating effect of different subgroups (i.e., occupation, age group, and cohorts) and sample characteristics (i.e., age dispersion and proportion of male workers). Table 5 reveals that the relation between age and growth and intrinsic motives was significantly different for workers in different occupational groups. Specifically, the relationship between age and growth motives was positive among blue-collar workers ($\rho = 0.21$), but negative among white-collar workers

Table 4. Meta-analytic results for the relationships between the individual work-related motives and age

Motives	<i>N</i>	<i>k</i>	<i>r</i>	ρ	<i>SD</i> ρ	95% LCI	95% UCI	Var expl
Development or challenge ^a	22 298	26	-0.05	-0.07	0.12	-0.12	-0.03	15.39
Accomplishment or achievement ^a	15 862	41	0.04	0.06	0.12	0.02	0.09	28.62
Use of skills (self-actualization), interesting work ^a	22 512	14	0.07	0.10	0.13	0.03	0.17	6.43
Autonomy ^a	28 384	34	0.19	0.27	0.19	0.21	0.33	5.90
Advancement or promotion ^a	27 282	13	-0.16	-0.23	0.14	-0.30	-0.15	4.30
Working with people (affiliation) ^a	23 555	25	-0.05	-0.07	0.09	-0.11	-0.03	21.23
Helping people or contributing to society ^a	7 897	15	0.07	0.09	0.04	0.07	0.11	70.48
Recognition ^a	19 168	9	-0.08	-0.13	0.05	-0.16	-0.09	32.25
Prestige and status	20 707	12	-0.01	-0.02	0.07	-0.06	0.02	21.07
Job security ^a	13 341	17	0.05	0.06	0.06	0.03	0.09	33.71
Compensation and benefits ^a	33 191	24	-0.08	-0.10	0.10	-0.14	-0.06	10.63

Note: *N* = the number of individuals in the *k* samples, *k* = the number of studies/samples, *r* = sample-size weighted uncorrected correlation, ρ = mean true score correlation, *SD* ρ = standard deviation of ρ , 95% LCI = lower bound of confidence interval, 95% UCI = upper bound of confidence interval, var. expl. = percentage variance in corrected correlations attributable to all artifacts.

^aSignificant mean correlation, confidence interval does not include zero.

Table 5. Subgroup moderator analyses for the relationships between work-related motives and age

