

Age, resistance to change, and job performance

Florian Kunze

*Institute for Leadership and Human Resource Management,
University of St Gallen, St Gallen, Switzerland*

Stephan Boehm

*Center for Disability and Integration, University of St Gallen,
St Gallen, Switzerland, and*

Heike Bruch

*Institute for Leadership and Human Resource Management,
University of St Gallen, St Gallen, Switzerland*

741

Abstract

Purpose In light of the increasingly aging workforce, it is interesting from both a theoretical and practical perspective to investigate empirically the commonly held stereotype that older workers are more resistant to change (RTC). Thus, the main purpose of this paper is to investigate the age/RTC relationship, considering tenure and occupational status (blue/white collar employees) as additional boundary conditions. Furthermore, the paper investigates the relationship between RTC and individual performance, thereby introducing RTC as a mediator in the age/job performance relationship.

Design/methodology/approach Study hypotheses are tested among a sample of 2,981 employees from diverse companies. Structural equation modeling with bootstrapping procedures is applied to investigate the moderated indirect model.

Findings Contrary to common stereotypes, employee age is negatively related to RTC. Tenure and occupational status are further identified as boundary conditions for this relationship. Moreover, RTC also shows an association with individual job performance, which allows for the establishment of an indirect mediation mechanism from age to job performance via the intermediation of RTC. These results can be explained using current life span concepts, particularly the selective optimization with compensation (SOC) model.

Research limitations/implications Hypotheses were tested in a cross sectional data set, which does not allow for conclusions of causality.

Originality/value This study contributes to the age stereotyping literature that has thus far neglected the age/RTC relationship. Furthermore, the age/job performance literature is extended by introducing RTC as an important mediating factor. In sum, this study should help provide a more positive and more differentiated picture of older employees in the workplace.

Keywords Older workers, Age discrimination, Stereotypes, Organizational behavior, Individual behavior

Paper type Research paper

Introduction

An ongoing demographic shift constitutes a key challenge for most industrialized countries: an aging and shrinking population caused by low birth rates and increased

A short overview of this study appeared in the 2010 conference proceedings of the Academy of Management Conference in Montreal (Kunze *et al.*, 2010).

longevity will necessitate that companies find ways to cope with an increasingly aging workforce (Feyrer, 2007; Peeters and van Emmerik, 2009). In the USA, for instance, by 2016 the number of workers who are 55-64 years old is expected to rise by 36.5 percent, while the number of those in the 25-54 age group is expected to climb by only 2.4 percent (US Bureau of Labor Statistics, 2009). To be economically successful, companies and society as a whole will have to facilitate a long-term productive engagement of older employees in the workforce (Feyrer, 2007).

One factor that may put such engagement at risk is negative age stereotypes held by many employers and coworkers about older employees (Posthuma and Campion, 2009; Stamov-Roßnagel and Hertel, 2010). In the European Union, for example, a recent representative survey of the workforce found that 58 percent of respondents indicated that age discrimination based on age stereotypes was widespread in the labor market (European Commission, 2009). According to conventional beliefs, older workers are poorer performers and are less motivated (Abraham and Hansson, 1995; Shore *et al.*, 2003), have a lower ability to learn (Brooke and Taylor, 2005; Wrenn and Maurer, 2004), and are more costly for companies (Capowski and Peak, 1994; Ostroff and Atwater, 2003).

Empirical research has demonstrated most of the common stereotypes to be unfounded. For example, extensive research has shown the negative age/job performance stereotype to be wrong (e.g. Kanfer and Ackerman, 2004; Ng and Feldman, 2008), while other studies have found training success and age, as well as the relation between costs and older workers, to be unrelated (Broadbridge, 2001). Yet the assessment of one often-reported stereotype – namely, that older workers are more resistant to change (e.g. Chiu *et al.*, 2001; Tuckman and Lorge, 1953; Weiss and Maurer, 2004) – has been rarely investigated for its empirical validity so far. Posthuma and Campion (2009) conclude in their recent literature review that there is “virtually no research that examines the validity of this stereotype [...] and future research should explore whether it is true” (p. 168).

Consequently, the current study builds upon several career and life-span models, including the work of Kanfer and Ackerman (2004), Carstensen *et al.* (1999), and Baltes and Baltes (1990), to examine if and how an employee’s age might relate to his or her RTC. In particular, Baltes and Baltes’ (1990) model of selective optimization with compensation (SOC) provides a holistic framework to not only explain a potential main effect of age on RTC, but also identify meaningful moderators of this relationship. More specifically, we will take occupational status and tenure as potential moderators for the age/RTC relationship into account, since employees with more autonomy in their jobs (e.g. white-collar workers) as well as lower-tenured employees may develop better SOC competencies, which in turn potentially influences the age/RTC relationship.

