

Victoria Longitudinal Study

Edmonton • Victoria
Canada

VLS Newsletter

Issue 5: 2012-2013

We have been waiting to publish our regular biennial *Newsletter* in order to offer some welcome and timely news. The VLS is gratified and honoured that it has received another five-year research grant from the National Institutes of Health (National Institute on Aging, NIA) to pursue our well-known longitudinal study of aging. The new grant—and this may seem improbable!—will cover years 22 through 27 of continuous support by NIA. In more practical terms, it will take us from 2013 to 2018, allowing us to complete several essential new rounds of sessions with our many loyal participants. Certainly, the research we have accomplished—as seen in our growing number of interesting presentations and publications—could not have been carried out without the many contributions of our participants, students, research assistants, collaborators and consultants, two universities, and funding agencies, especially NIA. To vivify and honour our numerous supporters over the years, we have included selected logos of our supporters on page 4 of the *Newsletter*.

In addition to reporting this breaking good news, the main purposes of this *Newsletter* are the same as always. We wish to (a) summarize some of our recent research activities, (b) acknowledge our gratitude to our benefactors and participants, and (c) share some brief updates about some of our VLS trainees and collaborators. This *Newsletter* is designed primarily for VLS participants and colleagues, but we are also distributing it to multiple recipients throughout Canada and the US, as well as in many parts of the world.



Please let us know if you have any suggestions for future issues. Our contact information is on page 4.

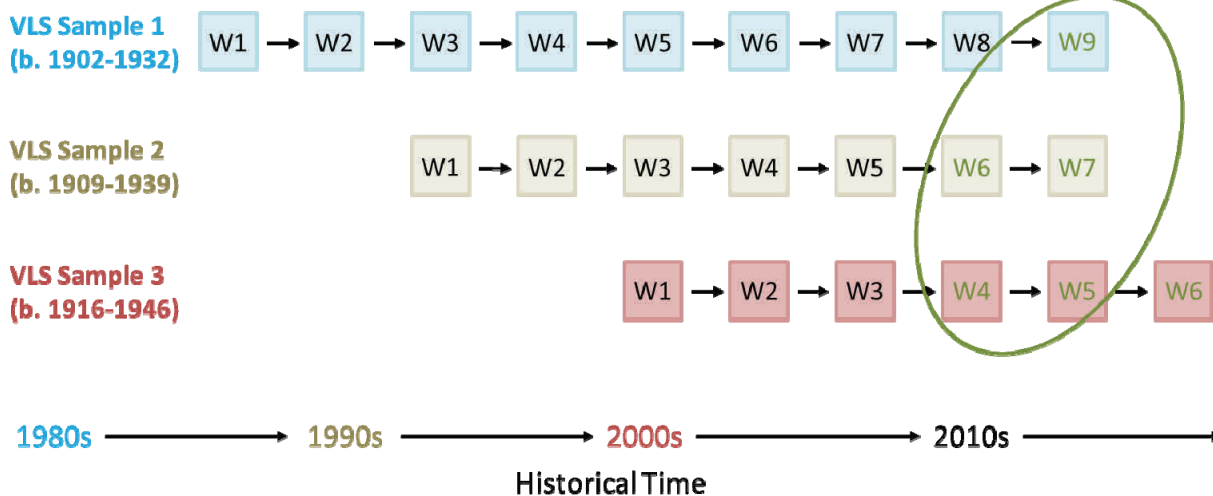
Dr. Roger A. Dixon

VLS Director (Edmonton and Victoria)
Canada Research Chair (University of Alberta)
Professor of Psychology (University of Alberta)
Adjunct Professor of Psychology (University of Victoria)
Principal Investigator, NIH Grant AG008235 (VLS)



The VLS “Sequential” Longitudinal Design

We are often asked about our overall blueprint for studying longitudinal changes in aging. Although the VLS includes other cohorts of participants, the three main longitudinal samples are indicated in the left column. The members of each of these samples enrolled with the VLS when they were between the ages of 55 and 85. We then follow each individual of each sample at regular intervals from Wave 1 (W1) forward—across historical time (as indicated by the arrows at the bottom of the figure). For a longitudinal study, it is important to maximize the number of participants who return for as many waves as possible. Whereas the boxes (black ink) show the waves we have completed, those in the big green oval (green ink) are waves we hope to begin during the next few years.



New Research from the VLS: Focusing on Biological Age - Is Age 75 the New 60?

