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The influence of age on the associations between HR practices and both affective commitment and job satisfaction: A meta-analysis

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Summary

Research on the association between high commitment Human Resource (HR) practices and work-related outcomes at the individual level rarely focuses on age differences. To fill this knowledge gap, a meta-analysis has been conducted to examine how the relationships between the availability of high commitment HR practices, as perceived by employees, and affective commitment and job satisfaction change with age. Drawing on Selection, Optimization, and Compensation (SOC) theory and on Regulatory Focus theory, we identify a bundle of maintenance HR practices and a bundle of development HR practices, and hypothesize that the association between maintenance HR practices and work-related attitudes strengthens with age, and that the association between development HR practices and work-related attitudes weakens with age. Our meta-analysis of 83 studies reveals that, in line with social exchange and signaling theories, employees' perceptions of HR practices are positively related to their work-related attitudes, and that calendar age influences this relationship largely as expected. These results are discussed in light of the above mentioned theories. Copyright © 2009 John Wiley & Sons, Ltd.

Introduction

Since workforces are aging across the world (OECD, 2005), and older workers can be of great value to their companies (Ng & Feldman, 2008), organizations should reconsider their organizational policies and practices in order to encourage older workers to remain engaged and active members of the workforce (Barnes-Farrell & Matthews, 2007). However, little is known about the influence of age on the association between Human Resource (HR) practices and individual worker outcomes. Only two previous studies (Conway, 2004; Finegold, Mohrman, & Spreitzer, 2002) have examined how the

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relationship between HR practices and commitment differs for workers in different life or career stages. This meta-analysis aims to fill this knowledge gap. In line with the lifespan approach of the Selection, Optimization, and Compensation (SOC) theory (Baltes, Staudinger, & Lindenberger, 1999) and the social psychological Regulatory Focus theory (Higgins, 1997), we argue that employee needs, and thus the utility of HR practices, change with age. Therefore, we would expect the associations between HR practices and work-related attitudes to also change with age. Before presenting specific hypotheses on the moderating effect of age, we will discuss the relationship between HR practices and individual work-related outcomes.

HR practices and individual work-related outcomes

Many studies have shown that “High Performance Work Practices” (HPWP), “High Commitment High Performance Practices” (HCHP), or “Best Practices” can have a positive impact on organizational performance (Arthur, 1994; Combs, Liu, Hall, & Ketchen, 2006; Huselid, 1995; MacDuffie, 1995). A significant shortcoming of these studies is that they focus solely on the association between HR practices and organizational performance, and thus reveal little of the processes or underlying mechanisms through which increased organizational performance can be achieved (also referred to as the “black box problem”—Wright, Gardner, & Moynihan, 2003). In theorizing about the HRM-performance link, various authors (Delaney & Huselid, 1996; Guest, 1997, 1999; Huselid, 1995; MacDuffie, 1995; Paauwe & Richardson, 1997) have proposed that HR practices influence organizational performance through individual work-related behavior, such as turnover and productivity, and even through individual work-related attitudes, such as commitment and motivation.

In this line of reasoning, the intended HR policies (which can be measured by interviewing or surveying HR and other managers) can function as “signals” of the organization’s intentions toward its employees (Den Hartog, Boselie, & Paauwe, 2004). However, intended HR policies have been found to differ significantly from HR practices as actually experienced by employees (e.g., the HR activities implemented in the organization as measured by surveying employees) (Biemans, 1999). For example, Khilji and Wang (2006) found that HR managers described the performance evaluation process as an open discussion between employees and management, whereas employees felt that employee-goals were set without consulting them. Clearly, individual work-related outcomes are affected by employees’ *perceptions* of HR practices, instead of by (written) HR policies as intended by for instance HR managers (Edgar & Geare, 2005; Guest, 1999; Huselid, 1995; Kinicki, Carson, & Bohlander, 1992; Whitener, 2001). Therefore, when we are interested in the effects of HR practices on work-related attitudes, HR practices should be measured as perceived by the individual worker.

Thus, in this study, we focus on high commitment or high involvement HR practices as perceived by employees. Based on Wood and de Menezes (1998), we define high commitment HR practices as practices that are aimed at eliciting a strong commitment to the organization, and at creating conditions in which employees will become highly involved in the organization and identify with its overall goals. How such HR practices are perceived is generally measured using items such as “My company provides me with the opportunity to improve my skills and knowledge” (Allen, Shore, & Griffeth, 2003), “A rigorous selection process is used to select new recruits” (Gould-Williams, 2004), and “There is regular feedback on performance, and guidance on how performance can be improved” (Conway, 2004). These items refer to *the availability of high commitment HR practices as perceived by employees*, which we refer to as “high commitment HR practices.”

The idea that high commitment HR practices affect work-related attitudes through employees’ perceptions or experiences of them is supported by social exchange theory (Blau, 1964; Eisenberger, Huntington, Hutchison, & Sowa, 1986) and signaling theory (Casper & Harris, 2008; Ostroff & Bowen,

2000). These theories propose that high commitment HR practices have an effect on employees by supporting them, or by functioning as “signals” of the organization’s intentions toward them. More specifically, these theories propose that perceived organizational support will result in greater affective attachment and stronger feelings of obligation toward the organization (Shore & Wayne, 1993). In this line of reasoning, the general assumption is that individual workers will view high commitment HR practices as a personalized commitment to them, an investment in them, and as recognition of their contribution, which they then reciprocate through correspondingly positive attitudes and behavior toward the organization (Hannah & Iverson, 2004).

Since previous studies have shown that perceptions of organizational support are positively related to affective commitment to the organization (Eisenberger, Fasolo, & Davis-LaMastro, 1990; Shore & Wayne, 1993; Wayne, Shore, & Liden, 1997) and job satisfaction (Eisenberger, Cummings, Armelo, & Lynch, 1997), we focus on these two work-related attitudes. Affective organizational commitment (which we will refer to as “affective commitment”) has been defined as the emotional attachment to, identification with, and involvement in the organization (Allen & Meyer, 1990). Job satisfaction has been defined as an affective attachment to the job, or as an emotional state resulting from the evaluation or appraisal of one’s job experiences (Locke, 1976). Hence, while job satisfaction and affective commitment both refer to *affective states*, or feelings employees may have, the objects of these feelings differ: affective commitment refers to feelings toward the organization, and job satisfaction refers to affective feelings toward the job or work role (Hulin, 1991). Another distinction between affective commitment and job satisfaction, according to Porter, Steers, Mowday, and Boulian (1974), is that it takes longer for employees to determine their level of commitment to an organization than their level of job satisfaction. As a consequence, affective commitment is longer term and more stable than job satisfaction (Tett & Meyer, 1993). Although affective commitment and job satisfaction are distinct concepts, they are both expected to be positively related to high commitment HR practices.

Hypothesis 1a: High commitment HR practices are positively related to affective commitment.

Hypothesis 1b: High commitment HR practices are positively related to job satisfaction.

High commitment HR practices, affective commitment, and job satisfaction: age as a moderator

Based on both the lifespan SOC theory (Baltes, Staudinger, & Lindenberger, 1999) and Regulatory Focus theory (Higgins, 1997), we expect that employee needs, such as the need for growth or security, and thus the utility of high commitment HR practices will change with age. Furthermore, since social exchange theory proposes that employee reciprocation is related to the utility or value of high commitment HR practices to them, the associations between these high commitment HR practices and work-related attitudes will also change with age (see also Finegold et al., 2002). Adopting a similar line of reasoning, Gong, Law, Chang, and Xin (2009) proposed that the intensity of middle managers’ needs determines the nature of their commitment, as a repayment, to the firm.