Motives	Subgroup	N	k	r	ρ	SD ρ	95%LCI	95%UCI	t-test
Growth	Age < 36 ^a	10 644	9	-0.11	-0.16	0.03	-0.18	-0.14	t-age group 2 = 2.26 ^a /t-age group 3 = 7.37 ^a
Growth	Age 36-40 ^a	9420	8	-0.07	-0.08	0.09	-0.14	-0.02	t-age group 3 = 5.73 ^a
Growth	Age > 40 ^a	8459	6	-0.18	-0.27	0.03	-0.29	-0.25	
Growth	White-collar workers ^a	1458	4	-0.17	-0.24	0.16	-0.40	-0.09	t-managers = 1.39/t-sales agents = 1.78/t-blue collar = 3.47 ^a /t-nurses = 3.28 ^a
Growth	Managers	809	3	-0.06	-0.10	0.11	-0.23	0.03	t-sales agents = 0.81/t-blue collar = 2.52 ^a /t-nurses = 2.12
Growth	Sales agents	335	3	0.01	0.01	0.21	-0.22	0.24	t-blue collar = 1.27/t-nurses = 0.70
Growth	Blue-collar workers ^a	947	3	0.18	0.21	0.18	0.01	0.42	t-nurses = 0.81
Growth	Nurses	565	3	0.09	0.11	0.13	-0.03	0.25	
Growth	Traditionals ^a	1381	7	-0.16	-0.20	0.18	-0.33	-0.07	t-Baby Boomers = 1.68/t-gen Xers = 0.51
Growth	Baby Boomers ^a	9660	12	-0.06	-0.08	0.06	-0.12	-0.05	t-gen Xers = 5.84 ^a
Growth	Generation Xers ^a	17 482	4	-0.14	-0.23	0.04	-0.27	-0.19	
Intrinsic	Age < 36 ^a	14 283	23	0.06	0.10	0.10	0.06	0.14	t-age group 2 = 0.85/t-age group 3 = 2.95 ^a
Intrinsic	Age 36-40 ^a	13 625	21	0.06	0.08	0.06	0.06	0.11	t-age group 3 = 2.69 ^a
Intrinsic	Age > 40 ^a	14 801	27	0.02	0.03	.007	0.00	0.06	
Intrinsic	White-collar workers ^a	5246	16	0.05	0.08	0.08	0.04	0.12	t-managers = 0.78/t-sales agents = 1.63/t-blue collar = 1.40/t-nurses = 0.27
Intrinsic	Managers	1500	7	0.00	-0.01	0.12	-0.11	0.08	t-sales agents = 1.21/t-blue collar = 2.11 ^a /t-nurses = 1.44
Intrinsic	Sales agents ^a	335	3	0.04	0.04	0	0.04	0.04	t-blue collar = 1.76/t-nurses = 0.87
Intrinsic	Blue-collar workers ^a	1028	4	0.16	0.23	0.21	0.02	0.43	t-nurses = 1.11
Intrinsic	Nurses ^a	1106	5	0.10	0.13	0.08	0.05	0.20	
Intrinsic	Traditionals ^a	3467	17	0.07	0.11	0.13	0.05	0.17	t-Baby Boomers = 1.81 ^a /t-gen Xers = 0.45
Intrinsic	Baby Boomers ^a	19 606	45	0.03	0.05	0.07	0.03	0.07	t-Generation Xers = 1.42
Intrinsic	Generation Xers ^a	19 636	9	0.05	0.09	0.08	0.04	0.14	
Social	Age < 36 ^a	12 076	11	-0.07	-0.13	0.07	-0.17	-0.09	t-age group 2 = 6.32 ^a /t-age group 3 = 5.12 ^a
Social	Age 36-40 ^a	2905	6	0.07	0.08	0.06	0.03	0.13	t-age group 3 = 1.92 ^a
Social	Age > 40	12 823	14	0.00	0.02	0.07	-0.02	0.05	
Social	White-collar workers	3371	10	0.03	0.04	0.10	-0.02	0.10	
Social	Traditionals ^a	1539	5	0.08	0.11	0.09	0.04	0.19	t-Baby Boomers = 1.08/t-gen Xers = 4.04 ^a
Social	Baby Boomers ^a	7335	20	0.04	0.06	0.08	0.03	0.10	t-gen Xers = 4.22 ^a
Social	Generation Xers ^a	18930	6	-0.05	-0.09	0.08	-0.16	-0.03	
Security	Age < 36 ^a	11 942	8	-0.12	-0.17	0.13	-0.26	-0.08	t-age group 2 = 3.38 ^a /t-age group 3 = 1.44
Security	Age 36-40	10 541	10	-0.00	-0.00	0.06	-0.04	0.04	t-age group 3 = 1.96 ^a
Security	Age > 40 ^a	11 548	10	-0.06	-0.08	0.12	-0.16	-0.01	

