SUPERVISOR-SUBORDINATE AGE DISSIMILARITY AND PERFORMANCE RATINGS: THE BUFFERING EFFECTS OF SUPERVISORY RELATIONSHIP AND PRACTICE*

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ABSTRACT
Using 394 pairs of employees and their immediate supervisors working in the Information and Communication Technology (ICT) sector in three northern European countries, this study examined the effect of workplace moderators on the link between relational demography and supervisor ratings of performance. Directional age differences between superior and subordinate (i.e., status incongruence caused when the supervisor is older or younger than his/her subordinate) and non-directional age differences were used as predictors of supervisor ratings of occupational expertise. The quality of the supervisor-subordinate relationship and the existence of positive age-related supervisory practices were examined as moderators of this relationship. The results provide no support for a relationship between directional age differences and age-related stereotyping by supervisors in ratings of performance, neither for the effects of age-related supervisory practices. However, high quality supervisor-subordinate relationships did moderate the effects of age dissimilarity on supervisory ratings. The implications of these findings for performance appraisal methodologies and recommendations for further research are discussed.

INTRODUCTION
Aging and dejuvenization of the working population suggest far-reaching changes in the composition of the workforce (Shultz & Adams, 2007). One of the main interests of career researchers concerns the relationship between age and career development opportunities, and how career potential or employability can be maintained throughout career stages (Tikkanen, 1998; Van der Heijden, Kuhn, Taylor, Thijsen, et al., 1998). Employability is often proposed as a prerequisite for career success (Fugate, Kinicki, & Ashforth, 2004; Van der Heijde & Van der Heijden, 2006), particularly as guarantees of lifetime employment and upward career progression in a single institution have declined (Briscoe & Hall, 2006; DeFillippi & Arthur, 1994; Hall & Mirvis, 1995; Sullivan, 1999). Yet, maintaining employability amongst older workers is problematic, largely because of a perception that they lack the necessary qualities associated with competence and employability. A recent occupational example of this phenomenon has been the relatively youthful workforce in the software industry—the focus of the present study—where employees over 40 are perceived as less employable on the open market and have become dependent on their current organizations to maintain employment in the industry (Barrett, 2001; Scholarios, Van der Heijden, Van der Schoot, Bozionelos, Epitropaki, Jędrzejowicz, et al. (2008).

This article’s focus is on supervisor-subordinate age dissimilarity, its effects on supervisor ratings of employee expertise, and ways to combat its impact in the workplace. Previous psychological research has examined the effects of employees’ demographic characteristics, such as age, gender, race, tenure, and
education, on outcomes such as performance, satisfaction, selection, turnover, and leadership (e.g., Blau, 1985; Mitchel, 1981; Steckler & Rosenthal, 1985; Waldman & Avolio, 1986). Under this tradition, studies have examined the independent effects of these demographic attributes on outcomes at the employee level.

However, Tsui and O’Reilly (1989) questioned whether this approach adequately captured the full impact of potential demographic effects, stimulating a valuable stream of research including compositional effects of demographic attributes (see also Chasteen, 2005). If working organizations are considered as composed of multiple sets of relationships, more complex methodologies are required (Pfeffer, 1985). More specifically, it may be that age is related to expertise ratings (Van der Heijden, 1998), but there may also be compositional effects of age distribution in an employee’s social group.

In order to address this need, the term relational demography was introduced to refer to “the comparative demographic characteristics of members of dyads or groups who are in a position to engage in regular interactions” (Tsui & O’Reilly, 1989, p. 403). This contribution aims to clarify the complexity of age-differentials and their impact upon supervisor ratings of employee performance. The impact of both non-directional and directional age differences, such as a supervisor being older than the employee, upon expertise ratings, is examined. This adds to the discussion regarding the validity of methodological approaches in demographic research.

The second objective of this article is to investigate whether relational work characteristics, such as Leader-Member eXchange (LMX), which refers to the quality of the relationship shared by supervisors and subordinates (Graen & Scandura, 1987), and age-related career practices on the part of the supervisor (Pazy, 2004) might combat the impact of age differences on performance ratings.

The study aims to address the absence of career research outside North America, most of which has tended to neglect the European context (Mayrhofer, Meyer, Iellatchitch, & Schiffinger, 2004). It is important to cross-validate outcomes of previous research in order to find out more about generalizability of the findings. One important contextual difference which shapes the effects of age differences on performance is a country’s Power Distance Index (PDI) value (see Hofstede, 2001, p. 87). In general, PDI values for North America are slightly higher than those for the Northern European countries, which might imply more formal and distant relationships between employees and their supervisors.

The present study involves employees and their direct supervisors working in Small and Medium-sized Enterprises (SMEs) in the Information and Communication Technology (ICT) industry in three European countries (the Netherlands, the United Kingdom, and Norway). The three countries were chosen because they are generally comparable in terms of indicators of cultural norms (e.g., power distance), the stage of development of their ICT markets, and the nature of the ICT labor market at the time of the study. Previous research
Scholarios et al. (2008, p. 1052) indicated that SMEs in the more developed ICT markets of Northern Europe compared to other areas of Europe tended to pay closer attention to the career-related concerns of ICT professionals they employed mainly because skill shortages were more acute in these contexts. Taken together, therefore, these countries provide a coherent cultural and economic context for examining supervisor-subordinate relationships and career issues related to ICT professionals. Thus, although we control for country differences, these do not form a central focus of the theoretical framework and analysis.

