

# MIND

# ALERT



**UNITING THE HEART AND MIND:  
HUMAN DEVELOPMENT IN THE SECOND HALF OF LIFE**  
2004 SPECIAL LECTURE BY GENE D. COHEN

A JOINT PROGRAM OF  
THE AMERICAN SOCIETY ON AGING  
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**“A** new picture of human development and aging is emerging, and with it, a new understanding of humans’ ongoing capacity for change.” So begins Gene Cohen, former acting director of the National Institute on Aging and pioneer in the field of creativity in aging, in the lecture transcribed in this booklet.

A onetime student of Erik Erikson, Dr. Cohen doesn’t just chronicle the growth of human development theory and research since Erikson’s seminal *Identity in the Life Cycle* proposed the existence of late-life phases of development. Dr. Cohen has devoted many years to defining and exploring these phases: how they express themselves in individual behaviors and emotions, how each phase evolves into the next, and, ultimately, how these later-life phases represent a richly creative period of life, full of personal growth and societal engagement.

Most exciting is Dr. Cohen’s synthesis of his four phases of post-midlife human development with emerging neurological research into the workings of the brain in old age. “Brain tissue is creatively restless tissue,” he says. “The tissue *wants* to express the human potential it holds, and there are developmental mechanisms at work that allow this potential to be expressed . . . throughout the whole life cycle.”

Dr. Cohen gave this lecture in April 2004 at the Joint Conference of the American Society on Aging and the National Council on the Aging as part of the MindAlert program, which is sponsored by ASA and MetLife Foundation. Also profiled in this booklet are the winners of the fourth annual MindAlert Awards, which recognize programs that support enhanced cognitive function in later life.

# UNITING THE HEART AND MIND: HUMAN DEVELOPMENT IN THE SECOND HALF OF LIFE

**Gene D. Cohen**

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A new picture of human development and aging is emerging, and with it, a new understanding of humans' ongoing capacity for change. The historian Daniel Borstein once wrote, "The greatest obstacle to discovery is not ignorance but the illusion of knowledge." And this saying is particularly true of the area of aging. So many scientific fields have succumbed to the illusion of knowledge that there's nothing to be gained by aging. Current encyclopedias, for example, which attempt to convey the latest scientific thinking for a general audience, continue to present theories of evolutionary biology, which basically argue that after you lose the ability to reproduce you no longer have any value to the species in an evolutionary sense. These volumes reflect just how widespread the dissemination of misinformation about aging is.

The truth is, scientists haven't really studied aging, though they have had the arrogance to say that there's nothing positive to it. Talk about the illusion of knowledge!

Meanwhile, some of the newest findings emerging from the field of evolutionary biology are beginning to turn our misconceptions about aging around. For example, studies looking at bottle-nose dolphins and pilot whales—fellow mammals—are finding that grandparents in both species protect and feed their grandchildren. Grandmother dolphins and pilot whales often

breastfeed the children, and in so doing help protect that species so it can thrive. They offer a very potent illustration of how aging contributes to the survival and growth of the species.

In the area of human development, however, the illusion that we already know about aging has only served to prevent us from making much progress in building sound theories of psychological growth in later life.

Just as a reminder of what older adults are capable of, when I was at the National Institute on Aging I had the wonderful opportunity to interview George Burns as part of a series of public service messages the NIA was producing. At the time, the comedian was 97—and it turned out that Burns' agent was 85 and his joke writer was in his 70s. Talk about the changing faces of aging!

In public service messages, you only have 20 or 30 seconds to get your point across, and the whole point of our campaign was to get people to write in to the NIA for information about aging. The most successful message that we recorded that day came about when I leaned over and asked Burns, "What does your doctor say about your smoking and your drinking?" Burns, in his own inimitable style, replied, "My doctor is dead."

After that PSA started running, the NIA was inundated with information requests for the next two years.



Dr. Gene Cohen of the National Institute on Aging talks to George Burns. Cohen asks, "What does your doctor say about your smoking and your drinking?"



Burns, in his inimitable style, replies, "My doctor is dead."



After the interview, Cohen gives Burns a certificate, and Burns gives Cohen a cigar.

Our understanding of aging and capacity goes far beyond individual anecdotes, though. Indeed, a growing area of neuroscience that focuses on behavior is helping us better understand the capacity for life-long learning and creative expression. One of the studies that opened up this field was led by Marian Diamond, a professor of human neuroanatomy in the Department of Integrative Biology at the University of California, Berkeley. (Incidentally, she presented the 2001 MindAlert lecture.) Dr. Diamond's landmark study—it's hard to believe it actually took place in the 1960s and 1970s—examined the effects of a challenging environment on the anatomy and functioning of the brain.

In this classic group of studies, Dr. Diamond and her colleagues separated laboratory rats into two groups. The first group was left in their "normal" environment, a standard maze constructed for the rats' diversion. The second, experimental group was placed in a much more complicated maze, with games and toys, and in a more social environment. Rats, like people, like to have others of their species around them.

After some time, the researchers compared the brains of the two groups of rats. The results turned upside down our understanding of the human brain. What the researchers found, to their surprise, was that the brains of the challenged rats showed an increase in weight, manifested as increased thickening of the cortical—or thinking—part of the brain. The nuclei of the brain cells grew in size, and these cells sprouted significant amounts of new dendrites.

But that wasn't all. Our neurons are surrounded and nourished by tiny cells called *glial cells*. Einstein's brain was found to have an increased number of glial cells. Well, the challenged rats also showed increased numbers of glial cells in their brains, as well as increased production of acetylcholine—a neurotransmitter that's found at deficit levels in individuals with Alzheimer's disease.

Now, if you think of these cells with dendrites as trees with branches, and if you think of the chemical messengers through which these cells communicate as squirrels, picture two trees with squirrels living on them. The squirrels are able to leap from

one tree to another more easily if the trees have more branches. Likewise, if adjacent cells have more dendrites they form more points of contact, called *synapses*. Increasing the number of synapses improves communication between cells.

The other exciting aspect of Diamond's research findings was that in looking at animals at different stages of their lives, the researchers discovered that all of the changes that I've described above—all of them—continued up to the end of life. So basically this very sophisticated research validated common wisdom—use it or lose it!—but also took this anecdotal piece of advice a

*Scientists haven't really studied aging, though they have had the arrogance to say that there's nothing positive to it. Talk about the illusion of knowledge!*

step further. Diamond showed that it's never too late to start "using it" to achieve significant benefit. With this discovery, she opened up a whole new understanding of brain plasticity.