Security	White-collar workers ^a	2262	7	0.08	0.09	0.11	0.01	0.18	<i>t</i> -sales agents = 0.21
Security	Sales agents	641	5	0.09	0.12	0.30	-0.15	0.39	
Security	Traditionals ^a	1847	8	0.10	0.14	0.19	0.00	0.27	<i>t</i> -Baby Boomers = 2.16 ^a / <i>t</i> -gen Xers = 4.04 ^a
Security	Baby Boomers	13 288	15	-0.01	-0.01	0.08	-0.06	0.03	<i>t</i> -Generation Xers = 3.63 ^a
Security	Generation Xers ^a	18 896	5	-0.11	-0.18	0.09	-0.26	-0.10	
Extrinsic	Age < 36 ^a	12 082	9	-0.10	-0.18	0.11	-0.25	-0.11	<i>t</i> -age group 2 = 2.48 ^a / <i>t</i> -age group 3 = 1.60
Extrinsic	Age 36-40 ^a	11 298	11	-0.06	-0.07	0.08	-0.12	-0.02	<i>t</i> -age group 3 = 0.63
Extrinsic	Age > 40 ^a	12 178	11	-0.07	-0.10	0.12	-0.17	-0.03	
Extrinsic	White-collar workers	3943	10	-0.04	-0.06	0.18	-0.17	0.05	<i>t</i> -sales agents = 1.12
Extrinsic	Sales agents	641	5	0.09	0.12	0.32	-0.17	0.40	
Extrinsic	Traditionals	2604	9	-0.04	-0.07	0.24	-0.23	0.08	<i>t</i> -Baby Boomers = 0.12/ <i>t</i> -gen Xers = 1.29
Extrinsic	Baby Boomers ^a	13 918	16	-0.05	-0.06	0.06	-0.09	-0.03	<i>t</i> -Generation Xers = 2.86 ^a
Extrinsic	Generation Xers ^a	19 036	6	-0.10	-0.19	0.10	-0.27	-0.11	

Note: *N* = the number of individuals in the *k* samples, *k* = the number of studies/samples, *r* = sample-size weighted uncorrected correlation, *ρ* = mean true score correlation, *SDρ* = standard deviation of *ρ*, 95% LCI = lower bound of confidence interval, 95% UCI = upper bound of confidence interval, *t*-test = *t* statistic to test moderating effect.

^aSignificant mean correlation (confidence interval does not include zero) or significant *t*.

($\rho = -0.24$) and unrelated among managers. The results of the moderator analysis also showed a significant difference between blue-collar workers and other occupational groups in the age-intrinsic motive relationship. Although there was a significant positive relationship between age and intrinsic motives among blue-collar workers, sales agents, and white-collar workers, the magnitude of this positive relation was significantly more positive among blue-collar workers ($\rho = 0.23$), followed by white-collar workers ($\rho = 0.08$), and sales agents ($\rho = 0.04$). Finally, although the relation between age and security motives was not significantly moderated by occupation, the hypothesized, positive relationship between age and security motives was obtained for white-collar workers ($\rho = 0.09$).

Results of moderator analyses by cohort revealed that cohort significantly moderated the relationship between age and all motive classes (see Table 5). The age-growth motive relation was negative for all cohorts, but the magnitude of the negative relation was significantly greater for the Generation \times cohort ($\rho = -0.23$) than the Baby Boomer cohort ($\rho = -0.08$). In a similar vein, the age-intrinsic motive relation was positive for all cohorts, but the magnitude of the positive relation was significantly greater for the Traditionals cohort ($\rho = 0.11$) than the Baby Boomer cohort ($\rho = 0.05$). Further, the age-social work motive relationship was positive for the Traditional ($\rho = 0.11$) and Baby Boomer ($\rho = 0.06$) cohorts, but negative for the Generation \times cohort ($\rho = -0.09$). With respect to the relationship between age and security work motives, moderator analyses showed that the relationship was significant and positive in Traditional cohort samples ($\rho = 0.14$), but non-significant in samples comprised of members of the Baby Boomer cohort, and significant but negatively related in samples comprised of members of the Generation \times cohort ($\rho = -0.18$). Finally, moderator analyses on the impact of cohort on the relationship between age and extrinsic work motives showed a significant negative relationship for Baby Boomer ($\rho = -0.06$) and Generation \times cohort samples ($\rho = -0.19$), but no significant relationship between age and extrinsic work motives for the Traditional cohort.

Results of moderator analyses by age group revealed that age group also significantly moderated the relationship between age and all motive classes (see Table 5). The age-growth motive and age-extrinsic motive relation was significantly negative among all age groups, but the magnitude of the age-growth motive relation was significantly more negative among employees aged 40 years or older, and the age-extrinsic motive was significantly more negative among younger workers aged 36 or younger. In a similar vein, the age intrinsic-growth relation was significantly positive among all age groups, but the magnitude of this relation was significantly less positive among older workers. With respect to the relationship between age and social work motives, moderator analyses showed that the relationship was significant and negative among younger workers ($\rho = -0.13$), significant but positively related in samples comprised of middle aged workers ($\rho = 0.08$), but non-significant in samples comprised of older workers. The age-security motive relation was significantly and negative among younger and older workers, but unrelated among middle-aged workers.

