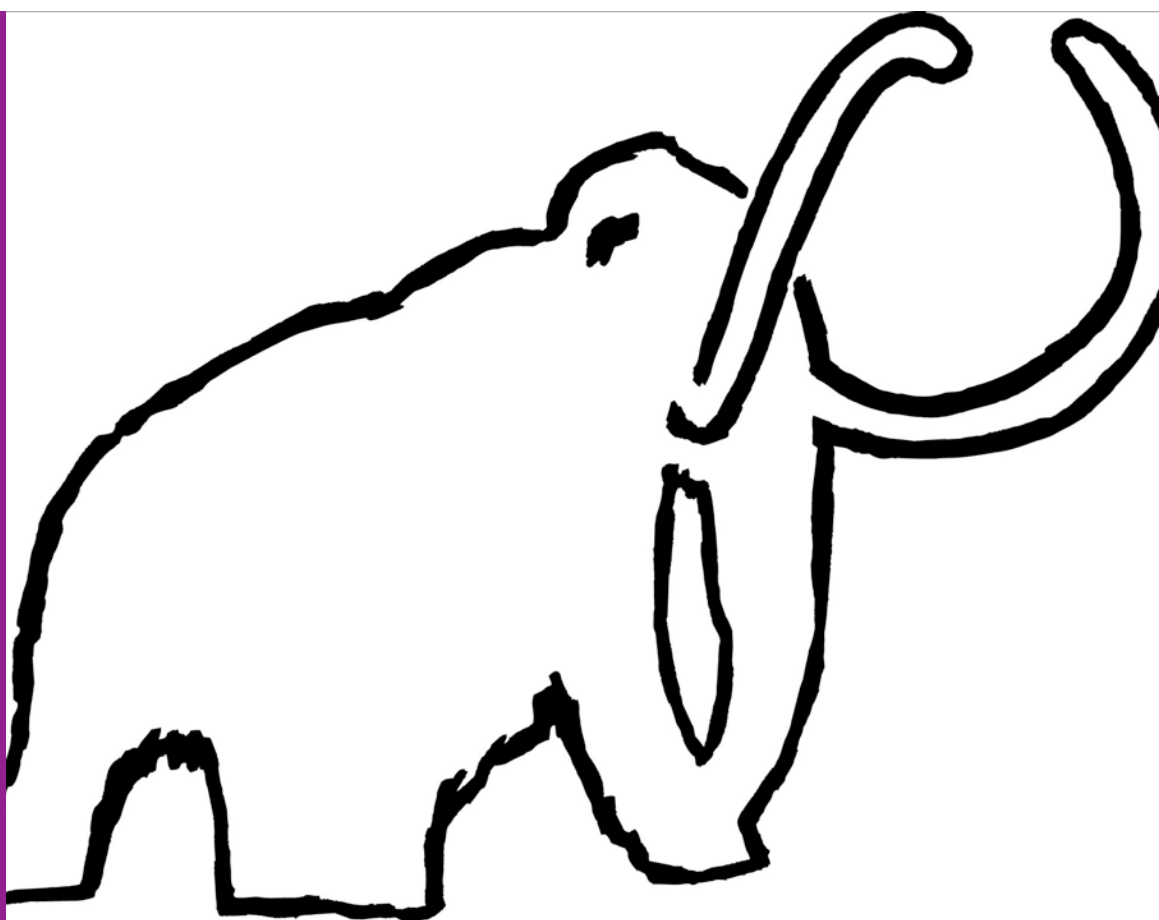


MAMMOTH-MAGAZINE

THE OFFICIAL
MAGAZINE OF
THE CENTRE FOR
STUDIES ON HU-
MAN STRESS

The Centre for
Studies on
Human Stress is
dedicated to
improving the
physical and
mental health of
individuals by
empowering
them with scien-
t i f i c a l l y
grounded
information on
the effects of
stress on the
brain and body.



So.....Why a Mammoth?

By Tania Elaine Schramek, M.Sc.



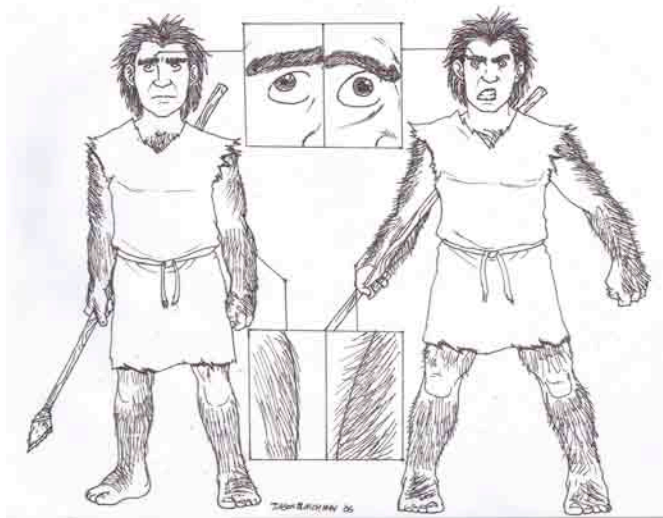
Why did the Centre for Studies on Human Stress decide to use a mammoth as its official logo? Indeed, a tired man or woman would have conveyed a better view of the reality of our lives. And when you think of stress, is a mammoth the first thing that comes to mind? Probably not. Yet, if we consider evolution and the role that our stress response system played in ensuring our survival as a species, then our choice of logo becomes clearer.