While Diamond was conducting this pathbreaking work in behavioral neuroscience, research on psychological theory about human development and aging was shrinking, and very little work was devoted to linking the two types of research and examining the implications for our knowledge about ongoing psychological development as people age.

Basically, behavioral neuroscience is viewed as focusing on the biological bases of behavior. However, psychological theory regarding human development and aging has focused more on how psychological issues and behavioral manifestations change over time, with even less attention to underlying biological mechanisms. Part of what I've tried to do is to bridge these two areas.

One of the key principles of behavioral neuroscience is that experience can modify brain structure long after the brain has stopped developing. But before Diamond's landmark studies, most of the research in

this area had been focused on what was built into the brain and how that played out early on in our lives. Many earlier behavioral neuroscience theories asserted that by the age of three or five, the biological underpinnings of human development were complete, and if underlying biological mechanisms influencing development hadn't had their impact by those ages, they never would. But Diamond's new research on brain plasticity began to show the remarkable effects of experience on the brain—effects that strongly resembled the impact of built-in developmental forces.

Joseph Ledoux, one of the leading neuroscientists in the United States, has focused significantly on synapses, which, again, are

*The researchers found that the couch potatoes received the same positive health effects from social engagement and productive activities as physically active elders received from exercise.*

the communication points where the axon of one neuron connects with the dendrites of another to send neurotransmitters, the chemical messengers involved in effecting communication among brain cells. Ledoux and a number of other investigators discovered the enormous impact of experience in increasing the number of synapses—by 20 percent or more. That's an extraordinary impact. In *Synaptic Self: How Our Brains Become Who We Are* (Viking Books, 2002), Ledoux wrote, "Synaptic connections are adjusted by environmentally driven neuroactivity and specific neurosystems. When these changes occur during early life, they are said to involve developmental plasticity. When they occur later, they are considered learning." Continuing on, here's the punchline: "But the line between developmental plasticity and learning is a fine one, and perhaps even nonexistent."

In effect, what Ledoux is saying is that the effects of learning on the structure of the central nervous system are very similar, if not identical, to many of the effects of childhood brain development.

Not only do Diamond's and Ledoux's findings show the impact that experience can have on our brains, they also show that we can influence our own destiny in terms of our capacity for ongoing development and change. That's part of the background of the new theory that I'll expand on later.

We all know the impact of physical exercise on health and longevity, and we all hear the glib advice "Be active." But what does "active" mean? In 1999, Thomas Glass, an epidemiologist at the Johns Hopkins Center on Aging and Health, published another very interesting study in the *British Medical Journal* (1999). Glass was reporting on epidemiological studies that three collaborating medical centers conducted in the United States. These studies focused on the impact on general health and longevity of being involved with social engagement and productive activities.

In these studies, researchers separated their subjects, who were all ages 65 and older, into two groups. The first group was made up of older couch potatoes who had very little challenging physical exercise but were quite involved in socially engaging and productive activities. The researchers compared this group to a second group of elders who were physically active. After 11 years, the researchers found that the couch potatoes received the same positive health effects from their social engagement and productive activities as physically active elders received from exercise. This is not a contest in terms of which is better—and again, we all know the value of physical exercise—but people hadn't really profoundly appreciated how significant other kinds of activity are.

## **Historical Perspectives on Aging and Human Development**

The term *psychological development* refers to how the capacities of the mind grow and change in terms of our thinking, emotions, and behavior over the course of the life cycle. Psychological development in the second half of life is an area that has attracted little scientific attention and theory development.

Psychological development helps set the stage for positive changes in one's life at

different points across the life cycle. Hence, we need to know much more about it in relation to aging to help maximize quality of life in the second half of life. The earliest description of human development that I could find was written more than 2,500 years ago by Confucius. He wrote, “At 15 I set my heart upon learning, at 30 I established myself in accordance with ritual, at 40 I no longer had perplexities, at 50 I knew the mandate of heaven, at 60 I was at ease with whatever I heard, at 70 I could follow my heart’s desire without transgressing the boundaries of right.” Unfortunately, he died when he was around 72; otherwise, he would have covered his 80s and 90s.

Since the time of Confucius, most people who have been involved in elaborating human-development theory have for the most part not been concerned about what takes place after the age of 50. Erik Erikson, who was one of my teachers when I was in college, of course looked further in the sense that the psychosocial stages of development he articulated continued into later life.

Though I studied Erikson’s classic work *Identity in the Life Cycle* at the time, I recently returned to it and discovered that his description of aging took up one page—making it one of the most successful sound bites in history. The significance of Erikson’s one page is that he established that development continued into old age. To his credit, he stated that what he wrote on aging was thin and that he would leave it to his students to explore the topic.

So I took him up on that challenge.

Remarkably, other major theorists have written very little about the aging process. Carl Jung wrote about aging, but less in the sense of development and more from the perspective of finding the meaning of aging. Jung’s key point: “Could by any chance culture be the meaning and purpose of a second half of life?” He talked about the first half of life in a more typical evolutionary biology sense—procreation and the advancement of the species—but he went beyond what most evolutionary biologists talked about. Unlike them, Jung saw value to aging. He was one of the few early psychological theorists to weigh in significantly on the topic.

Now, in many ways Sigmund Freud, whose influence on psychological theory was so profound, set the field of mental health back in terms of its perspective on aging when he wrote in 1907:

The age of patients has this much importance in determining their fitness for psychoanalytic treatment, that on the one hand, near or about the age of 50 the elasticity of the mental processes on which treatment depends, is, as a rule, lacking. Old people are no longer educable, and on the other hand, the massive material to be dealt with would prolong the duration of treatment indefinitely.

This is a classic illustration of the illusion of knowledge—from one of the great scientists in the history of the field. Now, paradoxically, Freud wrote this statement when he was about 50, and some of his own greatest works were written after the age of 65. Furthermore, *Oedipus Rex*, the work that Freud saw as the greatest literary masterpiece of all time—the literary validation of his then-pioneering psychoanalytic theory—was written by Sophocles when the Greek playwright was 71 years old.

Jean Piaget, who made such an extraor-



Sigmund Freud

dinary contribution to our understanding of cognitive development, basically ended his description of stages of intellectual and cognitive development with what he referred to as *formal operations*, reflecting the level of abstract thinking that matures during the teenage years through the close of adolescence.