THEORETICAL FRAMEWORK

Age and Ratings of Occupational Expertise

Being an expert and maintaining one’s expertise is by no means an easy task. However, the potential of a given organization to perform optimally in global markets depends on employees’ capabilities to develop, cultivate, and maintain fundamental qualifications, that is, their occupational expertise (Bereiter & Scardamalia, 1993; Ericsson, 1996, 2002; Ericsson & Smith, 1991; Van der Heijden, 2002). Schnabel’s (2000) “five big I’s”—internationalization, individualization, informalization, informatization, and intensification—provide one way of characterizing the expertise needs of jobs in the 21st century, capturing the increasingly complex and short-lived nature of the qualifications required to meet these demands.

In this contribution we build upon existing work developing a competence-based domain-independent operationalization of career potential or employability, of which occupational expertise is a core ingredient (Van der Heijde & Van der Heijden, 2006; Van der Heijden, 2002). In search of the core of the concept of employability, various attempts have been made to categorize its constituent dimensions. Following Thijsen’s (2000) focus on a behavioral tendency, we concentrate on employability as “the capacity of continuously fulfilling, acquiring or creating work through the optimal use of competences” (Van der Heijde & Van der Heijden, 2006, p. 453). The latter authors defined occupational expertise as one of five dimensions of employability which includes occupational knowledge and skills, meta-cognitive knowledge (“knowing about knowing” or “knowing that one knows”), social recognition by important key figures, and growth potential. This definition is compatible with others which highlight opportunities for employment on the internal or external labor market (Forrier & Sels, 2003) as well as a work-specific adaptability that enables workers to identify and realize career opportunities (Fugate et al., 2004). Employability implies a permanent acquisition and fulfillment of employment within or outside the current organization (see Van der Heijde & Van der Heijden, 2006, for further detail on the operationalization and measurement of employability as an individually-based quality).
Despite such efforts to provide reliable indicators of individual employability, age-related stereotyping may still play a role in supervisor ratings of subordinates’ occupational expertise. The importance of performance evaluation systems to organizations, not to mention the legal and moral importance of objective and fair appraisals, is without question (Judge & Ferris, 1993). However, research spanning the last decades has revealed that a person’s age forms one of the principal bases for stereotypical categorizations (see, for example, Brewer, 1988; Fiske & Neuberg, 1990).

Evidence from both multinationals and SMEs suggests that there is a broadly held view that older workers are less able to cope with the demands of a modern, complex and competitive organization than younger people, and that older workers’ ability or motivation to change jobs or to learn new skills and expertise has deteriorated (see Boerlijst, 1994; Van der Heijden, 2002). Moreover, with the knowledge and skills’ base of jobs regularly changing, even a person’s future employability in current job domains is at stake. Some supervisors adopt a policy of non-interference with older people, while others act according to their negative stereotypes, for example, by evaluating the performance of older workers differently (Hilton & Von Hippel, 1996; Kogan & Wallach, 1961).

The similarity-attraction paradigm and the concept of status-incongruence provide the bases of the hypotheses tested in this empirical study. The “similar-to-me” hypothesis states that people will be rated higher the more similar they are to the rater, or the more similar the rater believes people are to him or herself. Both self-categorization theory (Turner, 1987) and Byrne’s (1971) similarity-attraction theory offer support for this assumption. Byrne (1971) borrows from learning theory stating that similarity is the reinforcing stimulus leading to an evaluative response. Self-categorization theory predicts that the need for a positive self-identity causes us to have a preference for (Lawrence, 1980; Ryder, 1965; Webber & Donahue, 2001), smoother interaction with (Geddes & Konrad, 2003), and consequently, more positive evaluation of people that are similar to us, in this case, as far as age is concerned.

Although originally the similarity-attraction paradigm focused on similarity of attitudes, it has been extended to include demographic variables as well (Riordan, 2000). Previous research has found that supervisors’ age may interact with employees’ age to affect supervisory ratings (Cleveland & Landy, 1981; Gordon & Arvey, 2004; Kite & Johnson, 1988; Schwab & Heneman, 1978). Relational demography research takes this a step further by directly exploring the extent to which the comparative demographic characteristic, in our case age, of supervisor-subordinate dyads influences work outcomes such as performance ratings (O’Reilly, Caldwell, & Barnett, 1989), in our case occupational expertise. Conceptually, it appears that relational demography can affect perceptions of work outcomes and attitudes through interpersonal attraction, based upon similarity in attitudes, values, and experiences (Byrne, 1971; Byrne, Clore, & Smeaton, 1986), through strong communication (Byrne, 1969, 1971), and...
through the frequency of interactions (Roberts & O'Reilly, 1979). In line with Tsui and O'Reilly (1989), we assume that these effects account for variance beyond that accounted for by simple demographic attributes.

With regard to the impact of demographic characteristics in superior-subordinate dyads, performance evaluation has been the most frequently studied process (Kraiger & Ford, 1985; Mobley, 1982; Pulakos & Wexley, 1983). Although substantial research evidence demonstrates the importance of age for job performance (Ferris, Judge, Chachere, & Liden, 1991; Giniger, Dispenzieri, & Eisenberg, 1983; Ostroff, Atwater, & Feinberg, 2004; Waldman & Avolio, 1986), researchers have not typically investigated how variations in age, in either its simple or its relational form, affect performance outcomes such as occupational expertise.

