

Part One

OPPORTUNITIES AND INNOVATIONS

Aging is not lost youth, but a new stage of opportunity and strength.

—Betty Friedan

Chapter 1

Our Aging Population— It May Just Save Us All

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For the first time ever, a growing resource populates the world—millions of mature people. They are better educated and healthier than prior generations of older people, motivated to make a difference, and knowledgeable and emotionally stable enough to do so.

Emotional stability improves with age. Knowledge grows. Expertise deepens. The brain actually improves in many ways. I was making this case to my dad a while back, about the many positive changes that accompany advanced age, changes that go widely unrecognized in a society centered around the glories of youth. Given the typical characteristics of aging, I said, the presence of millions of older citizens could improve the world significantly.

Not that I needed to convince my father of any of this. He was 92 at the time. His reaction: “Maybe we need to stop talking only about

how to save the old folks, and start talking about how they may save us all.”

What my father knew, and I also had learned, was that aging has an upside, and that the current aging demographic has much to offer society. For the first time ever, a growing resource populates the world—millions of mature people. They are better educated and healthier than prior generations of older people, motivated to make a difference and knowledgeable and emotionally stable enough to do so. At the same time that we invest in solutions for the very real problems older people face, we must identify and embrace these characteristics and developmental trends that show improvement with age.

A key challenge in the early twenty-first century is to build an infrastructure that taps the important areas of individual growth that improve with age—emotional stability, knowledge, and expertise—for the good of society.

The conversation with my dad about aging actually began some 40 years ago. He was in his fifties, as I am today. I was hospitalized for many weeks, after sustaining multiple broken bones in a car accident, and most of my fellow patients were old women. Orthopedic wards tend to have many older patients, the result of falls and broken bones.

As my pain subsided and boredom set in, my dad, a distinguished researcher and professor at the University of Rochester, suggested that I take a college course. I chose Introductory Psychology, and he offered to attend and tape the classes. He sat in on every lecture and brought the tapes to the hospital. (Little did I know that psychology would one day be my disciplinary expertise. And the fact that older women patients surrounded me as I first delved deeply into human behavior no doubt spurred my interest in aging.)

Despite the fact that my dad at the time was running a large research laboratory filled with graduate students and post-docs, he found time to take an introductory college course purely to benefit his daughter. He is an exceptional man; do not think for a minute that I am suggesting he is typical of any group, old or young. But the tendency with age to prioritize things and people who matter most *is* typical. Moreover, he had reached a stage in life where he had the knowledge and resources to know how to help. The fact that he didn't fall apart emotionally, but felt deeply moved by my situation, also is relevant to what we have learned about the aging brain.

I was trained in both life-span developmental and clinical psychology. Psychological aging offers an excellent example of the gains and losses that occur with age. Most people worry about their aging minds as much (or even more) than their aging bodies. Such fears are not unfounded.

There also are gains, however, and social norms are likely a bigger issue than the physical and mental changes that come with age. For most of that 30-year stretch we label “old age,” most people in the United States and the developed world function very well. They live in their homes, and participate in family and community life. They increasingly work, if often part-time. Though there are problems with old age, and the last year or so of life is pretty bleak for many people, that bleakness characterizes the end of life, not old age per se.

Overall, absent significant brain disease, the gains that come with age can functionally offset the declines that typically occur. Indeed, these gains present us with an upside, a resource never before available in human history—tens of millions of older people who are knowledgeable about practical matters of life, who have reared and launched their children, and who care increasingly about investing their time in things that really matter.

Longevity Is Here to Stay

Fears about aging are inherently ironic. Through most of human evolution, life was barely long enough to ensure survival of the species. “Nasty, brutish, and short,” is how the seventeenth-century British philosopher Thomas Hobbes described life. Even by 1900, a quarter of babies died before they reached the age of five. Death was common at all ages. Of the babies who survived to 18 years, 20 percent were orphaned in the process.

Women routinely died in childbirth. Romanticized images of multiple generations living together on the homestead were hardly the norm; rather they were exceptions to the rule. The life expectancy at the dawn of the twentieth century was 47 years.