What do you think it would take to bring down a 4-6 ton mammoth? Some obvi-

ous choices are; strength, energy, speed, endurance, fearlessness, and good planning!

Would it surprise you to know that our stress response system is behind most, if not all, of these requirements? The stress response is also known as the fight or flight response because when we are faced with stress or a threat, we can fight (bring down the mammoth) or flee (run away because the mammoth is too aggressive). So, how has our stress response helped to ensure our survival? What happens when we have a stress response?

First, our senses sharpen such that our pupils dilate (become larger) so we can see more clearly, even in darkness, our hairs stand on end, making us more sensitive to our environment and also making us appear larger as to intimidate our opponent. Remember we were much hairier back then!



The cardio-vascular system leaps into action, our heart rate increases so we can pump more blood to our muscles, our arteries constrict to increase blood pressure and our veins open up to ease the return of blood to the heart. This gives us the super-strength needed to kill the mammoth or run as fast as we can to get away from it if it is too large.

The respiratory system joins in as the lungs, throat and nostrils open up and breathing speeds up to get more air in the system. The blood carries oxygen to the muscles, allowing them to work harder and longer. We also breathe more deeply, which helps us to scream more loudly and sound threatening, the human equivalent of a roar!

Stored fat from fatty cells and glucose (sugar) from the liver are sent into the blood or metabolized to create instant energy. Blood vessels to the kidney and digestive system are constricted to shut down systems that are not essential. These processes take time and a lot of energy. This is not a time to waste energy!

Blood vessels to the skin are constricted, reducing potential blood loss in the case of injury. Sweat glands also open, providing an external cooling liquid to our over-worked system (this makes the skin look pale and clammy). Endorphins, which are the body's natural pain killers, are released because you don't want to be bothered with pain while you are fighting. Our judgment system in the brain is also turned down so that more primitive responses take over as deep thought during this time could result in death—this is a time for action!

We need to focus on the threat at hand and not get distracted by the pretty new yellow flowers that have bloomed on that plant over there.

Each and every one of these biological actions helped our ancestors to fight mammoths and stock up on food and energy reserves. The stress response system is indeed effective otherwise we would not be here today. So, kudos to Mother Nature!

Lost in a Time-Warp

You may think that these biological events occurred only in prehistoric time, when we were chasing mammoths. But alas you would be wrong. The same biological actions that kept us around then, are alive and kicking today. Mother Nature has a way of conserving things that work. In reality, your body does not know the difference between a mammoth and stress at work. It only understands that a hormonal response is necessary and it will and does oblige. Now, back to our choice of logo, we propose that your body does not know that we are in 2006. As far as it is concerned, we are fighting mammoths everyday.

Let me ask you this. Was going on a mammoth hunt stressful for our ancestors? Absolutely! It was because a situation like this is known as an **absolute** stressor. This means that absolutely anyone exposed to it would have a stress response because the situation poses a definitive threat to our bodily integrity or to our survival. Other examples of absolute stressors are an earthquake, a tsunami, or the events of September 11th 2001. These are **objective** stressors that are universal. In fact, we would be hard pressed to find an individual who would not respond to these situations with the massive release of stress hormones.

You will likely agree that we are not faced with many woolly mammoths and the like and luckily only rarely are faced with absolute stressors in 2006. Yet, the World Health Organization (WHO) has predicted that by 2020 stress-related disorders like heart disease and depression will be in the top two leading causes of disability in adults. Why?

These days, our body's stress response system is activated just as much, if not more, than when we hunted mammoths. When this occurs, we secrete stress hormones. But there is a difference in what is activating the stress response. Today we face more **relative** stressors. These are stressors that only some exposed to them would interpret as being stressful. As such, they are **subjective** stressors that cause different reactions in different people, like a short deadline at work, traffic, paying taxes, or writing an exam.

Why is it that time pressure makes some people N.U.T.S with stress while others do their best work? To make a cake we need some basic ingredients. But, there are endless possibilities in how we combine them, what brands we use, and what we add for flavor. The same applies for stress. There is a basic Recipe for Stress that is the same for everyone.

For a situation to be stressful and cause the release of stress hormones we must *interpret* it as containing one or more of the following; Novelty, Unpredictability, a Threat to the sense of self or ego, and decrease our Sense of control or N.U.T.S. What is novel to you is different from what is novel to John. This is why stress is highly personal.