Beyond looking only at the antecedents of individual RTC, the current study will also investigate potential outcomes in terms of individual performance. To this end, we will introduce RTC as a mediator in the age/individual performance relationship. By doing so, we also aim to contribute to the age and job performance literature that has produced inconsistent findings thus far (McEvoy and Cascio, 1989; Ng and Feldman, 2008), with age showing almost no relationship to core task performance, a positive relationship to citizenship behaviors, and a negative relationship to counterproductive work behaviors. As postulated in the recent meta-analytical paper by Ng and Feldman

(2008), “conceptualizing and measuring mediating processes may be one of the most effective ways to help researchers explain *why* age matters to job performance, not only *that* age matters to job performance” (p. 406). Thus, we will test whether RTC is related to individual performance, measured through percentage of goal accomplishment. In sum, this study will investigate a moderated-indirect relationship in which age is indirectly related to individual goal accomplishment transmitted through RTC, depending on organizational tenure and occupational status as depicted in Figure 1.

Individual age and resistance to change

We will use the definition for individual differences of RTC coined by Oreg (2003), who established a second-order four-dimensional structure consisting of:

- (1) routine seeking, which involves the extent to which an employee aims for routine and stable environments;
- (2) emotional reaction to imposed change, which reflects the degree to which employees experience change as uncomfortable and stressful;
- (3) short-term focus, which represents the degree to which employees are preoccupied with short-term challenges compared to long-term benefits of the change; and
- (4) cognitive rigidity, which represents reluctance to consider and test new perspectives and concepts.

Taken together, these four dimensions can be conceptualized as reflecting the behavioral (routine seeking), affective (emotional reaction and short-term focus), and cognitive aspects (cognitive rigidity) of resistance to change in one overall construct (Oreg, 2003). In addition, Piderit (2000) argued theoretically for an integration of the behavioral, affective, and cognitive facets of RTC in one common construct as “any definition focusing on one view at the expense of the others seems incomplete” (p. 786). The RTC scale is explicitly not tailored for any specific type of change, but tries to explain “resistances above and beyond any contextual causes” (Oreg, 2003, p. 690).

For decades, surveys in companies have shown that older employees are often associated with the stereotype of being more resistant to change. By 1953, for instance, Tuckman and Lorge had already found older people to be subjected to the prejudice

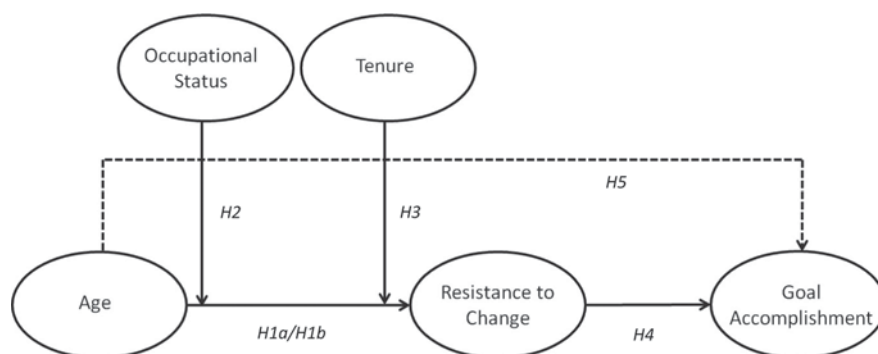


Figure 1.
Model overview

from young graduate students in that they were less adaptable to changing environments (Tuckman and Lorge, 1953). Similar findings of managers' and employers' age/RTC stereotypes have been reported in more recent studies in different cultural contexts (Chiu *et al.*, 2001; Rosen and Jerdee, 1977; Weiss and Maurer, 2004; Van Dalen *et al.*, 2009, Warr and Pennington, 1993).

Theoretical arguments underlying these stereotypes can be drawn from developmental and career stages models. For example, Pogson *et al.* (2003) defined three stages of managerial careers:

- (1) trial stage (<31 years old);
- (2) stabilization stage (31-44 years old); and
- (3) maintenance stage (45 years and older).

Older workers, being in the maintenance career stage, are assumed to be more cognitively rigid, more short-term focused, and hence more resistant to change. In line with these arguments, Finkelstein *et al.* (1995) showed in a meta-analytical study that older employees are typically associated with lower potential for development (including learning new skills and tackling new challenges) and higher degrees of stability, both of which imply an increased level of RTC.

Furthermore, a potentially positive impact of age on employees' RTC can be derived from work on cognitive changes during adulthood and the distinction between fluid (Gf) and crystallized intellectual abilities (Gc) (Cattell, 1987). Especially with regard to Gf, research has demonstrated that it peaks in early adulthood (around 25 years of age) and declines thereafter (Cattell, 1987; Salthouse, 1996), whereas Gc remains stable throughout the life span (Beier and Ackerman, 2005). As fluid intelligence is associated with the processing of novel information, it can be concluded that jobs and tasks characterized by novelty (such as change situations) are more challenging and less easy to accomplish for older workers, thereby increasing their resistance to them. In addition, aging adults are often associated with increases in crystallized intelligence, such as experiential knowledge. Hence, older employees might prefer job situations in which they can build upon this strength (i.e. stable work environments), while they might avoid and even resist situations in which the usefulness of their experience becomes threatened (such as change) (Kanfer and Ackerman, 2004).