Then, in a single century, we nearly doubled the length of the lives we live, adding almost 30 years to life expectancy for the average person between 1900 and 1999. The increase was spurred by massive cultural

shifts that were rooted in medical science and agricultural technologies, large-scale changes that improved sanitation and prevented the spread of disease.

Today, the majority of infants born in the developed world can expect to live into old age. In coming years, families will routinely include four and five generations. Growing old has its share of problems, to be sure, but the opportunity to grow old is very new.

As lives were extended, families had fewer children. The combination of these two phenomena starkly reconfigured population demographics and created aging societies. If people had begun to live longer but fertility had remained high, we wouldn't have aging societies today. The consequences of this aging pattern are clear and enduring, not just a short-term function of the baby boomers aging. The fact that the vast majority of babies born will reach 65 and beyond ensures that the age distribution is here to stay.¹ Short of global plagues that target only the elderly—science fiction-like possibilities—there is every reason to think that these demographic changes will remain into the foreseeable future.²

The numbers in Figure 1.1 are for the United States, a youngster when compared to our European counterparts. Western Europeans live longer and have lower fertility rates than Americans. Japan has

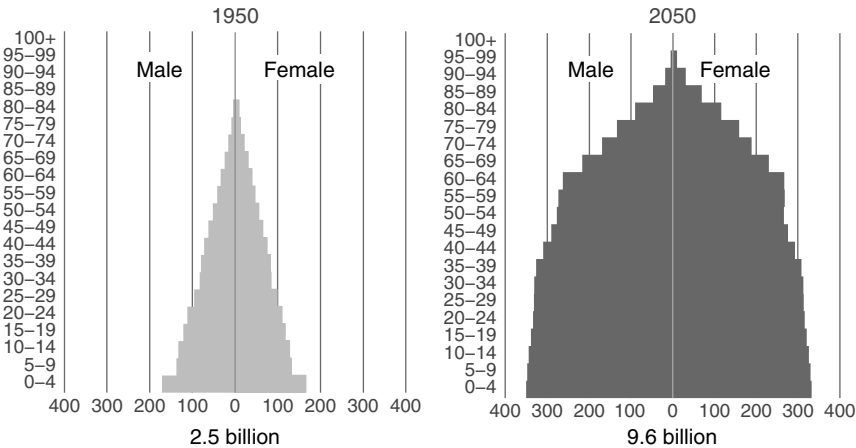


Figure 1.1 World Population by Age and Sex: 1950, 2050 (Projected)

SOURCE: UN World Population Prospects, 2012 Revision.

experienced even starker changes in longevity and fertility, with the longest life expectancies in the world and fertility below replacement levels. One in five Japanese already is over 65.

The fertility declines in the West are expanding to include the developing world, with countries like Brazil, India, and China now aging at an even faster rate than the developed world aged in the last century.

The Future of Aging Societies

In looking at societal aging, I often feel that there are two voices in the public discourse, the doomsayers and the romanticists. The doomsayers are the loudest. They use phrases like the “failure of success” and “gray dawn” to describe older societies. They worry that older societies will be unproductive. They say that large numbers of older citizens will break the bank, create intergenerational strife, and leave children in the dust. We hear their voices regularly on TV news and read their opinions in the newspapers.

The romanticists, on the other hand, equate aging with “sage-ing.” They are less prominent in public discourse, but passionate. They depict older people as spending their days pondering life and seeking joy and peace.

The truth, as I see it, lies somewhere in the middle. We should not lightly dismiss those forecasting doom. Golda Meier is famously quoted as saying, “Being seventy is not a sin. It’s not a joke either.” She was, of course, right. In truth, growing old isn’t easy on bodies or minds.

By very advanced age, arthritis, osteoporosis, and hypertension are normative. Muscle strength declines; falls are more common; eyesight, balance, and hearing suffer. Dementia risk doubles with every five years after 65. And because aging occurs in every cell in the body, the older we get, the more likely we are to be injured or become ill, with each health setback taking longer to recover.

However, it is important to recognize that health declines associated with age are a relative issue. In the last 50 years, each birth cohort that has reached old age has been healthier than the one before. Today’s 90-year olds are substantially healthier than those who reached 90 just a decade ago.³ Understand that gains in health may level off and could

even fall in light of the tolls taken by obesity and other lifestyle practices, as well as the unhealthful influence of disadvantages associated with race, poverty, and low education. It's hardly time to rest on our laurels. But if we take the long view, there is no question that health in old age has improved profoundly in the last century.