As previous studies exploring age demographic effects at the dyadic level (superior-subordinate) have failed to find an effect for non-directional age differences (e.g., Liden, Stilwell, & Ferris, 1996; Tsui & O'Reilly, 1989), following Vecchio (1993), and Perry, Kulik, and Zhou (1999) we test directional age differences as well (see Pfeffer, 1985). That is to say, the age gap between a superior and his or her subordinate may be more problematic in one direction (for example, when the superior is younger than his/her subordinate) than in the other (Tsui, Yin, & Egan, 1995). See also Boerlijst (1994) and Henkens (2005) for similar lines of thinking.

The latter implies that the similarity-attraction hypothesis may provide a relevant but incomplete explanation for relational demography effects in working organizations. Inconsistencies between a person’s relative status ranking on different status dimensions (e.g., organizational position and age) may affect that person’s attitudes and behaviors as well (Bacharach, Bamberger, & Mundell, 1993). Subordinates who have to report to a younger supervisor may experience status incongruence and, subsequently, respond negatively, because of perceived violation of the career timetable associated with supervisory positions, or because of a lack of trust in their supervisor’s capacity to lead them adequately (Perry et al., 1999).

Given the current demographic changes, age is an extremely important factor to be used in research pertaining to the similarity-attraction assumption, and to status-incongruence. This is why, in this contribution, both the extent of similarity-attraction (non-directional age differences) and social status-incongruence (directional age differences) is studied as a predictor of occupational expertise ratings (Tsui, Porter, & Egan, 2002), although, in line with Liden et al. (1996), and Tsui and O'Reilly (1989), we do not expect non-directional age differences to be significant.

**Hypothesis 1:** The greater the status-incongruence between a superior and a subordinate (directional age differences), the lower the expertise ratings.
Quality of Supervisor-Subordinate Relationship (LMX) as a Moderator

Leader-Member eXchange (LMX) represents a major theoretical and empirical approach to organizational leadership (Basu & Green, 1995; Graen & Uhl-Bien, 1995; Liden, Sparrowe, & Wayne, 1997). The core idea behind LMX is that within work units, different types of relationships develop between leaders and their subordinates, or members. Managers and supervisors are thought to develop close relationships with only a few subordinates and have high quality exchanges with them. The central theoretical premise behind the relationship between LMX and outcomes is that roles that have developed beyond the formal descriptions of the employment contract (in-group exchanges) will result in more positive consequences for members than will roles based strictly on the employment contract requirements (out-group exchanges) (Liden et al., 1997). Quite simply, members who receive more information and support from the leader, and who engage in tasks that require challenge and responsibility are expected to have more positive work attitudes and engage in more positive behaviors than members whose support is limited to what is required by the employment contract.

The vast majority of empirical research on LMX, especially during the initial period from 1975 to 1985, focused on the outcomes or consequences of the exchanges. Two main categories of outcomes have been investigated: (a) attitudes and perceptions and (b) behaviors (Liden et al., 1997). LMX appears to be related to an impressive set of attitudinal outcomes, such as job satisfaction (Major, Kozlowski, Chao, & Gardner, 1995; Schriesheim, Neider, & Scandura, 1998; Seers & Graen, 1984), organizational commitment (Duchon, Green, & Taber, 1986; Green, Anderson, & Shivers, 1996; Kinicki & Vecchio, 1994; Major et al., 1995), and well-being (e.g., Epitropaki & Martin, 1999; Nelson, Basu, & Purdie, 1998) (see also Mullarkey, Wall, Warr, Clegg, & Stride, 1999). Moreover, Howell and Hall-Meranda (1999), in their longitudinal study, found high-quality LMX to be positively related to follower performance.

LMX appears also to be influential for the nature of members’ work activities. In particular LMX has been shown to be positively associated with decision-making, communications, and liaison activities (Liden & Graen, 1980). LMX has also been investigated as a predictor of innovative behavior, defined as “the extent to which organizational members introduce ideas, procedures or artifacts that are new to the organization, and the extent to which they engage in activities that may lead to introduction of such ideas, procedures, and artifacts” (Basu, 1991, p. 27), and it has been found that the quality of LMX is positively related to innovative behavior (Basu, 1991; Basu & Green, 1997).

In our study we aim at extending the existing literature on age-related effects on performance ratings by including the quality of the relationship between an employee and his/her supervisor as a moderator in the theoretical framework.
It is conceivable that increased interaction and high-quality exchanges between superior and subordinate might buffer the negative effects of age differences on performance ratings. A higher amount of individuated knowledge about staff members and closer interpersonal ties between superiors and their subordinates are expected to motivate and enable individuated processing, and thereby reduce potential stereotyping (Bauer & Green, 1996; Dienesch & Liden, 1986; Mayer, Davis, & Schoorman, 1995; Somech, 2003).

Hypothesis 2: Quality of the relationship moderates the effect of directional age differences (between an employee and his/her supervisor) upon expertise ratings. More specifically, a higher LMX score is expected to decrease the strength of the negative relationship between directional age differences and occupational expertise.

Age-Related Supervisory Practices as a Moderator

As indicated before, previous research (Boerlijst, 1994) has shown that shortcomings on the part of supervisors may limit or hamper the career development of many employees. This is particularly the case for older workers, even though the competitiveness of the European Union in the coming decades is thought to depend on the contribution of its increasing proportion of older workers, especially in comparison with North America and Asia (Ilmarinen, 1999).