On the other hand, Mirvis and Hall (1996) argued that "there is no physiological and scant psychological evidence that aging is in any way related to personal adaptability and resistance to change" (p. 285). Recent empirical results have supported this assertion by reporting no significant effects between self-reported individual adaptability and age (O'Connell *et al.*, 2008) as well as between age and self-reported acceptance of organizational change (Iverson, 1996). Furthermore, in research on personal initiative and proactivity, no effects or even positive relationships were found with regard to age (Van Veldhoven and Dorenbosch, 2008; Warr and Fay, 2001).

As a conceptual framework accounting for these empirical results, the SOC model (Baltes and Baltes, 1990; Freund and Baltes, 2002) can be employed. The SOC model assumes that individuals manage their lives (especially their limited resources) through three processes of developmental regulation. First, selection refers to developing, setting, and committing to goals as well as to reconstructing one's goal systems over the life span. Optimization, as the second strategy, describes the acquisition and refinement of goal-relevant means. Finally, compensation refers to

compensatory strategies (i.e. the use of alternative means) employed to secure a certain level of functioning when losses occur in a specific domain. Research has demonstrated that SOC strategies are used from early adulthood on, with a peak for middle-aged individuals (Freund and Baltes, 2002). In the work context, Abraham and Hansson (1995) found that older employees (49-69 years old) report higher frequencies of SOC behavior which, in turn, is related to higher subjective ratings of competence maintenance and goal attainment. Building upon these findings, we suppose that SOC strategies may function as a moderator that enables older employees compared to younger employees to better “focus their efforts on a few important goals, identify specific ways to achieve these goals, and, when necessary, seek out alternative means to augment existing methods” (Bajor and Baltes, 2003, p. 351). Such intensified use of SOC strategies, should, in turn, negatively affect their RTC as they might more effectively select and align personal goals with relevant change goals as well as adapt to these goals by carefully managing and deploying their own resources.

In addition to the SOC model, neuropsychological research has proven that individuals tend to become more emotionally stable (Williams *et al.*, 2006, Roberts *et al.*, 2006), increase their emotional regulation capacities (Gross *et al.*, 1997), and process positive emotional information more deeply than negative emotional information (Carstensen *et al.*, 1999) as they age. Consequently, older employees should at the very least have a better capability to cope emotionally with changes occurring in their environments.

Given the competing theoretical arguments, the limited number of empirical studies, and the mixed results, we think that it is appropriate to formulate two competing hypotheses for the relationship between age and resistance to change that have to be addressed empirically.

H1a. Employees' age is positively related to their resistance to change in the workplace.

H1b. Employees' age is negatively related to their resistance to change in the workplace.

Interaction effects

In addition to investigating the main effect of age on RTC, we examine potential moderators of this relationship. Drawing from the SOC model as our main conceptual framework, occupational status and organizational tenure should be particularly relevant boundary conditions.

Age and occupational status interaction. Based on the SOC model, we propose that an employee's occupational status is a relevant boundary condition for the relationship between individual age and RTC. Building upon arguments and empirical findings from Abraham and Hansson (1995), Baltes and Dickson (2001), and Bajor and Baltes (2003), we argue that the successful use of SOC strategies is dependent the level of job autonomy. Only if individuals perceive a high degree of autonomy and independence in decision making can they engage in SOC strategies that, in turn, are likely to diminish their RTC. Prior research has indicated that employees in predominantly administrative and management positions (white-collar workers) possess more autonomy in their work than workers occupied with routine production tasks (blue-collar workers; (Randall, 1990). In blue-collar jobs, workers also often have low

levels of control over their work, fewer complex responsibilities, and a lower level of task ambiguity than their white-collar colleagues (Toppinen-Tanner *et al.*, 2002).

In line with the SOC model, these lines of reasoning may be framed as an argument for a higher RTC on the part of older employees who work in blue-collar jobs. Highly routinized tasks that are less cognitively challenging provide fewer chances for the application of SOC strategies and thus reduce the capability to deal with changing environments, which, in turn, may lead to a more pronounced effect of age on RTC.

On the other hand, it is reasonable to assume that older employees who are often confronted with complexity and autonomy in their tasks and decision making will develop higher levels of SOC behavior and remain more cognitively and emotionally open to change initiatives. Cognitive rigidity and routine seeking should be much less pronounced for those white-collar employees and may trigger a lower overall incidence of RTC. Based on this logic, we offer the following:

- H2.* The level of job autonomy associated with the occupational status of the employees moderates the relationship between age and RTC, such that higher age is associated with higher RTC for blue-collar workers than for white-collar workers.

