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Productive Aging and Work

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All would live long, but none would be old.

—BENJAMIN FRANKLIN (1705–1790)

One of society's greatest success stories over the past century has been the remarkable increase in life expectancy that has occurred in many developed countries. A child born in the United States in 1900 could expect to live to an average age of 47.3 years. By 2015, life expectancy at birth had increased to an average of 78.8 years (National Center for Health Statistics, 2017), a gain of more than 30 years. This "longevity revolution" (Butler, 2008) has produced many benefits for both individuals and society, but it also has created a number of challenges as the age structure of the population has changed. One such challenge clearly relevant to the goals of *Total Worker Health*® is how best to create a workplace that encourages workers to flourish and remain healthy and productive as they age. This chapter focuses on that challenge by briefly examining the changing age structure of the U.S. workforce, reviewing what we know about the impact of aging and emphasizing work-related outcomes in particular, and describing the concept of productive aging and basic steps that can be taken toward achieving the goal—anticipated many years ago by Benjamin Franklin—of encouraging long and healthy working

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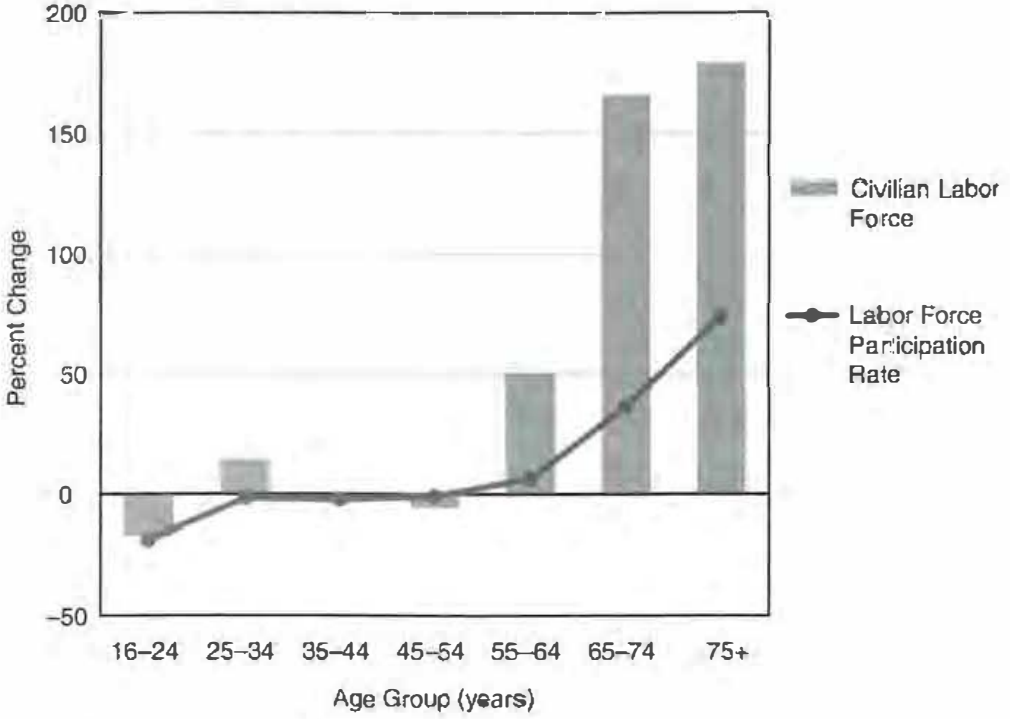
lives in which workers continue to make important contributions to the success of their organizations.

