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## Making Waves

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Recognizing Age-Friendly Commitments  
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Real Possibilities

# MAXIMIZING OUR AGING POTENTIAL

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Several decades ago scientists started investigating whether we can improve the cognitive functioning of our brain in later life—our greatest asset as humans. ▶

By the year 2070 the world's population is projected to stop growing for the first time in human history. This is extraordinary, especially given that the world population has exploded—from 1.7 billion to 7.1 billion—since the beginning of the twentieth century. Estimates suggest that the global population will rise to 9.4 billion by 2070 then stabilize and decline to 9 billion by 2100<sup>1</sup>.

This means that, in some of our lifetimes, we will move toward a situation in which not only natural resources, but also human resources, become constrained. Life expectancy is 30 years longer than a century ago, but at the same time fertility rates are declining so that population growth is offset<sup>2</sup>. We are aging, and there will be fewer of us.

In some areas of the world (e.g., Western Europe, rural areas globally), we have already experienced how

populations that are simultaneously shrinking and aging can lead to labor shortages, caregiving shortages, and pressure on government systems. While the pervasive narrative tells us that this is an inevitable foreshadowing of our future as a whole, what if there are actions we can take now to ameliorate this? What if, just as we recognize that innovation is needed to optimize our planet's finite natural resources, we also recognize that people have become a finite resource? In order to innovate and create sustainable societies, we need to understand whether and how we can maximize human potential in later life.

These are questions that scientists, economists, business owners, and policymakers have begun to explore. Several decades ago scientists started investigating whether it is possible to improve the cognitive functioning of our brain in later life—our greatest asset

as humans. In the 1950s and beyond we learned that we can, in fact, train older people to improve on intelligence tests. Research showed that 80-year-olds can restore up to 20 years of cognitive losses through trainings<sup>3</sup>. The limitation is that research has also shown that this only trains people for the tasks they are training for (in this case intelligence tests). It does not generalize to other tasks the person takes on.

For the past several decades researchers have looked to develop interventions that would compensate for age-related cognitive declines beyond a specific task. Several have been successfully identified. The one with the most general effects is not what we typically connect to cognitive functioning—physical exercise, more precisely, aerobic exercise. A 12-month-study conducted in Germany demonstrated that people over 60 years old who exercise at a moderate level for 45 minutes three times a week not only improved in their fitness levels, but also showed reactivation effects in their brain. Speed of information processing increased, and areas of the brain that underwent age-related decline before showed signs of reactivation<sup>4</sup>.

Businesses are invested in research that shows how work affects a person's productivity and aging over the life course. Is it possible to think about work environments, work lives, and work biographies that have a built-in cognitive training component? Are there interventions that would encourage and make it possible for people to work more productively for more years, particularly in jobs where labor shortages are anticipated?

Research conducted in the last decade shows that work complexity has a positive effect on cognitive functioning later in life<sup>5</sup>. However, this work did not speak to the question of whether it is also possible to buffer age-related cognitive decline at lower levels of job complexity.

The Volkswagen Foundation has been funding a study on assembly line workers to attempt to answer this question. The study showed that if you compare matched pairs of workers (on baseline cognition and openness to new experience), one who had many work task changes and the other who had few changes in the last 16 years (none of them implied that they were moving up the hierarchy), the worker who had more task changes also had higher levels of cognitive functioning. Then, when

you study their brains, structures linked to attention and learning have been found to be larger than in the matched group of workers<sup>6</sup>.

What this groundbreaking result shows us is that the ways that we function across our work lives influence the ways that we age, therefore also affecting the ways that we continue to be willing and able to be productive at work. This is relevant, right now, to society at large, to all of us as individuals, and to employers. And we should all be paying attention.

Shortages in specific occupations are already becoming more prevalent in Western Europe and in some U.S. industries. In addition to and outside of shortages, older workers are valuable to employers because of some of their patterns and habits of work, such as loyalty, reliability, promptness, and strong interpersonal skills. Older workers often hold a business's valuable networks and institutional knowledge. (Just ask the New York City Metropolitan Transit Authority, that called retired subway employees out of retirement after a hurricane devastated the system.) And when it comes to research and development teams, research has also found that age-heterogeneous teams come up with more successful innovations than age-homogeneous teams<sup>7</sup>.

For those employers who want to ensure that older employees stay available to them, there are specific actions they can take to keep their employees nimble. Large production companies in Germany use team-based work on the assembly line, which avoids exhaustion and overexertion due to repetitive work and also leaves some room for autonomy for the team members to organize their work. Further, a number of big employers in Germany have been offering lifetime work hour accounts, which allow employees to bank time to work more or less as they decide. These accounts make it possible to "bank time" for sabbaticals, which allow for a change of pace by definition, the opportunity for further training spurts or for investing in work-life balance.

In New York City, the Steinway & Sons piano factory similarly moves workers from position to position throughout their tenure with the company, which is most often 30 to 50 years. With a skill shortage and the lengthy apprentice process necessary to master the

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thousands of steps it takes to build each piano, Steinway & Sons relies on the retention of its employees over decades to continue its business. Elsewhere in New York, small businesses report that their employees must remain particularly flexible as they are called on daily to perform tasks outside of their job description. Warehouse workers assist in the office. Kitchen staff and waiters help each other out. All hands are needed for big events.

Work is only one example of how by modifying our society and our environment we can change the course of aging, which is not a hard-wired biological inevitability that follows one predetermined trajectory. Promoting cognitive plasticity can apply to creativity in civic engagement, the educational system, the arts, and participation in housing, neighborhoods, and governance.

Remaining active, engaged, and, as this research shows, having the opportunity to do new tasks, is not just an individual advantage but a societal imperative. Just as we are exploring and building new sources of energy, recycling material many

times over, and finding new ways to conserve water, figuring out how to best promote people's development and aging will be a focus of the next century. ●

<sup>1</sup> Lutz, W., Butz, W. P., and Samir, K. C. (Eds.). (2014). *World Population and Human Capital in the Twenty-First Century*. Oxford, UK: Oxford University Press.

<sup>2</sup> Stock, G. et al. (2013). *A Future with Children*. Berlin: National Academy of Sciences.

<sup>3</sup> Willis, S.L., and Nesselroade, C.S. (1990). Long-Term Effects of Fluid Ability Training in Old-Old Age. *Developmental Psychology*, 26, 905-910.

<sup>4</sup> Voelcker-Rehage, C., Godde, B., & Staudinger, U. M. (2011). Cardiovascular and coordination training differentially improve cognitive performance and neural processing in older adults. *Frontiers in Human Neuroscience*, 5, 1-12.

<sup>5</sup> Schooler, Carmi, Mulatu, Mesfin Samuel, and Oates, Gary. (1999). The Continuing Effects of Substantively Complex Work on the Intellectual Functioning of Older Workers. *Psychology and Aging*, 14(3), 483-506.

<sup>6</sup> Oltmanns, J., Godde, B., and Staudinger, U. M. (2014). *What is the Effect of Work Task Mobility on Cognitive Aging?* Manuscript submitted for publication.

<sup>7</sup> Bowen, C. E., Noack, C. M. G., and Staudinger, U. M. (2011). Aging in the Work Context. W. Schaie and S. Willis (Eds.), *Handbook of the Psychology of Aging* (7 ed., pp. 263-277). San Diego, CA: Elsevier Academic Press.



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