Age and tenure interaction. Based on arguments from the SOC model, organizational tenure might be another plausible boundary condition for the age/RTC association. We argue that long-term employment at the same workplace may decrease the developmental experiences available through contact with a greater variety of work situations. These developmental experiences may, in turn, affect SOC competencies (Baltes and Baltes, 1990; Abraham and Hansson, 1995) such that we have identified them as a factor to decrease RTC in our line of arguments for *H1b*. Therefore, frequent job changes should offer older employees better chances to develop their SOC competencies compared to their colleagues, who have worked long years in the same work environment. Consequently, routine seeking, cognitive rigidity, and emotional aversion to change should be more pronounced for staff members who are both old and long-tenured than for employees who are old, but are new to the company. The short-tenure of these employees may relate to more drive and readiness for change initiatives, despite having a higher age. Thus, we propose the following:

- H3.* Employee organizational tenure moderates the relationship between age and RTC, such that higher age is associated with higher RTC for long-tenured than for short-tenured employees.

Individual performance association of resistance to change

In addition to investigating age as a possible antecedent for RTC, it seems useful to explore its potential relationship to individual performance and thus also test for a mediation of RTC in the age/job performance relationship.

Resistance to change and goal accomplishment. Given prior conceptualizations and empirical research, we assume a negative relationship between RTC and individual effectiveness, measured via successful goal accomplishment. Oreg (2003), for example, found that individuals who are resistant to change showed an increased difficulty in working effectively. These findings may be attributable to the lack of support, communication, and participation that employees perceive from their employer when

they are resistant to change (e.g. Schalk *et al.*, 1998). Employees with high resistance may even experience a breach of the psychological contract with the company (Kiefer, 2005) due to change initiatives that endanger their resources or their status at work. Both a perceived lack of support and a breach of the psychological contract may hinder individual performance. Employees resistant to change may specifically question the relevance of the personal goals to which they have agreed with their direct supervisor. Some of these goals may entail change processes and behaviors in which they are not willing to engage.

Therefore, we assume that employees with high RTC should have more problems in achieving their performance goals compared to employees who are highly committed to change in the company and accordingly offer the following:

H4. RTC is negatively related to employees' successful goal accomplishment.

Mediation hypothesis

H1a and *H1b* propose a contrasting association of age with RTC. The relationship might either be positive, assuming that older workers are more resistant to change because of being in a maintenance career stage (Pogson *et al.*, 2003) and possessing less fluid intellectual abilities (e.g. Salthouse, 1996), or negative, assuming that older workers are less resistant to change because of more pronounced SOC behaviors (Abraham and Hansson, 1995; Baltes and Baltes, 1990) and better emotional capacities (e.g. Gross *et al.*, 1997). *H3*, in turn, predicts a negative association of RTC with job performance, arguing with a lack of perceived support from the organization (Schalk *et al.*, 1998) and perceived breach of the psychological contract (Kiefer, 2005). Together, the hypotheses theoretically specify a model in which age indirectly relates to job performance by contributing to an individual's RTC, depending on the restriction that either a positive or a negative relation of age with RTC can be observed in our data. Consequently we propose the following indirect-effect hypothesis:

H5. The indirect relationship between age and employees' goal accomplishment is mediated by employees' RTC.

Method

Sample and procedure

Data for the present study were collected from a sample pool of employees in 93 German firms in July 2009. These firms participated in a larger benchmarking study that was organized by the authors in collaboration with an agency in Germany. To be a part of the study, companies had to meet the criteria of being located in Germany and not exceeding 5,000 employees. Participating companies came from a number of industries, including services (65 percent), manufacturing (20 percent), trade (10 percent), and finance (6 percent). Their sizes ranged from 19 to 3,269 employees with a mean of 237, and they had 30,061 employees overall.

A standardized e-mail invitation was sent to all employees, containing a short description of the study purpose and a web link to a survey hosted by an independent third party. In total 15,243 employees participated in the survey, resulting in a response rate of 51 percent. To limit the number of questions for each employee and thus prevent a high incidence of non-response, participants were randomly assigned to one of four versions of the overall survey, based on an algorithm on the survey's webpage. For this

study, we applied responses from only one of the survey versions, which were answered by 3,776 employees. Due to missing data on one of the study's variables, this number was reduced to 2,981 participants, who became the final sample for our analysis (actual response rate for the survey version applied in the study = 40 percent)[1]. Respondents were equally represented as to gender. The average age was 39 (SD = 10.9), and respondents had worked, on average, eight years for their companies (SD = 8.1).

Measures

Age and tenure. Age and tenure were both assessed by asking the respondents a single item in which they indicated their age and tenure at the current organization in absolute years.

Occupational status. Respondents were asked to indicate their main work area and responsibility based on 18 categories (e.g. production, IT service, administrative support). Using these categories, a dummy variable was coded that differentiated between blue- and white-collar jobs.

Resistance to change. RTC was measured using the scale developed by Oreg (2003), which consists of 17 items to gauge four dimensions of RTC that form one overall construct:

- (1) routine seeking (five items);
- (2) emotional reaction (four items);
- (3) short-term thinking (four items); and
- (4) cognitive rigidity (four items).

The scale uses a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

The scale has already been validated in a German sample; however, given the limitation that only undergraduate students participated in that study (Oreg *et al.*, 2008), we decided to run a confirmatory factor analysis (CFA) with our employee sample prior to the main analysis. For this analysis we specified a second-order latent construct of RTC on which the four sub-dimensions were loaded (Oreg, 2003).