New VLS Research Comparing Biological to Chronological Age. Most research on memory and cognition examines differences in ability with increasing chronological age, or the number of years since birth. However, a recent research emphasis from the VLS has recognized the shortcomings of using chronological age as the only metric for indexing change in function or performance. For example, two 70-year olds may perform quite differently on the same measures of memory and cognition. What accounts for such differences? Some theorists argue that chronological age is not a causal process, but rather reflects a *useful continuum* along which causal processes (such as vascular disease or dementia) operate. In reflecting on this further, our VLS research team has begun to explore alternative ways of indexing change in performance over time. Rather than an exclusive focus on chronological age, we have started to explore other meaningful metrics of *developmental time* such as biological age. Biological age, or *bioage*, represents a given individual's functional capacity or overall health, reflecting the relative status of critical physiological systems. Returning to our example of two 70-year olds, if one individual had several diseases she/he would be biologically *older* than 70, whereas the other individual in relatively good health would exhibit a bioage younger than 70 years.

VLS Co-Authors. Two VLS colleagues, Drs. Stuart MacDonald (University of Victoria) and Roger Dixon (University of Alberta), and a graduate student (Correne DeCarlo), recently co-authored an article on biological aging published in *The Journals of Gerontology: Psychological Sciences and Social Sciences*. The co-authors addressed two key research objectives including: (1) whether a number of individual measures of cognitive function (memory, processing speed, reasoning) and biological function (blood pressure, lung volume) showed measureable change across a 6-year follow-up period, and (2)



whether observed change in biological function shared associations with change in cognitive performance. Of particular note, the VLS is ideally suited for examining the topic of biological aging given the available longitudinal data, as well as the numerous measures of biological and cognitive function employed.



Main Results. Some notable VLS research findings have emerged on the topic of biological aging. From the 2011 article, significant change in function was observed for measures of (1) cognition, including working, episodic, and semantic memory, reasoning, and vocabulary, and (2) select biological processes, including grip strength, lung capacity, body mass index, and blood pressure. Consistent with expectation, modest declines were observed in memory function, as well as for select biological indicators including lung function and grip strength. Next, we used advanced statistical models for the analysis of change to examine whether change in cognition and change in biological function were associated. Significant covariation was observed linking corresponding declines for select cognitive outcomes and biological markers. For example, for a measure of reasoning such as the ability to detect patterns in a sequence of letters, better biological function (including higher grip strength or lung volume, or lower body mass index) was associated with

better cognitive function. In fact, the results suggest that making improvements in biological function, such as enhancing cardiovascular function due to walking, may be associated with stability or perhaps even improvements in cognitive function. These findings support the notion that cognitive decline is not caused by chronological aging per se, but rather reflects multiple causes from a broad range of biological and physical health domains that operate along the age continuum.

In ongoing research, members of the VLS are exploring measures of walking or gait speed, indexed in various ways (e.g., timed 10-foot walk, GAITrite computerized walkway), and their association with cognitive and functional impairment, health, and even mortality risk. Why study walking? As it turns out, individual differences in walking may reflect the *relative health* of underlying organ systems including lungs, heart, nervous, circulatory, and musculoskeletal. Slowing gait may serve as an important indicator of biological vitality or *bioage*, reflecting function across many key bodily systems (e.g., circulatory, pulmonary) linked to cognition and mortality (Studenski et al., 2011).



Citations: MacDonald, S. W. S., DeCarlo, C. A., & Dixon, R. A. (2011). Linking biological and cognitive aging: Towards improving characterizations of developmental time. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 66B(S1), i59-i70.

Studenski, S., Perera, S., Patel, K., Rosano, C., Faulkner, K., Inzitari, M.,...Guralnik, J. (2011). Gait speed and survival in older adults. *The Journal of the American Medical Association*, 305, 50-58.

VLS Student Achievements

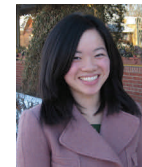
Many undergraduate and graduate students devote precious hours to working in various capacities with the VLS. Some follow independent study or specialized neuroscience training courses, some are volunteers in the lab, and some are enrolled in formal advanced degree programs (such as Master's or Ph.D.). We recently had occasion to review trainee activities and accomplishments during the past decade. We share some highlights of the review in this *Newsletter*. Regarding publications, trainees have appeared as co-authors on about

100 occasions. Regarding scientific presentations, trainees have appeared over 100 times as co-authors for papers and posters at local, national, and international conferences. Regarding awards, student trainees have received multiple funding awards (including graduate, doctoral, post-doctoral) from CIHR, NSERC, SSHRC, and other foundations (e.g., Alberta Health Services, Alberta Innovates-Health Solutions, Michael Smith Foundation for Health Research, Peter Lougheed

Foundation, Queen Elizabeth II). The VLS is very grateful to (and proud of) the students who have devoted some of the training period to working in our labs and on our research.