Developing the competence of aging workers particularly through workplace policies and practices is one vehicle for increasing employability (Boerlijst, Munnichs, & Van der Heijden, 1998; Davies & Sparrow, 1985). There are several strategies that can be used in order to promote growth and to prevent obsolescence (Pazy, 2004). In this contribution we focus on formal and informal age-related supervisory practices aimed at encouraging and stimulating individual career development.

Concretely, supervisors may stimulate employees to participate in training and development programs (Carnevale, Gainer, & Villet, 1990; Thijssen, 1996), to exchange information by participation in social networks (Adler & Kwon, 2002; Seibert, Kraimer, & Liden, 2001), or by mentoring (Bozionelos, 2004; Eby, 1997; Finkelstein, Allen, & Rhoton, 2003; Higgins & Kram, 2001), and to think about future career steps and opportunities. A basic requirement for growth is the formulation of an individual development plan that is drawn up by the employee in co-operation with his/her supervisor.

In a longitudinal Finnish study (Tuomi, Huuhtanen, Nykyri, & Ilmarinen, 2001), it was found that the most effective HRM policy appeared to consist of a combination of several measures related to style of leadership, health and working conditions. The result of these measures was an increase in employability of older workers (over-50s). Comparably, the European Foundation for the Improvement of Living and Working Conditions (Walker & Taylor, 1997) has
collected a portfolio of good practices for combating age barriers in employment, although there is a lack of research evidence on the efficacy of these practices.

For this study, a recently validated scale (Van der Heijden, Scholarios, Bozionelos, Van der Heijde, Epitropaki, & the Indic@tor consortium, 2005) was used to evaluate age-related supervisory practices and to examine whether this moderated the relationship between directional age differences and expertise ratings. Our interest was not in actual company practices but in supervisors’ attitudinal and behavioral awareness of age as an issue in relation to the career development of their subordinates. It is hypothesized that the relationship between directional age differences and expertise ratings is moderated by the amount of age-related supervisory practices, either because these measures actually help to raise the expertise of subordinates, or because of the greater sensitivity of supervisors to age issues (age awareness), which implies a lower susceptibility to age stereotyping.

Hypothesis 3: Age-related supervisory practices moderate the relationship between directional age differences (between an employee and his/her supervisor) and expertise ratings. More specifically, a higher score for age-related supervisory practices is expected to decrease the strength of the negative relationship between directional age differences and ratings of occupational expertise.

METHOD

Participants and Procedure

Survey data collection was carried out in three northern European countries— the Netherlands, the UK, and Norway. Employees working in numerous types of ICT jobs at middle and higher educational levels were invited to participate in the study. The aim was to survey matched pairs of ICT professionals and their immediate supervisors working in SMEs. In each country, sampling began by identifying regions with the highest concentration of ICT professionals in key industry sectors (i.e., manufacturing, services and ICT software services and supply) and then contacting SME companies with less than 250 employees. ICT professionals were defined as employees involved in conception, development, implementation and maintenance of software products and services. Potential survey participants were contacted either by sending e-mails to targeted companies or by personal contact with ICT professionals or managers motivated by the potential development opportunities afforded by the survey for identifying the employability profile of the workforce.

Data collection was carried out in two ways:

1. via a web-based survey which provided immediate feedback for all employees who completed the survey on-line, and
2. through paper-and-pencil versions of the questionnaire.
Two versions of the questionnaire (an employee and supervisor version) were developed. Measures of LMX and age-related supervisory practices were gathered from the employee questionnaire as it was employees’ perceptions of work environment with which we were most concerned. In order to prevent common-method bias (see Doty & Glick, 1998), supervisor ratings were used for the measure of occupational expertise. Usually, it is supervisors who assess regularly whether employees’ employability has increased or whether they observe a deteriorated competence base.

Ensuring consistent sample identification and data collection procedures was necessary for ensuring that participants from the three countries were similar in terms of background characteristics (Van de Vijver & Leung, 1980). This ensured that observed differences were due to country or sample-specific. A translation-back-translation methodology (Hambleton, 1994) was also used for each country questionnaire to establish conformity of meaning. Possible language and linguistic problems were carefully assessed and, if necessary, translated into refinements.

The final usable respondent sample for all three countries consisted of 394 employee-supervisor pairs: for the Netherlands \( N = 71 \); for the United Kingdom \( N = 161 \); and for Norway \( N = 162 \). This included 294 male employees (75%) and 100 female employees (25%). The mean age of the employees was 36 (\( SD = 8.70 \)) with a greater range in Norway (from 19 to 65) compared to those in the United Kingdom (from 22 to 55) and the Netherlands (from 20 to 59). The United Kingdom also had a larger cluster than the other countries of older employees over 40. Organizational tenure was on average 5.4 years (\( SD = 4.4 \)) and slightly higher in the United Kingdom, \( F(2, 391) = 4.87, p < .01 \). Sixty-six percent across all countries had a higher degree, but 18% were educated only to high school level. A significantly greater proportion in Norway (44% compared to 16 and 18% in the United Kingdom and the Netherlands, respectively) had a postgraduate degree, \( \chi^2(6) = 51.42, p < .001 \).

