Supporting the Aging Workforce: A Review and Recommendations for Workplace Intervention Research

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Abstract

The workforce in most industrialized countries is aging and becoming more age-diverse, and this trend is expected to continue throughout the twenty-first century. Although there has been an increased interest in research on age differences at work, few studies have examined actual interventions designed to support workers at different points across the life span. In this article, we review the literature related to aging at work, including physical, cognitive, personality, and motivational changes; life-span development theories; age stereotyping; age diversity; and work–life balance. Based on this review, we propose a number of avenues for intervention research to address age differences at work. We conclude by identifying critical challenges specific to studying age at work that should be addressed to advance research on interventions.

INTRODUCTION

The industrialized workforce is becoming older and more age-diverse, and this pattern is expected to continue over the coming decades. Although the good news is that people are aging more slowly (Vaupel 2010), that also means that they will need to continue to work later in life (Eurostat 2013, Toossi 2012) to support themselves during a longer retirement and to sustain retirement systems. As a result, many countries have begun to raise the retirement age. In addition, the recent economic downturn has left many workers with insufficient retirement savings such that they are working longer because of financial need. Not only has this led to a workforce that is getting older in most industrialized countries, it also means that older and younger people are working together as never before. Furthermore, not all older workers enjoy working in itself: In a recent survey of workers ages 45–74, as many as 60% reported working primarily because of financial need (AARP 2013).

As the workforce ages, organizations and societies must sustain workers' well-being and health through their later years of employment. Countries need to maintain the well-being and quality of life for their populations (see Costanza et al. 2014), and both employers and societies need to preserve the health of their older workers to contain health-care costs. And given the potential for generational differences and tensions, an issue that has gained some research attention (Lyons & Kuron 2013, Twenge et al. 2010) and discussion in the popular press, it is important to consider how to promote good relationships among workers of different ages.

As a result of these growing issues around age in the workplace, there has been a recent surge in psychological research regarding employee age, particularly in Europe and North America. For example, there has been significant research on issues such as motivational differences between workers of different ages (e.g., Kooij et al. 2011), age stereotyping (e.g., Ng & Feldman 2012), age diversity climate (e.g., Kunze et al. 2011), aging workers and family caregiving responsibilities (e.g., Neal & Hammer 2007), and retirement (e.g., Wang 2007). There have also been calls for research to better understand the role that chronological age plays in the workplace (e.g., Kulik et al. 2014). This interest has spawned numerous recent journal special issues, conferences, and edited volumes on age issues at work. In short, age has moved from being just a control variable in organizational research to a primary focus of attention. In fact, organizational psychology as a field has begun to accumulate a solid literature that should enable us to make recommendations for workplace policies and interventions to address age issues.

In recent years, industrial-organizational psychology and organizational behavior (IO/OB) journals have included interventions focused on issues such as employee safety (e.g., Zohar & Polachek 2014) and supervisor support for work–life balance (e.g., Hammer et al. 2011). However, almost none of this intervention research has explicitly examined age-focused workplace interventions. Furthermore, whereas research (e.g., Hertel et al. 2013, Kooij et al. 2010) has examined how older workers' perceptions of human resources (HR) practices affect job attitudes and behavior—a potential guide for intervention research—there has been almost no research on which actual interventions or objective policies benefit workers of different ages.

Our goal in this article is to challenge our field to address the issue of age at work head-on by developing research-based interventions that support older workers. We begin by defining what is meant by the term older worker in this literature. We then provide the reader with an overview of the core areas of age research that can be used to guide future aging research in the field of IO/OB. These studies provide explanatory mechanisms that can help guide workplace practice and support the development of age-related interventions at work that benefit older workers. We next examine the few published intervention studies that explicitly focus on age and the gap in the current research on age-related workplace interventions and practices. We then use these theories and research findings to propose a number of possible workplace interventions for future research.

We conclude by identifying several research issues that are particularly relevant to the study of aging at work. Our focus in this article is on improving older workers' proximal outcomes, such as work–life balance, job satisfaction, work engagement, burnout, and strain, as well as more distal outcomes, such as safety behavior and accidents, performance, employee health and work ability (a person's ability to meet his or her work demands), retirement decisions and turnover, and life satisfaction.

WHO IS AN OLDER WORKER?

The definition of an older worker has vexed the aging workforce literature for some time. The concept varies considerably across contexts and cultures, with a number of factors determining who is considered older. For example, there are different age stereotypes associated with different jobs (e.g., Perry et al. 1996). There is also worldwide variability in terms of retirement ages and legal protections. For example, in the United States, age-related legal protections begin at age 40. Furthermore, the concept of an older worker seems to be evolving: People appear to be aging more slowly (Vaupel 2010), and norms are changing such that working later in life is no longer unusual. Additionally, the aging of the baby boomers, a large, influential age cohort, appears to have changed the concept of who is considered an old worker. In the present article, we use the term older worker to mean workers approaching retirement age and those who may be working a bit beyond the standard retirement age: In the United States, that might include people in their late 50s and 60s. Furthermore, it is important to note that much of the nonworkplace aging literature includes people too young to work in most industrialized societies (e.g., early teens) through geriatric samples of participants well beyond when most people retire (in their 80s). In contrast, in this article we consider the types of changes that take place over the normal work life span (early 20s through 70s), acknowledging that many people continue to work successfully beyond this point. Finally, we note that individuals age differently: This means that comparisons between people in different age groups may be less useful than considerations of within-individual changes and change trajectories on a number of physiological and psychological factors across a person's life span. Throughout this review, whenever possible, we note how age is operationalized.

AGE-RELATED CHANGES WITHIN THE PERSON

In this section, we describe age-related changes within the person that can affect the workplace. A summary of these within-person changes is presented in **Table 1**.

Physical Changes

Aging is associated with declines in certain physiological and physical abilities. For example, age-related losses and changes are related to several physical functions, including sensory (e.g., eyesight and hearing), muscular (e.g., strength and flexibility), aerobic capacity (e.g., VO_{2max}), and immune response (Maertens et al. 2012). Moreover, aging is related to a reduced ability to maintain homeostasis, which translates to the body's reduced ability to maintain normal operations across situations or return to normal function after an environmental change (McDonald 1988). A reduced ability to reach homeostasis increases susceptibility to extreme physical work conditions (e.g., heat, cold, humidity), which could stress an individual's resources and require more time to recover from a stressful event (Hedge & Borman 2012a). For example, older workers may have more difficulty physically adjusting to nonstandard shift work (e.g., night shifts) because of their longer recovery time from sleep disturbances (Blok & de Looze 2011).

Table 1 Within-person age-related changes

Age-related change	Subcategory	Example
Physical changes	Sensory	Reduced visual acuity and reduced hearing ability
	Muscular	Reduced strength, power, and balance
	Cardiovascular/aerobic capacity	Reduced VO_2 capacity; higher blood pressure
	Immune response	Reduced production and effectiveness of white blood cells, resulting in increased susceptibility to illness
	Homeostasis	Longer physiological recovery from stressors (e.g., heat, cold, humidity, lack of sleep)
Cognitive changes	Fluid intelligence	Age-related reductions in processing speed, working memory, and selective attention
	Crystallized intelligence	Age-related gains in knowledge, skills, and wisdom
Affective changes	Emotional regulation	Positive relationship between age and affective well-being (positivity effect)
	Emotion generation	Less negative appraisal of stressful events and tendency to concentrate on positive rather than negative environmental cues in older adults
Personality	Big Five personality traits	Increase in conscientiousness and agreeableness and decrease in neuroticism over the life span
	Big Five facets	Larger increase in self-discipline (facet of conscientiousness) than in orderliness; increase in social dominance (facet of extraversion) through adulthood; moderate decrease in social vitality (facet of extraversion) over the life span
Motivation	Intrinsic motives	Positive relationship between age and accomplishment, connection with others, and autonomy
	Extrinsic motives	Negative relationship between age and extrinsic motives such as compensation, benefits, and promotions
	Growth motives	Negative relationship between age and growth motives such as achievement and mastery
	Generativity	Positive relationship between age and the social motive of helping people or contributing to society

Increased health issues and disabilities are positively related to age, with the likelihood of disabilities increasing significantly for those beyond age 50 (Kampfe et al. 2008). The effects of disabilities can range from minimal (e.g., aches, joint soreness) to incapacitating health problems (Ilmarinen et al. 1997). Interestingly, meta-analytic evidence supports a significant positive relationship between age and clinical health issues (e.g., elevated blood pressure, cholesterol) but finds no relationship between age and self-reported increased physical health problems (Ng & Feldman 2013a). Although one would anticipate that declines in physical functions would relate to work injuries, research has shown that older workers have a lower incidence of injuries (Ng & Feldman 2008) but that their recovery from injury is generally slower (Sterns et al. 1985).