To fully realize the unprecedented opportunities longer lives afford, we need a clear-eyed view of aging. We need to identify fixable problems, find cures for diseases, and develop technologies to address the unfixable ones.

My optimism about aging societies is spurred by the fact that even without scientific advances, aging has its upside. We risk missing the opportunities before us if we focus only on problems and weaknesses associated with advanced age. It is time to carve out new roles for new resources, build technologies that compensate for fragilities, and move forward. In that vein, to begin any serious conversation about the potential of older societies, we need to consider what older individuals may contribute. To start that discussion, we need to consider the aging mind, including evidence supporting the idea that older societies may be wiser societies.

Senior Moments

Cognition refers to the ability to think, reason, process information, remember, and feel. We draw on cognition to comprehend speech, visually perceive and interpret the world around us, calculate probabilities, inhibit thoughts and actions, plan, problem solve, and monitor our behavior. The brain is the organ responsible for cognition, and different regions of the brain are more and less affected by aging.

Most of the research on cognitive aging has focused on what goes wrong, so one doesn't find much comfort in the scientific literature. Until recently, scientists mostly stumbled upon, rather than actively pursued, positive aspects of aging. It's becoming clear that there are lots of preserved areas of function in the aging mind, even some gains, and I'll review them below. But let's put the clear areas of decline on the table first.

Anyone over 50 probably has noticed changes already—forgetting the name of a friend, or words in conversation; lacking concentration

when reading the newspaper. These experiences occur for many of us against a backdrop of fear that they may foreshadow dementia, perhaps the most frightening prospect associated with aging. Dementia takes many forms, Alzheimer's disease being the most common. Dementias are horrific diseases. Progressively people lose the ability to remember, and later the ability to dress, walk, and conduct simple activities of daily living.

Scientists once believed that dementia came hand in hand with aging. It is increasingly clear that this is not the case.⁴ The (only) good news in this realm is that the majority of people will not get Alzheimer's disease, and that there appears to be less dementia in more recent birth cohorts than earlier historical times.⁵ Unfortunately, however, a recent study estimated that as the population ages, so will the number of citizens with dementia. By 2050, the U.S. number is projected to be 13.8 million, up from around 5 million in 2010.⁶

The upside is that we are living at a time when the potentials of science to address illnesses of all kinds are breathtaking. (Of course, we also need to change the way we live. Lives that last 100 years must be paced differently than lives that last 50 years.)

As science looks for a cure to this public health issue, it is important to avoid conflating dementia and normal cognitive aging. Scientists have revealed subtle changes in cognition decades before frank symptoms of dementia appear.⁷ So studies of "normal" aging can be skewed because they nearly always include individuals who are in the earliest stages of brain disease.⁸

This fascinating research suggests that the cognitive decline we've considered "normal" may inadvertently include presymptomatic individuals with brain diseases. That is, many years before even a skilled clinician would label the deficits as "symptoms," these folks are scoring at the low end of the normal range. In coming years, we will gain a much clearer picture of "normal" aging, and in all likelihood it will be a more optimistic story than the one we tell today.

The data in Figure 1.2 depict the vastly more robust cognitive trajectory of people without dementia. Still, a vast body of research shows that as normal brains age, the mind is less adept at processing information and innovative thought. Concentration and focus suffer. At the core of these changes is slowing, which inhibits the ability to learn novel