Only two studies have examined this moderating role of age in similar associations. Conway (2004) studied whether the relationship between HR practices and commitment changes with career stage, and found that broad training (to support employability) was more strongly associated with affective commitment in the older age (>41) group than in the middle (31–40) and younger age (<30) groups. Finegold et al. (2002) examined whether those elements of the employment relationship that predict commitment and the willingness to change companies varied significantly with age. They found that satisfaction with job security was most strongly linked to commitment among older workers, whereas

satisfaction with opportunities to develop skills and having one's salary linked to individual performance had a stronger negative relationship with intention to leave among individuals aged under 30.

While these studies operationalized age as either life stage or career stage, our meta-analysis focuses on aging, and therefore operationalizes age as a continuous variable. Aging refers to changes that occur in biological, psychological, and social functioning over time (De Lange, Taris, Jansen, Smulders, Houtman, & Kompier, 2006; Settersten & Mayer, 1997; Sterns & Miklos, 1995). Aging involves both personal gains and losses, such as gains in general knowledge and losses in physical abilities (Kanfer & Ackerman, 2004; Warr, 2001). Since SOC and Regulatory Focus theories address how people cope with gains and losses over their lifespan, these theories seem appropriate for formulating hypotheses on the moderating role of age on the association between high commitment HR practices and work-related attitudes.

SOC theory (Baltes et al., 1999) defines successful lifespan development as the conjoint maximization of gains and minimization of losses. Further, SOC theory proposes that the processes of regulating development that aim to maximize gains and minimize losses involve *selecting* outcomes, *optimizing* resources to reach those desirable outcomes, and *compensating* for the loss of outcome-relevant means (Baltes et al., 1999). Similarly, Regulatory Focus theory is concerned with how people achieve pleasure and avoid pain in different ways (Higgins, 1997). Higgins distinguished between self-regulation with a focus on promotion, and self-regulation with a prevention focus, and proposed that aspirations and accomplishments (i.e., optimization) involve a promotion focus, whereas responsibilities and safety (i.e., compensation) involve a prevention focus. Moreover, Higgins argued that needs for growth and development induce a promotion focus, whereas security needs induce a prevention focus (see also Brockner & Higgins, 2001; Kluger, Stephan, Ganzach, & Hershkovitz, 2004).

Since the above-mentioned losses (for example in abilities) specifically occur in older age, SOC theory argues that the allocation of resources aimed at growth (i.e., optimization) will decrease with age, whereas the allocation of resources used for maintenance and regulation of loss (i.e., compensation) will increase with age (Baltes et al., 1999). This proposition is supported by Freund (2006) who found that the regulatory focus shifts from being primarily on promotion in young adulthood to one on maintenance and prevention in old adulthood (see also, Ebner, Freund, & Baltes, 2006; Kanfer & Ackerman, 2004). As a result, the needs for self-actualization or growth are likely to decrease with age, whereas security needs are likely to increase as workers age. In a similar vein, Rhodes (1983) found that employee needs change with age: needs for security tend to increase with age, and there was also some support for a parallel decrease in the need for growth.

As already mentioned, these changing employee needs affect the utility or fit of high commitment HR practices. Kinnie, Hutchinson, Purcell, Rayton, and Swart (2005), for instance, found that workers with different needs respond differently to the HR practices they experience, and that this is linked to their affective commitment (see also needs-supplies fit; Piasentin & Chapman, 2006). Hence, the age-related changes in needs will influence the utility or fit of high commitment HR practices and, thus, the relationship of these HR practices with affective commitment and job satisfaction.

Bundles of high commitment HR practices

In order to formulate hypotheses on the effect of high commitment HR practices on employees of different ages, we categorize these practices into theoretically meaningful HR bundles. According to MacDuffie (1995), HR bundles should consist of interrelated and internally consistent HR practices built around an organizational logic (see also Guest, Conway, & Dewe, 2004). In line with Toh, Morgeson, and Campion (2008), we distinguish between bundles of HR practices by the shared goals of the specific HR practices. SOC theory (Baltes et al., 1999) proposes various goals in lifespan

development to which individuals can allocate their resources. These lifespan goals are often “translated” (e.g., Ebner et al., 2006) into goal orientations with a focus on either promotion or on prevention as distinguished by Regulatory Focus theory (Higgins, 1997). Drawing on these theories, we therefore distinguish two HR bundles: Development (promotion) and maintenance (prevention) high commitment HR practices.

Based on the definitions of promotion and prevention in Regulatory Focus theory (Higgins, 1997), and of growth and maintenance in SOC theory (Baltes et al., 1999), we conceptualize maintenance high commitment HR practices as those related to protection, safety, and responsibility that help individual workers to maintain their current levels of functioning in the face of new challenges, or to return to previous levels after a loss (such practices include job security and flexible work schedules); and development high commitment HR practices as those related to advancement, growth, and accomplishment that help individual workers to achieve higher levels of functioning (e.g., training and internal promotion). Similarly, Gong et al. (2009) distinguish between a performance-oriented HR subsystem, which focuses on developing HR and providing motivation and opportunities for the productive use of such resources, and a maintenance-oriented HR subsystem, which focuses on employee protection and equality. Additionally, Kuvaas (2008) defines the perception of developmental HR practices as the degree to which employees perceive that their developmental needs are being supported by the organization’s HR practices.

Since goal focus and employee needs are expected to change from a goal focus on promotion and growth needs in young adulthood to a goal focus on maintenance and prevention, and security needs as one ages, we expect the relationships between high commitment maintenance HR practices and work-related attitudes to strengthen, and the relationships between development high commitment HR practices and work-related attitudes to weaken, with age. However, some earlier studies have found curvilinear effects of age on the associations between HR practices and commitment (Conway, 2004; Finegold et al., 2002). In these studies, the rationale for curvilinear effects of age was based on Super’s (1957) career stage model. In this model, employees pass through four stages in their career. First, employees pass through the “trial” stage, in which their primary concerns are to identify their interests and capabilities and to define their professional role or self-image (Ornstein, Cron, & Slocum, 1989). Subsequently, in the “establishment stage”, employees are concerned with moving upward and mastering their identified area of interest. In the subsequent “maintenance stage”, employees hold on to their earlier achieved accomplishments and try to maintain their self-concept; and finally, in the “disengagement stage,” employees begin to detach from the organization and to develop a new self-image that is independent of career success. Thus, employees are most concerned with development and growth in the second, establishment, career stage, and with security and maintenance in the earlier, trial, and later, maintenance and disengagement, career stages. On this basis, development high commitment HR practices will be more important for employees in the middle career stage of establishment, and maintenance high commitment HR practices will be more important for employees in their early or late careers.

In sum, although both life span and career stage theories suggest that older workers are more concerned with maintenance and less with development, these theories contradict each other with respect to younger workers; life span theories propose that younger workers are more concerned with development and less with maintenance, whereas career stage theories propose the exact opposite. This implies that the association between maintenance high commitment HR practices and work-related attitudes may either first decrease and then increase with age (i.e., a U-shaped effect) or may increase linearly over the life span, and that the association between development high commitment HR practices and work-related attitudes may either first increase and then decrease with age (i.e., an inverse U-shaped effect) or decrease linearly over the life span. Therefore, we formulated the following hypotheses:

Hypothesis 2: The associations between high commitment HR practices that relate to the maintenance HR bundle and both affective commitment and job satisfaction will strengthen in older age.