There are wide variations in how individuals age, and group averages may not describe how physical changes impact individuals throughout their work lives. In fact, there is limited research

relating these functional declines to actual work performance declines (Warr 2001), suggesting individual adaptation to the physical changes throughout the life span. Additionally, physical changes may vary with genetics, life experiences, and the physical demands of particular jobs and professions.

Cognitive Changes

There is a robust literature investigating cognitive changes over the life span (see Rizzuto et al. 2012 for a recent review). For example, there is a negative relationship between age and a variety of cognitive functions, such as processing speed, working memory, and selective attention (Craik & Salthouse 2008), grouped under the category of fluid intelligence (Gf). For instance, in a longitudinal study over several cohorts, Schaie (1994) reported that perceptual speed starts to decline at age 25 and significantly declines after age 60. However, crystallized intelligence (Gc or accumulated knowledge, skills, and wisdom) may peak at about age 60 (Salthouse 2012) and then only gradually declines in late life; this may explain why there is a lack of a consistent negative relationship between age and job performance (Ng & Feldman 2008), even though cognitive ability has a long-established positive relationship with job performance (Hunter & Hunter 1984). In other words, the gradual losses in Gf may be offset by the gains in Gc. Although there are certain jobs that require maximum performance in processes related to Gf that cannot be necessarily offset by Gc, such as air traffic controllers (Salthouse 2012), other jobs that emphasize the use of accumulated skills and knowledge, such as higher-level supervisors and managers, would be a good fit for older workers given their gains in Gc.

It is important to note that cognitive changes are the result of both environmental and genetic factors and thus result in considerable between-person variation. Rizzuto and colleagues (2012) identified several individual differences in cognitive aging, such that individuals with higher educational attainment and good health status, and those involved in highly complex and challenging jobs, seem to be more resilient. For those who may not have these individual characteristics or experiences, promising cognitive interventions have been investigated for older adults and may be relevant to the workplace (e.g., Park et al. 2014, Zinke et al. 2014).

Changes in Personality

Although personality is generally thought to be stable in adulthood, mean-level changes are also observed across the adult life span (Roberts et al. 2006). Roberts and colleagues' (2006) meta-analytic evidence, as well as studies using very large samples (Soto & John 2012, Soto et al. 2011), shows life-span increases in conscientiousness and agreeableness and decreases in neuroticism. Additionally, there is evidence that some facets of the Big Five personality traits change more than others. For example, within extraversion, social dominance increases through adulthood while social vitality decreases (Roberts et al. 2006). However, there is debate in the personality literature regarding the degree to which the changes in personality result from biological aging or from the environment (Costa & McCrae 2006).

There is limited research relating personality changes to age-related attitudinal and behavioral changes in the workplace (Ng & Feldman 2013b, Truxillo et al. 2012a). Wille and colleagues (2014) tracked the Big Five personality traits and work attitudes in a sample of young professionals entering the workforce for a 15-year period and found that as individuals increased in extraversion and conscientiousness and deceased in neuroticism, they simultaneously increased in job satisfaction. They also found evidence that job satisfaction influenced changes in agreeableness, suggesting a reciprocal influence between personality and work attitudes. These changes in personality may be important given the possible relation between conscientiousness, health, and disease processes (Bogg & Roberts 2013).

Affective Changes

Whereas age-related declines are generally associated with some cognitive and physical functions, emotional and affect regulation are functional areas in which age-related gains are observed (Scheibe & Zacher 2013). There is an extensive developmental psychology literature showing a positive relationship between age and affective well-being (Charles & Luong 2013), and some have referred to this relationship as the positivity effect (Reed & Carstensen 2012). Theoretical explanations for this phenomenon include gains in expertise through experience (Blanchard-Fields 2007), life-span motivational shifts toward emotional gratification (i.e., socioemotional selectivity theory; Reed & Carstensen 2012), and the use of strategies to avoid or limit exposure to negative events (i.e., strength and vulnerability integration theory; Charles 2010). Socioemotional selectivity theory (discussed below) suggests that individuals will prioritize goals that are emotionally satisfying and meaningful when time is perceived as constrained and therefore experience more positive emotions (Reed & Carstensen 2012).

Scheibe & Zacher (2013) proposed a model of emotion regulation, stress, and well-being in the workplace that integrates the developmental life-span perspective with the transactional stress model (Lazarus & Folkman 1984) and affective events theory (Weiss & Cropanzano 1996). They posited that age influences the types and frequency of work events encountered, initial appraisal and response to affective work events (emotion generation), and the management and coping of affective work events (emotion regulation). On the one hand, the researchers argued that older adults may be less affected by social stressors such as interpersonal conflict because they appraise stressful events less negatively than younger people and have a tendency to concentrate on positive rather than on negative environmental cues. On the other hand, older adults may be more susceptible to extremely acute and chronic physical and psychological workplace stressors because their physiological system takes longer to recover from stressful events.

Life-Span Development: Selection, Optimization, and Compensation Theory

Life-span development theories have emerged as the leading framework to investigate age-related changes, and they have been frequently applied in workplace research. A basic premise of these theories is that the within-person changes described above—physical, cognitive, and affective—require successful adaptation on the part of the individual.

The first of these life-span development theories, selection, optimization, and compensation (SOC) theory, is commonly used in the aging workforce literature to explain how individuals reduce age-related losses while capitalizing on age-related gains (Baltes & Baltes 1990). The theory proposes that three strategic actions—selection, optimization, and compensation—are used throughout the life span to adapt and match current personal resources to environmental demands. Selection occurs when people select and prioritize specific goals for maintaining rather than dividing their resources across a variety of goals. Optimization is the process by which the individual focuses his or her efforts and resources to achieve the goals. Finally, compensation involves the process of searching for and implementing strategies to offset age-related declines to maintain a certain level of performance.

The literature examining SOC in workplace contexts is increasing, and support for SOC in workplace research is robust. Using SOC adaptive processes is positively related to work ability (Weigl et al. 2013), job satisfaction (Schmitt et al. 2012), perceived career success and well-being (Wiese et al. 2002), performance maintenance and goal attainment (Abraham & Hansson 1995), supervisor-rated job performance (Bajor & Baltes 2003), and focus on future work opportunities (Zacher & Frese 2011). SOC processes are also related to reduced job and family stressors and

lower work-to-family and family-to-work conflict (Baltes & Heydens-Gahir 2003). Finally, recent research has examined the buffering effect of SOC strategies when faced with poor family-friendly policies and supervisor support (Young et al. 2007), low-complexity work (Zacher & Frese 2011), and high problem-solving demands (Schmitt et al. 2012). In summary, the evidence supports the use of SOC behaviors as a positive adaptive process that results in positive work attitudes, increased work ability, and increased well-being.

Life-Span Development: Socioemotional Selectivity Theory

Socioemotional selectivity theory (SST) is a another life-span aging theory gaining prominence in the aging workplace literature (Carstensen et al. 1999). The main proposition of SST is that an individual's perception of time induces social goal selection and pursuit (Carstensen et al. 1999). Knowledge acquisition and emotional regulation are the two identified types of social goals—knowledge related and emotion related, respectively. When time is perceived as being more open-ended, as it is among younger people, knowledge-related goals are prioritized; in contrast, emotion-related goals are prioritized when time is perceived as limited (with a perspective oriented toward the present), as it is among older people.