### Is There Such a Thing as a Midlife Crisis?

Now, Dan Levinson and his significant work *Seasons of a Man's Life* introduced the concept of the midlife crisis. Again, that book only covered up to age 50, and Levinson's study focused on 40 men between 35 and 40 years of age. Gail Sheehy attended Levinson's lectures and published *Passages* before Levinson came out with *Seasons of a Man's Life*. Sheehy's book was really based

*Ours is a species that wants to explore new things. I see this drive as a built-in evolutionary push.*

on the same content, and this book, too, stopped at age 50. Her followup book, *New Passages*, went beyond that point. But, in Sheehy's own words, *New Passages* wasn't theory driven. Rather, the book focused on particular cohort groups whose behaviors were influenced by what period of the 20th century they grew up in; it didn't look at universal developmental issues.

Now, the other thing about these theorists was that their perspective on human development was focused on crisis. Erikson popularized the term *identity crisis*, which he described as an event occurring during adolescence. Levinson talked about crisis from a midlife sense. In Erikson's writing, however, he talks about crisis being a key issue at all eight stages of development. So many of these theorists, including Freud, felt that if you didn't resolve these crises, you paid the price: You would move into the next developmental stage with unresolved issues from the previous one(s), which would take a toll on your mental

well-being. This approach defined a lot of the interventions that would then go on in therapy to work through those unresolved issues. Now, other theorists, such as George Vaillant, shifted away from talk of crisis to a discussion of "critical tasks" that you had to accomplish at certain stages of life. If you did not successfully accomplish these tasks, there, too, you would pay a price.

My point here is not to criticize these theories. I think that all the people I've mentioned have made enormous contributions to our understanding of human development. However, my feeling is that these theories are incomplete in a very fundamental way. Through my own research in this area, which has now been going on for 33 years, I've seen many people with serious, unresolved crises still accomplish remarkable things. Many people are crippled, so to speak, by their crises—but many others surmount their crises and do tremendous things.

Ours is a species that wants to explore new things. We want to climb mountains, we want to explore space, and, as John Glenn showed, there's no age limit to doing those remarkable things. I see this drive as an evolutionary push that is built into our species. In terms of influencing ongoing development, I see this push not just as sublimating psychosexual issues, as Freud discussed, or resolving problems in order to move forward. Yes, we all encounter problems, and they have an impact on our lives and we need to deal with them. But there's another area that I feel has received very little attention, and that's the inner push that relates to the inherent potential in our species.

Going back to my earlier discussion about how experience alters the basic structure of the brain, some dots have just not been connected. If we're now agreeing that you alter the structure of your brain through learning, is it unreasonable to expect that when you alter that structure you should see some impact on functioning? And this dynamic of development must go on throughout the life cycle.

Ongoing life experience doesn't just alter the development of the central nervous system in anatomical and structural ways—

that is, by causing an increase in the number of dendrites and the number of synapses—but also in ways related to our functioning, and the expanding nature of our capacity for facing challenge and opportunity. We’ve all looked at the genes as a sign that nature is all-powerful, but some of the latest research findings are showing the tremendous impact of experience on triggering or altering the expression of genes. The genes contain the potential, but in terms of their *expression*, the genes themselves are altered by experience.

What hasn’t been talked about is the functioning of the brain through the mind that reflects our mental awareness in terms of cognition and emotions. Remember that brain tissue is creatively restless tissue. Human brain tissue is in many ways the most remarkable accomplishment of evolution. The tissue *wants* to express the human potential it holds, and there are developmental mechanisms at work that allow this potential to be expressed in different ways—not just through the end of adolescence, but throughout the whole life cycle.

## THE FOUR PHASES

What I’m now proposing is four developmental stages of late life: the *midlife reevaluation* phase, the *liberation* phase, the *summing-up* phase and the *encore* phase. I introduced these four stages briefly at the end of my book *The Creative Age* (William Morrow & Co., 2000). Since the book came out there’s been so much interest in the stages that I’ve developed them extensively, trying to look at the nature of the inner push that results in the manifestations of these different phases.

### Midlife Reevaluation Phase

In the midlife reevaluation phase, I feel that what’s going on in the brain are factors that are influencing reevaluation, exploration, and transition. Interestingly, I published my first paper on this subject in January 1999. I remember the date very vividly because the next month the MacArthur Foundation, which has been involved with a major study on midlife, published a report

that the press picked up on. The press, in their own inimitable way, came up with the headline “Midlife Crisis Has Been Greatly Overrated.” In his book *Seasons of a Man’s Life* Levinson reported that 80 percent of people in midlife went through a crisis. The findings from the MacArthur study, which was largely survey research, found that the vast majority of people in midlife did *not* have a midlife crisis. In my paper, which used a different methodology—interview-driven, qualitative research—I reported the same finding. In fact, only 10 percent of people I interviewed reported having a midlife crisis *per se*. However, I also reported something that I felt was much more significant. In midlife most people underwent a profound reevaluation, asking themselves: Where have I been? Where am I now? Where am I going?

One of the main points of my discussion so far has been the importance of linking observations like this to findings emerging from basic neuroscience studies. This midlife reevaluation phase takes place a little more fluidly than Levinson thought—between 35 to 65 years of age. Which brings up another point: I use the term *phase* to imply something more fluid and less rigid; *stage* often connotes something abrupt. Development phases are largely sequential, but as developmental changes phase in and phase out, there’s a lot of overlapping. You see overlap-



Madeleine Albright



ping of these phases during the transition periods, so age 35 to age 65 is a pretty extensive period of time in which you can see the dynamics of midlife reevaluation.

Piaget's followers introduced a form of thinking called *formal (operational) thought*. Formal thought reflected more the influence of the mind than the heart, was oriented more toward solutions than questions, and focused more on the sense of absolutes rather than what is relative. Piaget's followers viewed *postformal thought* as integrating the influence of the heart and the mind, being more concerned with questions than answers, and focusing more on the relative than the absolute. Adolescents have capacity for certain aspects of postformal thought, but the people who developed the concept have increasingly seen postformal thought as a quality that matures with aging and contributes to wisdom. Postformal thought looks at some-

*Jung's key point: "Could by any chance culture be the meaning and purpose of a second half of life?"*

thing with both cognitive intelligence and emotional intelligence at the same time: the mind and heart addressing issues and arriving at competing and, at times, contradictory solutions.