CHANGING DEMOGRAPHICS

Although the workforce has been gradually aging for several decades, the cumulative impact of this change in the United States and other countries has become particularly salient in recent years. Figure 13.1 presents data from the U.S. Bureau of Labor Statistics that illustrate the percentage change and anticipated change in the civilian labor force and labor force participation rate (LFPR) between 2004 and 2024 for various age groups (Toossi, 2015). During this period, the largest percentage increases in the civilian labor force are for workers 55 years and older, and the overall change for younger age groups is nearly flat. An important factor contributing to these differences is the baby boomers generation—or approximately 76 million individuals born between 1946 and 1964. Because the cohorts who preceded (i.e., Traditionalists) and followed (i.e., Generation X) the baby boomers were smaller in size and had a slower growth rate, baby boomers have had a disproportionate impact on many aspects of our society, including the workplace. With many baby boomers now beginning to retire (the oldest turned 65 in 2011), there is increasing concern that such societal programs as Social Security and Medicare will need to be

FIGURE 13.1. Percent Change and Projected Change in Civilian Labor Force and Labor Force Participation Rate, 2004–2024



Data from tables in Toossi (2015).

restructured in to accommodate the growing number of older adults. One index reflecting this concern is called the *old-age dependency ratio*, or the population 65 years and older divided by the population aged 18 to 64. Between 2000 and 2050, this ratio is expected to increase from 20% to 37% (Colby & Ortman, 2014), which suggests a greater burden on working-age adults to help support those who are at retirement age and beyond.

The LFPR has increased and is projected to increase for workers 55 years and older but remain flat, if not slightly negative, for younger age groups (see Figure 13.1). There are many reasons why the LFPR is increasing for older workers that reflect both *pull* (i.e., positive) and *push* (i.e., negative) forces (Shultz, Morton, & Weckerle, 1998) that encourage an individual to keep working. On the pull side, older workers tend to be better educated and healthier than past generations (Lowsky, Olshansky, Bhattacharya, & Goldman, 2014; Rix, 2006), and substantial numbers have reported very good to excellent health status. In addition, the nature of work itself has changed from a manufacturing-dominated economy to one that emphasizes services and information-based activities having lower physical demands (Johnson, Mermin, & Resseger, 2007). Continuing to work also can provide a range of psychological benefits, including a sense of purpose in life and the opportunity to remain physically, mentally, and socially active.

On the push side, financial necessity is clearly a strong factor in workers' staying employed at older ages. A recent national survey of older workers reported that 44% of respondents indicated that "need the money" was the single most important reason for working or looking for work (AARP, 2014). That percentage compares with 19% of respondents who identified psychological benefits (e.g., enjoy the job, makes me feel useful) as the most important factor. For many workers, financial need is significantly reduced by participation in an employer-sponsored retirement plan. But only approximately half of all private sector workers participate in such a plan, and those who are covered have seen a gradual transition from defined benefit to defined contribution programs. Defined contribution programs do not provide a guaranteed source of income and depend on the worker's ability to contribute while working. The low level of personal savings in the United States also plays a role, particularly for workers without a pension. The Employee Benefit Research Institute (2017) estimated that only 18% of workers are "very confident" that they can retire comfortably and that fewer than half of workers have saved more than $25,000 for retirement. The need to maintain adequate health care coverage can result in staying at work and has been reported by 8% of older workers as the most important factor (AARP, 2014).

The change in the age structure of the workforce depicted in Figure 13.1 is not temporary and is expected to last well into the foreseeable future as people continue to live and work longer, and birth rates remain low. This change is also global in scope. Many countries in Europe (e.g., Italy, Germany, Sweden) and Asia (e.g., Japan, South Korea) are currently considered "older" than in the United States. There are other countries (e.g., China, Mexico) that are currently

considered "younger" but are experiencing demographic trends that eventually will result in older populations than in the United States. In addition, the traditional employment relationship in many countries is changing as reflected in *gig work*, that is, the trend toward contracting with rather than employing people, and increased precariousness of employment (Weil, 2014). These changes, accompanied by an aging workforce, will create a number of challenges in the future for workers, organizations, and society.

TWO CONTRASTING VIEWS OF AGING

As interest in aging has grown, two broad perspectives on what the aging process entails have emerged. Each perspective is based on empirical support, and, collectively, both provide insight into the range of changes that may occur within an aging workforce.