Researchers have used SST to explain different goals and motivations for workplace social interactions across the life span (de Lange et al. 2010). SST has also been used to explain the positive relationship between age and most job attitudes. Specifically, SST posits that older workers' greater focus on emotion-related goals results in a focus on positive work experiences, while at the same time positing that older workers would ignore or avoid negative aspects of the job and work environment (Ng & Feldman 2010). SST is also used as an explanation of the differential effects of work design characteristics (e.g., task and skill variety) on burnout and turnover for older and younger workers (Zaniboni et al. 2013).

Motivational Changes

There is an active literature investigating the intersection of work motivation and age-related physical, cognitive, and emotional changes across the life span. Kanfer & Ackerman's (2004) framework describes changes in work motivation over the life span. They identify four patterns of adult development that affect work motivation: loss, growth, reorganization, and exchange. Loss refers to age-related declines to individual resources, such as fluid intelligence. Growth describes cumulative life-span gains related to resources and experiences such as crystallized intelligence. Reorganization is related to life-span changes in the organization and the structure of characteristics not related to ability, including affect and emotion. Lastly, exchange describes changes in the action tendencies or the shift in the salience of particular action motives through the life span, such as changes in personality, self-concept, interests, and values.

Kanfer et al. (2013) provided an additional theoretical advancement in the age and work motivation literature in their proposed framework for work-related goals and the motivational mechanisms driving these goals in later adulthood. The framework follows a person-centered and developmental approach to older worker goals, how they relate over time, and the antecedents that influence older worker goal achievement. The authors argued for differentiation among three types of motivation: motivation to work, motivation at work, and motivation to retire. Individual differences (e.g., self-efficacy, attitudes, personality), context (e.g., finances, health), local work conditions (e.g., age climate, flexibility), and sociocultural/economic conditions and norms (e.g., normative retirement age) are argued to differentially influence the three types of motivation.

Despite previous assumptions that all types of work motives decline with age, there is increasing evidence that this is not the case (e.g., Inceoglu et al. 2012, Kooij et al. 2011, Zacher et al. 2010). For example, in a meta-analytic investigation of age and motives, Kooij and colleagues (2011) found a positive relationship between age and intrinsic motives (i.e., accomplishment, connection with others, autonomy). The researchers also showed a positive relationship between age and the social motive of helping people or contributing to society, and a positive relationship for the specific job security motive. The positive relationship between age and helping people and contributing to society aligns with the motivational shift observed over the life span regarding generativity motives (see Kanfer & Ackerman 2004, Lang & Carstensen 2002). However, Kooij and colleagues (2011) also showed a negative relationship between age and growth (i.e., achievement and mastery) and extrinsic motives (i.e., preferences for job characteristics and outcomes that occur as a consequence of work, such as pay and advancement). Moreover, although Ng & Feldman (2012) found little meta-analytic support for most negative stereotypes of older workers, they found that age was associated with a decrease in interest (motivation) in training. In summary, the research suggests changes in motivation across the life span, with increases in some types of motivation (e.g., intrinsic motivation, generativity) and decreases in others (e.g., extrinsic motivation, training motivation).

Successful Aging: Individual Differences in Aging

Particularly relevant to a review focused on workplace aging is the literature on successful aging. Research has found that some older adults do not experience substantial declines in their abilities until a very old age, and there is considerable variability in trajectories of age-related change (Hansson et al. 1997). In other words, some individuals appear to age more or less successfully and in different ways than others. This is an important consideration in examining aging issues, as individuals do not have the same aging trajectories but change at a different pace and in different ways. Moreover, differences between individuals in aging appear to increase in later years.

The successful aging literature investigates factors in those adults who seem to be maintaining their abilities longer throughout their life spans (Hansson et al. 1997). Conceptualizations of successful aging have ranged from biomedical perspective approaches, as in the absence of disease or illness, to descriptions in terms of longevity, lack of disability, and life satisfaction (Bowling 2007). Additionally, successful aging has been approached from a life-span developmental and psychosocial perspective, including concepts such as adaptation, control, social competence, mastery, and cognitive efficiency (Baltes & Baltes 1990). More recently, the successful aging concept has been integrated with how people experience, react to, and adapt to age-related changes in aging at work (Robson & Hansson 2007, Hansson et al. 1997). In their review of the successful aging literature, Hansson and colleagues (1997) suggested that one of the most important contributions to the literature on successful aging at work is the incorporation of a life-span developmental perspective into a work context (e.g., SOC theory, SST), which recognizes that people's developmental trajectories are influenced by age-related and non-age-related factors and that positive adaptation is possible.

There has been some initial work focused on developing measures of successful workplace aging based on Hansson et al.'s (1997) review and SOC theory (e.g., Robson & Hansson 2007, Robson et al. 2006). However, additional examination of the antecedents of successful workplace aging is needed to develop interventions focused on helping individuals utilize successful workplace aging behaviors. For instance, one question is whether changes and adaptations need to occur only at work, or more holistically, both inside and outside the workplace.

THE SOCIAL CONTEXT OF WORKPLACE AGING

The IO/OB literature has examined a number of issues regarding the social context faced by older workers. We group this literature into the concepts of age stereotyping, age discrimination, and the related areas of age climate and job-age stereotypes. We also examine issues related to age and team diversity, leadership, and work–life balance.

Age Stereotyping, Age Discrimination, and Related Issues

In addition to within-person changes, older people can be affected by the social context of aging. This includes issues such as age stereotypes of workers and whether these stereotypes lead to actual discrimination behavior against them. It also includes issues of how older and younger workers think they are perceived (meta-stereotyping) and the social context in terms of the age diversity climate of the organization or team.

Age stereotyping. Cuddy & Fiske (2002) described the general perception of older people as high on warmth but low on competence. In that sense, older people (including those much older than those typically seen in the workforce) would be seen as kind, but not as especially agentic. Examining older workers specifically in a series of studies, Rosen & Jerdee (1976a,b) found that older workers have a number of negative stereotypes associated with them. In a recent review of this research, Posthuma & Campion (2009) showed that older workers are stereotyped as having lower performance and lower ability to learn, being resistant to change, being inclined to have a shorter tenure, and being more costly. However, other than being less interested in training, meta-analytic evidence shows that most of the stereotypes of older workers are not supported empirically (Ng & Feldman 2012). In fact, meta-analyses demonstrate that older workers generally have more positive job attitudes (Ng & Feldman 2010) and higher levels of certain job performance dimensions, such as organizational citizenship behavior (Ng & Feldman 2008). Moreover, there is also evidence that not all stereotypes of older workers are negative, and stereotypes are changing with the aging of baby boomers and their larger role in the workplace. For example, more recent replications of Rosen & Jerdee's (1976a,b) studies demonstrated that older and younger workers are rated similarly in terms of suitability for hiring, training, and promotion (Weiss & Maurer 2004). Other studies in both the United States and Italy have found that older workers are perceived as more conscientious and less neurotic than their younger counterparts (Bertolino et al. 2013, Truxillo et al. 2012b). Finally, a meta-analysis by Bal et al. (2011) demonstrated that although older workers have more negative organizational decisions made about them (e.g., hiring) compared to younger workers, there are positive stereotypes associated with older workers, such as increased reliability.

Relevant information about the person being evaluated may help reduce the effects of negative age stereotypes. In their meta-analysis, Finkelstein et al. (1995) found that the judgments about older workers were more negative than those for their younger counterparts (*a*) in the absence of additional job-relevant information about the workers and (*b*) when both older and younger workers were rated. This is an important point, as it suggests that when people have relevant information about each other (deep characteristics) rather than simple surface characteristics (old or young), the effects of age stereotyping may decrease. This is comparable to findings in the teams literature showing that the negative effects of demographic differences within teams may dissipate over time as team members learn more about each other (e.g., Harrison et al. 2002).

Age discrimination. In addition to research on stereotypes, there are other studies demonstrating that the actual decisions made about older people at work may be different from those made about their younger counterparts. In a meta-analysis, Bal and colleagues (2011) examined the effects of age on a number of organizational decisions, finding that higher age was associated with negative outcomes in terms of advancement, selection, and overall evaluation. One of the challenges that continues in this line of research is to determine why age may be related to some of these negative decisions, especially because older workers are not perceived as lower than their younger counterparts on a number of positive personality traits and organizational citizenship behaviors (e.g., Bertolino et al. 2013), show few differences in performance (Ng & Feldman 2008), and have more positive work attitudes (Ng & Feldman 2010). One possibility is that, in addition to people's (often positive) explicit stereotypes of older workers, less conscious, implicit age stereotypes may also affect discriminatory decisions (Truxillo et al. in press).