Among the supervisors, 308 (78%) were male and 86 (22%) female. The average age of the supervisors was 43 (\( SD = 6.68 \)) and slightly higher (46) in Norway than for the Netherlands and the United Kingdom, \( F(2, 388) = 43.94, p < .001 \). On average, they had supervised their subordinates for 2.45 years (\( SD = 2.10 \)), and had been in charge of their current department for 5.36 years (\( SD = 3.42 \)).

**Measures**

**Demographic Variables**

Age was measured in years; organizational tenure in months; and gender was coded 1 for males and 2 for females. Educational qualification was measured by means of one item (1 = high-school or equivalent, 2 = college/some university, 3 = Bachelors’ degree or equivalent, 4 = postgraduate degree).
Occupational Expertise

The supervisor rating of their employee’s occupational expertise was measured using one dimension of the five-dimensional measure of employability developed by Van der Heijde and Van der Heijden (2006). This instrument has been shown to have high reliability across contexts as well as convergent, discriminant and predictive validity (in terms of both objective and subjective career success) (see also Van der Heijden, De Lange, Demerouti, & Van der Heijde, 2009). Recent cross-cultural research in seven European countries for the occupational expertise measure showed that Cronbach’s alpha values ranged from .82 to .96, depending upon country (Van der Heijden, Boon, Van der Klink, & Meijs, 2009; Van der Heijden et al., 2005).

The occupational expertise scale consists of 15 items scored on a 6-point rating scale. Example items are: “In my experience, this employee is competent enough to engage in in-depth discussions in his/her specialism,” “During the past year, this employee was generally able to carry out their work independently,” “In general, this employee is able to differentiate between primary and secondary issues in the job and set priorities,” and “During the past year, this employee has generally performed his/her job with few mistakes or problems.” Examples of scale extremes are: (1) not at all, (6) to a considerable degree, (1) never, and (6) very often. Cronbach’s alpha was .93 in this study.

Quality of the Relationship between Supervisor and Subordinate

This was assessed with the uni-dimensional thoroughly validated LMX (Leader-Member eXchange) scale developed by Graen and Uhl-Bien (1995). Recent cross-cultural research in seven European countries showed that Cronbach’s alpha ranged from .83 to .92, depending upon country, for this measure (Van der Heijden et al., 2009; Van der Heijden et al., 2005).

All seven items are scored on a 5-point rating scale. For the first six items the scale anchors range from: (1) not at all, to (5) a great deal, while for the seventh item the scale anchors range from: (1) extremely ineffective, to (5) extremely effective. Example items are: “To what extent do you know how satisfied your manager is with what you do?,” “What are the chances that your manager would help you solve problems in your work?,” “How well does your manager recognize your potential?,” and “In general, how would you characterize your working relationship with your manager?" Cronbach’s alpha was .86 in this study.

Age-Related Supervisory Practices

An indicator of the supervisor’s awareness of age-related issues with respect to the career management of their employee was measured by means of a four-item scale developed by Van der Heijden et al. (2005). Recent cross-cultural research
in seven European countries showed that Cronbach’s alpha values ranged from .61 to .86, depending upon country (Van der Heijden et al., 2005), and that the factor-analytic structure of the scale is uni-dimensional. The items, which were completed by the employees in this study, were: “During the past year, my supervisor has taken into account my age, experience and skills when assigning me new tasks and responsibilities,” “During the past year, my supervisor has protected me from assignments that would have been overwhelming for me,” “During the past year, my supervisor has talked with me about my career development,” and “My supervisor has taken into account my whole career when he/she has talked with me about my career development during the last year.” All items were scored on a 6-point rating scale ranging from: (1) strongly disagree, to (6) strongly agree. In the present study, Cronbach’s alpha was .80.

Analytical Strategy

Directional age differences were measured by a difference score calculated by subtracting the superior’s age from the subordinate’s age. A difference score of 0 on the age variable means that a subordinate and a superior are identical in age. Negative scores indicate that the employee is younger than his or her supervisor, and positive scores indicate that the employee is older than the supervisor. A squared version of this score was also calculated and represents the non-directional age difference (Tsui & O’Reilly, 1989).

To examine the effects of directional and non-directional (squared) age difference on occupational expertise ratings, two sets of four-step hierarchical regression analyses (Cohen & Cohen, 1983) were performed. This procedure controls for inter-correlations among independent variables by partiailling out shared variance, and by measuring the unique contribution of the specific block of variables entered into the regression after all other independent variables have been entered.

In the first two steps, the control variables (first country and then employee age, gender, educational qualification, and organizational tenure) were entered because we are interested in the effects of relational demography (as far as age is concerned) above and beyond the simple demographics. In the third step, the non-directional age difference was entered. This sequence was repeated substituting the directional age difference. In the fourth step, one specific workplace characteristic (LMX or age-related supervisory practice) was entered in each separate regression analysis. Finally, in the fifth step the interaction term was added in order to test whether the specific workplace characteristic could alleviate the impact of age differences on supervisory ratings. Variables were centered before building the interaction terms in order to reduce multi-collinearity (Aiken & West, 1991).

More specifically, we examined the extent to which the interaction between leader-member exchange and age differences (separately for non-directional and
directional) explained a unique proportion of the variance in supervisory ratings (Hypothesis 2), after controlling for the demographic factors and the main effects. Similarly, we examined whether the interaction between age-related supervisory practice and age difference explained a unique proportion of the variance in the outcome variable (Hypothesis 3).