Table 6 reports the results for the moderator (regression) analyses with the age-motive relations as dependent and age dispersion and proportion of male workers in the sample as independent variables. This table reveals that age dispersion had a positive influence on the age-social motive relationship.

Discussion

An updated literature review was conducted and a meta-analysis was performed to investigate the relationship between age and work-related motives. Using chronological age as our indicator of aging, we organized needs, values, and motive measures into a common structure that permitted meta-analyses of the relationship between age and different motive classes. Similar to other meta-analytic

Table 6. Moderator regression analyses for the relationships between work-related motives and age

Relationship	<i>k</i>	β	R^2
Age-growth motives			
Age dispersion	12	-0.14	0.02
Proportion male workers	22	0.16	0.03
Age-intrinsic motives			
Age dispersion	51	0.21	0.04
Proportion male workers	69	-0.01	0.00
Age-social motives			
Age dispersion	24	0.41 ^a	0.16
Proportion male workers	29	0.19	0.04
Age-security motives			
Age dispersion	17	-0.22	0.05
Proportion male workers	26	0.04	0.00
Age-extrinsic motives			
Age dispersion	20	-0.23	0.05
Proportion male workers	29	0.21	.04

Note: *k* = the number of studies/samples, β = standardized beta weight, R^2 = variance explained.

^a $p < .05$.

studies, on the relation between age and performance for example (Ng & Feldman, 2008), our effect sizes were small to medium (Cohen, 1992).

Growth and intrinsic work-related motives and age

As proposed by both SOC theory and Kanfer and Ackerman (2004), we found an age-related decrease in growth motives related to work features such as training and advancement. Although the data do not allow for a clear causal explanation of these findings, it may be that since fluid intelligence and learning abilities are likely to decline with age (see Ackerman, 1996), the strength of motives that impose strong demands on these abilities might also decline. In contrast, the strength of intrinsic work-related motives that do not require these abilities was positively associated with age, reflecting a compensatory strategy for age-related resources losses as proposed by the Life Span Theory of Control. Since modern theories of work motivation still focus on younger workers by emphasizing intrinsic rewards related to learning (Kanfer & Ackerman, 2004), these findings suggest that we should rethink our understanding of these motives from a life span perspective.

Social work-related motives and age

Contrary to our hypothesis based on Socio-Emotional Selectivity Theory, we found that social work-related motives were unrelated to age. Since intrinsic social motives related to communion striving (i.e., working with or helping others) are different than extrinsic social motives related to status striving (i.e., recognition and prestige), we conducted post hoc analyses to learn about potential how these two dimensions of social motives might change with age. The post hoc analyses reveal that social motives related to communion striving are unrelated to age, and that social motives related to status striving decrease with age ($\rho = -0.07$). This latter finding supports Kanfer and Ackerman's (2004) suggestion that the strength of achievement motives related to the demonstration of mastery and excellence compared to others declines with age.

Further examination of the motives comprising this motive class revealed an unexpected negative relationship between age and the strength of motives associated with relationships with other people including co-workers. Socio-Emotional Selectivity Theory predicts that older workers prefer social partners who are familiar to them and who provide a social climate in which they feel validated and loved. In the work context, however, social interactions with other people might be more superficial. In addition, the emphasis on a shorter future with the organization may reduce the attractiveness of developing emotionally satisfying interactions with co-workers (e.g., Carstensen, 1998).

The social motives of Baby Boomers and Traditionals, on the other hand, were found to increase with age as expected. These findings suggest that Socio-Emotional Selectivity Theory needs to be extended to the (work) context. In addition, the motive strength related to helping other people and contributing to society was positively related to age. This finding supports Socio-Emotional Selectivity Theory's prediction that older workers prioritize emotionally meaningful goals, such as generativity, and suggests that we need to examine age-related differences in social motives beyond the motives examined in this study.