The results of the CFA (CFI = .923, GFI = 0.949, RMSEA = 0.059) indicated an acceptable fit of the second-order latent construct of RTC with the four sub-dimensions to the data and were comparable to those reported in prior studies (Oreg, 2003; Oreg *et al.*, 2008). To justify this proceeding empirically, we specified a second model excluding the second-order latent factor. This model showed worse fit indices (CFI = 0.713, GFI = 0.829, RMSEA = 0.113), which further strengthened the confidence in our assumed measurement structure. The reliability score of the scale was also sufficient, with $\alpha = 0.83$.

Goal accomplishment. This variable was operationalized by asking the employees to indicate on a six-point Likert scale how many of their goals, as agreed upon with their direct supervisor, they had fulfilled since the start of the year. The scale ranged from 1 (0 percent of goals fulfilled) to 6 (120 percent of goals accomplished, i.e. over-accomplishment of goals).

Control variables. As control variables, we entered the employees' gender as well as the main effect of occupational status and employees' tenure in the analysis as these

demographic characteristics might also influence the RTC of the employees, as shown in other studies (e.g. Warr and Fay, 2001).

Analytical procedures

We applied structural equation modeling (SEM) procedures with maximum likelihood procedures to test our hypotheses in the moderated-indirect model. The interaction hypotheses were tested by applying the orthogonal-centering procedure described by Little *et al.* (2006). To facilitate interpretation, the interactions were also graphically plotted. The indirect effects were tested in SEM by applying bootstrapping procedures, as proposed by Cheung and Lau (2008). Finally, following the description of regression analysis by Preacher *et al.* (2007), we specified alternative models in SEM with high and low values of the moderators to investigate the conditional indirect effects with bootstrapping techniques.

Results

Descriptive statistics

Table I shows the means, standard deviations, and bivariate correlations for all study variables. We observed a negative relation between age and RTC ($r = -0.07$, $p < 0.001$). In contrast, tenure and occupational status show no significant relation with RTC. Concerning the outcome variable, we observed the expected negative relation of goal accomplishment with RTC ($r = -0.13$, $p < 0.001$).

Structural model

As the main part of the analysis, we examined the structural portion of our specified model. The main results are depicted in Figure 2. As summarized in Table II, the indices for the baseline model (Model 1), which allowed direct paths between age and RTC as well as between RTC and the performance measure, indicated a good fit of the model to the data (CFI = 0.914, GFI = 0.953, RMSEA = 0.046).

H1a and *H1b* inquired as to the nature of the relationship between an employee's age and RTC. Our results showed a negative relationship between those two variables ($\beta = -0.10$, $t = -3.95$, $p < 0.001$). This finding indicated that older people in our sample seem to be less resistant to change than their younger colleagues, rejecting *H1a* and supporting *H1b*.

In a further step, we also tested for the proposed interaction relationships. To this end, we simultaneously entered the two different interactions into our model to inspect

Variable	M	SD	1	2	3	4	5	6
1. Age	38.61	10.90						
2. Organizational tenure	7.97	8.08	0.55					
3. Gender	1.50	0.50	0.04	0.04				
4. Occupational status	1.76	0.43	0.06	0.08	0.06			
5. Resistance to change	2.94	0.69	0.07	0.01	0.01	0.02		
6. Goal accomplishment	4.09	1.04	0.00	0.06	0.08	0.00	0.13	

Note: $n = 2,981$; correlations greater than 0.05 are significant at the 0.05 level (two tailed)

Table I.
Aggregation statistics,
means, standard
deviations, and
intercorrelations of study
variables

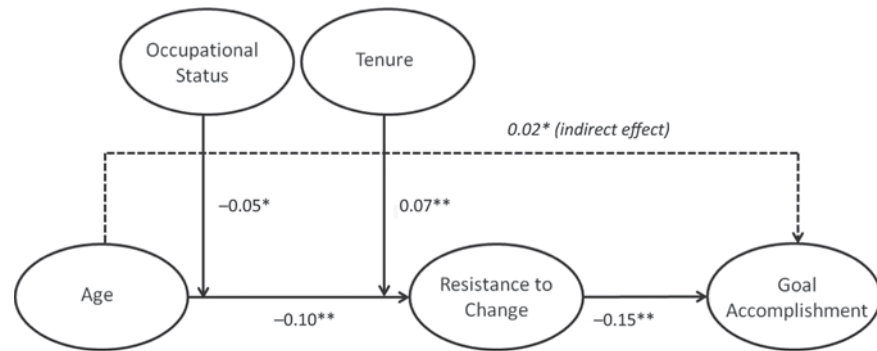


Figure 2.
Overview of results

Notes: $n = 2,981$, $* = p < 0.010$ (two-tailed), $** = p < 0.001$. Standardized regression coefficients are reported

Model	χ^2	df	$\Delta\chi^2$	Δdf	CFI	GFI	RMSEA
Model 1: Baseline model	1,717	234			0.914	0.953	0.046
Model 2: Moderation model	1,697	232	20***	2	0.915	0.954	0.046
Model 3: Moderated indirect model	1,695	231	22***	3	0.915	0.954	0.046