If you are seeing things using postformal thinking, your thinking is changing in such a way that it's really setting the stage for ambivalence, which is a major factor in midlife leading to this reevaluation phase. I think that the physiological changes brain tissue is undergoing in midlife may be influencing these cognitive manifestations. I'll discuss these changes, as revealed by some of the latest research, in a moment.

Now, attempting to look at the concepts of later-life phases in a universal context, not just a cohort context, means linking these phases to basic brain changes—and also looking at them historically. Is this just the way people are thinking in 21st-century America? What about people who lived in earlier times? Even in the United States in

1900, life expectancy was less than 50, so not many people lived to the latter parts of middle age. I think these dynamics have always been there, but they haven't really come into relief until now because there haven't ever before been so many older people.

So in addition to looking at contemporary examples of late-life development, it's really important to look also at historical examples. The 14th-century poet Dante began the *Divine Comedy* just as he was entering middle age. The first words of the *Inferno*: "Midway life's journey I was made aware / That I had strayed into a dark forest, / And the right path appeared not anywhere." You can see the poet beginning with a fundamental reevaluation: What is all this about?

Gerontology has provided us with other contributions to explain in a psychological sense what's going on during midlife. This is the research that has tried to determine the point in midlife and later life at which dread of death is greatest. Death is, of course, more in the minds of older as compared to younger people because elders see more contemporaries dying, but *dread of death* is a very different issue. I often challenge colleagues and ask them, How many older people have you seen with a real anxiety about death? If they have not been clinically depressed, recently experienced a major loss, or received a diagnosis of a life-determining illness, it's very unusual to see older people with dread of death. In fact, sociologists have found that among healthy people, dread of death is actually greatest in middle age. What happens, particularly as we turn 40, is that for the first time in our lives we begin to think about the time left to us as opposed to the time gone by.

Children are always looking at where they are from the start. Oh, I'm six now, I'm 12. Adolescents, still looking at where they are from birth—as opposed to where they are from death—have a sense of immortality that societies have exploited. It isn't just the physical strength of youth that has sent young people to war, but also their feelings of immortality. Upon entering middle age, our focus begins to shift profoundly toward looking at time left. So often, when I've spoken to people in antiaging societies, the people who are the most aggressively inter-

ested in research into expanding lifespan have just entered middle age.

I feel that what's also influencing this shift in perspective is the maturation of postformal thought, or a growing ability to deal with competing issues and solutions. It all comes together. I feel that the impact of experience, the changing way in which we think, and the ongoing development of the brain has altered the nature of that creatively restless tissue—in effect generating new psychological tendencies and capacities—bringing one into a new developmental period: the midlife reevaluation phase.

Classic literature has portrayed this transition through Odysseus, a middle-aged individual who spent 12 years in active reevaluation. His experience was somewhere between a reevaluation and a crisis. A more contemporary example of midlife reevaluation would be author Alex Haley. Listening to his grandmother talk about the background of his family sparked his curiosity, which led to an odyssey that took him 11 or 12 years to complete and led him to three continents. His research culminated in the writing of *Roots* when he was in his mid-50s. The book in turn had a profound effect on our culture. It was a manifestation of midlife reevaluation.

In her mid-40s, Madeleine Albright went through a traumatic divorce when her husband left her. The experience contributed to an intense reevaluation. She changed the nature of her activities, started teaching political science at Georgetown University, and began hosting political salons in her house in Georgetown. Many of those who attended became significant political leaders and policymakers. When Albright was 56, she was named U.N. Ambassador, culminating the period of her midlife reevaluation, and at 60 she became the first woman to be appointed secretary of state. This long period of midlife reevaluation, which began in a crisis, moved her in a very positive direction.

These are, of course, only snapshots, but they do reflect what people generally do at different phases of their lives. Changes in their brains that come with age affect the ways that they perceive their lives, the development of postformal thinking and, thus, the actions they take.

## Liberation Phase

The midlife reevaluation phase is followed by what I call the liberation phase. The dynamics going on in our creatively restless brain tissue are continuing to be influenced by ongoing life experience and are manifest in the form of a sense of liberation, a desire to experiment and to innovate. This desire overlaps with midlife reevaluation, and then comes on strong throughout our late 50s and 60s and into the 70s. As this shift is happening, what's going on in the brain is quite fascinating. These psychological periods correspond with significant physiological changes in the brain.

I spoke earlier about the impact of experience on dendritic sprouting and the formation of new synapses. Subsequent research has found that the time in the life cycle when we have the greatest number of dendrites in the brain, particularly in the hippocampus—the part of the brain that's involved with processing information—is from the early 50s to the late 70s. This is the time when we start receiving birthday cards saying it's too late, you're over the hill, get out your rocking chair. But in the brain, this period is when we have tremendous capacity in terms of both the buildup and the length of dendrites. They're having their greatest reach in terms of influencing communication between cells. And remarkably, this period corresponds extraordinarily well



Nelson Mandela



with what I've been describing as the liberation phase.

The 50s through the 70s is a period where you often see people expressing the sense of "If not now, when?" or "Well, what can they do to me?" People at this age want to do the right thing. These feelings powerfully influence behavior.

I'm currently working on a study of retirement that the Atlantic Philanthropies is supporting. One of the participants, who was 68 when we interviewed her, had been a librarian all her life. She told us that she had always been reticent to speak her mind. But the whole time she was a librarian, she became extremely knowledgeable about many of the most important issues in society. Then, when she retired and finally had time to do more of the things that she wanted to, she began to join different task forces in local government. She told us, "You know, I've learned a lot and I have things to say, and I'm not sure they're going like all these things that I'm going to say. I now feel more comfortable saying them. What can they do to me?" It's a remarkable feeling.

Throughout history, there have been many shapers and shakers of society who had an enormous impact on the world around them at age 70. Socrates was 70 when he was forced to commit suicide because the force of his cogent ideas were seen as destabilizing to the assumptions of

immediately and spent the last eight years of his life under house arrest. Even though he became blind, he worked out the mathematics of the swing of a pendulum. On his 70th birthday, Mark Twain wrote, "The seventieth birthday! It is the time of life when you arrive at a new and awful dignity; when you may throw aside the decent reserves which have oppressed you for a generation and stand unafraid and unabashed upon your seven-terraced summit and look down and teach—unrebuked."

Such a sense of liberation is a powerful feeling. Again, you see dramatic correlates between the emergence of this phase and a peak in the number of dendrites in the hippocampus—which processes questions like What can they do to me? and If not now, when? It could be coincidence, but I don't think so.