Security and extrinsic work-related motives and age

Contrary to our hypothesis that security motives increase with age, security motives were significantly negatively related to age. However, post hoc analyses revealed that the strength of intrinsic security motives (i.e., job security) does increase with age ($\rho = 0.06$). Furthermore, the strength of security motives does increase with age among Traditionals and white-collar workers. A possible explanation for this latter finding is that the other occupations in our study are physically or psychologically more demanding than white-collar work, resulting in losses in physical or psychological abilities irrespective of age. Workers in these professions may therefore use (different) coping strategies from the start of their career, whereas white-collar workers do not experience loss until old age. Finally, as proposed by the Life Span Theory of Control, extrinsic work-related motives decreased with age. It seems, thus, that older workers rely less on primary control strategies directed toward actions that modify external circumstances.

Moderator analyses

Consistent with the Kanfer and Ackerman formulation, we found that occupation moderated the relationship between age and growth and intrinsic motive strength. However, in contrast to expectations, age was positively related to growth motive strength among blue-collar workers. We can only speculate about this finding at this point, but it may well be that, unlike white-collar or service workers, blue-collar workers are also experiencing age-related losses in physical abilities requisite for task performance. Therefore, they may have no other choice than to train for other jobs, such as for supervisory jobs. Furthermore, according to Kanfer and Ackerman (2004) and the Life Span Theory of Control, age-related losses in abilities requisite for job performance promote the use of secondary control strategies that involve self-directed cognitive processing. Consistently, the age-intrinsic motive relation is stronger among blue-collar workers than among other occupational groups. Finally, the moderator analyses showed a positive relationship between age and the strength of intrinsic work-related motives for all occupations except managers. One possible explanation for this finding, related to the Life Span Theory of Control, is that these workers have more control over their environment (i.e., over subordinates) than workers in service and blue-collar jobs, and therefore do not need to rely on secondary control strategies.

Our findings also help to disentangle the impact that cohort may play in the relationship between age and person characteristics, such as motives, needs, and values. Findings obtained in moderator analyses by cohort showed that, contrary to our hypotheses, security and social motives decrease with age among Generation Xers. It might be that, since jobs and working conditions have improved in the last five decades, aging workers in the Generation \times cohort experience less work-related losses, and therefore, do not need compensatory strategies, whereas aging workers in the Traditional and Baby Boom cohorts do. Although Generation Xers are 44 years old at most, and may be considered too young to be experiencing substantial losses, Ebner et al. (2006) have found that goal focus toward maintenance and prevention already starts increasing in middle age. Another explanation is the increased flexibility of the workforce, resulting in different compensatory strategies of aging workers in the Generation \times cohort, emphasizing employability instead of job security for example. This suggests that we need more research to better define and study multiple dimensions of security. To our knowledge, these results are the first to indicate the differential impact of common experiences and environment on the trajectories of work-related motives across the life span.

Further, moderator analyses by age group revealed different forms of the age-motive relationships; the form of the relationship between age and social motive strength is a U-shaped curvilinear curve, although age is unrelated to social motive strength among older workers, and the form of the relationship between age and intrinsic motives is a positive, concave upward curve. Unexpectedly, the biggest 'shift' from extrinsic toward intrinsic motives occurs among younger workers. It seems that younger workers already start shifting their control strategies as they age in the work place. However, as expected, the sharpest decline in growth motives occurs among older workers. Finally, age-motive relationships are hardly influenced by the degree of age homogeneity or proportion of male employees in the samples. Age dispersion only has a positive influence on the age-social motive relationship, and gender has no moderating effect on age-motive relations at all.

In conclusion, our meta-analytic results largely support theories of adult development (i.e., SOC theory, the Life Span Theory of Control, and Socio-Emotional Selectivity Theory). Hence, these psychological theories of aging provide an excellent way for understanding the complexities of what work features are attractive to older workers. However, taxonomies that organize motives along content lines (i.e., growth, social, and security) rather than in terms of the motive locus (i.e., intrinsic and extrinsic) may provide an incomplete picture. Therefore, these motives need to be reconsidered from a life span perspective. In addition, the moderator analyses revealed that the work context (e.g., occupation and cohort) should be taken into account as well. These findings permit more precise prediction of which work features are more likely to appeal to older workers.