Hypothesis 3: The associations between high commitment HR practices that relate to the development HR bundle and both affective commitment and job satisfaction will weaken in older age.

Method

Meta-analysis

We tested our hypotheses by carrying out a meta-analysis. A meta-analysis quantitatively aggregates the results of several empirical studies while correcting for various factors that might bias relationship estimates. On this basis, a meta-analysis is seen as an effective way of summarizing earlier research and identifying appropriate topics for future research (Hunter & Schmidt, 2004; Lipsey & Wilson, 2001). Although age is hardly ever a major focus in existing research on HR practices and work-related attitudes, it is sometimes included as a confounder, covariate, or sample descriptive.

Search strategy

We used several search strategies to identify relevant published and unpublished studies. First, we searched the Psychinfo (1872–2009) and AbiInform (1971–2009) databases looking for the following keywords: “Human resource,” “HR practices,” “HR policies,” “HCHP,” “employment practices,” “employment policies,” “personnel practices,” “personnel policies,” “organizational practices,” “organizational policies,” “selection,” “staffing,” “security,” “performance management,” “performance appraisal,” “performance pay,” “rewards,” “pay,” “benefits,” “training,” “development,” “promotion,” “participation,” “suggestion system,” “grievance system,” “empowerment,” “information sharing,” “communication,” “job design,” “job enrichment,” “teamwork,” “work-life,” “work-family,” and “flexible” in combination with the keywords “(affective) commitment” and “(job) satisfaction.”

We did not limit our time frame because we considered studies from all periods to be potentially relevant. To uncover further studies, the literature references in the studies found in this first trawl were scrutinized to identify relevant studies that had not yet been included. As a further step, the authors of the relevant studies found were emailed when needed to request additional information or help with identifying unpublished studies. This resulted in additional information related to six studies (Edgar & Geare, 2005; Gould-Williams, 2004 (same sample); Harley, Allen, & Sargent, 2007; Probst, 2003; Smeenk, Eisinga, Teelken, & Doorewaard, 2006; Sun & Pan, 2008), and one additional published study (DeCotiis & Summers, 1987).

Of the potential studies identified, we only included those that met the following criteria: (a) Involved empirical research; (b) studied the individual level with employees as respondents (i.e.,

studies where the HR practices were rated by HR managers were excluded); (c) the HR practice refers to the existence or availability of an HR practice rather than to an evaluation of the HR practice (so satisfaction with respect to HR practices is excluded). However, since all companies have rewards systems, the HR practice “rewards and benefits” is always measured in terms of competitiveness or fairness of the rewards and benefits; (d) the studies do not focus on the outcome of HR practices such as feedback, autonomy, procedural, or distributive justice, psychological empowerment, and job design as for example measured with the Job Diagnostic Survey; (e) age was included; and f) publications were in English.

This resulted in $k = 83$ studies (samples) contained in 69 articles (the articles providing data are identified by an * in the reference list at the end of this article)¹, with a total sample size of $N = 52,470$ individual respondents and 247 effect sizes. These 83 studies were found in journal articles (88 per cent) and dissertations (12 per cent) published between 1977 and 2009. Overall, 53 per cent of the studies were carried out in the United States, 14 per cent in Europe, 10 per cent in Asia, and 23 per cent elsewhere. The studies were conducted in professional service companies (22 per cent), manufacturers (12 per cent), health companies (6 per cent), government organizations (5 per cent), and mixed or other companies (55 per cent). In terms of work, the respondents were managers (2 per cent of the total sample), professionals (10 per cent), non-professionals (11 per cent), or had other or mixed functions (77 per cent). In 49 per cent of the studies, less than 50 per cent of the respondents were male and, in the remaining studies, men were in the majority. The mean age of the total sample was 37.6 years (the mean standard deviation of age in the studies that reported this statistic was 9.0) and the overall age range (again not all studies reported this) was 16–77. Further, in studies that use age brackets, at the highest 31 per cent of the sample was older than 50, and 11 per cent was older than 60, respectively. Thus, we can conclude, that many individuals in our study were well over 50 years old. The mean company tenure was 7.6 years.

Measures

High commitment HR practices

As explained earlier, we chose to focus on the availability, as perceived by employees, of high commitment practices. In line with Combs et al. (2006), we first identified HR practices that researchers describe as high commitment practices, resulting in the 12 HR practices which are listed, with example items, in Table 1. In many of the studies found, researchers have measured HR practices with similar items to those reported in Table 1, but do not define them as high commitment practices. Since these HR practices (whether labeled as high commitment or not) are aimed at eliciting a strong commitment to the organization (Wood & de Menezes, 1998), they all qualify as high commitment practices for our purposes. Furthermore, in line with Boselie, Dietz, and Boon (2005), we have combined some of these high commitment HR practices: The HR practice of participation includes empowerment practices and suggestion/grievance schemes; the HR practice of teamwork includes cooperation; the HR practice of information sharing includes communication; the HR practice of staffing includes selection; the HR practice of rewards includes benefits; the HR practice of training includes development; the HR practice of internal promotion includes career development; and the HR practice of performance management includes both performance appraisal and performance pay.

Finally, we distinguished between maintenance and development high commitment HR practices using our conceptualizations of maintenance and development high commitment HR practices: Maintenance high commitment HR practices are those related to protection, safety, and responsibility

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

Table 1. Categorization of maintenance and development HR practices

	Maintenance HR practices with example items	Development HR practices with example items
Job security	<p>“The company has done all it can to avoid lay-offs”</p> <p>“The company makes a genuine effort to keep people employed even under adverse business conditions”</p>	<p>Training and development</p> <p>“The company provides appropriate job training” “My employer encourages me to extend my abilities”</p>
Staffing and selection	<p>“The company effectively reflects situational changes by re-organizing personnel to appropriate positions”</p> <p>“The organization selects the right people for jobs”</p>	<p>Internal promotion and career development</p> <p>“My organization provides me with the opportunity to achieve my career goals” “I have the opportunity for advancement in my company”</p>
Rewards and benefits	<p>“I am rewarded (or recognized) fairly for the amount of effort that I put in” “Rewards are fair and adequately reflect one’s contribution”</p>	<p>Job enrichment</p> <p>“Jobs are clearly defined and are designed to make full use of people’s skills” “Employees’ perceptions of the extent to which their jobs were challenging”</p>
Performance management (including both performance appraisal and pay)	<p>“Performance appraisals are based on objective and quantifiable results” “Rewards are based on individual performance”</p>	
Participation (including empowerment and grievance/suggestion schemes)	<p>“I am allowed to participate in decisions regarding my job”. “Perceived extent of individual influence over immediate work process, managerial, and institutional level decisions”</p>	
Information sharing (including communication)	<p>“This department keeps me informed about business issues and about how well it is doing” “Extent to which respondents felt that they were kept informed about what was going on in the company and about changes that affected their job”</p>	
Working in teams (including cooperation)	<p>“There is an emphasis on teamwork in the organization” “I really feel that I belong to a team”</p>	
Work/life policies	<p>“An army career allows me to maintain the kind of balance I want between my work and personal life”</p> <p>“My organization provides programs to assist in balancing the demands of dual career couples”</p>	
Flexible work schemes	<p>“I have some input into how my work hours are scheduled” “Flexible work arrangements are offered by the organization”</p>	

that help individual workers to maintain their current levels of functioning in the face of new challenges, or to recover to previous levels after a loss (e.g., job security and flexible work schedules); and development high commitment HR practices are those related to advancement, growth, and accomplishment that help individual workers to achieve higher levels of functioning (e.g., training and internal promotion). Based on this, we categorized each of the 12 high commitment HR practices as either a maintenance or a development HR practice (see Table 1). This table suggests that development practices are under-represented in the sense that nine of the observed practices were classified as maintenance high commitment HR practices, and only three (training, internal promotion, and job enrichment) as development high commitment practices (see also Zaleska & de Menezes, 2007 for a similar operationalization of development HR practices).

