

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	iii
ENGLISH ABSTRACT	iv
THAI ABSTRACT	vi
TABLE OF CONTENTS	viii
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF ABBREVIATIONS	xiii
CHAPTER 1 INTRODUCTION	1
1.1 Aims of the study	4
1.2 Hypotheses	4
CHAPTER 2 LITERATURE REVIEW	5
2.1 The prevalence of falls in older adults	5
2.2 Dual-task related gait changes	5
2.3 The contributing factors to dual-task gait performance	9
2.3.1 Cognitive function	9
2.3.1.1 Executive function	9
2.3.1.2 Ability to allocate attention	10
2.3.2 Balance performance	11
2.3.3 Gait speed	12
2.3.4 Balance confidence	12

2.3.5 Depression	13
CHAPTER 3 METHOD	15
3.1 Participants	15
3.1.1 Inclusion criteria	15
3.1.2 Exclusion criteria	15
3.2 Outcome measures	16
3.2.1 A general questionnaire	16
3.2.2 The Attention Network Test (ANT)	16
3.2.3 The Ability to allocate attention	16
3.2.4 Balance	18
3.2.5 Gait speed	18
3.2.6 Balance Confidence	19
3.2.7 Depression	19
3.2.8 The dual-task decrements in gait	19
3.3 Procedures	20
3.4 Sample Size	20
3.5 Equipments	21
3.6 Statistical Analysis	21
3.7 Location	22
CHAPTER 4 RESULTS	23
4.1 Participant Characteristics	23
4.2 Effect of a cognitive task on gait during level walking	25
4.3 Effect of a cognitive task and task prioritization on narrow walking	27

4.4 The relationships between the dual-task decrements (DTD) and the participant characteristics	31
4.5 Effect of variables on the dual-task decrements in gait	35
CHAPTER 5 DISCUSSION	38
5.1 Conclusions	43
REFERENCES	44
APPENDICES	51
APPENDIX A Mini-Mental State Examination	52
APPENDIX B Health Questionnaire	56
APPENDIX C The Attention Network Test	58
APPENDIX D Berg Balance Scale (BBS)	61
APPENDIX E Timed 10-Meter Walk Test	65
APPENDIX F Activities-Specific Balance Confidence Scale (ABC)	66
APPENDIX G Thai Geriatric Depression Scale (TGDS)	67
APPENDIX H Consent form	69
APPENDIX I Information sheet	71
APPENDIX J Certificate of ethical clearance	74
CURRICULUM VITAE	75

LIST OF TABLES

Table	Page
1 Participant demographics and characteristics	24
2 Correlation between the dual-task decrements and variables	32
3 Multiple linear regression analysis predicting the dual-task decrement in average gait speed	36
4 Multiple linear regression analysis predicting the dual-task decrement in average swing time	36
5 Multiple linear regression analysis predicting the dual-task decrement in swing time variability	37

LIST OF FIGURES

Figure	Page
1 The effect of age and dual task on stride velocity	6
2 The effect of age and dual task on variability of stride velocity	6
3 Representative examples of gait velocity and stride-to-stride variability in gait velocity under single-task condition and dual-task condition from one young, one middle-aged, and one older adults	7
4 The effects of dual task on gait speed among young adults, healthy older adults, and older fallers	8
5 The effects of dual task on swing time variability among young adults, healthy older adults, and older fallers	8
6 The effects of dual task on gait variability among older adults with Parkinson's disease and healthy older adults	12
7 The setting of Timed 10-meter walk test	19
8 The effects of a cognitive task on level walking	26
9 The effects of a cognitive task and task prioritization on narrow walking	28
10 The Attentional Network Test	60

ABBREVIATIONS

ABC	Activities-Specific Balance Confidence Scale
ANT	Attention Network Test
ASIS	Anterior superior iliac spine
BMI	Body Mass Index
BBS	Berg Balance Scale
DTD	Dual-task decrements
GDS	Geriatric Depression Scale
kg	Kilogram
HLGD	Higher-level gait disorder
MMSE	Mini-Mental State Examination
m	Meter
ms	Millisecond
s	Second
TGDS	Thai Geriatric Depression Scale
TMT	Trail Making Test