

# GERONTO-McGILL

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## HOW CAN INDEPENDENCE BE NEGATIVE WITH AGE?

by Tania Elaine Schramek

We would be hard pressed to find an older adult that does not want to maintain their sense of independence. Rightfully so; independence and positive views of aging go hand in hand in our society. But could the cost of an independent personality be negative health outcomes?

Although counterintuitive, this is exactly what a group of University of Illinois researchers found; having an independent personality was associated with low adherence to medication regimens prescribed for hypertension, cholesterol, and/or arthritis. Years of research have gone into understanding what contributes to health promoting behaviours such as medication compliance in older adults, including

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## A HEALTHY CIRCADIAN SYSTEM CAN CONTRIBUTE TO OVERALL HEALTH IN AGING

An interview with Diane B. Boivin, M.D., Ph.D., Department of Psychiatry of McGill University and Douglas Hospital Research Centre  
by Elaine Waddington Lamont

*“Eat well, drink in moderation, and sleep sound, in these three good health abound” - Latin Proverb.*

It is the third of these three keys to good health that is of interest to Diane Boivin, M.D., Ph.D., Associate Professor, Department of Psychiatry, McGill University, and Director of the Centre for

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## POLICY AND POLITICS HOW IS YOUR TIME SPENT?

by Daniel Auld

The media typically portray older adults as falling into one of two categories: those that are inactive and contribute little to society, or those that are highly active, multitasking between grandchildren and volunteering. Stereotypes being stereotypes, older individuals rarely fit these preconceived categories perfectly. So the question is, what are Canadians doing in their retirements? Are the activities of today's older adults comparable to those of previous generations? Most importantly, are Canadians 'aging well,' as measured by life satisfaction? The Canadian government sought to answer these questions, and Statistics Canada performed an in-depth analysis of time use by older adults.

One might ask why such a survey was necessary. To begin with, if Canadian society is to prepare for the wave of baby boomers about to retire – and the increasingly aged population – by creating new social policies, then a more accurate view of how our seniors spend their time would certainly be helpful. By comparing life satisfaction and the activities that seniors are participating in, we should gain a better understanding of the factors that contribute to life satisfaction in older age.

Although many definitions of aging well exist, the one that the Canadian government espouses is one in which those

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**An interview with Diane B. Boivin, M.D., Ph.D., Department of Psychiatry of McGill University and Douglas Hospital Research Centre**

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Study and Treatment of Circadian Rhythms, of the Douglas Hospital Research Centre.

Dr. Boivin first became interested in the study of sleep while in medical school at the Université de Montréal. After completing her medical degree, she went on to do her Doctoral degree at the Université de Montréal working with Jacques Montplaisir, M.D., Ph.D., on human narcolepsy, a neurological disorder characterized by excessive daytime sleepiness. However, it was the work of the renowned researcher Charles Czeisler, Ph.D., M.D., on the human circadian system that inspired her to change her focus from sleep to circadian rhythms.

Circadian rhythms are biological functions that run on a 24-hour clock. The rest/activity cycle is one of these. Hormonal levels, blood pressure, heart rate, feeding, and energy balance, are also biological processes that are controlled by the master circadian clock, located deep in the brain in the suprachiasmatic nucleus (SCN). The SCN clock acts as a conductor to synchronize our body functions. It is reset each day by light from the eyes, and then it, in turn, resets the rest of the body.

Dr. Boivin became fascinated with human circadian rhythms and spent 5 years working as a postdoctoral clinical/research fellow with Dr. Czeisler at Harvard Medical School in Boston. During her studies at Harvard, she explored two lines of research. She found that humans are much more sensitive to light than had previously been realized, a line of research that was published in the prestigious journal *Nature* (Boivin et al. 1996) where it attracted media attention.

In her other line of research, Dr. Boivin looked at changes in mood as a result of the circadian time of day and the duration of sleep, which was published in the *Archives of General Psychiatry* (Boivin et al., 1997).

Dr. Boivin came to the Department of Psychiatry at McGill University in 1997 and built her own state-of-the-art circadian rhythms laboratory. Her lab at the Douglas Hospital is fully equipped to keep subjects in time isolation for extended periods. This lab is unique in Canada in the sense that people can live in comfort for as long as several months, while Dr. Boivin collects blood and saliva, measures body temperature, and has subjects perform behavioral tests, so that their circadian rhythms can be accurately measured, without the influence of the outside environment.