Table II.
Structural model comparison

Notes: $n = 2,981$; CFI, comparative fit index; GFI, goodness of fit index; RMSEA, root mean square error of approximation; all structural models are compared to the baseline model; $***p < 0.001$ χ difference statistic compared to the baseline model

their overall effect on the model fit and the individual significance of the regression weights. The change in overall model fit, tested via the chi square change statistic, is documented in Table II. Together, the two moderators explained 1 percent additional variance in our model and the overall model fit increases ($\Delta\chi^2 = 20$). $H2$ proposed a moderation of occupational status on the relationship of age and RTC. The structural model results supported this assumption, showing a significant negative effect of the residual standardized product term on RTC ($\beta = -0.05$, $t = -2.60$, $p < 0.010$). In addition, the graphical inspection of the results supported our hypothesis, as shown in Figure 3. As expected, the negative association between age and RTC was less pronounced for blue-collar workers than for white-collar workers. Simple slope testing (Aiken and West, 1991) further supported these results by indicating a significant negative slope for white-collar workers ($\beta = -0.12$, $p < 0.002$) and a non-significant slope for blue-collar workers ($\beta = 0.02$, $p = ns$).

$H3$ predicted a moderation of organizational tenure on the age/RTC linkage and was confirmed by a significant positive effect size ($\beta = 0.07$, $t = 3.29$, $p < 0.001$). As illustrated in Figure 4, the negative relationship between age and RTC was much more pronounced under conditions of short individual tenure, whereas employees with long tenure show almost a zero relationship between age and RTC. Simple slope testing further corroborated these findings, showing a significant negative slope for the low tenure condition ($\beta = -0.08$, $p < 0.002$) and a non-significant slope for the high tenure condition ($\beta = 0.00$, $p = NS$).

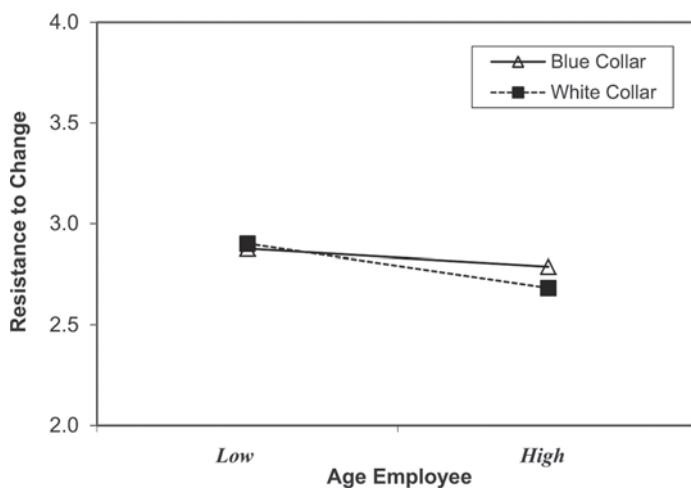


Figure 3.
Age/occupational status
interaction



Figure 4.
Age/tenure interaction

We also received support for *H3*, since RTC is negatively related to the percentage of goal accomplishment by the individual employee ($\beta = 0.15$, $t = 6.03$, $p < 0.001$).

Given that the relationships between age and RTC as well as the linkage between RTC and goal accomplishment were significant, we could test the assumed mediation effect by applying bootstrapping procedures (Cheung and Lau, 2008). To this end, we specified an additional model that integrated all moderators and also allowed for a direct path between age and goal accomplishment. This model showed an improved model fit compared to the baseline model (see Table II). Furthermore, the relationship between age and RTC as well as the relationship between age and goal accomplishment remained significant, whereas the direct path between age and goal accomplishment was non-significant. These findings suggest that the correlation between age and goal accomplishment was completely mediated by RTC. The

bootstrapping outcomes further substantiated these findings by showing a positive indirect effect of age on goal accomplishment ($\beta = 0.02$, SE = .00, CI = 0.01-0.02; $p < 0.002$). Thus, *H4* is supported.

Finally, as a further test for the moderation hypotheses (*H2* and *H3*), we specified additional models only for blue- or for white-collar workers, as well as with low (-1 SD) and high ($+1$ SD) organizational tenure, in which we tested the indirect effect depending on different values of the moderators. The results further strengthened our confidence in the two moderating hypotheses. In line with *H2*, the indirect relationship between age and goal accomplishment ($\beta = 0.02$, $p < 0.001$) was significant for white-collar workers, whereas for blue-collar workers the indirect relationship turned out to be non-significant ($\beta = 0.00$, $p = \text{ns}$). In line with *H3* for the low organizational tenure condition, the indirect relation between age and goal accomplishment ($\beta = 0.03$, $p < 0.001$) was significant, whereas for low organizational tenure the relationship was non-significant ($\beta = 0.00$, $p = \text{NS}$) [2].