Laura Ingalls Wilder told wonderful stories about 19th-century American life on the frontier, and her family pleaded with her for years to write these stories down. They said, these are wonderful stories that you should share. Finally, at 65, she's in her liberation phase, and her daughter says, "Enough is enough! You must start writing now." So she started the *Little House on the Prairie* series of books. *Little House on the Prairie* itself was published when Wilder was 68, and she wrote the entire series between the ages of 65 and 75.

*The summing-up phase is a period of life review, conflict resolution, and societal contribution.*

Athenian society at that time. Nelson Mandela was 70 when public pressure influenced his release from prison and the governmental suppression of his ideas. At 70 Copernicus finally felt comfortable publishing his extraordinary work theorizing that the Earth revolved around the sun, and he caused a double revolution in science and theology. He was lucky—he died almost immediately after he published his work. In the next century Galileo, at the age of 68, published his work proving Copernicus' theory, and he was arrested

## Summing-Up Phase

The liberation phase is followed by what I describe as the summing-up phase. It's a period in which the descriptive dynamics that are going on are recapitulation, resolution, and contribution. Robert Butler writes about the value of life review, but this phase is about more than that.

The summing-up phase is a period of life review, conflict resolution, and societal contribution. If you're looking back and summing up your life, one of the outcomes of this process—which, let me remind you, occurs at the end of a period in which your hippocampal dendrites have reached their maximum level—is a desire to give back. I feel that this drive is manifested in many major activities. The tremendous growth in

autobiographical writing at this time of life is an illustration of wanting to give back. Volunteerism, which is very strong among older people well into their 80s, is influenced by this period of summing up, philanthropy, and wanting to give back. Another part of the summing-up phase is looking at what's left to be done or what's unresolved, and so this period is often a time when you see the resolution of conflicts that have endured a very long time.

Now, sometimes a theory can influence how you search for information and what you find. I feel that these human development phases that I'm describing are influenced not just by life experience but by how all this accumulating experience has actually modified the anatomy and physiology of the brain, which translates into different activities.

Based on my theory, I wondered what I would find if I did a medical database search using words such as *autobiography*, *summing up*, *age*, and *brain imaging*. When I entered these words, the database came up with a study published just three months before. Using functional magnetic resonance imaging (MRI), the study compared the brain activity of young people and older people as they told their autobiographies. The research revealed that the young predominantly used their left hippocampus and the old used the right *as well as* the left hippocampus when they were telling their life stories. Now, the illusion-of-knowledge factor might have influenced people in previous eras to look at research like this and think: This is compensation. There are negative changes going on in the older brain, and this is the brain compensating for those changes. I have no problem at all with that interpretation, but compensation also connotes new capacity.

The study, I feel, is an extraordinary example of brain *recruitment*. It's the next stage beyond a generic concept of brain plasticity, which posits that brain tissue has the capacity to modify itself. This study shows that the brain also has the capacity to recruit other areas of the brain—here the right brain is being recruited to more actively join the left. From all we've learned from Nobel Laureate research on the different roles of the left and right brain, if the right

brain is getting involved in left-brain function, it also has to be making some contribution to the process through some of its own generic right-brain capacities—adding right-brain capacity to left-brain function. If you suffer from the illusion of knowledge and thus fail to recognize the importance of these newly discovered changes, arguing that *just* compensation is going on, then you're missing what's right in front of you. Not only is the left brain recruiting new right-brain tissue, right-brain tissue also has different capacities than left-brain tissue and

*This new synergy of effort between the left and right sides of the brain translates into a new influence on the mind.*

is bringing these new capacities to bear with aging. I feel that this recruitment contributes to a sort of inner push to want to sum up your life. In effect, this new synergy of effort between the left and right sides of the brain translates into a new influence on the mind, in this case in a growing desire and feeling of capacity that one can give back through the sharing of important memories. Remember, too, that the hippocampus is involved in information-processing and memory formation, and now both the left and the right hippocampi are active in combination.

Other research is introducing very new concepts and allowing wonderful new theoretical linkages to be made. The HAROLD theory (hemispheric asymmetry reduction in old age) is pointing out that as we age, the asymmetrical use of the hemispheres of our brain—preferring either the right or left sides for particular tasks—is reduced. In effect, as we age we use the whole brain more.

Again, many would trivialize these findings as compensatory. Now, with pharmacology, when a drug has an interesting effect that was not expected, one doesn't call this a side effect; you know, they call it an off-label effect, implying that the unexpected effect is not necessarily less important than the expected effect. Indeed, some-



times some of those off-label effects are as important as or more important than what the drug was originally intended for. So the HAROLD effect may be compensatory, but I feel it's far more than that. This is creatively restless brain tissue, and it's contributing to a changing inner push and inner milieu of the brain, which is influencing the mind and psychological development in later life.

We don't have the research yet, but I'm trying to sort of push for it, to see if part of what's going on with postformal thinking is that there's a beginning of a reduction in hemispheric asymmetry in midlife. Because I'm theorizing that if you're having a better linkage between the heart and the mind, that's also a better linkage between left brain and right brain. We're certainly observing postformal thought building in that stage of life, just as midlife reevaluation begins.

As I mentioned earlier, one aspect of the summing-up phase is that you identify unfinished business. For example, in 2000, a talented music critic wrote in *The New York Times* about Giuseppe Verdi, marveling that Verdi composed his opera *Falstaff* when he was 80. The critic thought *Falstaff* was one

of the greatest operas ever written, but for the life of him couldn't understand why Verdi wrote a comic opera at the end of his career. Well, I can't fault the critic for not reading my book because it came out the same month as his article was published, but I actually addressed that very issue in the book. *Falstaff* was only the second comic opera that Verdi had ever written. The first one, *A Day in the Life of a King*, was composed when he was 25; it flopped miserably the night that it opened at La Scala. The flop happened at a traumatic time in Verdi's life—he had recently lost his wife and a child. He wanted to leave opera, but he was under contract to compose another opera. Well, his patron wisely advised Verdi to take his time, and Verdi finally wrote a new opera that was very successful. Fifty-five years pass, and Verdi is at the top of his field, but he has this gnawing sense of unfinished business. I was thinking if I were Verdi, in my summing-up phase, I would want my new comic opera to open at La Scala, the scene of my greatest failure. And *Falstaff* did open there, to a resounding success.