Job-age stereotypes. The context can also have a significant effect on decisions about older and younger people. Finkelstein et al. (1995) found in their meta-analysis that older candidates were rated as less suitable for so-called younger types of jobs, although this was based on a sample of only two studies. The opposite was not found, in that there were no differences in the suitability ratings of older and younger people for older types of jobs. However, in a study about hiring for either an older or younger stereotyped job, Perry et al. (1996) showed that older worker bias was more likely to play out when there was a stereotyped younger job; at the same time, older age bias played out more when participants were cognitively busy, that is, when participants lacked the cognitive resources to compensate for their age biases. Conceptually, this is similar to the idea of career timetables (Lawrence 1988) within organizations, for which norms about career progress can affect workers' evaluations.

Age meta-stereotypes. One area that has gained some traction in recent years is the concept of meta-stereotypes, or what a particular group believes that those in other groups think about them (e.g., what older workers think that younger colleagues think about them) (Vorauer & Kumhyr 2001). Although this is a promising field of research, only one study has examined the issue of workplace age meta-stereotypes (Finkelstein et al. 2013), and the effects of workplace age meta-stereotypes on workplace outcomes such as attitudes, health, and well-being have not been examined.

Age climate. Over the past decade, there has been increasing interest in diversity climates at work. Recent work has specifically focused on the age diversity climate, or shared perceptions about age diversity policy, practices, and procedures (Böhm et al. 2014). Using a sample of 128 companies, Kunze et al. (2011) found that increased age diversity was related to an increase in the age discrimination climate, which in turn negatively affects organizational-level performance and commitment. On the more positive side, however, Böhm et al. (2014) found that organizations may have some levers by which they can affect the age diversity climate, namely, inclusive HR practices. Specifically, in a sample of 93 German companies, they found that inclusive HR practices led to a more positive age climate, which in turn was related to company performance and collective turnover intentions. In other words, there may be some organizational interventions that could be developed to improve the age diversity climate and its outcomes.

Team and Group Diversity

A good bit of research has examined the effects of demographic variables such as age in teams and groups. One of the typical findings is that, although team diversity can have a number of positive

outcomes, there is also some risk of negative outcomes. For instance, diversity in teams can lead to negative outcomes such as decreased performance (e.g., Tsui et al. 2002). Age-related relational demography research, which focuses on when a person is a different age than the rest of his or her work group, does in fact demonstrate some negative consequences, such as decreased integration into the group and increased turnover (O'Reilly et al. 1989). Similarly, faultlines research focuses on subgroups that may develop within a team based on demographic and other differences (Thatcher & Patel 2012). Age is one of the most frequently studied variables in the faultlines literature (Thatcher & Patel 2012), but the effects of age on the development of faultlines are weaker than are the effects of variables such as sex and ethnicity (Thatcher & Patel 2011). Furthermore, although demographic differences in teams can be important, some researchers have found that the effects of demographic differences (e.g., age) in teams may dissipate over time. Such demographic differences may be more salient to group members when a team first is formed, and the effects of these differences may decline as team members get to know one another; at that point, such surface traits will be less salient and less important to team members relative to deep characteristics (e.g., personality, ability) (Harrison et al. 1998, 2002). This is consistent with the finding within the aging literature that intergenerational contact may lead to decreases in negative outcomes such as ageism (Iweins et al. 2013). Furthermore, there may be moderators at play in the functioning of age-diverse teams: Wegge and colleagues (2008) found that age diversity had a negative relationship with performance on more routine tasks but a positive relationship when working on complex decision-making tasks. The authors explained this in terms of the increased decision-making capabilities of an age-diverse team.

Age and Leadership

A few studies have looked at the role that leader age might play in terms of making leaders effective, at least from the viewpoint of subordinates. Zacher et al. (2011) found that leader age affected leader effectiveness. But, more importantly, they found that leader generativity (the leader's desire to guide future generations) seemed to interact with leader age. Specifically, older leaders who were perceived as low in generativity were also perceived to be ineffective, whereas older leaders who were perceived as high in generativity were perceived to be just as effective as younger leaders. These results suggest that a leader's behavior interacts with leader age to affect leader effectiveness. Zacher & Bal (2012) examined the effects of leader age on follower perceptions of leaders in the context of German college professors and their research assistants. Interestingly, leader age was not related to the outcomes of subordinate perceptions, except for those subordinates who held negative age stereotypes. For these subordinates, older leaders were rated as less proactive and as using a more passive-avoidant leadership style. In other words, leader age mattered, depending on the stereotypes held by followers. Taken together, these studies suggest that negative effects of leader–follower age differences might be improved by helping older leaders increase their generativity (even though this may be considered an individual difference that increases with age), maybe even helping them develop generativity behaviors as they age. These studies also suggest that improving followers' negative perceptions of older people may improve the leader–member relationship. Zacher et al. (in press) developed a model of how leadership may develop over time, including variables such as leader age, follower age, and attributional processes, providing a useful guide for future research. The interplay of age and leadership needs much more study as to the degree to which age affects leadership, and under what conditions (Truxillo & Burlacu in press).

Work–Life Balance Across the Life Span

Changes over the past 30 years in the relationship between work and family domains include the aging of the population, an increasing percentage of dual-income families, increasing numbers of working single parents, and greater gender integration into organizations (Hammer & Zimmerman 2011). With these demographic and labor market changes, there has been a corresponding trend toward greater organizational adoption of work–life integration policies. Wang & Verma (2012) and Kossek et al. (2010) recently argued for integrating work–life support policies into overall organizational strategic goals. Formal work–life policies and programs include unpaid leave, flexible start and end times, reduced workload, permanent part-time positions, telecommuting, compressed work weeks, job sharing, phase back from work leave, dependent child care and eldercare assistance programs, and access to resources and services such as employee assistance programs (Batt & Valcour 2003, Neal & Hammer 2007). Similarly, Kossek et al. (2014) described work–family interventions as those aimed at reducing work–family conflict, in turn increasing the health and well-being of employees and the organizations in which they work. Examples include flexible work arrangements, family-supportive supervisor behavior training, work redesign to increase schedule control, and the provision of dependent care supports, both eldercare and child care.

Very few studies have examined the effectiveness of work–family practices and policies using more than basic correlational research designs (for a review, see Hammer et al. in press). Furthermore, to our knowledge, none has focused on the effects of these policies specifically on older workers. This is despite the fact that national US surveys continue to point to work–family conflict as being one of the top stressors impacting workers' lives today (e.g., Am. Psychol. Assoc. 2014, Matos & Galinsky 2014).

The only study we could identify that examined the differential effects of the availability of workplace supports for workers with different work–family caregiving role combinations (i.e., work and eldercare, work and child care, work and eldercare and child care) found that the work–family culture moderated the relationship between workplace supports and job satisfaction such that the relationship was strongest for employees with the eldercare/work role combination who reported an unsupportive work–family culture (Sahibzada et al. 2005). For those employees with eldercare demands compared to those in a work-only family, job satisfaction increased as the availability of workplace supports increased in the absence of a supportive work–family culture. The authors suggested that this finding could be attributed to the age of the employees with eldercare demands, who tended to be older (an average age of 46) than the other groups of workers studied. They suggested that these older employees were likely to have more job experience and thus may have had more access to formal workplace supports than their younger coworkers. Additionally, they may have been more likely to have chosen and stayed in companies that provided more supports. In short, research on tailoring work–life balance interventions to older workers has been scant, and more research is required to identify the differential needs of older and younger workers to effectively support workers through the life span.

WORKPLACE AGE INTERVENTIONS: WHERE ARE WE NOW?

