Notice of the Final Oral Examination
for the Degree of Doctor of Philosophy

of

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MSc (University of Victoria, 2015)
BA (University of Victoria, 2013)

“A Systematic Review and Multilevel Modelling Analysis of
Intraindividual and Interindividual Associations in Levels and
Variability in Blood Pressure and Cognitive Functioning”

Department of Psychology

Monday, August 30, 2021
9:30am (PDT)
Remote Defence

Supervisory Committee:
Dr. Andrea Piccinin, Department of Psychology, University of Victoria (Supervisor)
Dr. Graciela Muniz-Terrera, Department of Psychology, UVic (Member)
Dr. Sam Liu, Department of Exercise Science, Physical and Health Education,
UVic (Outside Member)

External Examiner:
Dr. Nancy Sin, Department of Psychology, University of British Columbia

Chair of Oral Examination:
Dr. Chris Darimont, Department of Geography, UVic

Dr. Robin G. Hicks, Dean, Faculty of Graduate Studies
Abstract

The aim of this dissertation was to address several gaps in the existing literature focused on the association between levels and variability in blood pressure (BP) and cognitive functioning. Using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), Chapter 1 synthesizes and critically analyzes the outcomes of research reporting the association between BP variability (BPV) and cognition. Fifty-five studies met eligibility criteria, including reports measuring short-term, mid-term and long-term BPV. Despite substantial between-study heterogeneity in study characteristics, the majority of studies reported that higher systolic BPV is associated with adverse cognitive outcomes. Further, Chapter 1 identified several gaps in the existing literature. For instance, no research has investigated the association between BPV and short-term fluctuations in cognitive functioning, or the association between mid-term BPV and concurrent cognitive functioning.

Building on Chapter 1, Chapter 2 used an intensive measurement design to investigate the extent to which mid-term variability in BP, recorded using home-based BP monitoring, is associated with levels and variability in cognitive functioning in a sample of community-living older adults (N=64; Mage=70.58, SD=3.5; 77% female) assessed twice daily over a two-week period. Partial correlation coefficients estimated the association between BPV and variability in several ambulatory cognitive assessments, accounting for the learning effect during the study protocol, while multi-level models (MLMs) estimated the association between BPV and concurrent cognitive functioning. In addition, MLMs examined the extent to which BP and cognitive functioning fluctuate within and between days at the intraindividual and interindividual levels. Findings suggest that more BPV may be associated with slower or more variable reaction time, while higher BP may be associated with worse performance on accuracy tasks.