Aging as Decline and Loss

Perhaps the most traditional view of aging is that of a process that involves a gradual and inevitable deterioration in function over time. Research on the biological and genetic mechanisms of senescence, for example, has posited a number of possible "pathways," including the accumulated impact of free radicals that eventually results in cellular damage, genetic mutations and failure to repair DNA damage over time, a biological clock that regulates the pace of aging through changes in the hormonal system, and a decline in the immune system that leads to increased vulnerability (Jin, 2010; Kaeberlein & Martin, 2016). These theories of aging are broadly categorized as either *nonprogrammed theories* that emphasize accumulated damage produced through environmental assault (e.g., free radicals, inadequate DNA repair) or *programmed theories* that emphasize an internal biological timetable that organisms invariably follow as they age (e.g., changes in hormones and immunity; Goldsmith, 2014). Although a consensus has yet to emerge around a single explanation of why we age, advances in this area have reinforced the view of aging as a complex process of decline that is similar perhaps to a type of universally experienced disease that eventually leads to dysfunction, disability, and death.

On the level of individual functioning, it is now well documented that nearly all physiological systems in the body show gradual decline and loss over time. A detailed description of these changes can be found elsewhere (e.g., Crawford, Graveling, Cowie, & Dixon, 2010; Johns & Weissman, 2015). However, a partial list includes sensory processes (e.g., hearing and vision), muscle strength, cardiovascular and respiratory functioning, bone health and musculoskeletal capacity, immune functioning, skin elasticity, motor processes (e.g., reaction time), and "fluid" or "working" memory (e.g., the ability to store and process new information). Although each system is different, many age-related changes begin early in life (often in the mid- to late 20s, if not younger); are not always

linear or generalizable, especially in nonelderly populations; and may take place long before an individual actually notices a decline in functioning.

Collectively, these changes suggest that an aging workforce is likely to be at a disadvantage when it comes to job performance and occupational safety and health outcomes. However, at least two caveats are in order. First, the aging process is characterized by increased variability over time, and some individuals show much less decline than others (e.g., Fozard, Vercruyssen, Reynolds, Hancock, & Quilter, 1994). The reason for different rates of aging is complex but undoubtedly includes environmental and genetic factors. Second, as Peter Warr and others have pointed out, workers are at risk of being "age impaired" only when the task requirements of a job exceed a worker's ability (Warr, 1994). And for many types of jobs, an individual's physical and cognitive abilities must decline quite substantially before they are exceeded by the task requirements of work.

Aging as Development and Growth

A different view of aging has emerged from the field of lifespan development that emphasizes the dynamic and adaptive nature of the aging process. From this perspective, development and growth do not end at a given age but can continue in many forms throughout adulthood. For example, an important attribute that tends to show a positive trajectory with age is *crystalized intelligence*, which refers to knowledge and skills acquired through experience and prior learning (Cattell, 1987). Examples include verbal ability (e.g., vocabulary), domain-specific knowledge, and problem solving based on the application of accumulated knowledge. Crystalized intelligence has been found to generally increase throughout life until around age 60 (and perhaps later) and may allow individuals to compensate for normal age-related decline in fluid or working memory by supporting strategies that capitalize on existing knowledge and skills (Salthouse, 2004).

Another area that shows considerable stability, if not improvement, throughout much of the lifespan is mental health and well-being. In a large survey of Canadian adults, Akhtar-Danesh and Landeen (2007) reported that both lifetime depression and depressive episodes of 12 months or more declined consistently with age: Individuals 75 years and older had the lowest rates for both measures. An analysis of data from the health and retirement study found a consistent decline in "clinically relevant depressive symptoms" from 17.4% in respondents 51 to 54 years old to 10.4% in respondents 70 to 74 years old (Federal Interagency Forum on Aging-Related Statistics, 2016). Depressive symptoms increased slightly for individuals 75 years and older, providing some support for a *U-shape relationship*, in which the prevalence of depressive symptoms tends to be higher for the youngest and oldest age groups. What might be considered the flipside of depression, life satisfaction and subjective well-being also have been found to improve with age. Controlling for birth cohort, Sutin et al. (2013) found that well-being improved over the life course, even after taking into account health, gender, ethnicity, and education.