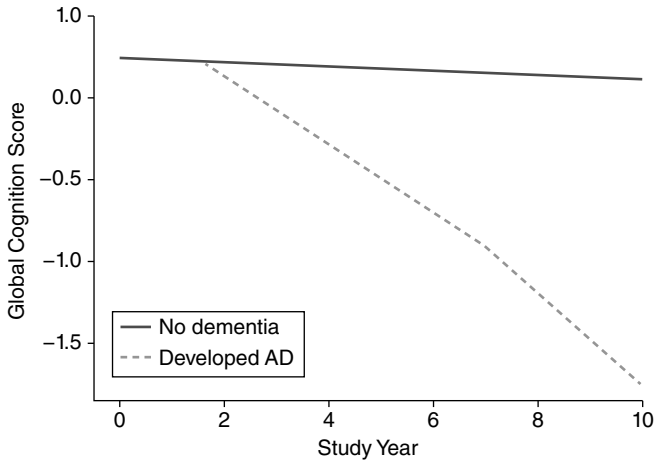


Figure 1.2 Decline in Cognition in People with and without Dementia

SOURCE: R. S. Wilson, S. E. Leurgans, P. A. Boyle, and D. A. Bennett, “Cognitive Decline in Prodromal Alzheimer Disease and Mild Cognitive Impairment,” *Archives of Neurology* (2011).

information, and affects attention and inhibition, as well as working, prospective, and episodic memory. Recollection and language are mildly impaired as time goes on.

Most aggravating to many people is the deterioration of memory. The aging brain over time particularly loses working memory—the ability to engage in tasks while mentally holding multiple pieces of information. This type of memory helps us to process and store new information, and to keep in mind the two or three numbers that we are trying to add together.

Older people are all too familiar with the troublesome inability to retrieve the exact word or name that they seek. A full spectrum of comedy relies on jokes in which an old person is asked the name of his old friend across the room. The punch line goes something like, “How soon do you need to know?”

Working memory loss appears inevitable, affecting even the healthiest people as they age. It is well documented across race, sex, educational background, and economic status, beginning, in fact, well before what we consider old age. Effects of slow and steady aging likely are linked to changes in the efficiency of neurotransmission.

The research also brings us good news—specifically, that not all types of memory decline. Procedural memory notably stays intact—governing what psychologists term “automatic” tasks, well-ingrained things that are performed without conscious effort. That could mean anything from using a computer to roller skating. This kind of memory is mostly exempt from the declines of age.

On another positive note, just as physical health has improved over the last century, cognitive decline has lessened. Elizabeth Zelinski and her colleagues studied two birth cohorts, born 15 years apart. As each group reached the age of 74, they were tested. The later-born of the two cohorts scored significantly higher. Indeed, they appeared about 15 years younger than the comparable group born in the earlier time frame.⁹ Each group performed more poorly over time but the negative slope in the later-born cohort was less steep.

So, cognitive decline is lessening in the modern era, very likely reflecting more education and better living conditions. As well, while there is ample evidence that aging brings unwanted changes in the speed and efficiency of cognitive processing, the negative slopes are significantly reduced when researchers remove individuals who are in the earliest stages of brain disease.

It’s also interesting—and encouraging—that the array of changes do not disrupt functioning in daily life. Although adults slow down, they don’t necessarily lose their ability to learn or solve problems in daily life. It’s a puzzle that fundamental elements of cognitive processing decline but the logical functional consequences don’t follow.

The Power of the Aging Brain

Indeed, why, when asked to name the smartest, most accomplished, effective leaders, do we tend to think of people well into their later years? How does Warren Buffett maintain his legendary reputation as an investor at 83? Why are young scholars so eager to work with professors well into their 60s and 70s? Why do we hear a global sigh of relief when Kofi Annan, at 75, enters into the mix when international conflicts grow heated?

The short answer? Experience. Younger people may learn faster than older people but older people know more. Despite losses in the speed and

efficiency of processing new information, learning continues through the most advanced ages. Barring dementia, knowledge continues to build. In the general population, vocabularies are larger and knowledge about the world is greater in the old as compared to the young. It may take older people longer to find words in conversation, but they know more of them.

In highly practiced areas, expertise deepens. Keep in mind that research findings about knowledge surely underestimate domain-specific knowledge because of the idiosyncratic nature of expertise. The general measures researchers use don't tap the deep knowledge that experts have in specialized domains. In one classic study of crossword puzzle champions, psychologist Tim Salthouse found that the older contenders performed better than younger ones, as seen in Figure 1.3.¹⁰ Experts—whether musicians, chess players, or scientists—often reach their peak in advanced years. Especially in areas of expertise, accumulated knowledge compensates well for processing declines.