Affective commitment and job satisfaction

As previously mentioned, since both social exchange and signaling theories propose that employees' perceptions of HR practices especially influence their affective commitment and job satisfaction, we focused on these two individual worker outcomes. Affective commitment was particularly measured with Allen and Meyer's (1990) affective commitment scale (e.g., "I enjoy discussing my organization with people outside it") and with Mowday, Steers, and Porter's (1979) Organizational Commitment Questionnaire (e.g., "I tell my friends the organization I work for is great"). Job satisfaction was measured with different scales, such as the Hackman and Oldham' (1974) scale (e.g., "Generally speaking, I am very satisfied with this job") or with a single item (e.g., "Overall, how satisfied are you with your job?").

Age

Age is operationalized as the mean calendar age of the participants in a sample. When studies reported age brackets, we used the mean and percentage of each age bracket to calculate the mean age of the study.

Statistical procedures

We used Hunter and Schmidt's (2004) meta-analytical technique, which involves corrections for both measurement and sampling errors. The effect sizes we were interested in are the correlation coefficients between HR practices and work-related attitudes. We used related software (Schmidt & Le, 2004) to conduct our meta-analysis. We employed the following procedure: (1) Wherever correlations were not reported (e.g., Chen (2005) who instead reported *F* values), correlations were computed using the meta-analysis calculator²; (2) correlations of HR practices derived from a single study that relate to the same HR practice (e.g., rewards and benefits) 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 (predictor and criterion unreliability). If reliability was not reported, the average reliability for that variable across all the samples included in the meta-analysis was used; (4) each correlation was also corrected for the statistical artifact of sampling error, resulting in a mean true score correlation, which we refer to here as the mean correlation (ρ); (5) we calculated confidence intervals (Field, 2005), and used these to interpret validity generalization results (see Cohen, 1993)—that is, a *significant* mean correlation is one where the confidence interval does not

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

include zero; and finally, (6) to determine whether it was appropriate to perform a moderator analysis, we used the 75 per cent rule, which argues that moderators must exist when 25 per cent or more of the variance in observed effect sizes remains after accounting for all the statistical artifacts (Hunter & Schmidt, 2004).

We tested for a moderating effect of age (Hypotheses 2 and 3) by performing a weighted least squared (WLS) multiple regression analysis, since this approach is widely seen as providing the most accurate results (Steel & Kammeyer-Mueller, 2002, and see also, Bal, De Lange, Jansen, & Van der Velde, 2008; Wright & Bonett, 2002). In this analysis, mean sample age is the independent variable, and the correlation coefficient between HR practices and work-related attitudes (corrected for measurement error, transformed to Fisher's Z , and then weighted based on N and on the predictor and criterion reliability) is the dependent variable. Since, apart from age, organizational tenure might also influence the relationship between HR practices and attitudes (Conway, 2004) we controlled for any moderating effect of tenure since, in this paper, the focus is on age. Although age and organizational tenure are highly correlated, WLS multiple regression analysis is unaffected by multicollinearity, giving virtually the same estimates regardless of how correlated the moderators are, even with small sample size (Steel & Kammeyer-Mueller, 2002).

To test for linear as well as curvilinear effects of age, we tested one model with age and one with age and age² terms (both controlling for tenure). In the second model, we use and report the standardized coefficients of age and age² to assure independence between these variables. If the tested model is not significant, significant β s in the model are ignored. We used Lipsey and Wilson's (2001) SPSS macros to perform these analyses. Finally, to help interpret the curvilinear effects of age, we produced illustrations using SPSS curve estimation procedures. The equation used in the curve estimation model is: Y (effect size) = $b_0 + (b_1 \times \text{age}) + (b_2 \times \text{age}^2)$, where b_1 is the B coefficient of age and b_2 is the B coefficient of age² (for age and age² we used the model without tenure).

Results

High commitment HR practices and affective commitment and job satisfaction (hypotheses 1a and 1b)

Table 2 reveals that Hypotheses 1a and 1b are supported: Employees' perceptions of the availability of high commitment HR practices are significantly and positively related to both their affective commitment and job satisfaction (except for the relationship between work-life policies and affective commitment, where the confidence interval includes zero). Overall, the mean correlation between high commitment HR practices and affective commitment is stronger ($\rho = 0.42$; $t = 2.61$, $p < 0.05$) than the mean correlation between high commitment HR practices and job satisfaction ($\rho = 0.34$). More specific, most HR practices (7 out of 12) are more strongly associated with affective commitment than with job satisfaction; internal promotion (respectively $\rho = 0.52$ and $\rho = 0.43$), participation ($\rho = 0.52$ and $\rho = 0.42$), rewards ($\rho = 0.49$ and $\rho = 0.43$), staffing ($\rho = 0.48$ and $\rho = 0.43$), training ($\rho = 0.42$ and $\rho = 0.41$), information sharing ($\rho = 0.40$ and $\rho = 0.35$), and flexible work schedules (respectively $\rho = 0.35$ and $\rho = 0.18$). Four HR practices are more strongly associated with job satisfaction than with affective commitment; job enrichment (respectively $\rho = 0.51$ and $\rho = 0.48$), performance management ($\rho = 0.48$ and $\rho = 0.44$), teamwork ($\rho = 0.46$ and $\rho = 0.42$), and job security ($\rho = 0.37$ and $\rho = 0.33$). Work-life policies are only significantly related to job satisfaction ($\rho = 0.16$).