Another example of the creative expression that comes out of the summing-up phase is Martha Graham, high priestess of modern dance. She continued to dance until her mid-70s, and then in the “keeper of the culture” aspect of the summing-up phase, she turned to choreography. She had a big enough impact as a dancer, but as a choreographer, her impact was even more profound, and she continued this activity for the next 21 years. She choreographed her final piece at the age of 96.

### Encore Phase

The final phase is what I call the encore phase. The dynamic aspect, I feel, that our creatively restless brain tissue undergoes during this phase is reflection and a desire for continuation and celebration. I use *encore* in the French sense—again, still, continuing. This phase is not just a swan song, but more a variation on a theme: the desire for people to continue. Part of the way that the species survives is manifested in the end of life as a desire to continue building upon the brain reserves that have been developed



Laura Ingalls Wilder

over the course of one's life. The impact of this desire is not just felt by the individual but also by those around him or her. There's a tremendous sense of celebration on later birthdays. They are often the basis for reunions—the family, not just the individual, wanting to continue. Despite facing great adversity due to illness or other limitations, people during this time of their lives feel a great desire to continue. That desire at times leads to new manifestations of creativity, as in the process of continuation one can see new variations on longstanding patterns of interesting expression and behavior, as well as periodic surprises through entirely new perspectives on life.

At the ages of 105 and 103, respectively, the Delaney sisters, two African American centenarians who built their whole lives together, wrote a joint autobiography that shows both the summing-up and the encore phases. That sense of celebration is present in the subtitle of their book—*The Delaney Sisters: The First Hundred Years*. Then two years later Bessie died and Sarah wrote an encore book, *On My Own*. In another example, it was impressive enough that George Abbott, the great playwright and Broadway producer, wrote *Damn Yankees* when he was 68. But then, as an encore, he revised it when he was 107.

## Conclusions

There's an enormous amount to say about these phases, and so I'm writing a new book, to be published in the fall of 2005, that will give me enough space to do it. But even if this discussion of the theory may have been superficial at times, I wanted to give you a sense of sequential but overlapping phases of later life. I've taken a different tack than that of most writers in psychological development, who have focused on a model of crisis or task resolution. I don't want to overthrow their theories, but rather to add to them the idea of a creative inner push that influences us and is manifested in these different ways. For me, looking at aging with this concept of human development in mind gives a more complete picture of the human condition.

Such a model of aging also can help us understand our own capacity for change. Since our experiences influence the very structure of our brain, how we continue to challenge ourselves through experience influences our own developmental destiny and our capacity for change.

Final comment: Dear Abby once asked a 105-year-old woman what the advantages of being a centenarian were. The woman reflected for a moment, then replied, "There's less peer pressure."

## ABOUT THE AUTHOR



**Gene D. Cohen, M.D., Ph.D.**, is the first director of the Center on Aging, Health and Humanities, established in 1994 at George Washington University, where he also holds the positions of professor of healthcare sciences and professor of psychiatry and behavioral sciences. Within the center, he cofounded the Creativity Discovery Corps, whose mission is to identify and preserve the creative accomplishments and rich histories of underrecognized older adults, especially those who are socially isolated and homebound.

In addition, Dr. Cohen is the founding director of a think tank on aging—the Washington, D.C., Center on Aging, established in 1994. He is also a past president of the Gerontological Society of America. From 1991 to 1993, he served as acting director of the National Institute on Aging (NIA) at the National Institutes of Health. Before coming to the NIA, Dr. Cohen served as the first chief of the National Institute of Mental Health's Center on Aging—the first federal center on mental health and aging established in any country.

Dr. Cohen graduated with honors from Harvard College. He then received his medical degree from the Georgetown University School of Medicine and his doctorate in gerontology from the Union Institute. He was the first editor in chief of *The American Journal of Geriatric Psychiatry*. He is also the author of more than 150 publications in the field of aging, including the first book on creativity and aging, *The Creative Age: Awakening Human Potential in the Second Half of Life*. PBS produced a one-hour television program on *The Creative Age*.

Dr. Cohen has major interests both in creativity and aging, as well as in intergenerational programs involving older adults and children. He has developed three intergenerational board games that have received recognition in national and international juried game and art shows. The games were the subject of three featured lectures that he was asked to give by the Smithsonian Institution. Most recently, he developed the first board game for use by people with Alzheimer's disease and their families; along with a companion project Dr. Cohen developed, the game received first place in the Blair L. Sadler International Healing Arts Competition Award through the Society for the Arts in Health Care.

Dr. Cohen has been very active in the dissemination of knowledge about aging through the major media. He has appeared on *Nightline*, *The MacNeil/Lehrer NewsHour*, *CBS Nightly News*, *NBC Nightly News*, *The Today Show*, *Good Morning America*, the *CBS Early Show*, and in a series of televised public service announcements with George Burns.

# TEN WAYS TO CHALLENGE YOUR MIND AND IMPROVE YOUR HEALTH AS YOU AGE

by Gene D. Cohen

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Scientific findings from new retirement research show that when older people are involved socially and challenge themselves with productive and everyday creative activities, both their overall health and their sense of well-being improve. Moreover, landmark results from neuroscience studies reveal that when we continue to challenge our minds in the second half of life, our brain cells sprout new branches, or dendrites, that improve connections within the brain regardless of age. In effect, the aging brain responds to mental exercise in much the same way that muscle responds to physical exercise. As modern neuroscience demonstrates, it is never too late to use it to prevent losing it.

Here are just 10 of the ways you can reinvent yourself, tap hidden potential, challenge your mind, be productive, and use creativity in your everyday life as you age:

**1. Play games and do crossword puzzles that challenge your mind.** Word games in particular provide both social stimulation and mental challenge. Studies show that you can continue to increase your vocabulary at least into your 80s.

**2. Plan a dinner and book or video discussion group with a circle of friends.** Provocative discussion and food for thought in a stimulating, entertaining social activity is as good for the mind as it is for the palate.

**3. Travel to someplace new—locally or far away.** Explore a new place you'd like to visit, either alone or with friends or family. Your destination can be as close as a new museum exhibit in town or as far away as Asia. Record your experience in a diary, encouraging yourself to be creative in what you write or sketch.

**4. Take an educational course—explore a new area.** Lifelong learning is

lifelong growth and development. Today's increasingly intergenerational mix in continuing-education classrooms provides opportunities for gaining interesting new knowledge and new relationships. Combine learning and travel through programs like Elderhostel.

