

**MOTOR AND COGNITIVE SKILLS IN INDIVIDUALS
WITH MILD COGNITIVE IMPAIRMENT**

SIRINUN BORIPUNTAKUL

**DOCTOR OF PHILOSOPHY
IN BIOMEDICAL SCIENCE**

THE GRADUATE SCHOOL

CHIANG MAI UNIVERSITY

MAY 2013

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved

**MOTOR AND COGNITIVE SKILLS IN INDIVIDUALS
WITH MILD COGNITIVE IMPAIRMENT**

SIRINUN BORIPUNTAKUL

**A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
IN BIOMEDICAL SCIENCE**

**THE GRADUATE SCHOOL
CHIANG MAI UNIVERSITY**

MAY 2013

**MOTOR AND COGNITIVE SKILLS IN INDIVIDUALS
WITH MILD COGNITIVE IMPAIRMENT**

SIRINUN BORIPUNTAKUL

**THIS THESIS HAS BEEN APPROVED
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN BIOMEDICAL SCIENCE**

EXAMINING COMMITTEE

Plaiwan Suttanon.....CHAIRPERSON

Asst. Prof. Dr. Plaiwan Suttanon

S. Sungkarat.....MEMBER

Asst. Prof. Dr. Somporn Sungkarat

SR Lord.....MEMBER

Prof. Dr. Stephen Ronald Lord

S. Chamnongkich.....MEMBER

Asst. Prof. Dr. Samatchai Chamnongkich

Patima Silsupadol.....MEMBER

Dr. Patima Silsupadol

THESIS ADVISORY COMMITTEE

S. Sungkarat.....ADVISOR

Asst. Prof. Dr. Somporn Sungkarat

SR Lord.....CO-ADVISOR

Prof. Dr. Stephen Ronald Lord

S. Chamnongkich.....CO-ADVISOR

Asst. Prof. Dr. Samatchai Chamnongkich

Patima Silsupadol.....CO-ADVISOR

Dr. Patima Silsupadol

7 May 2013

© Copyright by Chiang Mai University

ACKNOWLEDGEMENTS

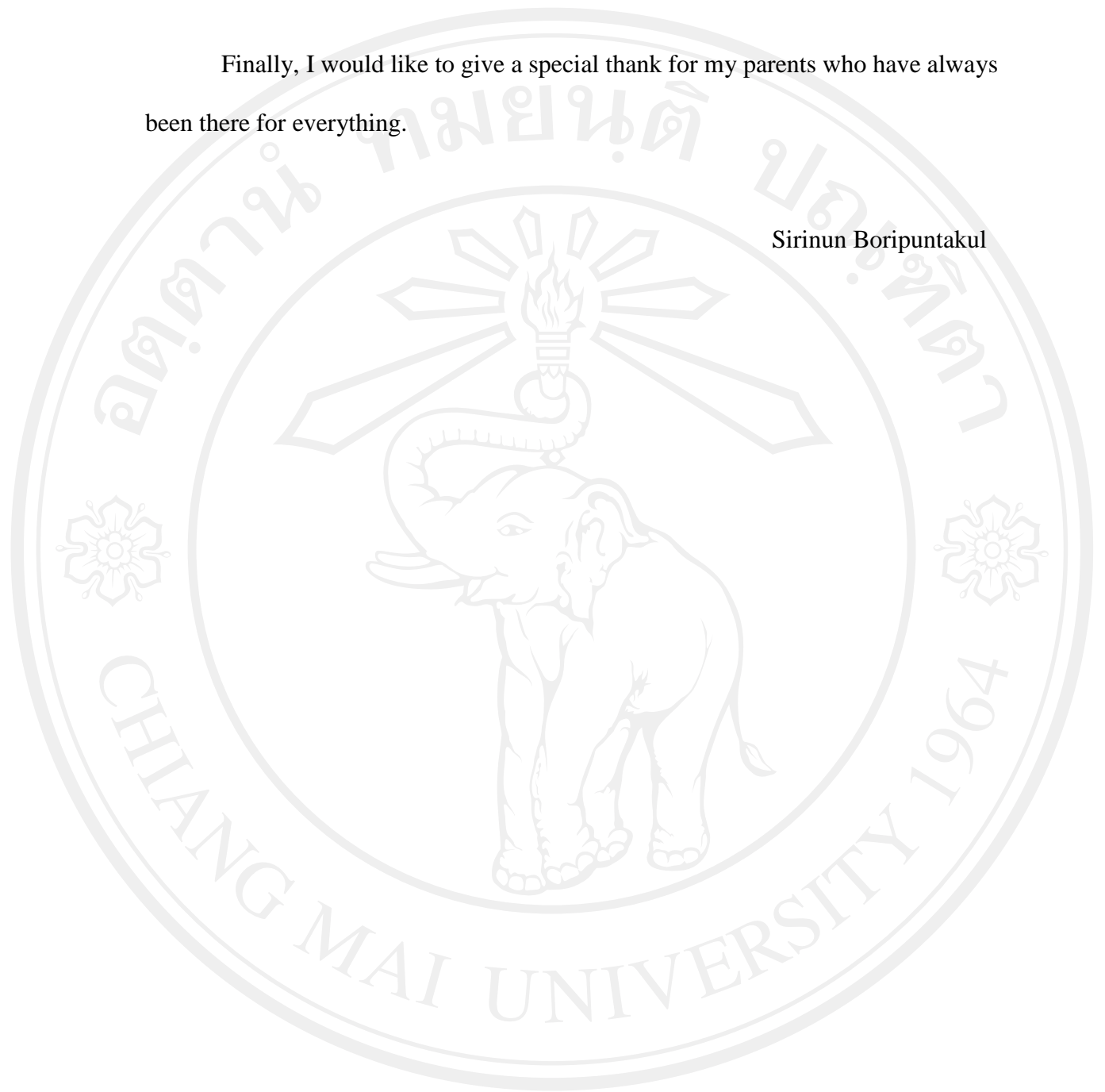
My sincere gratitude is to my advisor, Asst. Prof. Dr. Somporn Sungkarat and my co-advisor and my co-advisor, Prof. Dr. Stephen Ronald Lord and Dr. Kim Delbaere for their incredible guidance as mentors, for encouraging and nurturing throughout my dissertation. My grateful thanks also go to my dissertation committee, Asst. Prof. Dr. Plaiwan Suttanon, Asst. Prof. Dr. Samatchai Chamnongkich and Dr. Patima Silsupadol for their vulnerable suggestion that challenged me to think beyond the obvious answers.

Besides, I would like to thank the authority of Faculty of Associated Medical Sciences, Chiang Mai University and Neuroscience Research Australia, Australia for providing me with a good environment and facilities to complete the study. Also, I would like to take this opportunity to thank to the Office of the Higher Education Commission, Biomedical Engineering Center, Chiang Mai University, Thailand and National Health and Medical Research Council, Australia for funding.

Great deals appreciated go to all participants and my wonderful friends, Mr. Surachart Suksriwan, Miss Sirintip Kumfu, Miss Suleeporn Wongcharoen, Miss Paris Puipanichsiri and Miss Romchat Prasert for scarifying the time in process of data collection.

Finally, I would like to give a special thank for my parents who have always been there for everything.

Sirinun Boripuntakul



ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright© by Chiang Mai University
All rights reserved