Dr. Boivin has continued the work she started in Boston, and has developed an expertise in the study of human circadian rhythms, resetting effect of light and its application to shift-work, jet lag, and sleep. Although most of this work has focused on young healthy individuals, she has now decided to apply that expertise to the study of older people.

Recently, Dr. Boivin received a mid-career award in aging from the Canadian Institutes of Health Research to study "Successful aging, sleep, and circadian rhythms". By developing this research line into the aging population she hopes to determine how the circadian system changes as we age. She says, "Good sleep and circadian rhythms later on in life can contribute to good health overall and to healthy aging".

Sleep is not static, but gradually changes as we age. The individuals that are most affected by aging tend to show a disruption of their rest-activity cycle and a reduced amplitude of circadian rhythms. This is especially true of patients with dementia, who suffer from severe disturbances of their rest-activity cycle. In fact, post-mortem studies suggest that this may be caused by a reduction in the number of neurons in the SCN. This line of investigation also raises the intriguing possibility that older people who maintain a regular sleep schedule and regular exposure to light and darkness would age better than those who don't.

A factor that complicates the diagnosis of sleep problems in older people is that psychological distress can appear in the form of physical complaints like sleep disruption. For example, depression can be associated with early morning awakening. Aging also tends to cause early awakening, due to an advance of the circadian system, independent of depression. In its most severe form, this is called an Advance Sleep Phase Disorder. This means that people might come to their doctor complaining of disrupted sleep when in fact they are experiencing normal aging, depression, or both.

What we need are more studies that will allow us to understand the interaction between sleep and the circadian system, as well as the impact of sleep schedules and napping in the elderly. Dr. Boivin is also interested in studying the effect of interventions like light exposure, exercise, and diet on sleep and wakefulness. "The important question here is whether there is a way people can improve the quality of their sleep, waking, and overall health".

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## HOW IS YOUR TIME SPENT?

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who age well “...are able to find a ‘fit’ or balance between their activities and their resources, thus finding meaning or satisfaction with their particular combination of activities relative to their level of resources.” As is clear, aging well can encompass many lifestyles, with the key being satisfaction. Indeed, this is a sound position to adopt given that studies show that engagement in activities which are personally meaningful and freely chosen is associated with positive physical and psychological outcomes.

So what do older Canadians do with their time? The Statistics Canada report – which utilized data collected in 2005 and was published this past summer – indicates that the majority of men and women begin to disengage from paid work in their early fifties, spending instead more time sleeping and resting, doing household chores, shopping, reading and watching television. Interestingly, for both men and women, time spent watching television represented an increase second only to the increased time spent sleeping.

However, what is clear from the information gathered is that there is no one particular set of activities that are universally optimal for aging well. Nevertheless, some trends did emerge. For instance, in general, healthy people devoted more time to paid work, unpaid work and active leisure. Healthy and *satisfied* women spent more time on leisure activities that had cognitive or physical (active) components, versus healthy but *less satisfied* women. Interestingly, less healthy

and less satisfied people of both sexes spent more time on passive leisure, such as watching television.

Although it is clear that time spent in leisure activities typically increases when individuals retire, aging Canadians are actually spending more time in the paid work force than their predecessors, according to information gathered in previous Statistics Canada surveys conducted in 1998 and 1992. Accordingly, Canadians between 55 and 72 were devoting less time to leisure activities and more time to paid employment. Canadian seniors are not alone in spending more time in paid work; indeed, this is part of a larger trend among industrialized democracies. According to the Organization for Economic Cooperation and Development, aging individuals are recognized as a major source of expertise and labour for the workplace. In a recent report, the OECD recommended that policies be put in place to promote and retain the employment of older individuals, as well as to increase the employability of these older individuals. For many, continued participation in the work force is something they desire; for these individuals, improving their opportunities to do so will likely increase their life satisfaction.

Each individual who reaches retirement age will have many lifestyle choices to make, such as whether to remain in the paid workforce, what kind of volunteer work to pursue, what sort of leisure activities to pursue, etc. Clearly these choices will be influenced by many

factors and resources, prominent among which being health. How the government implements policies that will support seniors in doing what offers them the greatest satisfaction will help to determine how well we age as a society, and how engaged and happy our seniors are.

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- Ageing and Employment Policies: Live Longer, Work Longer (2006) Organization for Economic Cooperation and Development. ISBN: 9264035885*

## HOW CAN INDEPENDENCE BE NEGATIVE WITH AGE?

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education levels, income, and social support, yet personality factors are relatively new on the scene.

