



**University
of Victoria**

Graduate Studies

**Notice of the Final Oral Examination
for the Degree of Master of Science**

of

RAQUEL GRAHAM

BA (University of British Columbia, 2012)

**“The Role of Physical Activity in Preventing Cognitive Decline in Individuals with
Hypertension and Diabetes”**

Department of Psychology

Tuesday, August 9, 2016

10:00AM

Cornett Building

Room B316

Supervisory Committee:

Dr. Scott Hofer, Department of Psychology, University of Victoria (Supervisor)

Dr. Ryan Rhodes, School of Exercise Science, Physical & Health Education, UVic (Member)

External Examiner:

Dr. Lynne Young, School of Nursing, UVic

Chair of Oral Examination:

Dr. Alexander Thomo, Department of Computer Science, UVic

Abstract

While some cognitive decline is part of the normal aging process, certain changes have been linked to physical health or lifestyle-related diseases and may be preventable. Hypertension and type 2 diabetes are two conditions that have been associated with a heightened risk of accelerated cognitive decline. In terms of protective factors, physical activity can positively impact a broad range of cognitive processes including memory, attention, and executive functioning and may also protect against or delay cognitive decline and dementia. The present study examines the extent to which physical activity moderates the impacts of hypertension and diabetes (and their interactions) on different cognitive functions. Data are from the Memory and Aging Project (MAP), a longitudinal study of older adults ($N = 1400$, mean age = 79). A series of multilevel models evaluated baseline differences and linear and quadratic change on four cognitive measures: mental status, perceptual speed, and immediate and delayed episodic memory. Higher levels of self-reported physical activity were associated with better perceptual speed at baseline, and significantly less linear decline across all four measures. Physical activity was not significantly associated with curvilinear change. Individuals with diabetes had significantly worse immediate episodic memory performance at baseline, but diabetes was largely unrelated to rate of change and initial performance on the other measures. Hypertension was associated with better initial mental status (linear and quadratic models) and delayed episodic memory (quadratic model). Contrary to expectations, most interactions between physical activity and the two health conditions were non-significant. However, physical activity appeared to moderate the relationship between diabetes and immediate episodic memory, such that individuals with diabetes who were more physically active experienced a reduced rate of linear and curvilinear decline compared to inactive individuals with diabetes. The findings from this study suggest that physical activity may reduce the impact of diabetes on certain cognitive functions, and that immediate episodic memory may be particularly susceptible.