From this brief review of the workplace aging literature, it is clear that our knowledge of factors that affect aging at work is growing. However, as noted in the Introduction, few IO/OB studies specifically explore interventions for older workers. Some research has examined how to change the physical and ergonomic design of the workplace to address older workers' needs (although the benefits to older workers specifically are often equivocal; e.g., May et al. 2004), but generally these

studies have not strayed into the psychology of aging. Although there is research on interventions for older people (often retirees and people beyond working age), there are few studies directly assessing older workers as a specific population, comparing effects on older and younger workers, or having their basis in psychological theory and research about aging.

We provide here two examples of published studies about health promotion interventions for older workers. In the first, Hughes et al. (2011) conducted a randomized control trial to compare two health promotion programs for 423 university employees over age 40. In addition to a control group, which received only printed materials, there were two intervention conditions, a web-based health risk assessment with personal coaching (COACH) and a web-based risk assessment with training modules (RealAge). Outcomes assessed at 6 and 12 months included fruit and vegetable consumption; weight, smoking, and other health indicators; exercise; and stress/psychosocial variables. The COACH intervention showed improvements in fruit and vegetable consumption and physical activity, whereas the RealAge intervention seemed to improve waist circumference. Despite the strengths of this intervention from a design and measurement standpoint, the study was atheoretical in terms of measuring psychological variables or applying psychological theories related to aging so as to better understand the mechanisms involved in adopting or maintaining participation in the program. In the second study, Strijk et al. (2013) compared an intervention (weekly yoga, workouts, aerobic exercise, lifestyle coaching for goal setting, feedback, and problem solving strategies) with a control group in a sample of 730 Dutch hospital workers over age 45. They measured vitality, work engagement, productivity, and sick leave at baseline, 6 months, and 12 months. The results showed that the intervention had no effects, except for people in the intervention group who actually complied with the yoga and workout regimes. Again, although this study employed a strong design and measures, there was no underlying psychological theory or processes that might be used to explain the results.

These two studies illustrate some key gaps in the current state of research on workplace age interventions. First, this research gives little consideration to the psychological processes that might explain why an intervention would benefit older workers. Second, given our understanding of the influence of social context on behavior, psychology has a lot to offer in terms of implementing successful age-oriented workplace interventions. Perhaps most importantly, we found very little workplace intervention research—be it in psychology, health, or medicine—that has used age as a focal variable. Over 15 years ago, Griffiths (1999) pointed out the need for more job design and management research using intervention research and explicitly considering age. Although research on age at work has increased in the intervening years, research on workplace interventions for older workers has not (e.g., Crawford et al. 2010, McDermott et al. 2010). But we now know quite a bit about the psychology of aging and older people generally, and older workers specifically. In this next section, we describe how theory and findings about the aging process and work can be applied to workplace interventions.

POTENTIAL INTERVENTIONS TO SUPPORT OLDER WORKERS

In this section, we propose a number of interventions and practices, based on these empirical findings and theories regarding age differences at work, that might be used to support older workers and an age-diverse workforce. **Table 2** includes a summary of these potential interventions and practices and their theoretical mechanisms. We note that in considering these interventions, older workers should not be seen as a single group with the same age-related trajectories; rather, individual differences among them should be considered as well. Furthermore, such interventions need to account for the needs of coworkers and supervisors, as well as intra-individual change over time.

Table 2 Proposed research agenda for age-related workplace interventions based on existing theories and research findings

Intervention category	Examples	Explanatory mechanism/relevant research
Selection, optimization, and compensation (SOC) training programs	Training for older workers on how to best select skills and tasks that fit their abilities and interests	SOC theory (Baltes & Baltes 1990); changes in fluid intelligence and crystallized intelligence (e.g., Schaie 1994); changes in personality (e.g., Roberts et al. 2006)
Work redesign	Increased autonomy and skill variety; decreased task variety; mentoring interventions	Age-related changes in motivation (e.g., Kanfer & Ackerman 2004, Kooij et al. 2011); positive outcomes associated with perceived job characteristics for older workers (e.g., Hertel et al. 2013, Truxillo et al. 2012b, Zaniboni et al. 2013); socioemotional selectivity theory (SST) (Carstensen et al. 1999); SOC theory (Baltes & Baltes 1990)
Increasing positive relations between groups	Positive intergenerational exposure; team interventions; improved age diversity climate through training of supervisors and teams; leadership training for supervisors to deal with age differences; reduction of negative stereotypes (explicit and implicit)	Intergenerational contact (Iweins et al. 2013); team interventions (see Harrison et al. 2002); reduced age faultlines (Thatcher & Patel 2011); age diversity climate (Böhm et al. 2014)
Age-supportive human resources (HR) practices	Interventions to allow flexible HR practices for different age groups; emphasis on different HR bundles for different age groups	SOC theory and SST (Kooij et al. 2010, 2014)
Work–life supportive policies	Flexible work arrangements; part-time work; telecommuting; eldercare support	Social exchange; work–life balance and conflict (Hammer et al. 2013, Hill et al. 2003, Madsen 2003)
Training practices for older workers	Additional time; smaller groups; self-paced learning; emphasis on learning goal orientation; error management training (encouraging participants to make mistakes in training)	Age-related cognitive and affective changes affect training (Beier et al. 2012, Callahan et al. 2003, Wolfson et al. 2014)
Training for leaders/ supervisors to support worker safety and health	Training for supervisors to provide improved leadership and employee support; training for older workers to support and mentor younger colleagues regarding safety	Changes in work–life balance issues across the life span (Hammer et al. 2011)
Ergonomic interventions	Redesign of physical aspects of jobs; use of technology to support older workers	Age-related changes in physical and cognitive abilities (Sharit & Czaja 2012)
Health promotion	Interventions to increase physical activity and intellectual activity and improve nutrition	Support physical and mental needs of older people (Crawford et al. 2010, Rothman 2006)
Helping workers throughout the life span	Career management interventions	SOC theory and SST (Kooij & Van De Voorde 2011; Zacher 2014a,b)
Total Worker Health™ approaches	Comprehensive interventions to reduce occupational hazards and improve health, safety, and well-being	Improve both the health and safety of workers of all ages through multiple mechanisms (Schill & Chosewood 2013)

Selection, Optimization, and Compensation Training Programs

As noted above, SOC theory has been shown to be a robust theory that can be used to explain behaviors of older and younger people and age differences in reactions to job characteristics and various HR practices. We propose that workplace interventions based on SOC theory are ripe for examination. Weigl, Müller, and colleagues (Müller et al. 2013a,b; Weigl et al. 2013) found that SOC strategies for older workers can lead to positive outcomes, such as more positive health during bridge employment and improved work ability. These authors also developed a scale to assess SOC strategies, a potentially useful tool in older worker interventions.

We see a number of ways to approach such SOC interventions. First, there could be training for older workers on how best to select and focus on the skills and tasks that fit their abilities and interests. Second, training and preparing supervisors and other team members for these changes would be required to increase the effectiveness of the SOC strategies. Finally, organizational reflection as to the limits regarding what tasks might be off-loaded by older workers, along with guidance, support, and cooperation, would be an additional consideration to insure the effectiveness of the intervention. In any case, SOC interventions appear to hold particular promise as ways to address the aging workforce (Zabel & Baltes in press).

Work Redesign Interventions

Closely related to SOC interventions, the research cited above on job design suggests a need for intervention work. For example, research has shown more positive outcomes for older workers when they perceive increased autonomy (Hertel et al. 2013) and skill variety (Zaniboni et al. 2013) and decreased task variety (Zaniboni et al. 2014) compared to their younger counterparts. Workplace interventions should work to support older workers in crafting their jobs to fit their needs, again with cooperation from supervisors and coworkers. Moreover, interventions should take into account changes in motivation across the life span (Kooij et al. 2011), such as moves among some older workers away from extrinsic factors, such as pay and advancement, toward intrinsic factors. This might include addressing generativity needs (Kanfer & Ackerman 2004) through interventions focused on mentoring, an approach that would benefit younger workers as well as organizations wishing to preserve organizational memory after the eventual retirement of older workers.