Our lives today are filled with situations that we interpret as stressful or relative stressors. *But, our stress response system does not know the difference between an absolute and a relative stressor.* In other words, it can't tell whether we are facing a large woolly mammoth or a traffic jam; it releases the same stress hormones!

How is it that our highly sophisticated brain cannot tell time and not know that we are in 2006? Our brain can probably tell time but we are draining the batteries in the clock far too quickly. This is because our stress response system was not designed to be activated as often as it is these days. After all, we did not hunt mammoths every day. A good sized mammoth would provide food for our tribe for quite some time.

It is entirely appropriate for your brain to release stress hormones in the face of a charging mammoth; this is an absolute stressor and we need the energy. Traffic on the other hand is not life threatening, does not require energy expenditure, nor will it prevent you and your family from eating over the next month. It is a relative stressor.

For a system that was designed to only be activated on occasion, the constant demands we place on it due to our interpretations of situations as stressful are causing undue wear and tear which can lead to considerable health problems, including high blood pressure, high cholesterol, and type II diabetes.

So, a mammoth as our logo reminds us of the difference between absolute stressors and relative stressors and that managing stress is within reach. Life has evolved to what it is today, and as such, we will never be able to eliminate all sources of stress, both absolute and

relative. But we can learn to *influence our interpretations* in a way that will ultimately decrease the number of times our stress response system gets activated, decrease the amount of stress hormones we release and help us live and cope with stress.

Essentially, we need to teach our brain and stress response system the difference between absolute and relative stressors. Here is an example of how to do this. It is 8:30am and you get a message from your boss asking that you be in his/her office at 9:00am. If you feel your stress response mounting, (heart beating in your throat, you begin to sweat, and you become nervous), then bring to mind an image that represents joy and pleasure for you. I use the look on my son's face when I brought out his first birthday cake. By doing this a few times you are, in essence, telling the brain that the situation is not too threatening and that it does not require all of those stress hormones. It will calm down and secrete fewer stress hormones. In other words, you will be telling the brain that this is not an absolute stressor. The most important thing to keep in mind is that when it comes to relative stressors, **YOU** are in charge. This latter fact also explains our choice of a mammoth as the official logo. Mammoths have evolved into elephants, which are friendly, intelligent animals. Keep this in mind and know that stress too can be tamed.

In the face of an absolute stressor, there is no way you could bring a happy image to mind. Remember, when our stress response kicks in, our brain fine tunes its focus on the source of the threat or stress and ignores the rest (The new yellow flowers in our example above). It would have simply been impossible for someone near the World Trade Center on September 11th 2001 to bring to mind a happy thought to calm the stress response system down, this was an absolute stressor. Your boss, traffic, and taxes are not absolute stressors. Remind your brain and stress response system of this. Take control and keep your stress response system in check. In other words, **Manage your Mammoth!** 🐘





Stress in the Golden Years

By Alexandra Fiocco, M.Sc.



Question: Who is faced with more stress, adults or people over 65? If your first reaction was “Easy, adults!”, then you are not alone. However, that does not mean that you are correct.

There exists a major misconception in our society that stress is something that is only experienced by adults and fades away once we retire and enter into the Golden Age. Indeed, a recent Global Stress Survey performed in more than 250 people by the Centre for Studies on Human Stress showed that 73% of respondents thought that adults experience more stress on a daily basis compared to older adults. The truth however, is that no one is immune to stress.

Why does this myth exist? For one, many people think that stress is all about “Time Pressure”. Based on the Global Stress Survey, “Time Pressure” and “Work Overload” were considered to be the main causes of stress, whereas factors including “Novelty” and “Unpredictability” were less likely to be perceived as stress inducing.

However, if you have been following the articles on the Mammoth-Magazine, then you know that for a situation to be stressful and cause the release of stress hormones it must contain one of the following ingredients; Novelty, Unpredictability, a Threat to ego, and leave you with a poor Sense of Control or N.U.T.S.

Consequently, one does not have to experience time pressure or work overload to be stressed. This is why these ingredients further contribute to stress in the Golden Years.

Let’s consider some of the sources of N.U.T.S. that are more commonly faced by the older adult. For many, retirement is a chance to pursue other interests and to spend more time with family and friends. While many think that retirement means a decrease in stress, retirement can be a very stressful period in a person’s life. This is especially the case for those who have been forced to retire against their desire.

A recent Global Stress Survey performed in more than 250 people by the Centre for Studies on Human Stress showed that 73% of respondents thought that adults experience more stress on a daily basis compared to older adults. The truth however, is that no one is immune to stress.