**RESULTS**

We begin the presentation of findings with preliminary descriptive statistics for the means, standard deviations, inter-correlations and reliabilities of the study variables, with some discussion of differences between the three countries. We then present the results of the hierarchical regression analyses for the three hypotheses’ tests, dealing, first, with the impact of age differences on supervisory ratings, and then with the moderating effects of the quality of the supervisor-subordinate relationship and positive age-related supervisory practices.

**Descriptive Statistics and Country Comparisons**

Table 1 shows supervisory ratings of occupational expertise for different employee-supervisor age difference groups in the three countries, and Table 2 presents country means, standard deviations, inter-correlations, and reliability

<table>
<thead>
<tr>
<th></th>
<th>United Kingdom (N = 161)</th>
<th>The Netherlands (N = 71)</th>
<th>Norway (N = 162)</th>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Subordinate Age (mean)</td>
<td>36.47</td>
<td>8.76</td>
<td>34.17</td>
</tr>
<tr>
<td>Supervisor Age (mean)</td>
<td>40.71</td>
<td>6.39</td>
<td>40.41</td>
</tr>
<tr>
<td>Supervisor Rating of Expertise (mean)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisor Older (N = 294; 75%)</td>
<td>4.19</td>
<td>.60</td>
<td>4.66</td>
</tr>
<tr>
<td>Same Age (N = 13; 3%)</td>
<td>4.21</td>
<td>.66</td>
<td>4.64</td>
</tr>
<tr>
<td>Employee Older (N = 84; 21%)</td>
<td>4.40</td>
<td>.42</td>
<td>4.59</td>
</tr>
</tbody>
</table>

*Note:* Supervisor ratings of employee expertise were measured on a 6-point scale.
Table 2. Means, Standard Deviations, Inter-correlations and Reliability Coefficients for Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>United Kingdom (N = 161)</th>
<th>The Netherlands (N = 71)</th>
<th>Norway (N = 162)</th>
<th>Fit-test</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subordinate age (yrs)</td>
<td>36.47, 8.76</td>
<td>34.17, 7.47</td>
<td>37.20, 9.04</td>
<td>3.05*</td>
<td>—</td>
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</tr>
<tr>
<td>Gender (2 = female)</td>
<td>1.27, .44</td>
<td>1.21, .41</td>
<td>1.26, .44</td>
<td>.42</td>
<td>-.09</td>
<td>—</td>
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<tr>
<td>Ed. Qualifications</td>
<td>2.57, .98</td>
<td>2.76, .96</td>
<td>2.95, 1.14</td>
<td>5.50**</td>
<td>-.05</td>
<td>-.07</td>
<td>—</td>
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<tr>
<td>Tenure (months)</td>
<td>76.95, 76.06</td>
<td>55.25, 42.07</td>
<td>60.44, 39.88</td>
<td>4.87**</td>
<td>.32</td>
<td>.00</td>
<td>.03</td>
<td>—</td>
<td></td>
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<tr>
<td>Age dissimilarity (non-directional)</td>
<td>135.24, 157.76</td>
<td>125.97, 167.44</td>
<td>171.12, 186.53</td>
<td>2.47</td>
<td>-.28</td>
<td>.00</td>
<td>-.01</td>
<td>-.15</td>
<td>—</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Age dissimilarity (directional)</td>
<td>-.42, 10.87</td>
<td>-6.15, 9.46</td>
<td>-9.23, 9.31</td>
<td>10.18**</td>
<td>.55</td>
<td>-.11</td>
<td>-.10</td>
<td>.27</td>
<td>-.65</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LMX</td>
<td>3.59, .65</td>
<td>3.87, .65</td>
<td>3.65, .53</td>
<td>2.11**</td>
<td>-.06</td>
<td>-.16</td>
<td>-.04</td>
<td>-.07</td>
<td>-.02</td>
<td>.02</td>
<td>.86</td>
<td></td>
<td></td>
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<tr>
<td>Supervisory practices</td>
<td>3.69, .96</td>
<td>3.39, 1.26</td>
<td>2.49, .99</td>
<td>5.75**</td>
<td>-.01</td>
<td>-.16</td>
<td>-.11</td>
<td>.07</td>
<td>-.05</td>
<td>.11</td>
<td>.15</td>
<td>.80</td>
<td></td>
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<tr>
<td>Ratings of expertise</td>
<td>4.19, .60</td>
<td>4.66, .53</td>
<td>4.40, .68</td>
<td>14.42**</td>
<td>-.01</td>
<td>.02</td>
<td>.06</td>
<td>.02</td>
<td>-.03</td>
<td>.02</td>
<td>.23</td>
<td>.01</td>
<td>.93</td>
</tr>
</tbody>
</table>

Notes: N = 393. Due to a high number of missing values one pair was left out of the final analyses; Correlations and reliability coefficients (in diagonal) are based on the total sample; LMX was measured on a 5-point scale; age-related supervisory practices and ratings of expertise were measured on 6-point scales; Inter-correlations above an absolute value of .10 were significant at the .05 level; *p < .05, **p < .01.
Hierarchical Regression Analyses

