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

of

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MSc (University of Victoria, 2016)
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“Executive Motor Control Across the Lifespan: Clinical Insights from Attention Deficit Hyperactivity Disorder, Concussion and Mild Cognitive Impairment”

Department of Psychology

Friday, May 15, 2020
1:30 P.M.
Conducted Remotely

Supervisory Committee:
Dr. Stuart MacDonald, Department of Psychology, University of Victoria (Co-Supervisor)
Dr. Mauricio Garcia-Barrera, Department of Psychology, UVic (Co-Supervisor)
Dr. Sarah Macoun, Department of Psychology, UVic (Member)
Dr. Sandra Hundza, School of Exercise Science, Physical & Health Education, UVic (Outside Member)

External Examiner:
Dr. Nash Unsworth, Department of Psychology, University of Oregon

Chair of Oral Examination:
Prof. John Borrows, Faculty of Law, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies
Abstract

The process of controlling executive and motor behaviours is central to one’s ability to self-regulate and accomplish day-to-day goals across the lifespan. Executive and motor control share a set of underlying neural substrates that support a common set of processes, including planning, sequencing and monitoring of behaviour. They share a bidirectional relationship, such that gains or deficits in one area can have profound effects on the other. This doctoral dissertation examines the interplay between executive and motor control at three distinct stages of life and in the context of neurological conditions whose clinical manifestations shed additional light on the nature of the constructs. Central to each investigation is the methodological theme of intraindividual variability, as a means of leveraging valuable data within-persons. Chapter 2 examines executive and motor control in typically developing children and children with attention-deficit/hyperactivity disorder (ADHD). Findings suggest that dysregulation of motor processes accounts for hyperactive symptoms in ADHD and detracts from higher-order executive control. Chapter 3 examines the impact of mild traumatic brain injury (mTBI) in young adult varsity athletes, who routinely practice executive motor control by virtue of their level of play. Findings suggest that the impacts of mTBI are discernible through a dampened electrophysiological response during computerized tests of higher order executive functioning, and may not outweigh the otherwise myriad health benefits of athletic engagement. Chapter 4 examines the impact of dementia on executive motor control during gait dual-tasking in older adults. Findings suggest that the consistency of performance across multiple indicators of gait is sensitive to dementia, and that engagement in cognitive and social lifestyle behaviours is protective against likelihood of both dementia and mild cognitive impairment (MCI) classification. On mass, these findings highlight the importance of assessing executive motor control to understand the pathophysiology of neurological conditions. The potential benefits that may generalize from one area to the other offer unique opportunities for preventative and rehabilitative efforts.