Table 2. Meta-analysis results for the relationships between HR practices and work-related attitudes

Relationship	<i>N</i>	<i>k</i>	<i>r</i>	ρ	<i>SD</i> ρ	Confidence interval		Credibility interval		Variance-explained
All HR practices— affective commitment	31 515	50	0.34	0.42	0.14	0.38	0.46	0.24	0.61	0.08
All HR practices— job satisfaction	37 261	56	0.27	0.34	0.18	0.29	0.39	0.11	0.57	0.06
Internal promotion— affective commitment	2849	9	0.43	0.52	0.11	0.45	0.60	0.38	0.67	0.19
Training— affective commitment	19 006	22	0.35	0.42	0.13	0.37	0.48	0.26	0.59	0.07
Job enrichment— affective commitment	2149	4	0.39	0.48	0.12	0.36	0.60	0.32	0.63	0.12
Job security— affective commitment	3774	11	0.28	0.33	0.05	0.31	0.37	0.27	0.39	0.63
Rewards— affective commitment	2491	11	0.39	0.49	0.17	0.39	0.59	0.28	0.71	0.15
Participation— affective commitment	8566	19	0.43	0.52	0.10	0.47	0.56	0.39	0.64	0.19
Information sharing— affective commitment	5749	10	0.33	0.40	0.07	0.36	0.45	0.31	0.50	0.27
Teamwork— affective commitment	1535	6	0.33	0.42	0.10	0.34	0.49	0.29	0.54	0.33
Work-life policies— affective commitment	2020	5	0.06	0.08	0.17	-0.07	0.22	-0.14	0.29	0.11
Flexible work schedules— affective commitment	5677	9	0.28	0.35	0.20	0.23	0.48	0.10	0.61	0.05
Staffing— affective commitment	4133	12	0.39	0.48	0.14	0.41	0.56	0.31	0.66	0.15
Performance management— affective commitment	8814	17	0.35	0.44	0.06	0.41	0.47	0.37	0.52	0.41
Internal promotion— job satisfaction	1755	4	0.38	0.43	0.17	0.26	0.60	0.21	0.65	0.07
Training— job satisfaction	14 671	17	0.34	0.41	0.15	0.34	0.48	0.21	0.61	0.05
Job enrichment— job satisfaction	2331	3	0.41	0.51	0.07	0.43	0.58	0.42	0.59	0.24
Job security— job satisfaction	3800	11	0.32	0.37	0.15	0.28	0.46	0.18	0.56	0.13
Rewards— job satisfaction	3408	6	0.34	0.43	0.05	0.38	0.47	0.36	0.50	0.42
Participation— job satisfaction	7235	22	0.33	0.42	0.22	0.32	0.51	0.13	0.70	0.07
Information sharing— job satisfaction	4972	6	0.27	0.35	0.19	0.20	0.50	0.11	0.59	0.05
Teamwork— job satisfaction	4972	9	0.38	0.46	0.08	0.41	0.52	0.36	0.57	0.23
Work-life policies— job satisfaction	9713	7	0.11	0.16	0.11	0.08	0.24	0.02	0.30	0.12
Flexible work schedules— job satisfaction	11 225	13	0.14	0.18	0.07	0.14	0.22	0.08	0.27	0.24
Staffing— job satisfaction	1663	6	0.36	0.43	0.14	0.32	0.54	0.25	0.61	0.17
Performance management— job satisfaction	3394	8	0.37	0.48	0.15	0.37	0.58	0.28	0.67	0.11

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 , Confidence Interval = 95% confidence interval for ρ , Credibility Interval = 80% credibility interval for ρ , Var expl = percentage of variance in corrected correlations attributable to all the artifacts considered.

Age as a moderator in the relationships between HR practices and affective commitment and job satisfaction (hypotheses 2 and 3)

Since at least 25 per cent of the variance in all the observed mean correlations remains unexplained after taking the statistical artifacts into account (final column of Table 2), a moderator analysis is appropriate. We have hypothesized that age moderates the relationship between HR practices and work-related attitudes. More specifically, we hypothesized that the relationships between maintenance HR practices and both affective commitment and job satisfaction strengthen in old age (Hypothesis 2), whereas the relationships between development HR practices and both affective commitment and job satisfaction weaken in old age (Hypothesis 3).

Table 3 reveals that Hypothesis 2 is supported for the associations of teamwork and flexible work schedules with both affective commitment and job satisfaction and for the associations of performance management, rewards, and information sharing with job satisfaction; the associations between teamwork and affective commitment, between flexible work schedules and affective commitment, and between rewards and satisfaction first weaken and then strengthen, and the other associations increase with age. However, contrary to our hypothesis, the relationship between the maintenance HR practice

Table 3. Moderator analyses of age and organization tenure on the relationships between HR practices and work-related attitudes

Relationship	<i>k</i>	β tenure	β age	β age ²	<i>R</i> ^{2a}
Promotion— affective commitment					
Tenure and age	9	-0.40	0.14		0.10
Tenure, age, and age ² *	9	-0.23	0.13**	-0.92**	0.56
Training— affective commitment					
Tenure and age ***	21	-0.74***	0.37		0.42
Tenure, age, and age ² **	21	-0.73***	0.34	-0.02	0.42
Job enrichment— affective commitment					
Tenure and age	NT				
Tenure, age, and age ²	NT				
Security— affective commitment					
Tenure and age	10	-0.21	0.33		0.06
Tenure, age, and age ²	10	0.08	0.36	-0.51	0.09
Rewards— affective commitment					
Tenure and age	9	-0.08	-0.18		0.06
Tenure, age, and age ²	9	-0.02	-0.39	-0.54	0.17
Participation— affective commitment					
Tenure and age	13	-0.31	-0.33		0.31
Tenure, age, and age ²	13	-0.43	-0.24	-0.42	0.36
Information— affective commitment					
Tenure and age *	9	-0.30	-0.49		0.46
Tenure, age, and age ² *	9	-0.12	-0.69	-0.21	0.47
Teamwork— affective commitment					
Tenure and age	6	-0.21	0.13		0.03
Tenure, age, and age ² *	6	-0.78*	0.55**	1.43**	0.62
Work/life policies— affective commitment					
Tenure and age	NT				
Tenure, age, and age ²	NT				
Flexible schedules— affective commitment					
Tenure and age ***	6	-1.16***	0.41*		0.88
Tenure, age, and age ² ***	6	-1.32***	0.60*	0.35*	0.95
Staffing— affective commitment					
Tenure and age *	11	0.55*	0.15		0.39
Tenure, age, and age ²	11	0.51	0.24	0.19	0.41
Performance Mgt— affective commitment					
Tenure and age	13	0.12	-0.34		0.07
Tenure, age, and age ² **	13	-0.01	-0.43***	-0.36***	0.45
Promotion— job satisfaction					
Tenure and age ***	4	0.37	0.66**		1.00
Tenure, age, and age ²	NT				
Training— job satisfaction					
Tenure and age **	15	-0.71**	0.11		0.41
Tenure, age, and age ² **	15	-0.80**	0.45	0.43	0.51
Job enrichment— job satisfaction					
Tenure and age	NT				
Tenure, age, and age ²	NT				
Security— job satisfaction					
Tenure and age ***	9	0.64**	0.30		0.77
Tenure, age, and age ² ***	9	0.67*	0.25	-0.01	0.74
Rewards— job satisfaction					
Tenure and age	6	0.54	-1.03		0.38
Tenure, age, and age ² ***	6	-0.21	-0.68***	0.74***	0.86

(Continues)

Table 3. (Continued)

Relationship	<i>k</i>	β tenure	β age	β age ²	<i>R</i> ^{2a}
Participation—job satisfaction					
Tenure and age	9	0.64	−0.76*		0.35
Tenure, age, and age ²	9	0.72	−2.94	1.88	0.39
Information—job satisfaction					
Tenure and age ***	5	−0.41***	0.68***		0.96
Tenure, age, and age ^{2***}	5	−0.79***	0.30	−0.22	0.97
Teamwork—job satisfaction					
Tenure and age*	8	−0.50	0.66*		0.51
Tenure, age, and age ^{2*}	8	−0.55	0.62	−0.02	0.52
Work/life policies—job satisfaction					
Tenure and age	NT				
Tenure, age, and age ²	NT				
Flexible schedules—job satisfaction					
Tenure and age *	7	0.04	0.71*		0.54
Tenure, age, and age ^{2**}	7	−0.22	1.18	−0.41	0.65
Staffing—job satisfaction					
Tenure and age*	5	−0.98**	0.58		0.58
Tenure, age, and age ^{2**}	5	−0.90**	0.64	−0.53	0.78
Performance Mgt—job satisfaction					
Tenure and age**	5	−0.52	0.88**		0.62
Tenure, age, and age ^{2***}	5	0.45	3.11	2.23	0.80

k = the number of studies/samples, β = regression coefficient, *R*² = variance explained, NT = not tested due to an insufficient number of studies.