The researchers administered validated personality measures to a group of adults between the ages of 67-89 and then recorded adherence to their respective prescription medications. They used a special pill bottle that electronically recorded the bottle being opened. Much to their surprise, individuals who scored high on measures of independence like autonomy, individualism, and self-reliance were the most non-adherent. The usual suspects where non-adherence is concerned include intentional avoidance due to side effects, non-intentional avoidance due to barriers (i.e. affordability, mobility),

and inadvertent non-adherence related to a poor understanding of the medications or simple forgetfulness. But these factors did not play a role in this study.

While the exact explanation for these findings eludes the researchers they proposed that highly independent older adults may be less willing to forgo a sense of personal freedom for the sake of compliance to medical recommendations. This is consistent with the fact that independent personality types show stronger self-reliance and self-confidence in their own judgment when confronting problems. Clearly, further investigations into the relationship between personality and health behaviour are of great importance because the same independence that often affords individuals a greater quality of life with age could be the very

element that may interfere with a long and healthy one.

### Source:

*Insel, K.C., Reminger, S. L., & Hsiao, C-H. (2006). The Negative Association of Independent Personality and Medication Adherence. Journal of Aging and Health, Vol. 18 No. 3, 407-418.*

## AGING AND COGNITION: IT'S BETTER TO BE BILINGUAL

by Elaine Waddington Lamont

Are you bilingual? Have you been speaking two languages since childhood and use both with equal fluency? Do you use both languages nearly every day? If you answered yes to these questions, then some studies state that you may have a cognitive advantage over monolingual people. In a recent article, Ellen Bialystok, Fergus Craik, and Anthony Ruocco show that bilingual people are better at making decisions when their attention is divided between two tasks. In this study of young and older, mono- and bilinguals, subjects were tested on the Dual Modality Classification Task. Subjects have to sort stimuli into two categories: letters vs. numbers, or animals vs. musical instruments. What makes this difficult is that both pictures and sounds are presented simultaneously, and these can be the same or different stimuli. For

example, you might see the number “2” on a computer screen and hear the sound of a cat meowing. In this case, you would have to press the buttons for “number” and say “animal” aloud.

It is in this divided attention situation where bilinguals have the advantage. They make fewer mistakes at classifying the pictures and sounds than monolingual people do and this advantage is just as strong in older subjects as it is in young ones. The authors speculate that bilinguals are better during this divided attention task because they are already very good at using their executive functions to juggle more than one language in their everyday lives. It seems the benefits also extend to people who are partially bilingual. People who are less fluent or who learned a second language later in life also do better than

monolinguals in the divided attention task. So why not learn a second language? Or even three or four? You might improve your multitasking skills.

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*Bialystok, E., Craik, F. I. M., & Ruocco, A. C. (2006). Dual-modality monitoring in a classification task: The effects of bilingualism and ageing. The Quarterly Journal of Experimental Psychology, 59 (11), 1968-1983*

## THE WORD FROM THE WORM: AGING AND ITS RELATION TO DISEASES OF PROTEIN AGGREGATION

by Daniel Auld

Advanced age is associated with increased risk for several diseases that are characterized by toxic protein aggregations. Alzheimer's disease, for instance, is associated with aggregations of the toxic beta-amyloid protein (also termed A-beta). Different theories have been proposed to explain why the risk for protein aggregation increases with age. One theory holds that something in the aging process itself goes awry and causes or permits protein aggregates to form. Researchers at the Salk Institute in San Diego sought to test this theory with a simple model of protein aggregation disease. They used tiny worms called *C. elegans* in which the expression of A-beta (the Alzheimer's protein) was increased to the extent that toxic aggregates developed. The researchers then slowed aging by reducing the activity of a cellular signaling pathway that is known to accelerate aging, namely the insulin/insulin growth factor 1-like (IIGF) pathway. By reducing its activity, the researchers decreased the amount of A-beta aggregation and toxicity in the worms. Their findings therefore support the theory described above and suggest that the aging process actually modulates the formation of protein aggregates. The authors of the study believe that in aging, the IIGF pathway reduces activity of other important cellular functions that normally serve to break down protein aggregations, thus permitting more toxic protein clumps to form. They go on to suggest that this kind of IIGF age-related mechanism may contribute to many age-associated diseases that are characterized by protein aggregation. This sort of knowledge may point the way to future treatments of these diseases.