Increasing Positive Relations Between Groups

One often cited issue is the potential for differences between demographic groups to translate into tensions between people of different ages (relational demography) or to actual faultlines. Furthermore, age differences within organizations have the potential to lead to more negative outcomes (e.g., Kunze et al. 2011). However, there is also evidence that positive exposure to team members who are demographically different may decrease negative effects over time (e.g., Harrison et al. 2002) and that perceived intergenerational contact may improve perceptions of others of different ages (Iweins et al. 2013). This might also help relieve any differences found between generations (e.g., Lyons & Kuron 2013). In this light, interventions that increase the positive exposure to others of different ages, either through the composition of teams (in a systematic way so as not to exacerbate differences) or through more focused interventions and structured discussions to reduce stereotypes (both explicit and implicit), would seem a fruitful avenue for organizational research. The result may not be the removal of all tensions among team members—such tensions seem inevitable in interactions among people—but rather that simple age differences

would not be the cause of these; such differences might instead be the result of deep differences (Harrison et al. 2002), such as personality.

These sorts of age interventions could also be seen over time as supporting a positive organizational age climate, and the climate should be considered as a focus of intervention in itself. As with other types of climates (e.g., safety climate; Zohar & Luria 2005), support for persons of all ages would need to be communicated from the top down and exhibited by supervisors and team members. Such a climate would also be supported by interventions focused on the HR system. An intervention to improve the age diversity climate might include training supervisors and teams on differences between team members of different ages and the strengths that each can bring. This might also include training leaders and followers on age differences and how best to navigate age differences between supervisors and subordinates (see Zacher & Bal 2012).

Age-Supportive Human Resources Practices

Several studies have shown that older and younger workers react differently to different types of perceived HR practices (Kooij et al. 2010, 2014). For example, consistent with life-span development theories such as SOC theory and SST, younger workers seem to have better outcomes when there are perceived to be more training opportunities, and older workers seem to have better outcomes with maintenance-focused practices, such as schedule flexibility.

The compelling work by Kooij and colleagues (2011, 2014) on differential effects of perceived HR practices on older and younger workers, as well as its strong theoretical support, suggests the potential for a number of ways that organizations can work to support their employees across the life span. Kooij and colleagues (2014) identified four distinct bundles of HR practices—development, maintenance, utilization, and accommodative—based on life-span theory and research that could aid the aging worker. Development practices such as formal training would focus on helping increase aging workers' levels of functioning. Maintenance practices, including flexible work schedules, would aim to sustain current levels of functioning. Utilization practices, such as lateral job movement, would focus on facilitating a worker's return to previous levels of functioning. Finally, accommodative practices, such as part-time work, would aim to have the aging worker function at an adequate, but lower level of functioning. Future research is needed to examine the effectiveness of bundling these four different types of HR interventions in the context of an aging worker facing life-span changes.

Truxillo et al.'s (2014) review of the aging literature within the context of standard organization HR functions suggests a number of ways to make HR systems more sensitive to age (e.g., how to make training more attractive for older employees). However, as also noted by these researchers, age differences have been examined only in terms of employee perceptions of HR, and the effects of different actual HR practices on older and younger people have not been examined. This is an important point given that actual HR practices and the way that employees perceive them may be quite different (Khilji & Wang 2006).

Work–Life Supportive Policies and Programs

Flexible work arrangements, reduced load/part-time work, telecommuting, and eldercare supports are among the most important HR/work–life policies that support older workers. Flexibility to go to medical appointments, care for an aging spouse or partner, or help take care of grandchildren would be beneficial to older workers and may increase their valued contribution to the organization through positive social exchange processes and reductions in work–nonwork conflicts. Such flexible polices may even help with recruitment and retention of all workers,

including older workers, as recent meta-analytic findings indicate that the availability of flextime and/or work–life balance initiatives is a significant predictor of applicant attraction (Uggerslev et al. 2012). Thus, schedule flexibility may be as important for older workers as it is for younger workers with child care responsibilities. However, to our knowledge, the effects of such interventions on older workers specifically, or as compared to their younger counterparts, have not been examined.

Such a work–life intervention could be modeled off of Hammer et al.'s (2011) family-supportive supervisor behavior (FSSB) intervention. Hammer et al. (2011) used a randomized field study to assess the effects of a training program aimed at increasing FSSBs. They first conducted a workplace industry assessment to identify barriers to work–family conflict reduction and determined that supervisors needed more clarity on how to behave in a family-supportive manner. They then validated a measure of family-supportive behaviors (Hammer et al. 2009) and developed the FSSB training intervention to reflect the behavioral dimensions identified in the validation study. Ultimately, after training supervisors on FSSBs, Hammer et al. (2011) found that workers described higher job satisfaction, lower turnover intentions, and more positive reports of health. However, none of this existing training has attended to or captured the age diversity of the workplace and thus may be more or less effective for older workers compared to younger workers. This is clearly an area in need of future research.

Telecommuting allows workers greater autonomy in decision making regarding where and when to work, increasing their ability to perform family-related tasks, which may be especially important for older workers. Work by Hill and colleagues (1996, 2003) and by others (Madsen 2003) has demonstrated positive outcomes associated with employee use of telework policies, including increased productivity, a positive influence on personal/family life success, and reduced work–family conflict. Future research is needed to fully examine the effectiveness of telecommuting interventions as an accommodation strategy in the context of an aging workforce.

Reduced workload/part-time options make up another category of flexible work arrangements and can include phase back from temporary leave, phase out toward retirement, permanent part-time positions, and job sharing. These types of work–life policies typically involve a voluntary reduction of hours in an attempt to more successfully balance work and nonwork responsibilities (Hammer et al. 2013). These arrangements might be beneficial to retain workers with a reduced work ability, albeit at a lower level of functioning (Kooij et al. 2014).

Finally, eldercare supports are another potential resource provided by an organization to aid an aging workforce. Interventions can be designed to facilitate the eldercare responsibilities employees have outside of the work domain and may include information, referral services, and subsidies for eldercare respite services and leave usage. Currently, there is little research on the specific benefits of such work–life support policies and programs, reduced load/part-time work, telecommuting, and eldercare support for older workers compared to younger workers, but this is clearly an area of needed research. There may be benefits and policies that are more useful to older workers than to their younger counterparts. For example, as people age, the impact of sleep disturbance is exacerbated; therefore, older workers may benefit more from flexible work and shift hour options (Hansson et al. 1997). Moreover, research on factors such as child care, spouse/partner care, and eldercare responsibilities and their potential differential effect on work and well-being outcomes is limited, and it may be that the stress and strain associated with caregiving for parents, spouses/partners, or children may be qualitatively different. Therefore, a separate line of research is needed to better understand how to support older workers who have caregiving responsibilities. We suggest here that paying attention to the possible differential work–life support needs of workers will lead to higher levels of both individual worker and organizational effectiveness.

Facilitating Training for Older Workers

Given the workforce aging trends, age diversity is an important workforce characteristic to account for when establishing an effective human capital management strategy, requiring thoughtful organizational talent development policies, practices, and initiatives embedded in an age-inclusive organizational context (Noe et al. 2014). Compounding the difficulty of creating successful training and development interventions for older workers, research shows that age is negatively related to training performance (Ng & Feldman 2008) and to training interest (Ng & Feldman 2012). However, this does not mean that older workers do not benefit from training (Beier et al. 2012); in fact, older workers can be quite successful if the training is designed to accommodate their needs (Callahan et al. 2003, Van Rooij 2012). A consideration of the target audience (person variables), training context, and transfer environment will be extremely important to develop an age-inclusive training. For example, age-related cognitive, physical, and emotional changes can impact training development (Wolfson et al. 2014). In addition, age-related motivational changes may require framing the training as an intrinsic benefit (Beier et al. 2012). Tying the content to be learned to a similar domain as that of the individual's prior knowledge or experiences should also benefit older workers (Beier & Ackerman 2005). Finally, it is vital to consider the influence of the social context on employee development behavior, such as negative stereotypes about older workers and differences in access to developmental opportunities (Maurer 2007, Maurer & Rafuse 2001). These situational factors have been argued to impact an individual's career development self-efficacy (Maurer 2001), which can reduce seeking out training and development opportunities. Finally, the acceptance of lifelong learning as a part of working in the twenty-first century is necessary among workers of all ages.