^aWhen the number of studies is small, the proportion of variance explained should be interpreted with caution as this proportion is optimized to this small sample of studies. ****p* < 0.001; ***p* < 0.01; **p* < 0.05.

of performance management and affective commitment first strengthens and then weakens with age. The moderating impact of age on the relationships between work-life policies and affective commitment and job satisfaction could not be tested due to an insufficient number of studies examining this association.

Hypothesis 3 is supported for the relationship between promotion and affective commitment; this relation first strengthens and then weakens with age. Contrary to our hypothesis, the relationship between the development HR practice of promotion and job satisfaction strengthens with age. The moderating impact of age on the associations between job enrichment and affective commitment and job satisfaction could not be tested due to an insufficient number of studies examining this relationship.

To help interpret the curvilinear effects of age, we have included Figures 1 and 2 based on SPSS curve estimation procedures. In Figure 1, the *y* axis, mean ES, is the mean effect size which, in this case, is the association between the various high commitment HR practices and affective commitment. Hence, Figure 1 shows that the associations between the high commitment HR practices included in the index and affective commitment first weaken and then strengthen with age or first strengthen and then weaken with age. In Figure 2, mean ES on the *y* axis refers to the association between the various high commitment HR practices and job satisfaction. Hence, this figure illustrates that the associations between the high commitment HR practices included in the index and job satisfaction either strengthen with age (linearly) or first weaken and then strengthen with age (curvilinearly).

As noted earlier, we controlled for the moderating effect of organizational tenure as an alternative indicator of age. Table 3 reveals that tenure significantly and negatively moderates the associations

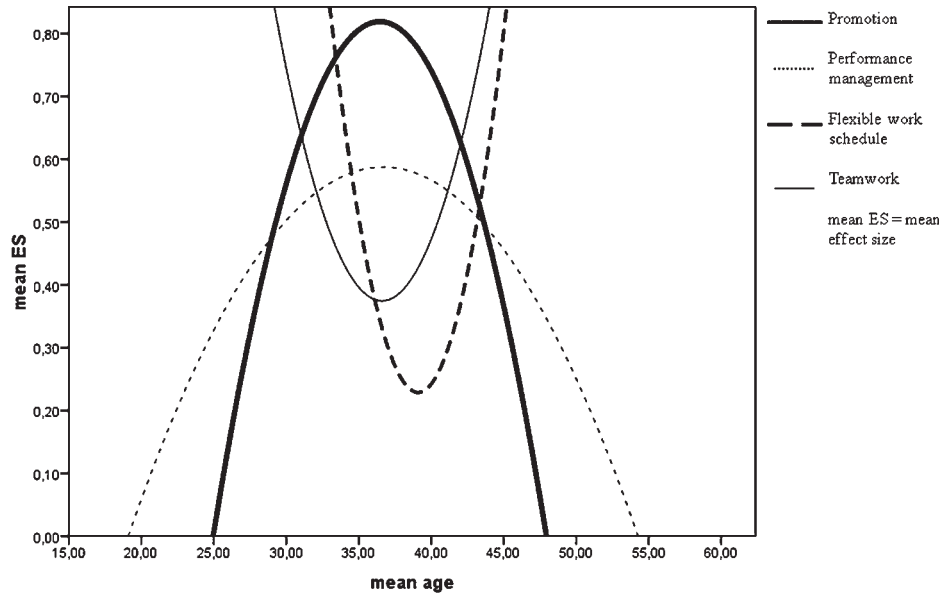


Figure 1. Relationships between mean age and the associations between high commitment HR practices and affective commitment

between training and both affective commitment and job satisfaction, and also the associations between information sharing and job satisfaction, staffing and job satisfaction, and between flexible work schedules and affective commitment. Conversely, organizational tenure positively moderates the associations between security and job satisfaction, and between staffing and affective commitment. The

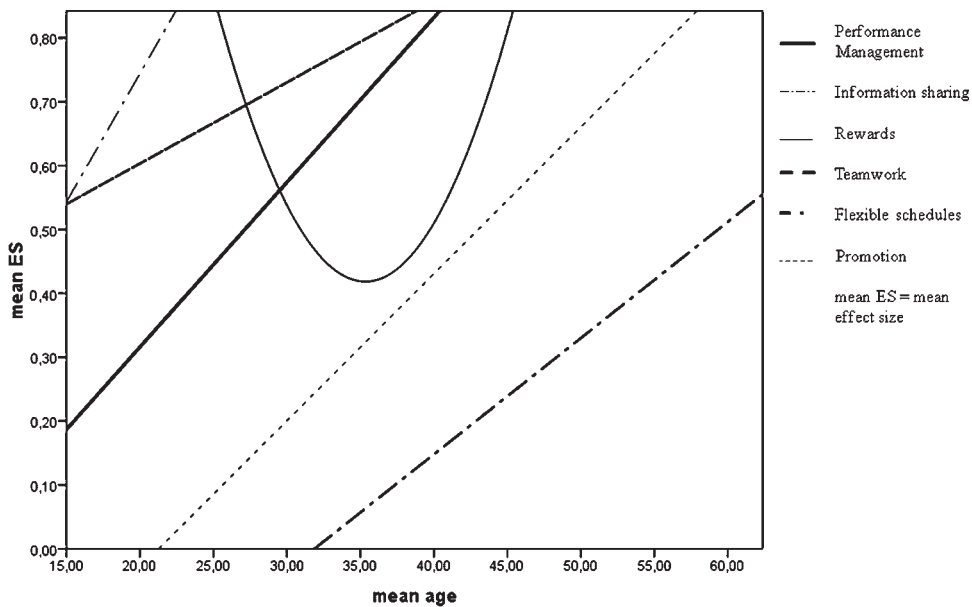


Figure 2. Relationships between mean age and the associations between high commitment HR practices and job satisfaction

other associations (i.e., of promotion, security, performance management, rewards, participation, information sharing, and teamwork with affective commitment; and of teamwork, promotion, performance management, rewards, participation, and flexible work schedules with job satisfaction) are not influenced by organizational tenure.

Discussion

For this study, we conducted a meta-analysis to examine how the relationship between HR practices and individual work-related attitudes changes with age. More specifically, based on SOC and Regulatory Focus theories, we focused on the impact of calendar age on the association between the availability of maintenance and development high commitment HR practices, as perceived by employees, and affective commitment and job satisfaction. We will now discuss the meta-analysis results as they relate to each hypothesis.

The associations between high commitment HR practices and affective commitment and job satisfaction

Based on social exchange and signaling theories, we hypothesized and indeed found positive associations between employees' perceptions of the availability of high commitment HR practices and affective commitment and job satisfaction. Hence, such HR practices can elicit positive work-related attitudes. Particularly the high commitment HR practices related to promotion, job enrichment, and participation (the first two of which are considered development HR practices) were found to be positively related to affective commitment and job satisfaction. Thus, it would seem that workers' positive work attitudes stem more from HR practices aimed at their development than from those aiming to maintain their current level of functioning.