Discussion

Following a direct call by Posthuma and Campion (2009), the main aim of this study was to generate evidence on the relationship between employees' age and their RTC. This relationship is often assumed to be positive due to common stereotypes existing in the workplace (e.g. Chiu *et al.*, 2001; Van Dalen *et al.*, 2009; Weiss and Maurer, 2004). On the other hand, various concepts including the SOC model speak to the negative relationship between age and RTC, which is why we decided to pose two opposing hypotheses for the relationship. Second, we sought to contribute to the age/job performance literature (McEvoy and Cascio, 1989; Ng and Feldman, 2008) by introducing RTC as a potential mediator in the age/job performance relationship.

As to the competing *H1a* and *H1b*, we observed a negative linkage between age and individual RTC, implying that – overall – younger employees in our sample were more resistant to change than their older colleagues, rejecting the common stereotype. However, it should be noted that the negative association between age and RTC observed is relatively small. Nevertheless, the negative relation between age and RTC remained stable in a randomly drawn 50 percent subsample as well, thereby at least enabling us to challenge the common stereotype that presumes older workers are less able to cope with changing environments.

Explanations for this rather counterintuitive finding might primarily be taken from the arguments provided in the theory section of the paper. First and foremost, the SOC model provides a framework explaining why older employees might have better strategies to cope with organizational change. The intensified use of SOC strategies might function as a moderator that might enable older employees to be better in differentiating between more and less central goals, and in finding ways to adapt to changing organizational environments by optimizing the deployment of their own resources. Consequently, older employees might not only score higher on certain job competencies (Abraham and Hansson, 1995), well-being, and career satisfaction (Wiese *et al.*, 2002), but might also be more willing to adapt to change situations.

These factors seem to overcome career stage arguments (e.g. Pogson *et al.*, 2003) and findings from cognition research (e.g. Kanfer and Ackerman, 2004) assuming that older workers are more resistant to change. In sum, this result should make a valid contribution to the age-stereotyping literature, as we have now carried out a

preliminary investigation of the nearly unexplored empirical linkage between RTC and age (Posthuma and Campion, 2009).

These findings, however, might only be valid for the older employees still being active in the workforce, raising the potential for a healthy-worker bias of our results (McMichael, 1976). Those older workers who showed high RTC might have voluntarily or involuntarily left the workforce, creating a self-selected sample that shows a bias towards an unduly negative relation between age and RTC. Future research might overcome this weakness by including older workers who have currently left their companies in the research sample.

By testing two potential interaction effects, we were able to shed more light on the thus far vague age/RTC relationship. Building upon the SOC model, we analyzed the role of occupational status and tenure as potential boundary conditions and found basic support for our expectations. Thus, having longer organizational tenure and being a blue-collar worker are boundary conditions for the relationship between age and RTC as well as for the indirect relationship between age and individual performance. In other words, we assume from our cross-sectional results that even if companies have a comparably older workforce, they might not face substantial performance losses through an increased RTC of their staff, especially if these older employees have low tenure and/or white-collar functions. However, for the other demographic groups, old blue-collar employees as well as high-tenured and aged employees, our analyses indicate that they are at least unrelated to RTC, which is also contrary to the common positive stereotype. Compared to the main effect, these interaction results are rather unlikely to be affected by a healthy-worker bias. Given that the interaction terms had comparatively small effect sizes, we performed a robustness check with a 50 percent subsample to validate their relevance. This analysis strengthened our confidence for the tenure moderation, while the occupational status interaction was only found to be significant at the 0.10 percent level and should thus be interpreted with more caution and desirably replicated in future studies.

We also demonstrated that RTC is related to individual performance. Our results indicated that individual RTC has negatively linked with goal accomplishment. These findings suggest that companies should seriously consider whether their employees show high levels of RTC as it is positively correlated with individual performance outcomes.

Finally, we established RTC as a mediator in the indirect relationship between age and individual performance. Older employees seem to be better performers in terms of higher goal accomplishment through the mediating factor of RTC. In contrast to the recent meta-analysis by Ng and Feldman (2008), which largely reported no relationship of age to several dimensions of task performance, we were able to show an indirect positive relationship of age to core job performance. In addition, the indirect relationship was shown to be contingent upon the occupational status and tenure of the employees. Again, this indirect linkage was relatively small, but remained constant in the 50 percent subsample, strengthening our confidence in its reliability and validity.

Practical implications

For companies, this study's results provide several important implications. First, the widespread age/RTC prejudice seems to be inaccurate in real work settings. In fact, older employees still being active in the workforce and included in the current sample

tended to report slightly higher openness to change than their younger colleagues, a difference that also correlates positively with their individual performance. These results should be the subject of age awareness seminars offered by companies, especially for executives (Elliott, 1995; Rynes and Rosen, 1995). Such educational steps seem important since negative ageist stereotypes have a tendency to become self-fulfilling prophecies (Nelson, 2005). Older employees, who are often explicitly or implicitly confronted with the stereotype that they are not willing to support organizational change initiatives, may sooner or later simply believe what they are told and accept this role.