This increase in well-being, even as physical and cognitive functioning are declining, has been referred to as the *paradox of aging*. Explanations have focused on changes in emotion, goals, values, and motivation that occur with age (Kanfer & Ackerman, 2004). One influential theory proposed by Laura Carstensen and colleagues maintains that as people get older, their sense of the time they have left (or "time horizon") changes, and they invest greater effort into emotionally meaningful activities. The result is a shift in motivation characterized by a desire for more satisfying personal relationships and a reduced emphasis on activities that focus strictly on acquiring information (Carstensen, Fung, & Charles, 2003). Applied to the workplace, this theory suggests that as workers reach the middle and latter part of their careers and "time left" starts to dwindle, their preferences and goals are likely to gradually shift to activities that allow for greater emotional satisfaction and support of one's identity.

AGING IN THE CONTEXT OF WORK

Given the two broad views of aging outlined previously, it should come as no surprise that the impact of aging in the context of work is neither simple nor uniform in direction. Table 13.1 presents a summary of how a select group of work-related variables changes with age. Based on the current research literature, each variable is categorized as tending to worsen, improve, or have no consistent relationship with age.

Before discussing Table 13.1, a few caveats are in order. The summary is intended to characterize the overall pattern of results for each variable; there are undoubtedly exceptions that may reflect how a given construct is measured or particular features of the workplace (e.g., supervisory practices) that may overshadow the impact of age. Also, the variables in the table are broad, and

TABLE 13.1 Relationship Between Age and Selected Work and Health Measures

Tends to worsen with age	Little or no consistent relationship with age	Tends to improve with age
Fatal or severe workplace injuries (CDC, 2007a)	Core job performance (Ng & Feldman, 2008)	Nonfatal workplace injuries (CDC, 2007b)
Return to work following injury/illness (Bureau of Labor Statistics, 2016)	Absenteeism (Hackett, 1990)	Job satisfaction (Ng & Feldman, 2010)
Chronic health conditions (e.g., arthritis, hypertension; National Institute on Aging, 2007)	Ability to learn from training (Ng & Feldman, 2008)	Counterproductive work behaviors (O'Driscoll & Roche, 2015)
Work disability (U.S. Census Bureau & U.S. Bureau of Labor Statistics, 2006)	Creativity (Ng & Feldman, 2008)	Presenteeism (Gosselin, Lemyre, & Corneil, 2013)
Work Ability (Ilmarinen, Tuomi, & Klockars, 1997)	Work-related musculoskeletal disorders (Okunribido & Wynn, 2010)	Diversity of knowledge and experience (Ng & Feldman, 2008)

Note. CDC = Centers for Disease Control and Prevention.

some subcategories may show a different association with age. For example, although nonfatal workplace injuries decline with age, a specific type of nonfatal injury—slips, trips, and falls—tends to increase and should remain a concern with an aging workforce (Layne & Pollack, 2004). Similarly, although age makes little difference in the benefit workers receive from training, research has found that other older workers may take longer to learn the same information compared with younger workers (Charness & Czaja, 2006).

For some measures, their association with age can be affected by moderator variables. For example, in an analysis of national survey data, Grosch and Pransky (2009) found that the prevalence of back pain remained fairly constant with age but declined slightly for workers 55 years and older. However, when physical demands were considered, older workers who reported being involved in repeated lifting activities at work were at much greater risk of experiencing back pain than younger workers who also reported repeated lifting. Workplace exposure (in this case, lifting) interacted with age to influence the relationship between age and musculoskeletal health.

Other caveats: The summary presented in Table 13.1 is based largely on cross-sectional studies in which workers of different ages were compared at a single point in time. This approach, in contrast to longitudinal research, which follows workers over time, has been criticized for sometimes overestimating age-related change and making it difficult to disentangle age effects from cohort, period, and healthy worker effects (Hofer & Sliwinski, 2001). Moreover, the focus in Table 13.1 is on the presence or absence of simple linear relationships, even though some studies have found evidence for curvilinear relationships with age (e.g., workers' compensation claims; Safety & Health Assessment & Research for Prevention, 2007).