Ashley Fischer
Ph.D. Student
SFU



Sophie Yeung
Ph.D. Student
SFU



Sydney Pearson
M.D. Student
UCalgary

Retirement

One of three VLS founders, Dr. David F. Hultsch, retired from the University of Victoria in 2011. His VLS colleagues (Chris Hertzog, Roger Dixon, Brent Small, Stuart MacDonald) organized a celebration of his career in conjunction with the 2012 Cognitive Aging Conference in Atlanta.



VLS Consultants

The VLS benefits from a stellar roster of consultants: Drs. Lars Bäckman (Karolinska), Richard Camicioli (Alberta), Ian J. Deary (Edinburgh), Christopher Hertzog (Georgia Tech), Scott M. Hofer (Victoria), John J. McArdle (Southern California), and Brent J. Small (South Florida).

Transitions and Awards

Correne DeCarlo received an Alzheimer's Society Research Program 3-year Doctoral Award. She also received the Phillip M. Rennick Award for graduate student research at the International Neuropsychological Society Conference in Amsterdam, July 2013.



Peggy McFall received a 2-year graduate fellowship from Alberta Innovates: Health Solutions.



Shannon Runge received the Interdisciplinary Paper Award at the Gerontological Society of America Conference in November 2012. Her presentation examined the combined influences of lifestyle activities and genetic polymorphisms on cognitive aging.



Bonnie Whitehead received a Campus Alberta Neuroscience Conference 2012 Master's Level poster award.



Sheri Thibeau, a new VLS graduate student at UAlberta, received the University of Calgary Department of Psychology Academic Achievement Award for 2012-2013. She has also just received the Queen Elizabeth II Master's Scholarship.



Shraddha Sapkota received the Alberta Association on Gerontology 2012 Student Award, and the Daniels/Rabin Parkinson's Society of Alberta Graduate Scholarship 2012.



Dr. Anna-Lisa Cohen was promoted to Associate Professor in the Department of Psychology at Yeshiva University in New York City. Dr. Cohen was a graduate student supervised by Roger Dixon at UVic.

Both **Shraddha Sapkota** and **Bonnie Whitehead** have recently completed their M.Sc. theses!

VLS Undergraduates have conducted very interesting research. These include the following recent students:

- (1) **Nickie Cowan** (UAlberta) "Mobility dysfunction—APOE genotype indicators: Implications for the VLS"
- (2) **Jessica Zvonkovic** (UAlberta) "Alzheimer's disease, depression, and genetic associations"
- (3) **Sydney Pearson** (UAlberta) "From global metabolomics to candidate metabolites: Linking CNS and neurocognitive phenotypes in aging"

Dr. Roger Dixon received the "Baltes Award for Distinguished Research in Aging" from the American Psychological Association (Division of Adult Development and Aging). This prestigious award honours scholars who have had careers featuring exceptional theoretical and empirical contributions to research on aging. Roger will give the invited Baltes Award Address at the 2014 APA convention in Washington, D.C.

VLS

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Editors: Roger A. Dixon
Jill Friesen



Roger Dixon, Stuart MacDonald, and David Hultsch have enjoyed a long history of regular meetings in Edmonton and Victoria to work on VLS initiatives.

A Change in VLS Venue in Victoria



The VLS lab at UVic recently moved to the R Hut on Phoenix Drive. We look forward to welcoming our Victoria participants to this new and easy-to-access location. Call (250-721-6296) or visit the VLS website for a map to the new location.



WE'RE ON THE WEB!
www.ualberta.ca/~vlslab/

HELP KEEP US UP-TO-DATE

If you have moved or changed your name or phone number, please contact one of our offices.

VLS Lab Edmonton
Department of Psychology
P-217 Biological Sciences Building
University of Alberta
Edmonton, AB T6G 2E9
Phone: (780) 492-7602 Email: vlslab@ualberta.ca



VLS Lab Victoria
R-Hut, Room 140A
University of Victoria
P.O. Box 1700 STN. CSC
Victoria, BC V8W 2Y2
Phone: (250) 721-6296 Email: vls@uvic.ca



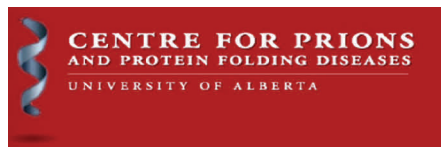
University of Victoria

Acknowledgments

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Campus Alberta Neuroscience



Michael Smith Foundation for Health Research



NSERC CRSNG



GLENROSE REHABILITATION HOSPITAL FOUNDATION



National Institute on Aging



CIHR IRSC Canadian Institutes of Health Research Instituts de recherche en santé du Canada



Canada Research Chairs

Chaires de recherche du Canada