Retirement :

Why would retirement be a source of stress? Besides the worries that accompany living on a fixed income, a more concerning reason is Role Change. Many people define themselves by their job, which makes sense to

some degree since your job is something that you do at least five days a week for about 8 hours a day. Think about it, when you are first introduced to someone, what is the first thing you might tell that person about yourself? What you do for a living of course. With retirement, you are no longer that “employed person”, you are no longer “Bob the contractor”. So, the question remains, who are you after retirement? For individuals that did not work outside the home their partner’s retirement also means a considerable change in their role. They are no longer called upon to do the many things required to help support a working partner. The daily routine is disrupted and there are simply fewer things to do.

This is very stressful for some individuals, especially for those who are unable to identify with other aspect of their life (i.e. identity loss). For example, while Bob is no longer a contractor for a big construction company, he now volunteers for meals on wheels three times a week and reads to sick children at the hospital four times a week. Bob also takes the time to enjoy his many hobbies such as fishing on weekends and Ballroom dancing with his wife every Thursday night. Although Bob is now retired, he is finding his role in others areas of life that give meaning to who he is and provide him with a satisfying identity.

Apart from these important physical changes there are more superficial changes that develop as we age which serve as a source of stress for many individuals. Yes, I’m talking about those dreaded wrinkles.

Loss of spouse and friends :

During the Golden Years, many are faced with the death of beloved friends, family members and spouses. I was once told by my 70 year-old Aunt that the majority of her recent social gatherings have convened at the funeral parlor. Death of a spouse has been ranked as the most stressful event that one could experience, surpassing stress associated with divorce, separation, jail time, loss of job, and personal injury, among a few.

It is often said that when one spouse dies in old age, the other is soon to follow, thus coined the term “dying from a broken heart”. This is not always the case however, especially for those who are determined to remain active and choose to surround themselves with family and friends. Indeed, while some widows continue to grieve and isolate themselves, which can lead to illness and possible death, others are able to

surpass their grief and build a new life as a single person, or find companionship in a new person.



Death of a spouse can be considered very stressful. Not only is the widowed person faced with the task of learning to live alone without their loved companion, but many must perform responsibilities that the former spouse had assumed. Indeed, many widowed women are challenged with financial responsibilities, such as paying taxes, bills, and keeping track of investments because they relied on their husband for such tasks. Similarly, many widowed men are faced with upkeep of the household, cooking and cleaning, as they normally relied on their wife for such responsibilities. Spouses who have shared these tasks before death tend to adjust more successfully as they are not bombarded with these extra sources of stress. Similarly, stress may be reduced if funeral arrangements were discussed prior to death of the spouse. However, this is not always possible, especially when death is sudden and unexpected (e.g. aneurism).

Developmental Changes :

As we all know, the Golden Age is filled with developmental changes. During this time, it is common to experience some decline in physical stamina as muscles and joints become less functional. This is especially the case for individuals who do not maintain regular exercise.

Some changes may be perceived as sudden and unexpected, such as loss of hearing. Other changes may take more time, but once the final stage arrives, their effects can be very stressful. For example, a man named John took pride in being a type of Malboro Man, very strong and masculine. While shoveling the snow one day in January, John took one wrong step causing him to fall and break his hip. After that one fall, John was never able to shovel snow, or to walk unassisted. This change in physical ability was very stressful for John. Not only did it threaten his Malboro

Man ego, but it further made him feel that he had no control over what happens to him.

Apart from these important physical changes there are more superficial changes that develop as we age which serve as a source of stress for many individuals. Yes, I'm talking about those dreaded wrinkles. Women across North America are terrified by the fact that their skin is no longer as "youthful" as it once was. Indeed, the cosmetic industry has made a fortune for centuries by feeding on women's self-image. Looking "old" is considered very stressful for many women as they have no control over the aging process and fear that they are no longer "wanted", thus posing a threat to their ego. This can be particularly stressful for the individual whose reflection in the mirror is not at all representative of what they feel in their heart. Promises of Botox now serve as deceptive tool of control. I say deceptive, because no matter how much Botox you inject into your cheeks, your cells are still aging, and will continue to do so.

So, how does an individual who is 70 years of age survive the effects of stress to be able to live another 20 or 30 years? If they are not as good as their younger counterparts in dealing with stress, then how can they survive? The answer to this question is Coping.

Loss of Independence Leading to Change in Residence :

Many people entering the Golden Age find that they can no longer function in their home the way that they used to. Things that were once considered mundane, such as mowing the lawn once a week or preparing a nutritious meal every night, are now more difficult to accomplish. When this happens, older adults are often forced to move into a retirement home or condo. Moving into a Golden Age facility is one of the top stressors for this age group.

Many of us are able to walk around our home with our eyes closed. We know where everything is and where everything should be. It is our home, our sanctuary, "home sweet home". Moving into a retirement complex can mean leaving all of that comfort behind, literally. Indeed, individuals moved to a retirement home are forced to leave behind approximately normally 90% of their personal belongings. Not only are dearly possessions left to sell or throw out, but memories that have been collected over the years are left behind to fade.