Further, we found that all the high commitment HR practices combined had a stronger association with affective commitment than with job satisfaction. As explained earlier, affective commitment refers to affective feelings toward the *organization* in general, whereas job satisfaction refers to affective feelings toward the more specific job or work role. Since social exchange and signaling theories argue that employees view HR practices as *organizational* support, which they then reciprocate back to the *organization*, the stronger association between HR practices and affective commitment makes sense (see also Allen et al., 2003). In a similar vein, Boxall and Macky (2009) even refer to high commitment HR practices as high commitment *employment* practices as opposed to high involvement *work* practices.

Age as a moderator in the relationships between high commitment HR practices and affective commitment and job satisfaction

Based on lifespan and social psychological theories, we hypothesized that the relationships between the perceived availability of maintenance HR practices and both affective commitment and job satisfaction would strengthen in older age, whereas the relationships between the availability of development HR practices and both affective commitment and job satisfaction would weaken in older age. The results of our meta-analysis reveal that our hypothesis regarding maintenance HR practices is supported for

performance management, rewards, information sharing, teamwork, and flexibility; and that our hypothesis regarding development HR practices is supported for promotion. Hence, it seems, as we had anticipated, that employee needs do change with age.

However, Figures 1 and 2 show that the associations between promotion and affective commitment (as expected) and between performance management and affective commitment weaken in older age, whereas the associations between promotion and job satisfaction and between performance management and job satisfaction (as expected) strengthen in older age. Hence, it seems that, as one ages, certain HR practices become more important to elicit job satisfaction while becoming less important in eliciting affective commitment (see also Bal et al., 2008, who found similar results for psychological contract breach). A possible explanation is that older workers are presented with fewer opportunities to change employer, and will therefore feel committed toward their existing organization irrespective of these HR practices (see also Festinger's (1957) cognitive dissonance theory), resulting in a weaker association between these high commitment HR practices and affective commitment. Ng and Feldman (2009) offer a similar explanation for the weak relationship between contract breach and negative outcomes among older workers. Although older workers' internal job mobility is also lower than that of younger workers, their work role or job content (and thus their job satisfaction) can still change (i.e., through job crafting—Wrzesniewski & Dutton, 2001). Another possible explanation is that older workers adopt a shorter time perspective than younger workers simply because they are closer to retirement age (see also Socio-Emotional Selectivity theory—Carstensen, 1995). Since affective commitment is longer term and more stable than job satisfaction, high commitment HR practices may have limited impact on the affective commitment of older workers, but a greater impact on the shorter term and more variable job satisfaction.

A further possible explanation for the unexpected strengthening of the association between the development HR practice of promotion and job satisfaction is that older workers may continue to reap the benefits of their earlier investments in this development HR practice and that this increasingly delivers job satisfaction. Wright and Hamilton (1978) refer to this as the “job change” hypothesis, which proposes that older workers are more satisfied simply because they have better jobs. Furthermore, we found that particularly the maintenance HR practices of rewards, performance management, information sharing, teamwork, and flexible work schedules become increasingly important in achieving positive work-related attitudes as one ages. Since “rewards” also covers intrinsic feelings of recognition, these findings are in line with recent studies that have found that feelings of recognition and fair performance appraisal are important for older workers (Armstrong-Stassen, 2008; Rau & Adams, 2005). Furthermore, according to Socio-Emotional Selectivity theory (Carstensen, 1995), since older people perceive their future time as more limited than younger people, they give higher priority to emotionally meaningful social interactions and goals (i.e., social needs), such as generativity, emotional intimacy, and social embeddedness (see Lang & Carstensen, 2002), that result from working in teams.

With respect to younger workers, we found that the associations between maintenance HR practices and job satisfaction either strengthen in younger age (a positive linear effect of age) or weaken in younger age (a U-shaped curvilinear effect of age). The associations between maintenance HR practices and affective commitment also weaken in younger age (a U-shaped curvilinear effect of age), and the association between development HR practices and affective commitment strengthens in younger age (an inversed U-shaped effect of age). Finally, we found that most of the associations between high commitment HR practices and both affective commitment and job satisfaction were either not affected or were negatively affected by organizational tenure. That is, the longer employees work in an organization, the less their affective commitment and job satisfaction are a result of high commitment HR practices.

Limitations

Before addressing the theoretical and practical implications of our meta-analysis, we first need to recognize some important limitations of our study.

Firstly, although the distinction made between maintenance and development HR practices is innovative, the distinction between HR practices aimed at maintaining current levels of functioning and those aimed at achieving higher levels of functioning is somewhat ambiguous. As Boselie et al. (2005) noted, there is no accepted theory for classifying various practices into different bundles or categories. For example, although Zaleska and de Menezes' (2007) operationalization of development practices (as employee satisfaction with received training, development opportunities, and career management) is similar to our operationalization of development practices, Kuvaas (2008) operationalized developmental HR practices as career development, training opportunities, and performance appraisal. To test whether the distinction between development and maintenance high commitment HR practices makes sense, future research could examine how employees (of different ages) perceive these various HR practices, and test whether the pathways that link these HR practices to work-related outcomes are mediated by their effect on development or maintenance of employees' functioning.

Further, in terms of HR practices, we were unable to include HR practices specifically aimed at older workers, such as additional leave and reduced workload, because we could not find sufficient studies that examined the effects of such HR practices (there were notable exceptions, namely: Armstrong-Stassen, 2008; Karazman, Kloimuller, Geissler, & Karazman-Morawetz, 1999; and Rau & Adams, 2005). Also, the results of our meta-analysis are based only on studies that include HR practices, work-related attitudes, and age, and thus we excluded studies that measured employees' perceptions of HR practices and work-related attitudes, but not age. Although the strongly significant positive associations between HR practices and work-related attitudes suggest that this has not affected our results, the number of studies examining some of the relationships considered in the meta-analysis is relatively small.

Additionally, one should note that older people tend to be under-represented in organizations because of early retirement options and health effects, and therefore they are also under-represented in empirical studies. The *mean* age of our total sample was 37.5. From those studies that did report individual ages, we can be certain that our sample included workers as young as 16 and as old as 77. Further, we included studies in which 31 per cent of the sample was older than 50, and 11 per cent was older than 60, respectively. Therefore, we believe our results are not biased by an overall lack of elderly workers in the samples analyzed.

Another limitation is the cross-sectional design of most of the studies included in our meta-analysis which makes conclusions about causality unreliable. While one might expect the perceived availability of HR practices to lead to positive work-related attitudes, the opposite causality is not impossible. Such a seemingly "counter-intuitive" causal relationship could be created by at least two mechanisms (see also De Lange, Taris, Kompier, Houtman, & Bongers, 2005): Firstly, employers may *actually* offer committed employees more, or better, HR practices than employees who are less committed; and, secondly, employees who are more committed may have a more positive view of their work and will, therefore, *perceive* the HR practices offered more positively than employees who are less committed. This latter mechanism might especially have occurred with the HR practice of "rewards and benefits" since this is measured as the competitiveness or fairness of rewards and benefits, reflecting an evaluation of this HR practice rather than simply its existence. This might also explain the relatively high mean correlations between rewards and both affective commitment and job satisfaction.