But it's not a simple matter of accumulating facts and figures. Older people approach problems differently than younger people do. In *The Secret Life of the Grown-Up Brain*, Barbara Strauch, *New York Times* science editor, defied conventional wisdom by maintaining that the aging brain has strengths of its own that hold much opportunity for the betterment

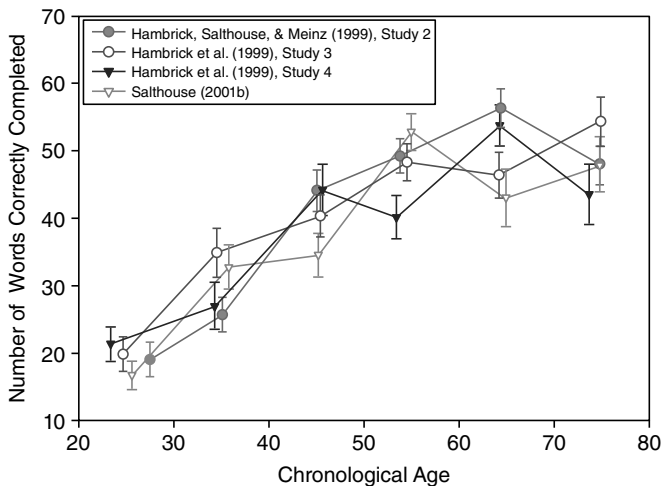


Figure 1.3 Crossword Puzzle Performance by Age

SOURCE: T. Salthouse, "What and When of Cognitive Aging," *Current Directions in Psychological Science* (2004).

of society. The August 2013 issue of *TIME Magazine* carried a large story suggesting that people get more creative as they grow older.

This wouldn't surprise psychologist Lynn Hasher. Hasher and her colleagues have studied disinhibition for many years, documenting in study after study age differences in the ability to suppress irrelevant information—what we might commonly call concentration. When working on a task, young people inhibit extraneous information better than older people. Hasher and her colleagues, however, discovered a potential silver lining. In elegant experiments, she shows that older people access and use the extraneous information when solving problems that arise in subsequent tasks.¹¹ Younger people are not privileged by the extraneous information. In other words, when your mind wanders while working on one problem, it may be readying itself to solve another.

Neuroscientist Denise Park maintains that high levels of functioning also are facilitated by the nature of our lives.¹² Novel situations become increasingly challenging with age, but older people encounter fewer of them. Instead, we engage increasingly in highly practiced, routine activities—which rely on procedural memory, the memory system that is not affected by age.

We know ourselves better too, what we're good at and where we're lacking. In a study of medication adherence, Park found that older people remembered to take their medication better than middle-aged people whose memories were ostensibly better.¹³ Older people, she observed, had established routines that served them better than direct reliance on memory. When you doubt your memory (which is well advised at any age), you rely on strategies that help you compensate.

A stereotype of older people depicts them as fixed in their ways. Park's findings suggest that there is some truth to it. However, daily routines don't extend to rigidity in attitudes or the unwillingness to consider different perspectives. Recent findings suggest that old and young people are relatively open to changing their attitudes. It's middle-aged people who cling to their established views.¹⁴

Additionally, research on perspective suggests that older people may have a substantial advantage. In a study from my Stanford laboratory, led by Sarah Sullivan, older and younger people were asked to read a story and later recount it from the perspective of the protagonist. In one condition, the protagonist was 25. In the other, she was 75.¹⁵ Otherwise

the story was identical. Younger people told both versions the same way. Older people told it as younger people did when recounting the 25-year-old's perspective but differently when told from the perspective of the 75-year-old. It makes sense. We don't lose our younger selves as we grow older. Younger people haven't had the advantage of being old but older people have all experienced youth.

Along the same lines, one of the most reliable findings about aging minds is that they are filled with knowledge about practical matters of life. Increasingly, we find ourselves in situations that have a familiar feeling. We learn from past mistakes. The concept of wisdom has been around for one thousand years, but research on the topic is relatively new.