Limitations

Sagie et al. (1996) argue that, since individual preferences are largely learned from parents, teachers, peers, and significant others and modified on the basis of experience, age does not directly impact work values, and thus work motives, but is actually a substitute for societal roles, socialization and expectations. In line with this reasoning, a number of researchers have suggested that chronological age may be an insufficient operationalization of the age factor in the work setting (De Lange et al., 2006; Kooij et al., 2008; Sterns & Miklos, 1995). In this meta-analysis, we have operationalized age as chronological age, whereas other operationalizations of age, such as career stage and life status, but in particular job or organizational tenure, are also potentially relevant (see De Lange et al., 2006; Kooij et al., 2008). These operationalizations are rarely used in our selected empirical studies, and we were therefore not able to examine the influence of these age-related variables.

Furthermore, the moderator analyses have some limitations. First of all, the number of studies in the subgroups of the moderator analyses is small. Although the number of studies is taken into account in the significance level of the effect sizes and *t* statistics, this meta-analysis should be replicated when more studies are available. Second, the operationalization of the moderator variable “occupation” is rather broad. The occupational category of managers, for example, included managers from different hierarchical levels, and the occupational category of white-collar workers included a broad range of jobs, including scientists and engineers. However, scientists and executive managers might have different motives than clerical workers and assembly line supervisors. Although post hoc analyses with different categories of white-collar workers provided similar results, the results for occupation as a moderator variable should be interpreted with caution.

Another limitation of this study is that older workers tend to be underrepresented in organizations because of early retirement options and healthy worker effects, and therefore, are also underrepresented in empirical studies. Since the *mean* age in our samples ranged from 18.7 to 62.3, the effect of this selection bias will probably be small. Finally, the studies included in our meta-analysis measure needs and work values at only one point in time, which makes conclusions about intra-individual changes in needs and work values or work-related motives impossible (see also Hertzog & Nesselroade, 2003).

In spite of these limitations, we feel that the present meta-analysis does have several important theoretical and practical implications.

Theoretical implications and future research

First of all, our findings suggest that we need to rethink our understanding of motives from a life span perspective. As mentioned by Kanfer and Ackerman (2004), modern theories of work motivation still focus on younger workers or new entrants, by emphasizing intrinsic rewards related to learning and extrinsic rewards related to pay, promotion, and recognition. Hence, an important suggestion for future research on aging and work motivation is the development of better measures of motives that are appropriate across the life span, as well as measures of emergent motives, such as generativity (see for example the Meaning of Work Scale developed by Mor-Barak, 1995), knowledge utilization, helping, collaboration, and enhancing positive affect (Kanfer & Ackerman, 2004). In addition, future research should report correlations between these measures of motives and age, so that age differences in these motive measures can be examined meta-analytically.

In line with this reasoning, Maehr and Kleiber (1981) have suggested that achievement motivation should be redefined from a more extrinsic, competitive pattern of achievement (which is more typical for younger people) to a more intrinsic, mastery related pattern. Similarly, Heggstad (1997) and Kanfer and Ackerman (2000) distinguished different components of achievement, i.e., desire to learn, mastery and competitive achievement and found that age-related changes differed for each of these components of achievement. In this study we found that age-related changes differed for development (i.e., learning) and achievement (i.e., mastery) motives, but we did not distinguish between mastery and competitive achievement.

However, since achievement as measured by the MNQ includes an element of competitive achievement (e.g., “I try to perform better than my co-workers”), whereas the other measures of achievement do not, we have post hoc analyzed the difference between mean correlations between age and achievement as measured by the MNQ and those as measured by other instruments. We found that the mean correlations differed significantly ($t = 3.43, p < 0.05$); achievement measured with the MNQ is unrelated to age, whereas achievement measured by other instruments increases with age. This suggests that competitive achievement decreases with age (see also Holahan, 1988; Kanfer & Ackerman, 2004). Kanfer and Ackerman (2004) provide support for this suggestion by arguing that

since generativity motives, which focus attention on the process and collaborative nature of goal accomplishments, increase with age, older workers will emphasize cooperation rather than competition. More research is needed to examine this phenomenon. For example, future research could further examine age-related differences in the achievement goal model developed by Elliot (e.g., Elliot, 1999; Elliot & McGregor, 2001), who distinguishes mastery as well as performance-related motives.