The increased use of technology-based instruction (TBI) as a development strategy (Kraiger & Ford 2006) is another issue to consider in an aging workforce context. Wolfson and colleagues (2014) examined research intersecting age-related socioemotional and cognitive changes and TBI and proposed several recommendations to enhance older adult learning and transfer outcomes. They suggested that TBI for older workers should be highly structured, give feedback and adaptive guidance, and incorporate a user-friendly and consistent interface. Similarly, Van Rooij (2012) reviewed the age-inclusive instructional design literature and found evidence of positive effects for older training participants when there are smaller groups, the training is self-paced, a learning goal orientation is emphasized, error management training is provided, and training participants are encouraged to make mistakes. Other research in the IO/OB literature has echoed Van Rooij's conclusions (e.g., Callahan et al. 2003, Carter & Beier 2010).

In summary, although multiple disciplines, including industrial gerontology, instructional design, and IO/OB, have examined the issue of aging and training and development and have proposed several recommendations, there is still limited systematic investigation considering the individual, training-related, and training transfer environments in conjunction. Furthermore, a difficult paradox exists when considering age-specific training interventions in the workplace, which is how to avoid exacerbating the issue of older worker stereotypes while also building interventions focused on accommodating or exploiting age-related changes. One solution could be to include older workers in the development of training because it would result in training that accounts for older workers' needs and would capitalize on older workers' generativity motives.

Supporting Worker Safety and Health

At least three critical meta-analyses in the past 5 years have demonstrated the link between the safety climate (organizational level and group level, as well as individual perceptions of the

climate) and safety outcomes (Beus et al. 2010, Christian et al. 2009, Clarke 2006). It has further been argued that the safety climate is determined by supervisory practices, communications, and behaviors (e.g., Zohar & Luria 2005). Therefore, the development of an intervention that targets supervisory behaviors to support people of specific ages would show promise. Additionally, given the positive relationship between age and safety outcomes (Ng & Feldman 2008), another possibility is the involvement of older workers in supporting the safety of younger workers. This could involve training or mentoring of younger workers by their older counterparts.

Ergonomic Interventions

Ergonomic and human factor interventions focus on appropriately designing and fitting job tasks, tools, and the environment to individual needs with the focus of supporting the health and productivity of workers (Choi 2009). These types of work design interventions are relevant given the age-related changes to cognitive, sensory, and motor capabilities experienced by workers over their lifetimes. For example, to account for age-related changes, researchers have made recommendations to increase worksite illumination, control for glare, use larger fonts, and reduce background noise (Charness et al. 2007). Interventions that consider reach capability and reduction of lifting and carrying tasks might also be helpful (Sharit & Czaja 2012). Owing to age-related reductions in the ability to maintain homeostasis, which result in longer physiological recovery from stressful events, a consideration of how to limit nonstandard shifts that cause sleep disturbance could be especially beneficial to older workers (Blok & de Looze 2011). Additionally, insuring that the ambient work environment (i.e., high and low temperature, humidity) remains relatively comfortable would also reduce physiological stress on older workers (Hedge & Borman 2012a). However, actual research on the effectiveness of these interventions to support older workers is limited.

Given these observations, it may appear that an attractive alternative for older workers would be desk jobs that require less physical effort. However, there are also risks with sedentary work for older workers (Sharit & Czaja 2012), the greatest being that prolonged sitting can result in spinal issues such as back pain and reduced mobility (Chaffin et al. 1999). Therefore, seating designs that provide lumbar support, a backrest, armrests, adjustable seat height, cushioned surfaces, and sufficient leg space should reduce back stress (Sharit & Czaja 2012). We also point to recent changes in desk design, such as walking desks and adjustable sitting/standing desks. Additionally, given the adoption of technology in the workplace, design features related to technological systems should also be considered (Charness et al. 2007). Charness and colleagues (2007) reviewed considerations and recommendations related to aging and workplace technology, including design principles, but additional empirical work about the effects of these types of workplace interventions is still needed.

Health Promotion

Given that successful aging often depends on lifestyle factors such as exercise and healthy eating (Hansson et al. 1997), health promotion interventions clearly hold promise for older workers. In a recent review of the health and safety promotion needs of older workers, Crawford and colleagues (2010) noted, however, that there is limited research on health promotion interventions targeting older workers. Based on their review of 180 publications, the authors concluded that age-related physical and psychological changes could be moderated by lifestyle factors, such as increased physical activity, intellectual activity, and nutrition. Moreover, research in the developmental psychology literature on age differences in initiating change (perhaps easier for

younger workers) and maintaining it (perhaps easier for older workers) suggests that the psychology literature could contribute to the development of successful interventions for older workers versus their younger counterparts (Rothman 2006).

Supporting Workers Throughout the Life Span

Research examining successful aging strategies and behaviors (discussed above) may be an area ripe for identifying interventions that would facilitate adaptation to life-span changes. Relatedly, interventions focused on building resilience resources could also be beneficial to the aging worker. For example, Burton et al. (2010) observed a positive effect on resilience in a 13-week training program.

Additionally, helping workers adapt to life-span changes is important given the dynamic nature of today's workplace. In fact, career adaptability is found to be positively related to career satisfaction and self-rated career performance (Zacher 2014a), and research has found that future temporal focus (Zacher 2014b) and subjective health (Kooij & Van De Voorde 2011) are positively related to career adaptability. Furthermore, in a 7-month follow-up of a randomized controlled field trial intervention on improving career management preparedness, Vuori et al. (2012) found that those in the intervention group had decreased depressive symptoms and retirement intentions and increased mental resources compared to the control group. Therefore, investigations of career adaptability may identify potential mechanisms that could be the focus of interventions.

Total Worker Health™ Approaches

Total Worker Health™ (TWH™) approaches, recently trademarked and advocated by the National Institute for Occupational Safety and Health (NIOSH), are comprehensive interventions that integrate both organizational and individual approaches to reducing occupational hazards and improving the health, safety, and well-being of workers. For example, interventions that integrate system-wide changes, such as improving schedule control and supervisor support for family and personal life, have been shown to be effective and are characteristic of what the NIOSH designates as TWH™ interventions (Schill & Chosewood 2013). Recently, a summit was held that specifically focused on recommendations for reducing barriers to the implementation of health protection and health promotion for older workers (Loeppke et al. 2013). Many of their recommendations from this summit are consistent with those reviewed and suggested in this article, such as the need to better understand the aging workforce and to have a multigenerational perspective in the workplace. To date, however, we are unaware of any TWH™ interventions that have been specifically developed to support older workers or that examine age differences (Anger et al. in press). However, Crawford et al. (2010) suggested that a combination of health promotion/individual-level behavioral changes and physical workplace equipment changes or adjustments would lead to the most effective workplace interventions for aging workers. This clearly represents a TWH™ approach to aging worker interventions.

CRITICAL RESEARCH NEEDS

In this article, we emphasize the theory and research that is available to IO/OB researchers for understanding the implications of age differences at work. Furthermore, above we describe some possible age-related workplace interventions that might flow from this literature. In this section, we point out some vexatious research issues specific to studying the aging workforce. These are summarized in **Table 3**.

Table 3 Critical research needs for studying the aging workforce

Research need	Example
Research design	Identify causal mechanisms; use multilevel (individual, group, organizational) designs; use experimental and quasi-experimental designs; use longitudinal designs with very long time horizons to assess within-person change; examine measures that are atypical for industrial-organizational and organizational behavior research but that are critical to the issue of age (e.g., objective health measures); work across disciplines
Scalable, wise interventions	Consider small, psychologically rich interventions to facilitate dissemination
Global research	Compare workforce aging issues across countries and cultures to guide interventions for different cultures
Support for workers of all ages	Study interventions for workers of all ages (young, middle-aged, and older); frame interventions as addressing age issues in different ways (e.g., preventing later losses versus addressing existing deficits)
Age differences in adoption versus maintenance	Conduct research on age differences in accepting versus maintaining change; consider the age appropriateness of interventions not only in terms of benefit to people of different ages, but also in terms of likelihood of adoption
Holistic, integrated interventions	Consider the whole person in and out of work to address aging workers' issues; borrow from research on nonwork interventions (e.g., on maintaining cognitive skills) for their value in the workplace
Better understanding of chronological age as a construct	Understand which of the many factors associated with chronological age affect attitudes, behavior, well-being, and health
Technology	Adapt technology to fit worker needs rather than adapting only the worker to the technology

Research Design and Methodological Issues

Much of the work to date in the area of the aging workforce considers only correlational studies. But to identify causal mechanisms, future research should use experimental and quasi-experimental designs with intervention and control groups that are evaluated at the individual, group, or organizational level. In addition, although longitudinal studies are useful in many types of IO/OB research, they are crucial to understanding many aging workforce phenomena, including within-person changes over long periods of time. Such research will provide insights into interventions for workers in early and midcareer (discussed below) and may help to disentangle the thorny issue of maturational effects versus generational differences.