Despite these issues, Table 13.1 presents a general profile of the types of change that can be expected with an aging workforce. Particularly noteworthy is that a number of consequential variables do not show a consistent relationship with age (i.e., middle column). The reasons for this pattern are undoubtedly complex, but in some cases may reflect a situation in which the losses of aging (e.g., decrease in physiological functioning) are counterbalanced by the gains (e.g., increase in crystalized intelligence). For example, although workers may experience reduced stamina and a certain degree of joint stiffening with age, they also may learn more efficient and safer strategies for doing their work so that job performance and the likelihood of musculoskeletal disorders remain relatively stable across the working life. Variables that tend to worsen with age (first column) appear to share the common thread of greater vulnerability and gradually worsening physical health that can occur with age. As a result, chronic health conditions increase in prevalence as a workforce ages, and arthritis is the most common at 48% for workers 55 years and older, followed by hypertension (43%), and diabetes (13%; National Institute on Aging, 2007). Workplace injuries, when they do occur, are more likely to be severe or fatal, to take longer to recover from, and more likely to result in disability.

Variables that tend to improve with age (third column) suggest that an aging workforce can have many important benefits for an organization that reflect

underlying improvements in crystalized intelligence (e.g., fewer nonfatal injuries, diversity of knowledge) and emotional health (e.g., job satisfaction, less counterproductive behavior). Age, which is highly correlated with tenure, often is associated with more favorable working conditions, such as increased levels of autonomy and social support, which also may contribute to many of these improvements (Sauter, Streit, & Hanseman, 2009).

A complex picture emerges of the potential impact of aging within the context of work. Performance on laboratory tasks does not necessarily predict effectiveness in the workplace. This complexity has a number of important implications. First, primary prevention efforts, which focus on preventing a health or safety problem before it occurs, become paramount with an aging workforce because once a health issue surfaces, it will tend to be more severe (or fatal) and require a longer recovery period as workers age. Second, chronological age, when it plays a role, is at best a modest predictor of some health and safety outcomes, and can be overshadowed by features of the work environment, such as physical demands or work organization characteristics. The gradual, complex nature of the aging process suggests that there may be many avenues and levels of influence that can be used in advancing the safety, health, and well-being of an aging workforce. Extrapolating from Table 13.1, a basic rule of thumb should be to "minimize the losses" that may occur with aging (first column), and "maximize the gains" (third column).

PRODUCTIVE AGING AND WORK

As our knowledge of aging has increased, concepts such as *healthy aging, active aging, successful aging* and *productive aging* have been introduced to suggest that it is possible to effectively navigate the multidimensional changes that come with growing older. Although each of these concepts has a slightly different emphasis, they all advocate being proactive about age-related change and striving toward specific goals, such as avoiding disease and disability, maintaining high physical and cognitive functioning, experiencing mastery/growth, and continuing to engage with life (e.g., Martin et al., 2015; Rowe & Kahn, 1998). More recently, these concepts have been extended to the workplace and advice offered to workers and employers regarding how work-related functioning and health can be maintained or even strengthened with age. For example, Zacher (2015) proposed a comprehensive theoretical model for *successful aging at work*, which presents alternatives to traditional working life trajectories and emphasizes employees' contributions to their own successful aging at work.

In 2015, the National Institute for Occupational Safety and Health (NIOSH) established the National Center for Productive Aging and Work (NCPAW) as part of its Office for Total Worker Health. The goals of NCPAW are to advance research on productive aging through collaboration with intramural and extramural partners; expand knowledge of effective interventions and best practices; and develop a broad range of translational products and resources for workers,

employers, and other stakeholders. The term *productive aging* came from the seminal work of Robert Butler and his colleagues, who developed the concept for the general population to emphasize the positive aspects of growing older and how individuals can make important contributions to their own lives, their communities and organizations, and society as a whole (Butler & Gleason, 1985). Productive aging is, in part, a counterpoint to the view of aging as basically an "accumulation of losses" and the assumption that these losses must invariably lead older adults to become disengaged, unproductive, and dependent on others. Butler emphasized that, given demographic trends, it is imperative for society to better use the skills, wisdom, and experience of older adults (Butler & Gleason, 1985). The term *productive* was defined broadly to include participation in the workforce as well as other activities that in some way benefit larger society, such as volunteer activity, family-related activities, and self-care activities that maintain independence (Bass & Caro, 2001). The relationship between good health and productive aging is understood to be bidirectional: Each directly impacts the other.