Age Dissimilarity Effects

The results of the regression analyses for the prediction of supervisory ratings of occupational expertise are summarized in Table 3. Equations 1 and 2 relate to the effects of non-directional age dissimilarity, while Equations 3 and 4 relate to the analyses for directional age dissimilarity. Each equation indicates the effects of one of the hypothesized moderators examined in this study (i.e., LMX or age-related supervisory practice). The increase in $R^2$ contributed by the third step is of particular interest (Cohen & Cohen, 1983). If $R^2$ is significant, it suggests that the age difference measure accounts for a substantial incremental amount of variance in the dependent variable (supervisory rating of occupational
<table>
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<tr>
<th>Moderator:</th>
<th>Eq. 1 LMX</th>
<th>Eq. 2 Supervisory practice</th>
<th>Eq. 3 LMX</th>
<th>Eq. 4 Supervisory practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.675**</td>
<td>3.733**</td>
<td>4.038**</td>
<td>3.745**</td>
</tr>
</tbody>
</table>

Step 1 (base: UK):

The Netherlands:  .360** .499**
Norway: .197* .256*

Step 2:

Age: .001 .001
Gender: -.042 .033 -.044 .043
Ed. Qualifications: .050 .065†
Tenure: .001 .001 .001 .001

Step 3:

Age Dissimilarity: -.002 .001 .010 .002

Step 4:

Moderator: .377** .044 .274** .045

Step 5:

Moderator-Age: .077† -.035 -.098* .032

Dissimilarity interactions

Model summary:

|  | Step 1: $\Delta R^2$ | Step 2: $\Delta R^2$ | Step 3: $\Delta R^2$ | Step 4: $\Delta R^2$ | Step 5: $\Delta R^2$ |
|  | .016 | .016 | .016 | .016 | .000 |
|  | .000 | .000 | .000 | .000 | .001 |
|  | .123** | .004 | .123** | .004 | .004 |
|  | .008† | .002 | .016† | .002 | .092 |
|  | .217 | .092 | .224 | .092 | .092 |

Full model $R^2$: 11.82** 4.32** 12.34** 4.30**

Overall $F$
expertise) over and above the control variables (country, subordinates’ age, gender, educational qualification, and tenure).

In the present analysis, none of the regression analyses using the non-directional or directional age difference scores explained a significant amount of variance in expertise ratings beyond that explained by the control variables. This means that the data did not support Hypothesis 1. Rather, country appears to explain 7% of the variance in occupational expertise ratings, with the overall ratings for the Netherlands being highest ($M = 4.66$), and for the UK being the lowest ($M = 4.19$) (see also Table 1).

**Moderator Effects**

Examining Steps 4 and 5, there is some support for the moderating effect of LMX (partially supporting Hypothesis 2). The unstandardized regression coefficients for LMX ($B = .377$ and $B = .274$, both $p < .01$) show a significant positive relationship between the quality of the supervisory relationship and supervisory ratings of expertise. The unstandardized regression coefficient for the interaction terms in Equations 1 and 3 are also significant ($B = .077$, $p < .10$ and $B = –.098$, $p < .05$), but only at the .10 level when non-directional age differences are used (Equation 1). The $R^2$ change associated with the interaction term for directional age difference (Equation 3) was .02. In other words, the interaction between age dissimilarity and LMX explained an additional 2% of the variance in supervisory ratings over and above the 12% which is explained by including LMX alone.

Quality of the relationship appears to moderate the effects of age differences on expertise ratings, even though we could not find a significantly negative relationship between directional age differences and occupational expertise (as formulated in Hypothesis 1). Exploring this interaction further, we calculated predicted values for the dependent (supervisor ratings) for groups at the low and high values of the predictor variables (i.e., –1 and 1 SDs from the mean) as recommended by Cohen, Cohen, West, and Aiken (2003). Figure 1 shows the predicted values for each group and a plot of these values. The highest predicted ratings were obtained for those in high LMX relationships and low age dissimilarity ($Y = 4.40$) and these ratings declined for those with high age dissimilarity, whether LMX was high ($Y = 4.22$) or low ($Y = 3.87$). This was in the expected direction. Surprisingly, though, the lowest predicted supervisory ratings were received by those in a low LMX relationship and with low age dissimilarity ($Y = 3.66$). Contrary to the direction of moderation predicted in Hypothesis 2, age dissimilarity seemed to have a beneficial effect where the quality of the supervisory relationship was low.

Also contrary to our expectations, for age-related supervisory practices, neither main nor interaction effects were found, implying that Hypothesis 3 was not supported.
DISCUSSION AND CONCLUSIONS

Contrary to our expectations in Hypothesis 1, age dissimilarity between supervisor and subordinate which reflected status incongruence did not explain a significant amount of variance over and above the effects of country and demographic factors (primarily education). Dutch superiors appeared to rate their employees highest, followed by Norwegian and British ones, regardless of age dissimilarity. It was also found that in Norway at least, younger supervisors even rated their older employees higher than older supervisors rated their younger employees. This reverses the expected direction of potential age-stereotyping in the performance rating.

It is difficult to interpret what lies behind these country differences, especially as the psychometric qualities of the measures across the countries were found to be sound and our approach aimed to ensure that the three versions of the questionnaire met psychometric standards necessary for cross-cultural research (Hambleton, 1994). In other words, we do not expect methodological flaws to be an explanation in this regard. Moreover, differences in the age distributions
within each country were accounted for in the hypothesis testing and cannot explain the results. It may simply be that supervisors’ judgments of how age relates to expertise are needs- and context-specific, in our case, specific to the requirements of the specific ICT market within each country at that time, and hence no age stereotyping is shown. Supervisors in Norwegian SMEs may simply have had greater need for more experienced, older staff, and reflected this in their evaluations of expertise, regardless of age dissimilarity with their subordinates. Examining the country context further, consultancy services accounted for 45% of all employment in the Norwegian ICT sector at the time of the study and had shown significant growth between 1995 and 2001 (Statistics Norway, 2008). Norwegian SMEs may have relied on more experienced workers’ firm-specific knowledge and skills to remain competitive.