Furthermore, negative age stereotypes in an organization may lead to age-based discrimination, which may have a negative effect on individual and company performance (Goldman *et al.*, 2006; Kunze *et al.*, 2011). Employees who report age-based discrimination are, for instance, 59 percent more likely to leave a company than employees not reporting age-related discrimination (Johnson and Neumark, 1997).

Limitations and future research directions

Although we believe that our findings offer a number of promising practical and theoretical implications, a few limitations merit mentioning. First, due to the cross-sectional design of our study, we were not able to test for causal relationships. Especially for the RTC/individual outcome association, an opposed relationship is imaginable. Therefore, future studies should aim to replicate our findings with longitudinal data, which is the only way to rule out doubts about the causal direction.

Second, a potential risk exists that our results might be biased by common method variance since all our data was taken from a single data source (Podsakoff *et al.*, 2003). However, for *H1a* and *H1b*, an inflation of our results due to same-source bias is very unlikely. Age is an objective variable (Snyder *et al.*, 1984) and thus less likely to be biased (Podsakoff and Organ, 1986). In addition, all hypotheses testing for interaction effects are also unlikely to be affected by common method variance (Evans, 1985). Thus, the only proposed relationship likely to be affected by common source problems is the one predicting a linkage between RTC and goal accomplishment (*H3*). To account for this potential bias of our results, we followed the procedure recommended by Podsakoff *et al.* (2003) and entered a single-unmeasured-latent-method factor in an additional SEM model. Results revealed that the common method is also not a major issue for this relationship as the relationship remained significant in the common-method-factor model, with comparable effect sizes and almost no loss in explained variance.

Third, the baseline response rate of 40 percent may be the source of a potential bias for our results. For example, one might argue that some older employees who are high on RTC refused to answer because they are afraid the survey results might be used to foster further change initiatives. However, a *post hoc* analysis revealed that our results remained unchanged when missing values were replaced with multiple imputation techniques (Schafer and Graham, 2002).

Beyond these limitations, there seem to be several interesting directions for future research that could advance our study's results. It might be valuable to investigate whether negative age stereotypes held by supervisors or peers (Kunze *et al.*, 2013) might be a factor enhancing RTC. In addition, other moderators – such as employees' personality (Goldberg, 1990) – might be considered for the age/RTC relationship. Older

employees with high openness to experience, for instance, may be better able to deal with change, while high neuroticism may be a non-favorable boundary condition. Furthermore, scholars could consider directly integrating theoretical assumptions that we used for our moderators (e.g. high tenure and blue-collar jobs are both negatively related to SOC behaviors) in future moderated-mediation models. Moreover, other potential mediating variables, such as self-efficacy (Artistico *et al.*, 2003; Ng and Feldman, 2008), emotional expression, and regulation (Gross *et al.*, 1997), which are assumed to be positively correlated with age, may be integrated into future models. Zacher *et al.* (2010) demonstrated that future time perspective was a mediator of the age/peer rated performance relationship. Thus, future studies might simultaneously test RTC and future time perspectives as competitive mediators in one coherent model.

In sum, age seems not to be an obstacle, but rather a positive correlate of the willingness to change and productivity of older workers in a demographically changing workplace at least for white-collar workers with short tenure. Therefore, we hope that this study is another step toward shifting the paradigm in dealing with the demographic change from seeing it as a threat, to embracing it as an opportunity.

Notes

1. In order to account for a potential non response bias of our results, we created another dataset, in which the missing values for age and tenure (as main sources of non response in our dataset) were replaced with multiple imputation techniques (Schafer and Graham, 2002). With using this dataset, we replicated all main data analyses, which did not result in any substantial change of results. Consequently, we concluded that no systematic bias due to non response is present in our study.
2. Given our relatively small effect sizes, we performed a robustness check to inspect whether the significant effects were only caused by our large sample size. We randomly drew a 50 percent subsample from our data. In that subsample, we reran all our analyses. The results showed that all hypothesized effects remained stable and significant, despite the occupational status moderation term, which turned out to be significant only on the 0.10 percent level ($p = 0.06$). In sum, this robustness check strengthened our confidence that our effects are not merely based on the large sample size, but have substantial theoretical and practical relevance, as will be discussed in the following section.

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About the authors

Florian Kunze is an Assistant Professor at the University of St Gallen, Switzerland. His current research interests include consequences of the demographic change for companies, within group processes and dynamics in work teams and organizations, discrimination and stereotyping due to demographic characteristics, and leadership research. Florian Kunze is the corresponding author and can be contacted at: florian.kunze@unisg.ch

Stephan Boehm is an Assistant Professor and Director of the Center for Disability and Integration at the University of St Gallen, Switzerland. His research interests include diversity management with a focus on the integration of disabled employees, the management of the demographic change, as well as group and organizational level processes of categorization, stereotyping, and discrimination.

Heike Bruch is a Professor of Leadership and Director of the Institute for Leadership and Human Resource Management at the University of St Gallen, Switzerland. Her research interests include organizational energy, leaders' action, emotions in organizations, as well as team and organization processes triggered by diversity.