It can be very stressful for an older person who must turn away from a once familiar life in order to

face a new and unsure environment. As well, they may feel a loss of privacy and control over their daily life.

Notice that these sources of stress may all include N.U.T.S:

Novelty: Each of these situations require a transition from what you were accustomed to, to something new, be it; developing new hobbies to replace time that was spent at work, learning to live without your life-long companion, learning to walk around with a walker, or getting use to your new living arrangements at the retirement home.

Unpredictability: Many of these situations may have come unexpectedly, such as; forced retirement, sudden death of spouse due to heart attack, sudden fall causing a fractured hip and decreasing mobility, or the sudden realization that you can no longer live alone.

Threat to ego: Many may perceive these situations as threatening to their ego or sense of self such as; feeling less of a person because you are no longer the "bread winner" of the family, thinking that no one will ever want you now that you are a widow, feeling unwanted and unattractive because of a few crows feet and laugh lines, and feeling obsolete now that you can no longer take care of yourself in your own home.

Sense of Control (lack of): Many feel that there is very little control over any aspect of aging, or these stressful situations. While the best advice would be to accept aging as a part of life's journey, many people cannot relinquish control, which is why all of these sources of stress can cause a stress response in many (but not all) people in the Golden Age. Indeed, Josh Billings once said "In youth we run into difficulties; in old age difficulties run into us".

The Aging Stress Response :

This should demonstrate that older adults experience as much (if not more) stress than do younger adults. However, even if the number of sources of stress were equal among the two, the impact of stress on their relative systems is not equivalent. Recent research has shown that with age, the stress response becomes less efficient. When young people are faced by a stressor, their stress hormones increase rapidly and then return to normal once the stressor subsides. In older adults, while the initial hormonal response is the same, stress hormone levels can remain elevated even after the source of stress is gone, and therefore they are not as good in shutting off their stress response. This leads to unnecessarily high levels of stress hormones circulating in the body and possibly having toxic effects on the person's physical and mental well-being.

Furthermore, it has become widely known that stress accelerates the aging process. Researchers at the University of California in San Francisco have shown that stress harms a part of our DNA that controls cell aging, called the telomere. The telomere has been described as that little piece of plastic at the end of a shoelace (in case you didn't know, they are called "aglets"). Much like how the aglets prevent the shoelace from unraveling and fraying away, the telomere protects the DNA from fraying away and dying. As we age, telomeres become thinner and therefore are unable to protect the DNA as efficiently, which explains natural decline in certain functions such as vision or hearing. However, chronic stress can weaken telomeres, independently from the natural course of aging, which quickens the aging process. Indeed, people who experience more stress tend to have shorter telomeres on their DNA.

So, how does an individual who is 70 years of age survive the effects of stress to be able to live another 20 or 30 years? If they are not as good as their younger counterparts in dealing with stress, then how can they survive?

The answer to this question is Coping. Remember that not all stressors are created or perceived equally. Indeed, depending on how one "copes" with the source of stress will determine whether a negative or positive outcome follows (remember Bob the contractor). This has also been shown in the telomere studies: people who cope better with their stress do not suffer the same damage to their telomeres.

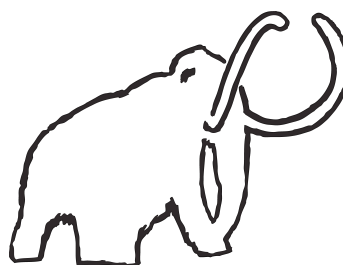
So what is the take home message here? Stress affects people of all ages. Although the sources of stress may change as we age, their effects are the same. We have a hormonal response that affects our mind and body. The wear and tear brought on by the aging process, however, can render the older adult more vulnerable to the effects of stress. Consequently, special attention must be paid to decreasing the impact of situations that involve N.U.T.S. in this population. Retirement and moving out of our home can surely make the Golden Years a more stressful time but events such as these can also give rise to a new lease on life.

Our bodies only release stress hormones if we interpret a situation as being stressful. With a little time, the older adult can view retirement as an opportunity to engage in activities for which there was no time in the past. Moving out of the home can represent freedom (i.e. no more cooking and cleaning or hard yard work) instead of a loss of autonomy. For a generation that has spent much of their lives making sure that we

had all the love, security, and tools we needed to succeed, the Golden Years should indeed be a well-deserved time to enjoy the many benefits their hard work has afforded them. ❧



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Does Aging of the Brain Necessarily Mean Aging of the Mind?

MAMMOTH-MAGAZINE, Issue 2, November 13, 2006



by Sonia Lupien, Ph.D. (Translation by Tania Elaine Schramek, M.Sc.)