The final concern that we would like to raise here is how one conceptualizes age. Although we controlled for organizational tenure, we focused on calendar age as our sole operationalization of age. Other operationalizations of age, such as career and life stages and especially job tenure, have also been

found to influence the perceptions being considered (see De Lange et al., 2006; Kooij, De Lange, Jansen, & Dijkers, 2008; Ng & Feldman, 2008). Such operationalizations are rarely used in empirical studies and therefore it was not practical to include them in our meta-analysis.

Despite these limitations, we feel that the presented meta-analysis does have several important theoretical and practical implications.

Theoretical implications and future research

This meta-analysis has revealed that employees' perceptions of high commitment HR practices are important in understanding the effects of these HR practices. The availability of high commitment HR practices, as perceived by employees, was found to be positively related to their affective commitment and to their job satisfaction. These positive associations provide support for social exchange and signaling theories, which suggest that employees view HR practices as a personalized commitment to them, an investment in them, and as recognition of their contributions - which they then reciprocate through corresponding positive attitudes. In addition, this positive association between HR practices and work-related attitudes provides additional insights into the complex relationship between HR practices and organizational performance. Therefore, we would argue that theoretical developments and future empirical research in this field should incorporate individual-level employee perceptions of HR practices rather than merely studying the association between HR practices and employee behavior at the organizational level (Den Hartog et al., 2004; Guest, 1999; Kinnie et al., 2005; Wright & Boswell, 2002).

In addition, it seems that individual characteristics can affect the association between employees' perceptions of HR practices and work-related attitudes at the individual level: Calendar age had a significant moderating effect on almost 42 per cent of the associations investigated between high commitment HR practices and work-related attitudes. As expected, the associations between the maintenance HR practices of performance management, rewards, information sharing, teamwork, and flexible work schedules and work-related attitudes strengthen with age, whereas the relationship between the development HR practice of promotion and affective commitment weakens with age.

The increasing importance of teamwork that we found for older workers' work-related attitudes supports Socio-Emotional Selectivity theory, which is based on SOC theory and proposes an age-related increase in selected social relationships (i.e., social needs) as a compensatory strategy for coping with age-related physical and cognitive losses. Additionally, our finding that some HR practices become more important for older workers' short-term job satisfaction, while becoming less important for their long-term affective commitment, also provides support for the idea in Socio-Emotional Selectivity theory that older people perceive their future time as more limited than younger people (see Lang & Carstensen, 2002), and are thus more likely to focus on the short-term.

With respect to younger workers, our results provide support both for life span and career stage theories; half of the relations that support our hypotheses are curvilinear and half are linear. Furthermore, life span theory is particularly reflected in job satisfaction and career stage theory is particularly reflected in affective commitment. This implies that age-related losses are reflected in job satisfaction, whereas concerns with moving upward and mastering are reflected in affective commitment. Finally, our results with respect to organizational tenure provide further support for Super's (1957) career development model which proposes that in the final career stage (decline), individuals develop a new self-image which is independent of work.

On this basis, we would argue that further empirical research is needed to explore the mechanisms that underlie age effects: For example on how employee needs change with age, whether goal or

regulatory foci change with age, how older workers cope with losses, and how age-related factors such as career or life stage, or future time perspective, influence the importance of HR practices in determining various work-related attitudes. In addition, most of the studies we included in our analysis concentrated on high commitment practices, whereas organizations have been found to offer their older workers accommodative practices, such as additional leave or reduced workload (Remery, Henkens, Schippers, & Ekamper, 2003). Therefore, future research on how the association between HR practices and work-related attitudes changes with age should also include such HR practices. Finally, in order to be able to draw firm conclusions on causality, one needs longitudinal studies into the impact of HR practices on work-related attitudes.

Practical implications

Our results reveal that employees' perceptions of HR practices and particularly those aimed at personal development (such as internal promotion) are relevant if one wishes to increase positive work-related attitudes. Overall, the HR practices concerning internal promotion, participation, and job enrichment appear to be the most useful if one wants to improve employees' work-related attitudes. HR practices do influence work-related attitudes and, thus, can also affect worker behavior. On this basis, HR managers should ensure that there is adequate implementation and equal application (for workers of all ages) of intended HR policies in their organization. The fact that development HR practices were relatively uncommon in the studies included in our meta-analysis reflects, we think, a reality in which organizations less often offer these practices as against maintenance practices. Since it is particularly these types of HR practices that elicit positive work-related attitudes, we would suggest that HR managers consider introducing additional development HR practices, such as task enrichment.

Further, we found that HR practices are particularly important in establishing certain work-related attitudes: That is, HR practices are more strongly associated with affective commitment than with job satisfaction. Thus, it seems that affective commitment is particularly influenced by high commitment HR practices, whereas other factors, such as job content or supervisory support, might also be relevant in eliciting job satisfaction.

With respect to the effects of aging, our findings provide support for the suggestion that one should tailor HR practices to reflect the age of individual workers. For example, HR practitioners should consider increasing teamwork (or mentoring roles), rewards (e.g., through increased recognition) or flexible work schedules for older workers since these HR practices seem likely to increase their positive work-related attitudes. The finding that internal promotion increasingly elicits job satisfaction as workers age contradicts the stereotypical managerial view of older workers—that they are unwilling or unable to learn new skills (Kooij et al., 2008).

Author biographies

Dorien Kooij is working as a PhD-student at the Department of Organizational Behavior and Development of the VU University Amsterdam, The Netherlands. Dorien Kooij graduated, cum laude, in 2002 with a specialization in HRM at the UvA University of Amsterdam. In September 2006 she started her PhD-project, titled "The impact of HR practices on older workers." Her main research interests are in HRM, work motivation and aging at work.

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Josje Dikkers is assistant professor at the Department of Organizational Behavior and Development of the VU University Amsterdam. Josje Dikkers graduated, cum laude, in 2001 with a specialization in Work & Organizational Psychology at Tilburg University. From 2001 until 2005 she worked as a PhD-student at the Department of Work & Organizational Psychology of the Radboud University Nijmegen. Her PhD-project focused on the interaction between people’s work and private life (i.e., work-home interaction) in relation to organizational, work and home characteristics, and is comprised of four publications in international academic journals. Josje Dikkers teaches and coordinates courses on Organizational Behavior and research methodology. Her research interests focus on the interaction between work and well being, and more specifically on HRM-policies (and culture) facilitating work-home balance, normative parenting beliefs in relation to women’s career success, and humor in the workplace. Recent publications were in, for example, the *International Journal of Stress Management*, and *Work and Stress*.

Annet H. de Lange is working as an associate professor at the department of Social and Organizational Psychology at the University of Groningen, the Netherlands, and holds a PhD (cum laude/ doctorate) from the Radboud University of Nijmegen, the Netherlands. Her main research interests concern life-span perspectives on ageing at work, causality and longitudinal survey research, and the across-time development of the relation between work and mental health. Her research has been successful, culminating in several honorary prices (IBM Frye Stipendium, André Büssing Memorial Price of EA-OHP, Stichting Praemium Erasmianum Prize (www.erasmusprize.org <<http://www.erasmusprize.org/>>), and the journal of occupational health psychology best paper of past ten years award). She serves as consulting editor of *Work and Stress* and the *European Journal of Work and Organizational Psychology*. She has published in, and reviewed for, many international journals.

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