**5. Explore the hobby or crafts section at a bookstore for new ideas.** Even if you're not sure what you might be interested in, browsing through the enormous diversity of books on hobbies and crafts may ignite new curiosity or remind you of a long-standing interest that you never had time to pursue in the past.

**6. Volunteer.** Volunteering is a way of sharing special skills or learning new ones while interacting with people and providing service to your community. Volunteering can be an avenue to experimenting with new approaches and to working with people of all age groups. Even among people ages 75 and older, nearly 40 percent continue to volunteer. The desire for civic engagement is high.

**7. Consider new work or a new career—perhaps part time.** Engagement in part-time and temporary work as well as small businesses increases with age. Attitudes toward older workers are improving, especially in our expanding service-oriented society, where the experience and conscientiousness of seasoned workers pays off. Check out books on jobs, visit a career counselor, and venture ahead.

**8. Regularly write letters or e-mails to family members and friends.** Letters have become so scarce these days that receiving one will thrill a friend or loved one. Feel free to be creative and funny in your writing. You'll be stimulating your creative side while at the same time entertaining the recipient. E-mail keeps you up with the



times and in touch with grandkids, who typically return e-mails.

**9. Develop a dream journal.** Dreams and daydreams are among the best illustrations of our inner creativity. Their form and content are the essence of creative expression. Write them down—or draw the images that came to you in your dream. They may open your eyes to inner thoughts and desires and help you tap into your creative potential.

**10. Write your memoirs or a family history.** Autobiographies are not just for the famous. Developing a genealogy, family history, or personal history provides a wonderful, valuable gift to your family. It can also launch you on a new creative journey of personal exploration and discovery, getting you in touch with fascinating historical and inner psychological roots.

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# 2004 MINDALERT AWARDS

**T**he *ASA-MetLife Foundation MindAlert Awards* were established to recognize innovations in mental fitness programming for older adults. Based on research showing that cognitive decline is not inevitable in aging, these awards recognize programs, products, or tools that promote cognitive fitness in later life. The programs are judged for their innovation, their basis in research, demonstration of their effectiveness, potential for replication, and the extent to which the programs are accessible to diverse populations of elders. The awards are given in three categories:

- Normal Mental Fitness
- Early-Stage Dementia Programming
- Innovative Older Adult Learning Programming

The winners of the 2004 awards were recognized at the Joint Conference of the American Society on Aging and the National Council on the Aging, held in San Francisco, April 14–17, 2004. Representatives from the three winning programs also gave brief overviews of their work at a conference workshop titled “Recognizing Innovations in Mental Fitness Programming for Older Adults.”

For information on how to submit an application for future awards programs, visit the MindAlert website at [www.asaging.org/mindalert](http://www.asaging.org/mindalert).

## **Normal Mental Fitness**

Senior Peer Counseling  
Center for Healthy Aging  
Santa Barbara, Calif.

Although the concept of senior peer counseling is not new, staffing and funding shortages in mental health services have increased its value considerably. For older adults in need of emotional support, yet uncomfortable with professional psychiatric services, peer counselors help in coping with such issues as caregiving, finding community resources, and enhancing enthusiasm for life through active involvement.

Center for Healthy Aging’s senior peer counselors benefit from their participation in the program by receiving mentally challenging materials. Meaningful learning for peer counselors begins with a 24-session training that addresses such topics as the psychology of aging, the “ABCs” of counseling, adapting to our rapidly changing society, and creative aging.

Counselors attend weekly meetings with a licensed mental health professional to increase their skills and expand their relationships with other counselors. Learning new skills, interacting with other counselors, becoming involved in an important community service, and developing valuable relationships with their clients give the counselors satisfaction, increased self-esteem, and strong enthusiasm for the program.

The innovation of Center for Healthy Aging’s peer counseling program is found in its focus on self-awareness and self-learning. This atmosphere contributes to high retention rates for the peer counselors. The center has developed a training manual and video that have been used by many programs around the United States and the world.

*Contact: Marlena Ross, Center for Healthy Aging, 2125 Arizona Ave., Santa Monica, CA 90404; (310) 576-2554, ext. 371; e-mail: mross@centerforhealthyaging.org.*

## **Early-Stage Dementia Program**

The Buddy Program  
Northwestern University  
Cognitive Neurology &  
Alzheimer’s Disease Center  
Chicago

The Cognitive Neurology and Alzheimer’s Disease Center (CNADC) of Northwestern University’s Feinberg School of Medicine is a multidisciplinary organization dedicated to research on the role of the brain in coordinating mental functions, bringing research to practice through high-quality clinical services, and training researchers and clinicians in cognitive neurology.



CNADC developed the Buddy Program six years ago. The program matches first-year medical students at the school with individuals diagnosed with early-stage Alzheimer's disease or related dementias. It allows the students and diagnosed individuals to get to know each other on a personal rather than a clinical level.

The Buddy Program thus addresses two aspects of care:

1. Growing numbers of individuals are diagnosed in the earlier stages of dementia. CNADC identified a gap between the diagnosis and the provision of services that help meet these individuals' intellectual and social needs. The Buddy Program helps fill this gap by offering people in the early stages of Alzheimer's disease opportunities to maintain their preferred level of activity in ways that are particularly suited to their individual capacity.

2. The literature has demonstrated that healthcare professionals—and physicians in particular—tend to have a negative attitude toward older patients and a lack of awareness regarding early diagnosis of dementia. The Buddy Program provides participating students with increased knowledge about Alzheimer's, as well as positive experiences with older patients.

*Contact: Darby Morhardt, Northwestern University Cognitive Neurology & Alzheimer's Disease Center, 675 N. St. Clair, #20-100, Chicago, IL 60611; (312) 695-7913; e-mail: dmorhardt@northwestern.edu.*

## **Innovative Older Adult Learning Program**

The Illuminated Life  
Osher Lifelong Learning Institute &  
University of Hawaii at Manoa  
Manoa, Hawaii

The Illuminated Life workshop is a comprehensive, structured life-review program designed to help independent older adults enhance their psychological functioning. Its retrospective-proactive orientation assists participants in gathering insights about their lives in order to consider creative postretirement roles and integrate the

learning of a lifetime. Since its creation in 1987 by Abe Arkoff, professor emeritus at the university, the workshop has been presented at its home base, the university's Osher Lifelong Learning Institute, and in other venues including retirement residences, senior centers, churches, Elderhostel programs, and several mainland sites.