In addition, much of the IO/OB research on older workers is lacking in some of the measures that may be of greatest interest when examining a vigorous aging workforce, particularly measures of objective health. The use of such measures might require working beyond disciplinary lines. Indeed, because the aging workforce is a multifaceted issue, it may involve collaboration with colleagues not only from psychology and business, but also from sociology, economics, demography, medicine, and ergonomics.

Scalable, Wise Interventions

In addition to large-scale interventions, we need to consider interventions that can be easily adopted at a low cost to enable their dissemination even to small employers. Walton (2014)

described the concept of "wise" interventions, which are brief and precise and hone in on the underlying psychological process involved in change. Walton provided a number of real-world examples of wise interventions—simple but with significant psychological impact—across a number of arenas, from dealing with marital conflict to improving educational attainment. We believe that using a wise intervention approach to address aging issues at work should aid in the adoption and dissemination of interventions across employers. For example, interventions to guide supervisors on how to support a strong age diversity climate might use smartphones and similar devices rather than lengthy classroom-based sessions.

Global Issues

The aging workforce is a global issue, creating challenges for many industrialized workforces. However, most of the research in this arena has been from a limited number of European countries and the United States. But there is reason to believe that differences across countries and cultures can affect aging issues. For example, Bleidorn and colleagues (2013) found that age-related personality maturation (e.g., increases in conscientiousness) begins earlier in countries where people start work responsibilities earlier in life. In the workplace arena, Inceoglu et al. (2009) found in a comparison of work motivation in five European countries that a country's retirement age affected the relative change in work motivation. Additionally, Barnes-Farrell et al. (2002) found that subjective age perceptions (or perceptions about one's own age) were differentially related to stress outcomes in samples from different nations. However, such cross-country comparisons are relatively rare in older worker research. As another example, we can imagine that some of the changes predicted by SOC theory could depend on the broader context of the culture and country. Given the global nature of this problem, we encourage researchers to undertake more cross-cultural and cross-national comparisons that can also aid in developing interventions.

Only Older Workers or Workers of All Ages?

One way to address the needs of older workers is to consider the needs of workers of all ages. As the research shows, a positive age diversity climate, which supports people across the life span, benefits all workers (Böhm et al. 2014). Moreover, today's younger workers are tomorrow's middle-aged and older workers, and thus interventions to support people throughout their work life span are critical.

Related to this issue of age interventions across the work life span, we propose a framework for considering potential workplace interventions for older workers. Specifically, we propose that the health promotion/prevention model might be a useful lens by which one could approach interventions addressing the aging workforce. This model has three tiers/categories of types of interventions—primary, secondary, and tertiary—which are differentiated by the target population and intention of the intervention (i.e., prevention versus accommodation). Primary interventions have a broad population focus and are aimed at preventing the onset of specific diseases via risk reduction by altering behaviors or exposures that can lead to disease, or by enhancing resistance to the effects of exposure to a disease agent. For example, in the aging worker context, primary interventions would be those that would help all workers, but would especially aid workers proactively so that when they reach the end of their career, they have the resources to be healthy and effective. Examples might include interventions focused on creating an age-supportive work climate, building awareness and use of successful workplace aging techniques, reducing exposure to hazardous chemicals, and offering health promotion programs.

Secondary interventions identify and address changes to control disease progression. Applied to an aging context, this would include interventions for those in mid- to late career aimed at reducing stressors associated with reduced age-related function, such as short-term memory interventions, ergonomic interventions, and flexible work schedules. Interventions could also exploit gains associated with age, such as increased generativity (e.g., mentoring programs).

Tertiary interventions are applied when the condition is not reversible, and the focus is on rehabilitation and assisting the individual to accommodate to the disability. Applied to the aging workforce, tertiary interventions would specifically target older workers with reduced work ability with the goal of retaining them in the workforce. For example, providing access to hearing aids and glasses might aid an individual with vision and hearing losses. Thus, tertiary interventions seek to decrease the effects of disease on a person's function, longevity, and quality of life. In summary, applying a health promotion/prevention approach to catalog age-focused prevention, control, and accommodation workplace interventions may identify best practices as well as research gaps that could trigger future development and research.

Age Differences in Accepting and Maintaining Change

Some work in developmental psychology suggests that there may be differences between older and younger people in initiating change and maintaining it. For example, there is evidence that, although younger people may initiate change more easily, older workers can sustain it more effectively (Rothman 2006). This line of research is important to consider in developing programs for workers of different ages, and it certainly should be integrated into interventions that involve change and maintenance of behaviors. Furthermore, it suggests that interventions should be considered from two angles: those that are likely to be adopted by older and younger people and those that, if adopted, are more likely to benefit older and younger people.

Integrated, Holistic Interventions

One weakness of some IO/OB research is a tendency to focus strictly on workplace issues, not taking into consideration the larger social context in which people live and that can substantially affect their health and ability to work (see Loeppke et al. 2013). Thus, integrated approaches that support older people in arenas both inside and outside of work should be adopted, taking a more person-centered approach to workers (Weiss & Rupp 2011). Furthermore, research findings about interventions outside of work proven to support people's health and cognitive skills (e.g., Park et al. 2014, Zinke et al. 2014) should be drawn upon by organizational researchers to address the health and well-being of older employees.

Better Understanding of the Chronological Age Construct

Chronological age is a convenient marker for a plethora of other variables—cognitive, physical, affective, and motivational—that could affect individuals' attitudes, behavior, and well-being, as well as what they need in terms of workplace interventions. Now that age is beginning to be viewed as more than just a control variable in the IO/OB literature and a topic worthy of examination in its own right, a next step is to better understand what chronological age is and how it affects employee attitudes and behavior. For instance, Wang and colleagues (in press) showed that age is related to feedback orientation and that this is the mechanism though which age moderates the effects of feedback on feedback reactions. In addition, although age may relate to work ability (Ilmarinen et al. 1997), so does health (e.g., McGonagle et al. in press)—a variable highly associated with age.

Thus, future research should go beyond measuring simple chronological age and instead treat it as a function of multiple facets of the aging process that impact an individual's ability to continue to work, including physical, cognitive, affective, and motivational components. Such an approach would allow the field to move beyond trying to define an older worker in terms of a specific chronological age and instead look at the factors associated with age that might also affect the workplace (e.g., subjective perceptions of age and aging) (Barak 1987). This could allow for the development of interventions that fit different types of older workers.

Technology as Friend, Not Foe

Much discussion has been geared toward older workers' ability to cope with changing technology. Besides the fact that this assumption may be outdated as more older workers become technologically savvy, we recommend a rather different mindset: Let technology serve the individual and support the aging worker. In short, we challenge organizations to consider not only how to help older workers adapt to technology, but also how to develop technology that is easily adopted by and actively addresses the needs of older workers.

CONCLUSION

The aging of the workforce is an issue that is already impacting industrialized societies, and it is expected to grow in the coming decades. Although robust research based on age at work has begun to take root in the IO/OB literature, there has been virtually no research on actual interventions and best practices to support the aging workforce. Above we provide an overview of the research that can guide future studies on age-related interventions. We also cautiously identify some potential workplace interventions that could support older employees and that might be evaluated in future research. As a field, we need to accept the challenge of identifying what employers and societies can do to help deal with this growing issue—and move beyond age as a statistical control variable.

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Errata

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