Extended to the workplace, our view of productive aging at NCPAW is that it refers to the continued ability of workers to remain engaged and make active contributions to their organizations and their own work-related skills and abilities. A safe and healthy work environment is seen as providing a necessary foundation for these contributions. Furthermore, productive aging in the context of work has four main attributes described as follows.

A Lifespan Perspective

This perspective holds that patterns of change and transition occur throughout the working life. Aging is viewed as a biopsychosocial process that involves losses and gains, and represents the product of many interacting factors inside and outside the worker. A fundamental characteristic of a lifespan perspective is *plasticity*, or the idea that an individual has the potential to change and adapt in response to his or her environment and experiences (Baltes, Lindenberger, & Staudinger, 2006; Sigelman & Rider, 2017). Although aging and eventual decline are inevitable, it also is possible for individuals, organizations, and society to manage or have some level of impact on the aging process. An important implication of this perspective is that the scope of productive aging includes all age groups of workers and is not limited to just "older workers," however that group may be defined. Prioritizing worker health and safety at all life stages is an investment that is cost effective and can reduce chronic health conditions later in life (Loeppke et al., 2013).

A Comprehensive and Integrated Approach

Given the complexity of the aging process, a multilevel, holistic strategy toward prevention and advancing worker well-being is needed. Simply focusing on a narrow range of workplace hazards or safety practices does not take full of

advantages of the many pathways that play a role in how workers age and the impact of growing older.

Total Worker Health, the focus of this volume, represents one such comprehensive approach or model. Although not based primarily on aging-related research, a TWH approach prioritizes a hazard-free work environment for workers of all ages while also comprehensively addressing other workplace systems, including those relevant to the control of psychosocial hazards and exposures, the organization of work, compensation and benefits, and work–life management efforts. The emphasis of the TWH approach on integration reflects that occupational safety and health programs have traditionally been compartmentalized, have functioned independently of one another with little coordination, or both. A growing body of research, however, has indicated that workplace programs that are integrated and share common objectives are more effective than programs developed in isolation (Sorensen et al., 2013).

A related approach, more firmly anchored in aging research, is the concept of *work ability*, which refers to a worker's capacity to continue working in his or her current job given work demands and available resources (Ilmarinen, 1999). Originally developed at the Finnish Institute of Occupational Health, the concept of work ability has been the subject of extensive international research. A major premise of the model is that work ability can be maintained, if not improved, over the working life by focusing efforts on four principal factors or dimensions (Ilmarinen, 2009; Silverstein, 2008):

- *physical work environment*—for example, ergonomics programs, hygiene improvements, workstation design, changes to reduce the risk of falling, reduction of prolonged physical exertion, better delivery of visual and auditory information;
- *individual health resources*—for example, chronic disease management and monitoring, programs to promote individual health behaviors, health education and screening, return to work programs;
- *leadership and organization of work*—for example, workplace flexibility programs, job design, supervisor training, better management of working hours and shift work; and
- *professional development*—for example, supportive training methods for older workers, lifelong learning opportunities, mentoring programs, training in the use of technology.

This focus on multiple factors or levels is consistent with a TWH perspective as well as that of other models of healthy organizations, including the World Health Organization's healthy workplace framework (Burton, 2010) and the SafeWell practice guidelines (McLellan, Harden, Markkanen, & Sorensen, 2012).