Some of the most rigorous research was generated by Paul Baltes and his colleagues at the Max Planck Institute for Human Development in Berlin. In a series of studies, they presented older and younger participants with difficult situations and asked how they would address them. Responses were scored based on carefully crafted criteria, including an ability to see things from multiple perspectives, having large stores of practical knowledge, and understanding the relative nature of right and wrong. Reliably, middle-aged and older people scored higher than younger people. The Baltes group observed neither improvements nor declines from middle to old age.

As a rule, researchers have found also that older people seem to appreciate that there are very few pure truths in life. They outperform other age groups in dealing with emotional conflicts that are hotly charged.¹⁶ Richard Nisbett and his colleagues at the University of Michigan have been studying conflict resolution involving cultural and economic disputes over resources. Judges, blind to the age of the participants, reliably score older people's solutions as more even-handed and acceptable than those generated by younger counterparts.¹⁷ Across these studies, higher performance is related to the appreciation of multiple perspectives, willingness to compromise, and recognition of the limits of knowledge.

Motivation, the Aging Brain's Secret Weapon

When it comes to motivation, scientists also find changes across adulthood.¹⁸ In addition to meeting survival basics like hunger and thirst, two

general clusters of goals drive much behavior throughout life. One cluster involves exploration and expanding horizons, and includes objectives about learning, risk taking, finding one's place in the world, banking information, and social contacts that may pay off in the long run. The other set of goals centers on emotional satisfaction and emotional meaning.

These two constellations of goals operate throughout life and often compete with one another. When time is perceived as open-ended, as it typically is in youth, exploration usually wins out. Young people persist in struggling to find their place in a crowded world even if that means engaging in activities that don't feel particularly good. When time horizons grow shorter, goals that bring satisfaction and meaning to life win out. For most people, these goals focus on the people and causes that matter the most in life. With age, we tolerate superficial conversations less and value intimate conversations with loved ones more than ever.

And so, with age, we grow more selective about what time we invest and with whom. When time horizons grow short, we see clearly what is important and what isn't. We care less about the trivial matters in life. One elderly woman told me—apologizing because she didn't intend to sound arrogant—that as she gets older she cares less about what others think of her and more about what she thinks of others.

Not surprisingly, these motivational changes are good for mental health. Older people have lower rates of clinical depression, anxiety, and substance abuse.¹⁹ Age is associated with improved emotional experience and emotional stability. Negative emotions are experienced less frequently. We regulate emotions better, avoiding extreme highs and extreme lows.²⁰

Brains don't operate like computers, equally reviewing all information. Rather, brains attend to and process information that is relevant to our goals; so our goals determine what we see, hear, and remember. As we grow older and prioritize emotional goals, we come to focus on the good more than the bad in day-to-day life.²¹

So while aging is associated with decline in some aspects of cognitive functioning, and while the incidence of brain disease increases steadily at advanced ages, the majority of people—who will live out their lives without dementia—will find that age also is associated with greater knowledge about the world, deeper expertise in selected domains, and concern for investing in activities and people that really matter.

Tapping a Rich Resource

Many older people today are doing very well, contributing to families, workplaces, and younger generations. To the extent that these mature citizens are physically fit, mentally sharp, and financially secure, societies will thrive. Whether longevity is a benefit or a burden hinges on the status of long-lived people.

Yet humans are creatures of culture. We look to culture to tell us when to get an education, when to marry, work, have children, retire. And the culture that guides us through life today hasn't adjusted to the length of the lives we are living, or to our health and potential for productivity.

Societies need to find creative ways to maximally use older workers and volunteers. We might ask what sorts of societal needs can be best addressed by the well-engrained practical knowledge of older citizens. We have the opportunity to think of new ways to use new available strengths in a new type of citizen.

Instead of proclaiming older societies less productive and innovative, we will do well to begin building an infrastructure that taps this unique resource. The last thing we should be doing is asking older folks to go away and make room for the next generation. While human aging can bring scores of problems, from the physical to societal challenges such as funding retirement systems, populations where people live out their full lives offer unprecedented opportunities.

Aging comes with emotional balance, improved perspective and better mental health—a combination of characteristics that, to many, comprises the very definition of wisdom. Thus, although we must not let up on searches for cures for brain diseases or ignore the less pronounced changes that occur with normal aging, it is critical that we do not overlook the real talent available in a resource never before available in human societies—aging minds.

Notes

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