Each of the 14 two-hour weekly meetings addresses a "life question." Participants prepare for each meeting by reading a brief workbook chapter and completing an exercise that helps them arrive at their own answer to the life question. The first hour of the workshop features the whole group's pursuit of a life question, guided by a leader who follows a detailed guidebook. In the second hour, participants break into smaller groups, where they share their answers following clear guidelines on sharing and disclosing information.

The Osher Institute is currently testing adaptations of the workshop materials for pairs and leaderless groups.

*Contact: Rebecca Goodman, Osher Lifelong Learning Institute, University of Hawaii at Manoa, PMB #460, 2440 Campus Road, Honolulu, HI 96822; (808) 956-8224; e-mail: rgoodman@hawaii.edu.*

## **Awards Review Committee**

ASA expresses its gratitude to the review committee for their work in reviewing award submissions:

**Sharon Arkin**, Department of Speech and Hearing, University of Arizona, Tucson; **James Birren**, Center on Aging, University of California, Los Angeles; **Dean Blevins**, Center for Mental Health Care & Outcomes Research, Central Arkansas Veterans HealthCare System, North Little Rock, Ark.; **Sandra Cusack**, Gerontology Research Centre, Simon Fraser University, Vancouver, B.C.; **Deanna Eversoll**, DEB Constant, Lincoln, Neb.; Barbara Ginsberg, My Turn Program, Kingsborough Community College, Brooklyn, N.Y.; **Paula Panchuck**, Lasell Village at Lasell College, Newton, Mass.; and **Kathy Porcella**, Evergreen Society, Johns Hopkins University, Columbia, Md.

## ABOUT THE MINDALERT PROGRAM

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**T**he American Society on Aging's MindAlert Program seeks to disseminate research and innovative practices that address the steps that older adults can take to maintain and enhance their cognitive and mental functions in their later years. To support this ambitious goal, ASA has established the MindAlert Program with funding from MetLife Foundation.

The program, now in its fourth year, has the following components:

- A MetLife Foundation MindAlert lecture and booklet, which disseminate the latest research findings on maintaining and enhancing cognitive function in late life.
- The ASA-MetLife Foundation MindAlert Awards, which identify and recognize innovative community-based programs that translate research into practical cognitive-health-promotion activities.
- A Web-based clearinghouse of resources related to late-life maintenance and enhancement of cognitive and mental functioning.
- A cognitive-health-promotion curriculum that aging-services and healthcare providers can implement in a wide variety of settings with older adults.
- A trainers bureau and train-the-trainers program to facilitate the implementation of cognitive vitality programs in such settings as senior centers, adult learning programs in community colleges, and park and recreation programs.

If you would like more information about the MindAlert program, including its Web-based clearinghouse of resources on mental fitness, visit [www.asaging.org/mindalert](http://www.asaging.org/mindalert), or contact the American Society on Aging at [mindalert@asaging.org](mailto:mindalert@asaging.org).

### The American Society on Aging

With more than 6,000 members, the American Society on Aging (ASA) is the United States' largest association of professionals in the field of aging. Founded in 1954, ASA's mission is to promote the well-being of aging people and their families by enhancing the abilities and commitment of

those who work with them. To that end, ASA sponsors a wide variety of conferences and offers annual networking opportunities and Web-based training. The society also publishes a bimonthly newspaper, a quarterly journal, and eight quarterly newsletters for its members. To obtain more information on ASA or to join, call (800) 537-9728 or visit [www.asaging.org](http://www.asaging.org).

### MindAlert Program Sponsor: MetLife Foundation

MetLife Foundation, established in 1976 by the Metropolitan Life Insurance Company, has been involved in a variety of aging-related initiatives. Since 1986, the foundation has supported research on Alzheimer's disease through the MetLife Foundation Awards for Medical Research program and has contributed more than \$9.5 million to efforts to find a cure. In addition, the foundation has provided support for a traveling exhibit on memory; a public education video for use by caregivers and families of people with Alzheimer's disease; and support for healthy-aging projects addressing issues of caregiving, intergenerational activities, health and wellness programs, and volunteer opportunities. MetLife Foundation supports health, education, civic, and cultural programs throughout the United States. For more information about the foundation, visit [www.metlife.org](http://www.metlife.org).

## MetLife Foundation



## **PAST MINDALERT SPECIAL LECTURES**

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**T**he MindAlert monographs from 2001, 2002, 2003, and 2004 are available on ASA's website at [www.asaging.org](http://www.asaging.org) as free, easily downloadable PDF files. Past monographs:

### **Good News About the Aging Brain!**

The MindAlert monograph for 2001 presents special lectures by the nationally known brain researchers Marian Diamond and Arnold Scheibel, who describe their groundbreaking research on brain function and the optimistic implications for successful aging.

### **Brain Health From 1 to 100**

In the MindAlert monograph for 2002, the special lecture by Paul Nussbaum, a leading clinical neuropsychologist, describes what he refers to as a health promotion opportunity of unprecedented stature: our ability to foster our own "brain wellness" for healthy and functional aging.

### **Centenarians: Lessons on Living Long and Living Well**

In the 2003 MindAlert lecture, Thomas Perls, head of the renowned New England Centenarian Study, shares the findings of his research and talks about how we all can make our later years healthy, vital ones.

**Each monograph** also includes descriptions of winners of the year's MindAlert Awards, sponsored by the American Society on Aging and MetLife Foundation.

**MindAlert Program Coordinator**

Nancy Ceridwyn

**Monograph Editor**

Jonathan Kauffman

**Proofreader**

Ingrid Wynden

**Graphic Designer**

Raleigh Freeman

**Illustrator**

Tyler Cohen

**Cover Photographs (top row)**

Marianne Gontarz-York

**American Society on Aging**

833 Market Street, Suite 511

San Francisco , CA 94105

Phone: (415) 974-9600

Fax: (415) 974-0300

E-mail: [nceridwyn@asaging.org](mailto:nceridwyn@asaging.org)

At 15 I set my heart upon learning,  
At 30 I established myself in accordance with ritual,  
At 40 I no longer had perplexities,  
At 50 I knew the mandate of heaven,  
At 60 I was at ease with whatever I heard,  
At 70 I could follow my heart's desire without  
transgressing the boundaries of right.

—Confucius (541–479 BCE)



**MetLife Foundation**