Outcomes That Recognize the Priorities of Workers and Organizations

When it comes to productive aging and work, the question arises: Productive for whom? The desired outcomes for a worker may not always be the same as

those for a manager or an organization. For example, *organization-centered* outcomes tend to focus on reducing health care costs, having fewer workplace injuries, and achieving lower rates of absenteeism and turnover. In comparison, *worker-centered* outcomes may emphasize maintaining or improving individual physical health, working in a safe and comfortable environment, and achieving a high level of individual well-being and the sense of making a contribution to the organization. A growing consensus among workplace experts is that changes in either of these two categories of outcomes can affect the other. Studies on worker well-being, for instance, have consistently found that improvements can lead to reduced absenteeism, higher productivity, and fewer reported workplace injuries (all organization-centered outcomes; Harter, Schmidt, & Keyes, 2002). Similarly, an organization that increases its productivity and is able to transfer knowledge to younger workers through mentoring programs may, as a result, have more resources to invest in worker well-being programs and injury prevention (Wilson, Dejoy, Vandenberg, Richardson, & McGrath, 2004).

The bidirectional nature of this relationship suggests that both categories of outcomes need to be acknowledged and prioritized in any attempt to encourage productive aging. Failure to attend to organization and worker goals may serve to undermine the programs and policies that are implemented. Focusing on both categories can contribute to a culture of health that will help sustain improvements in productive aging over time.

A Supportive Work Culture for Multigenerational Issues

Because many older workers are delaying retirement and younger workers are tending to have higher levels of education, the workforce will continue to increase in age diversity in a variety of different ways (e.g., more younger workers supervising older workers). Changing demographics have resulted in organizations in which there can be as many as five generations working together (i.e., Traditionalists, 1925–1945; baby boomers, 1946–1964; Generation X, 1965–1980; Millennials, 1981–2001; Generation Z, 2002–to be determined). A *generation* can be described as a cohort of individuals born during the same period who share a set of formative life experiences (e.g., economic and political movements, historical events) that shape attitudes, beliefs, and values.

A great deal of variability can be found within a given generation; thus, relying solely on these broad categories risks oversimplification and the creation of exaggerated stereotypes. It also can be difficult to separate the impact of generation from other changes that occur over time at work (e.g., career progression). However, that work-related values and, by extension, behaviors can vary across age cohorts has important implications for organizations when it comes to such issues as training, worker motivation, use of technology, recruitment, leadership, communication strategies, and teamwork.

In terms of productive aging, creating a supportive culture involves better understanding the generational composition of the workforce, facilitating regular discussion about generational issues, and developing a set of programs

and policies that are broad enough to address the needs of all workers throughout the working life (e.g., family leave policies that appeal to both younger and older workers) and encourage positive interactions between different age cohorts (e.g., mentoring programs, age-diverse teams). A major challenge is to prevent the intergroup conflict that can sometimes accompany a multiage workforce by fostering a culture that respects and uses the unique skills, knowledge, and perspectives of workers in all age groups (Rudolph & Zacher, 2015).

GETTING STARTED: DESIGNING A WORKPLACE THAT ADVANCES PRODUCTIVE AGING

A recent national survey of human resources professionals reported that 87% expressed at least some level of awareness of the aging workforce issue. However, only 13% indicated that their organizations had actually developed or implemented a plan to change policies or practices to address this issue (Society for Human Resource Management, 2015). This discrepancy between awareness and action often is referred to as the *knowing–doing gap* (Pfeffer & Sutton, 2000) and raises an important question: Given our growing knowledge of the impact of aging on workers, what steps can organizations take to develop practical strategies for maintaining the health and productivity of workers as they age?

Unfortunately, no interventions or programs for productive aging work in all situations. The success of a particular program depends on a number of factors, including the size of the organization, the nature and complexity of the work, available resources, and readiness within the organization for change. However, it is possible to recommend a systematic planning process for productive aging that involves three distinct steps.

Conducting an Organizational Assessment

The foundation of any program or intervention should be based on a thorough understanding of the workplace issues and challenges that may be emerging as the workforce continues to age. Examining the age demographics of the workforce and how they may be changing is a starting point. How is the workforce distributed across various age groups or generations? How is that expected to change over the next 10 years as some workers become eligible for retirement? As part of this assessment, it can be helpful to consider the core types of expertise and skills that are essential to the organization's mission and whether retaining this expertise into the future represents a challenge.