Second, our findings suggest that SOC and Socio-Emotional Selectivity theories need to be extended to the work context (see also Abraham & Hansson, 1995; Wiese, Freund, & Baltes, 2002); although growth motives showed the expected age-related decrease, security motives and social motives only revealed the expected age-related pattern among Baby Boomers, Traditionals or white-collar workers. Therefore, future research should examine age-related differences in motives in different work contexts. For example, if older individuals seek social interaction to sustain positive self-concept and affect, then you would expect to find less older workers in jobs or organizations that do not have supportive cultures or environments, but high employee competition. Furthermore, future research should study age-related versus cohort-related differences. For example, aging Generation Xers no longer use social interactions at work to support their self-concept, but non-work social interactions (using new technologies such as email and mobile phones). Similarly, the economic history of people's childhood and early adolescence influences age-related changes in security motives. Therefore, future research needs to better define security motives in terms of employability, different benefits, employment security with respect to a particular occupation or organization etc.

Another suggestion for future research is to include unconscious motives measures. Since we did not find studies that measure unconscious motives (for example with the Thematic Apperception Test; McClelland et al., 1958), the relation between age and unconscious motives remains a gap in our knowledge. Conscious motives are also influenced by cognition and experience, caused by occupation, existing stereotypes or the supervisor's expectations for example, whereas life span theories are more concerned with internal regulation processes. Therefore, future research should include these measures to examine whether unconscious security and social motives do change with age as expected.

Finally, although we found some support for the Life Span Theory of Control, this theoretical idea should also be fine-tuned to the work context, by introducing more work specific age-related processes. For example, the diminishing time left in the organization (or retirement perspective) and stereotypical views about older workers might explain age-related constraints on primary control in the work setting. Another age-related constraint on primary control in the work setting, suggested by Kanfer and Ackerman (2004), is the declining attractiveness of higher levels of effort with age. Future research should also consider these work-related factors.

Practical implications

Our meta-analysis has three important practical implications. First of all, since the importance of certain work outcomes changes with age, organizations should consider adjusting their HR policy and practices to fit the needs of workers with different ages. For example, since the importance of helping people seems to increase with age, older workers should be offered more mentor roles, and since motive strength for interesting work, autonomy, and achievement increases with age, older workers' jobs should be redesigned to include these characteristics (see also Armstrong-Stassen, 2008; Paul & Townsend, 1993). In addition, since work-related motives are influenced by the social environment, such as occupation, organizations should differentiate their HR policy and practices to fit the different needs of workers in different job types. Finally, we found that, although the motive strength related to development and challenge decreases with age, intrinsic and achievement motives are more important

for older workers as compared to younger workers. So, instead of simply offering older workers limited opportunities for training and development (Greller & Simpson, 1999), managers should assure interesting jobs for older workers in which these older workers can accomplish worthwhile tasks. Hopefully this meta-analysis will lead to the gradual adjustment of prejudices about older workers.

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Ruth Kanfer is Professor of Industrial and Organizational Psychology at the School of Psychology of Georgia Institute of Technology. She holds a PhD in Psychology from the Arizona State University. Her research focuses on the influence of motivation, personality, and emotion in workplace behavior, job performance, and worker well being. Her past projects have examined the impact of these person factors and situational constraints as they affect skill training, job search, teamwork, job performance, and the development of workplace competencies. Her recent projects have focused on adult development and workforce aging, job search-employment relations, motivation in and of teams, and person determinants of cross-cultural effectiveness. She is co-director of the Kanfer-Ackerman laboratory, where longitudinal and large-scale laboratory and field collaborative projects are conducted on topics such as workforce aging, work adjustment, cognitive fatigue, skill acquisition, adult development and career trajectories, and self-regulated learning.

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