Do you remember your 18th birthday ? Ah! Those were the days! The world was your oyster and you were finally allowed to make your own choices. Now let's go back a few years, do you remember your 5th birthday, your first day in kindergarten? Probably, we tend to remember such special occasions because they marked developmental milestones in our lives. In fact, most human societies divide life into such stages, although when we enter a given stage tends to differ from one society to the next. Regardless of what age at which we reach these milestones, each one of them is characterized by a change in how we view the world and how we view our place in society.

When do we become old?

Attaining these significant life stages is largely determined on the basis of well-established psychological (in children: brain development and schooling level

and physiological (e.g. puberty) norms. Interestingly, no such norms exist to signal reaching the golden years. But we all know that we have entered the golden years on our 65th birthday. We owe this arbitrary cutoff to a 19th century German economist named Otto Von Bismarck who proposed that individuals aged 65 and over should be allocated social benefits (pension, social security). This was indeed economically sound in the 19th century, given that life expectancy did not exceed 70 years.

Two centuries later, we still reach the golden years at the age of 65 but we tend to live well beyond 70 with life expectancy now closer to 85. In fact, since the 1970's there has been a startling increase in the number of individuals over the age 65. The *Baby-Boomer* generation, estimated to represent 75 million individuals, will turn 65 in 2010. While today 12% of the population of North America is over 65, by 2050,

<i>(taken from Hubert de Ravinel, "Vieillir au Québec"; Editions de la Presse, Montréal, 1972)</i>		
Question	High School Students	Adults
Are elderly adults useful in our society ?	No, because they do not work and depend on society to live.	Older adults are very useful in society. In fact, my mother-in-law takes care of my handicapped daughter.
Is society useful to older adults ?	Yes, very useful because society supports them financially.	In our society, the older adult is a burden. They are considered dependent and are treated like garbage because we give them a pension.
Are older adults handicapped ?	Almost ; first physically, then mentally because their thinking process is slow.	In our society the elderly are considered invalid because they are handicapped in the workplace.
Can older adults be in politics ?	I don't think so because at a certain age we lose our memory and become weak.	No, their mind is not flexible enough to accept the rapid pace at which we are evolving today.

this number will reach 17%. Clearly, such demographic changes will have important economic repercussions in western societies especially with respect to health-care investments.

We will also be forced to revisit our vision of the older adult and his/her role in society. We often associate an aging brain to an aging mind, with the underlying idea that aging of the brain will inevitably lead to a significant decline in memory function and/or general cognitive processes. You have surely passed an older adult walking slowly and thought to yourself that their slow pace was also related to a slow mind. Haven't we all passed a car driven by an older adult thinking that it would be best to put some distance between us and them just in case...they have slower reflexes and could become confused on the road? The table below contains excerpts of interviews conducted by H. de Ravinel in 1972 with adolescents and adults in the Montreal region addressing the role of the older adult in our modern society. These few examples clearly demonstrate how our perception of old age is negatively biased.

In the mid-eighties however, a second scientific approach saw the light, which showed that the death of the mind is not an inevitable consequence of human aging.

Although these interviews were conducted in the 1970's, I am not convinced that our current view of aging is any different than it was 30 years ago. These attitudes are likely fueled by the notion that an aging brain and body invariably translates to an aging mind.

This negative view of aging came in from scientific studies performed in the 1970's in which the performance of golden agers (65+) was compared to that of their much younger (18-30) counterparts. Clearly, with such methods most studies showed that older adults lagged behind both cognitively and in terms of health. These were thus coined age-related declines. Although these studies contributed significantly to our knowledge of developmental changes in later adulthood, they nonetheless helped to fuel the idea that aging is necessarily defined by loss.

Do We All Age Equally?

In the mid-eighties however, a second scientific approach saw the light, which showed that the death of the mind is not an inevitable consequence of human aging. This theoretical approach was born from a simple yet important observation. Many researchers noticed that the performance of older adults on both physiological and psychological tests was much more heterogeneous than was the performance of young adults. Thus, they found larger inter-individual variability among older adults. Some individuals performed poorly, others had average performance and others still, had performance levels far above their peers and comparable to that of young adults. This reality led researchers to believe that in order to discover the psychological and physiological determinants of aging; it would be preferable to compare older adults to one another. In doing so, researchers were able to show that not all individuals age equally. Thus was born the notion of variability in aging.

This theoretical approach also helped to explain the paradox of society as a whole having a nega-

tive view of aging but nonetheless placing golden agers in positions of power. Minister Bernard Landry was 64 when he began his mandate as the prime minister of Quebec. President Ronald Reagan was in his 70's while he was in power. Why is it that our negative views of aging do not apply in these cases? Variability in aging comes in to neatly explain why. While some individuals show signs of pathological aging, others fall within the average range, and some perform well above their peers. It is clear that at least three subgroups exist among the older population. It follows that those scoring above average are deemed to be 'aging successfully'. It would be these successful agers that we elect for positions of power in our society. We tend to do so because of the combination of their youthful cognitive abilities and the rich experiences that come with their many years.