Other important baseline data include a careful examination of current or potential hazards and risk factors at different levels of the work environment. This examination might involve, for example, an assessment of physical demands, ergonomic concerns, safety issues, and work organization factors. Also, collecting information on existing organizational policies, programs, and

practices that support or, perhaps in some cases, unintentionally compromise worker safety and health is important. Data on the health and well-being of the workforce also can help identify priority areas through, for example, examination of sickness and injury data; workers' compensation claims; short- and long-term disability trends; and worker survey data asking about safety and health issues, including psychosocial outcomes, such as job stress, worker engagement, and the general health culture of the organization. Data for the assessment should be collected from as many relevant sources as possible, including organizational records, walk-throughs, discussion groups, and worker and management surveys.

Developing an Action Plan

Designing an intervention or program to encourage productive aging requires getting into the specifics of what will be done, by whom, and with what goals in mind. Adopting a model or theory, such as work ability, the TWH approach, or other holistic strategies, can serve as a useful guide to the different levels of change that should be considered. Figure 13.2 presents an action planning grid adapted from a training workshop on designing age-friendly workplaces that was developed by the University of Washington and is based largely on the work ability model (Silverstein, 2008; University of Washington, 2009). This grid provides an overview of the types of decisions that need to be made in developing a program or intervention for productive aging.

Typically, this grid is completed by individuals from throughout the organization who work together over several days in planning teams. A challenge is to develop goals in multiple categories that are large enough to make an impact but manageable enough to be accomplished in a reasonable amount of time. There is also growing evidence from field studies that developing several small

FIGURE 13.2. Action planning grid based on the Work Ability model

Type of Program or Intervention	Goal and How It Will Be Measured	How Will It Happen?	Who Will Ensure It Does?	When Will It Finish?	Challenges and Responses
Physical Work Environment					
Individual Health Resources					
Leadership and Work Organization					
Professional Development					

From *Designing the Age-Friendly Workplace: Participant Workbook*, by University of Washington, Seattle, 2009 (training materials based on the workbook can be found at http://www.agefriendlyworkplace.org). In the public domain.

interventions across categories (e.g., rest breaks, better illumination, simple job rotation) can cumulatively have a positive effect on a range of health and productivity outcomes (e.g., Loch, Sting, Bauer, & Mauermann, 2010).

Implementing and Evaluating Programs

Many experts on organizational interventions have noted that how an intervention or program is implemented can be as important as the content or focus of that effort (e.g., Nielsen, Taris, & Cox, 2010). When a program has the support and commitment of management, involves a transparent process in which workers are encouraged to provide input, and is adequately communicated to all stakeholders in the organization, it is much more likely to succeed. A number of resources currently exist that provide in-depth guidance with regard to the implementation process (Egan, Bambra, Petticrew, & Whitehead, 2009; NIOSH, 2016).

Although often not given as much priority, the careful evaluation of an intervention or program can provide valuable information about what works and why. A distinction often is made between evaluating the implementation process itself (e.g., reaching the intended audience, sufficient worker participation, implementing the program according to plan) and evaluating whether desired outcomes were achieved (e.g., fewer injuries, improvements in health and well-being, cost-effectiveness of a program; Cox, Karanika, Griffiths, & Houdmont, 2007). Both types of evaluation are important and provide complementary information about the success or failure of a program. In addition, it is important to choose evaluation criteria that are both short- and long-term. Early improvements may not always be sustained into the future and, conversely, programs showing few improvements at first may require a longer time horizon before they have a measurable impact.

CONCLUSION

As the age structure of many developed countries, including the United States, has changed, so too has our overall perspective on aging. Although some degree of decline and deterioration may be inevitable, there is growing evidence that the effects of aging, both positive and negative, can be moderated through efforts on many different levels. Consistent with a TWH perspective, research suggests that organizational programs most likely to succeed over the long term are those that are broad based and take a holistic view of worker safety and health. A major challenge is to further expand our knowledge of effective interventions and programs to more fully use the strengths and abilities of an aging workforce.

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