### Source:

Cohen, E. Bieschke, J., Perciavalle, R.M., Kelly, J.W., & Dillin, A. (2006) *Opposing Activities Protect Against Age-Onset Proteotoxicity* Science 15 September 2006: Vol. 313. no. 5793, pp. 1604 – 1610

*An interview with  
Diane B. Boivin, M.D., Ph.D.,  
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McGill University and Douglas  
Hospital Research Centre*

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She suggests that older people should be interested in their sleep and rest-activity cycles because this is something that they have some control over. "Our sleep gets disrupted as we age, but some people seem to be less affected than others". We need to ask, "What are the lifestyle choices that can maintain good sleep throughout life?" "There is a mutual interaction between sleep and psychological, as well as physical well-being. Everything we can do to improve our sleep and circadian rhythms could have a beneficial effect for living a healthy, long life".

## SCIENCE HERE AND NOW CARING FOR CAREGIVERS

by Tania Elaine Schramek

Montreal's Francine Ducharme indeed has quite the feather in her cap as she was the first to receive a Ph.D. in nursing from a Canadian university. She then went on to her post-doctoral studies at Douglas Hospital Research Centre. Currently, Dr. Ducharme is a professor in the department of Nursing of the Université de Montréal and holds a Desjardins Research Chair for her efforts out of the Institut universitaire de gériatrie de Montréal.

Dr. Ducharme wishes to understand the determinants of health and well-being in individuals caring for ailing family members and tries to find ways to decrease stress in caregivers. She also evaluates the

effectiveness of existing educational interventions and available resources for caregivers.

In a recent study<sup>1</sup>, Dr. Ducharme tested an intervention program that sought "to modify perceived stress related to situations of homecaring for an elderly relative; to improve caregivers' coping (use of coping strategies) with requirements related to their caregiver role; and to promote caregiver health". For the study, 81 caregivers were divided into two groups; one received Dr. Ducharme's program aimed at decreasing stress, the other group used existing resources available in CLSC's.

Dr. Ducharme's program had a significant impact on the perceived challenge associated with caregiver role, increased the caregivers sense of control, increased their use of social support, and their use of problem-solving strategies. Although the reported caregiver burden was the same after the intervention, caregivers nonetheless felt better equipped to cope with the challenges of caring for their loved ones compared to the CLSC group. Why was Dr. Ducharme's intervention successful? She argues that caregivers using her program were left with a feeling of empowerment with respect to their caregiving role. Given that a poor sense of control over a situation is a universal stress trigger<sup>2</sup> it is not surprising that these caregivers fared better and reported less stress.

Dr. Ducharme argues that another reason why the intervention program proved successful is related to their individually tailored approach. The program involves five 30-45 minutes in-home weekly visits each of which has a specific goal in terms of stress management. In the first visit, caregivers talk about their experience and cognitively appraise the effects of stress on his/her well-being. Second, the caregiver is made aware of possible coping strategies. Third, the caregiver is guided in selecting, from the stressors present, one specific stressor on which to focus the stress management process. Next, the practitioner explores

different strategies suited to the chosen stressor and the caregiver tries out strategies that "fit" the stressor. Fifth, they evaluate whether the perception of stress has decreased. Finally, the practitioner returns to the home one month later for a follow-up visit to answer any questions and to teach the caregiver how to transfer the methods they have learned to other situations they find stressful.

Although in-home caregivers surely share common experiences, their individual stress triggers are likely different given that stress is a highly personal experience<sup>3</sup>, thus consistent with Dr. Ducharme's individually tailored approach. Dr. Ducharme's work also extends to gaining a better understanding of the decision processes involved in placing a loved-one in a care facility<sup>4</sup>, how men adjust and cope with being the caregiver of their ailing wives<sup>4</sup>, and how the caregiving experience varies cross-culturally through studies conducted in Lebanon<sup>4</sup>. One interesting aspect of her work is that she uses somewhat non-traditional research designs (although valid and accepted), but her results provide a more accurate view of caregiver realities and may be more conducive to producing changes in practice.

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- 1) Ducharme F, Lebel P, Lachance L, Trudeau T. Implementation and effects of an individual stress management intervention for family caregivers of an elderly relative living at home: a mixed research design. *Res Nurs Health*. 2006 Oct;29(5):427-41.
- 2) <http://www.douglasrecherche.qc.ca/groups/stress/general-public/deconstructing-stress/recipe.asp?l=e>
- 3) <http://www.douglasrecherche.qc.ca/groups/stress/general-public/what-is-stress/stressors.asp?l=e>
- 4) <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi> (enter Ducharme, F)

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