In sum, scientific studies comparing older adults to one another (rather than comparing them to young adults) have allowed us to see that our mind does not necessarily age at the same pace as do our brain and body. For some of us, the mind remains alert and vivid until our last breath, while for others the mind is the first to go. The majority of individuals however fall in between these two extremes remaining vivid and alert with mild memory loss. In such cases, is brain aging a greater cause for concern?

Dr. Claparède (1911-1951) worked with individuals suffering from a form of amnesia that makes it impossible for them to form new memories. He would see the same individuals everyday but had to introduce himself each time. The minute he left the room they had no recollection of who he was or of him having been there. It was thus said of these patients that they had "lost their memory".

«Losing memory :Where Does it Go ?

It is quite common to hear that older adults with memory problems have "lost their memory". Although it may seem trivial to pay so much attention to such a simple statement, we must consider that it carries considerable diagnostic weight. By stating that a person has "lost their memory", we are implicitly implying that our hands are tied and that nothing can be done to help this individual "find their memory". The diagnosis of memory loss in this framework is thus irreversible. If we concede and stop concerning ourselves with everyday lapses of memory, then mild memory deficits can turn into full blown memory loss.

As such, the question of whether older adults are « losing their memory » takes on a completely dif-

ferent meaning, one that has tremendous moral, social, and ethical considerations. If we can demonstrate that memory is not lost, even if forgetting is frequent, then we can work towards improving the quality of life of older adults in our society. In fact, a simple and inexpensive study was conducted decades ago by Dr. Claparède³ showing precisely this, that memory is not lost.

The Story of a Thumbtack:

Dr. Claparède (1911-1951) worked with individuals suffering from a form of amnesia that makes it impossible for them to form new memories. He would see the same individuals everyday but had to introduce himself each time. The minute he left the room they had no recollection of who he was or of him having been there. It was thus said of these patients that they had "lost their memory". Dr. Claparède wondered whether the memory was truly erased from the brain or if it remained but was simply inaccessible to the individual. To answer his question, one day he placed a thumbtack in the palm of his hand and shook his patient's hand as he did every time he visited with her. The patient immediately withdrew her hand after being pricked by the thumbtack. The next day, the woman simply refused to shake his hand even though she had no idea who he was or why she did not want to shake his hand. With this alarmingly simple experiment Dr. Claparède demonstrated that the forgotten information was not erased from her memory system but rather inaccessible to her.

Thus, we do not lose our memory as we age. Our ability to retrieve information stored in our memory systems may simply be compromised. The problem is likely one of memory recall. Much like there are different ways to enter a library, there are many different ways in which we can access our memory. The first is known as explicit recall, which entails the conscience or voluntary retrieval of stored information in memory. The second is known as implicit recall and involves unconscious and involuntary retrieval of information in memory. Taken within the context of the experiment conducted by Dr. Claparède, although the woman could not explicitly remember the thumbtack prick, she nonetheless refused to shake his hand. Her implicit recall processes were intact while her explicit recall processes were impaired.

Today we now know that most human memory deficits are not related to a loss of information per se but rather an inability to readily retrieve this information⁵. It may be that some older adults cannot make use of the cues they once did in order to retrieve stored information from memory, which therefore increases the probability of forgetting. Importantly, if older adults ignore such instances and do not work to keep their memory active, then they will find themselves forget-

ting more and more. However, what the last two decades of scientific studies on human memory resoundingly show³⁻⁵, is that even if instances of forgetting are common, this does not mean that the memory deficits are irreversible. To avoid permanent memory deficits it is thus essential to teach older adults that it IS possible to keep their memory in shape. Of equal importance, we need to demystify the aging process and teach children that getting old does not automatically mean losing one's mind and memory.

Human Memory Processing :

The process of storing information into memory involves several important steps. First, we must encode the information. The act of encoding turns sensory information (auditory, visual tactile etc) into mental representations. Clearly, we do not and cannot encode all of the sensory information we are exposed to. Instead, we encode information that is pertinent for us largely based on our motivations, interests, social habits etc. Thus, we encode some items (e.g. a phone call from our granddaughter Sarah) but others do not make their way into our memory system (e.g. what we ate on Tuesday). Only information that has been encoded can be available for later recall.

We also non-intentionally encode certain items. For instance, we might have seen an accident on the road and later told our spouse about it even though we had not originally set out to encode this event. This is called incidental encoding. Other times we intentionally encode information because it is important to us like the date and time of our next doctor's appointment.

Given that retirement represents a new stage in life punctuated with changes in one's lifestyle and habits, it is not uncommon for older adults to encode information differently than before. If it is not particularly important for you to remember where your glasses are, then you may not pay as much attention to where you put them and as such this information will not be encoded in the brain. So when you do need them and cannot find them, it is not because you forgot where they are. Rather, you simply did not intentionally encode this information. You cannot forget something that was not encoded in the first place.