With respect to the hypotheses dealing with moderators, quality of the relationship between the superior and his/her subordinate as measured by LMX appeared to moderate the relationship between directional age differences and ratings of occupational expertise, regardless of country. Even though the assumption regarding the impact of status incongruence upon performance appraisal could not be supported with our data, we found that supervisory expertise ratings were higher in cases of higher quality relationships (partly confirming Hypothesis 2). However, further examination of the interaction effect showed that, for lower quality relationships, high status incongruence (when supervisors were younger than their employees) led to a relatively better supervisory rating, while low status incongruence led to a lower rating. For higher quality relationships the reverse was found; higher ratings were found in cases of lower status incongruence.

In trying to explain this complex interaction pattern using quality of the relationship between supervisor and subordinate we might examine the supervisory appraisal process further. While lower ratings were expected with a low quality relationship, our data indicate that supervisors might also fall back upon age-related stereotyping in cases of a higher quality relationship. Looking at the items of the LMX measure, we may conclude that a higher score is associated with a higher amount of interaction and mutual understanding between the two. While familiarity is usually seen as an important buffer of the negative effects of age-related stereotyping (see Kingstrom & Mainstone, 1985; Strauss, 2005; Van Hooft, Van der Flier, & Minne, 2006), our outcome appears to be in line with Smith, Miller, Maitner, Crump, Garcia-Marques, and Mackie (2006) who predicted that more exposure (in our case, a higher amount of interaction as expected when the LMX score is higher) to information about a target person (in our case the subordinate) decreases analytic processing of the information, thereby increasing the supervisor’s reliance on stereotypes in his or her expertise ratings. The latter obviously might play a role in cases of status incongruence which might, in turn, explain the disadvantageous situation characterized by a higher LMX score together with higher age dissimilarity scores (see Figure 1).
With respect to our final hypothesis, age-related supervisory practices did not buffer effects of age dissimilarity on supervisor ratings of occupational expertise (Hypothesis 3 could not be confirmed). It appears, therefore, that a high quality relationship between supervisor and subordinate is the only way to decrease the negative impact which age-related differences otherwise might have.

Additional qualitative data on our ICT professionals’ sample showed that most supervisors have an interest in the career potential of their subordinates, yet in quite an *ad hoc* way due to the influence of the highly changeable ICT market. Supply and demand dictate the required competencies for ICT professionals (Scholarios et al., 2008). It was found that issues of an ageing workforce were not expected to cause any problem for these SMEs. The ICT professionals that participated in our study were relatively young, and perceived as quite ambitious, eager to learn, and mobile by their superiors. Possibly, the relatively narrow employee age distribution across the three countries might partly explain why negative effects of age dissimilarity were not found using our data. Obviously, more research including objective performance measures is needed in order to be able to conclude whether age-related stereotyping is taking place, instead of a careful consideration and weighing of observations of employee’s work behavior and capabilities.

**Limitations and Recommendations for Further Research**

The present study has some limitations. First, all data were collected using survey research opening up the possibility of response set consistencies. A methodological strength of our approach, however, which may have limited this concern was the use of multiple-source data with the moderator variables assessed using subordinate perceptions and the dependent variable (ratings of occupational expertise) assessed by the supervisor.

A second limitation was that the data were cross-sectional, implying that further research is needed in order to address issues of causality. The inability to empirically test causal inferences makes it impossible to rule out alternative explanations for the effects noted in this study. An example of an alternative explanation that can be tested in longitudinal approaches comprises the idea that the outcomes pertaining to the quality of the supervisor-subordinate relationship represent a selection effect, as presumably those subordinates with higher expertise ratings might perceive a higher LMX score, or, simply, that more competent employees enjoy a better relationship with their supervisors. Research using multi-wave designs can also provide more specific information about the stability and change of the variables, and about cross-lagged (i.e., over time) relationships compared with our cross-sectional approach (De Lange, Taris, Kompier, Houtman, & Bongers, 2004; Taris & Kompier, 2003).
More research is also needed in order to investigate whether the impact of relational norms may differ according to national culture. For example, the relational norm of age could be more salient in cultures that value and respect the wisdom of the elderly. Empirical research should compare contexts in which relational norms differ. For example, in some occupations it may be “normative” for supervisors to be younger.

Moreover, further research is needed to investigate the extent to which our findings would generalize to other occupational settings and/or to other countries, that is to say, whether they are culturally-invariant. A concrete useful follow-up study could provide an empirical test for possible differences between North America and Europe. Although the operationalization of occupational expertise that was used in this study concerns mainly ability-related performance ratings which are assumed to be more culturally-invariant (see also Ployhart, Wiechmann, Schmitt, Sacco, & Rogg, 2003), one could speculate that the prevalence and the impact of age-related stereotyping differs across cultures (Perry & Parlamis, 2005). The Indic@tor Study data, on which this study was based, provide ample opportunities in this regard (see Van der Heijden et al., 2005). Notwithstanding the limitations that are inherent to our approach, the results are noteworthy and provide challenges for future research and cross-validation.

REFERENCES


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