It is important to note that the more we elaborate on the 'to be remembered' material, the greater the chance this information will make its way into long-term memory. There are two general forms of encoding. Shallow encoding often occurs when our attention is divided and as such tends to leave a weaker memory trace. For instance, if you are on the phone with your lawyer and you put your glasses in the window sill in the bedroom, you may not later remember where your glasses are because you were paying attention to the

conversation you were having. The contents of the conversation will likely be better remembered because your full attention was devoted to it. This is an example of deep encoding. To be sure, deep encoding requires sustained attention and vigilance and therefore more effort.

Once encoded, information is stored into long-term memory. Even though information in long-term memory is typically there to stay, easy access to it is not guaranteed. This is because retrieving stored information can become more of a challenge with age.

The Aging of Memory :

Studies that have followed the same groups of individuals over time have shown that memory performance starts to decline at the age of 50, and not at the golden age of 65. A closer look at the nature of this decline in memory has revealed that older adults require more time to encode new information and often engage in shallow encoding processes. Younger adults make use of deep encoding and therefore tend to elaborate more upon the information thus increasing memory performance. Overall, what longitudinal studies have told us is that when greater effort is required at the time of encoding or retrieval, older adults fare worse than do their younger counterparts.

Free recall is an example of a memory process that requires considerable effort and that differentiates young and older adults in terms of performance. Here we attempt to access an item in memory without the use of retrieval cues. Say for instance, I show you a list of 25 words and then simply ask you to tell me as many words as you can from the list, this would be free recall. When older adults find themselves having difficulty at free recall many will simply give up and presume that they are losing their memory because of the increased effort.

If, on the other hand, I show you a list of 25 words and then show you the same 25 words along with 10 new words and simply asked you to point out the ones you had seen before, then less effort is required to retrieve the information. This is an example of recognition memory by the use of cues. Older adults often perform just as well on recognition memory tasks than do young adults. Applied to real life, this means that helping an older adult to retrieve information may simply be a matter of providing a sufficient number of cues. If you are around the table and you want your parent to tell an interesting story to the guests, then instead of asking for free recall, "remember the time you raised your voice in a store to an impolite employee?", try "tell us about the time you yelled at a clerk at the local Canadian tire when you were looking for....".

In fact, improving environmental conditions in a way that favors the older adult has been shown to significantly decrease the differences in performance observed between young and older adults. The take home message here is that neither major memory loss nor cognitive decline defines the aging process. We simply have to work a little harder to encode and retrieve information in memory and get a little help from those around us.

A closer look at effort...?

That being said, why does it appear that older adults make fewer efforts? It is not for lack of motivation that the older adult does not 'work' at memory processing. We know that helping older adults to elaborate on the information to be encoded goes a long way in improving their ability to remember. First and foremost the older individual must be aware that elaboration simply does not come as naturally and automatically as it did when they were younger. This is simply a consequence of the brain aging. If you have one gift to give an older adult in your surroundings, this piece of information should be it. Memory loss is NOT a natural consequence of aging; we simply need to work a little harder as we age to do the same things. Think of it this way, if you jogged 5 days a week and then stopped for 6 months due to a knee injury, then you would likely have to work a lot harder to run the same route. Even though your knee will never be like new, after a while, you would get back into shape and pull off some respectable times on your run. If on the other hand, you stop trying to complete your route, then you will stay out of shape and you may even get worse. Memory in aging can be seen the same way.

Collective Efforts are the Key:

We can ask older adults around us to work harder to encode new information so that their recall improves but their efforts would be in vain if we don't somehow contribute. It is essential that the children, grandchildren, and caregivers of older adults be aware of the realities of aging and memory. If we view aging as a ticket to bad memory, then nothing will be done to help our parents or grandparents encode or retrieve information that is important to them.

Memory can be seen as a tremendously large library in which the books of our knowledge and life experiences are housed. Each of us uses a different classification system and as a result the methods of gaining access to the information stored in our memory also differ among us. For some, Africa would be classified under the category; *Continent*, while for others, Africa would be in the *Family Vacations* category. Consequently, we all use and need different cues to get at the information found in our books. I could help my

father remember that on Monday the 12th he has an appointment by pointing out that it falls on the same day as my daughter's birthday. He adores my daughter and this piece of information will surely help him to elaborate and adequately encode the information. You could help your father remember the same date by reminding him that it falls on Monday night football in two weeks, an event he NEVER misses.

As mentioned above, the content of our libraries is different because we are different people with distinct life experiences. As such, we access the books in our library in distinct and highly personalized ways. Therefore, there are many ways in which we can help older adults around us retrieve information stored in their memory. The key to doing so is by *knowing* our loved ones. And the best way to get to know them is to sit down with them and *listen*. ❧



Mammoth-Magazine

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