CHAPTER 4

RESULTS

4.1 Demographic Characteristics of the Participants

Thirty participants (15 individuals with aMCI and 15 healthy controls) participated in the study. The demographic characteristics of participants with aMCI were similar to that of healthy controls. Statistical analyses showed no significant differences between the two groups in all variables. The demographic characteristics of the participants are presented in Table 1.

Table 1 Demographic characteristic of the participants

Variables*	Group		*p*-value
	aMCI (n=15)	Control (n=15)	
Age (yr)	76.40 ± 5.93	76.67 ± 6.75	0.69
Height (cm)	157.27 ± 6.24	157.93 ± 7.55	0.79
Weight (kg)	55.07 ± 9.10	54.40 ± 9.53	0.84
Male: Female	7: 8	7: 8	-
At least 1 fall in the past 1 yr	8	7	0.88
MMSE-Thai 2002 (score)	26.80 ± 2.57	28.00 ± 1.60	0.11
TGDS (score)	5.40 ± 3.07	4.33 ± 3.60	0.39
Drugs (types)	4	3	0.10

Note: * values are shown in mean ± standard deviation; MMSE-Thai 2002 = Mini-Mental State Examination (Thai version 2002) total score = 30 points; TGDS = Thai Geriatric Depression Scale, total score = 30 points

4.2 Mean gait parameters

Mean velocity, stride length, and swing time for the aMCI and control groups under the 4 testing conditions are presented in Figure 1, 2, and 3, respectively. Group X Testing condition interaction was not significant for gait velocity, stride length and swing time.

An analysis of variance (ANOVA) revealed a significant group effect for gait velocity ($F_{2,28} = 5.582$, $p = 0.025$, effect size = 0.17), and stride length ($F_{2,28} = 10.374$, $p = 0.003$, effect size = 0.27) but not swing time. Across the four testing conditions, participants in the aMCI group walked with slower speed (66.19 ± 24.45 cm/sec) than those in the control group (80.43 ± 24.36 cm/sec). In addition, they walked with shorter stride length (91.73 ± 16.48 cm) than the control group (105.82 ± 14.11 cm).

Dual-task condition, regardless of any specific cognitive task, showed similar effect on gait speed, stride length and swing time between the aMCI and control groups (Condition Effect, $p < 0.05$). Specifically, all participants walked faster, with longer stride length and lesser swing time under the single-task condition than the all 3 dual-task conditions. With respect to gait velocity and swing time, participants walked faster and lesser swing time while performing the digit span task than while performing the verbal fluency task (Post hoc analysis; Bonferroni correction showed significant differences at p = 0.01 and p = 0.004, respectively).

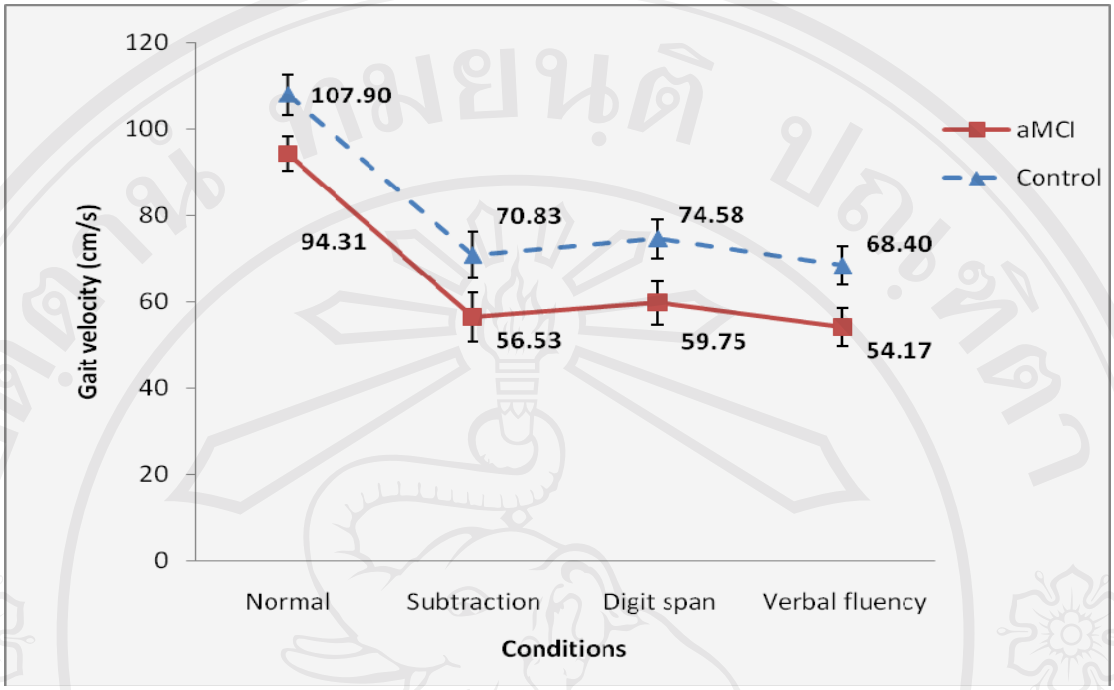

Figure 1 Mean gait velocity of the aMCI and Control groups under the four testing conditions. Data are presented as mean ± SEM.

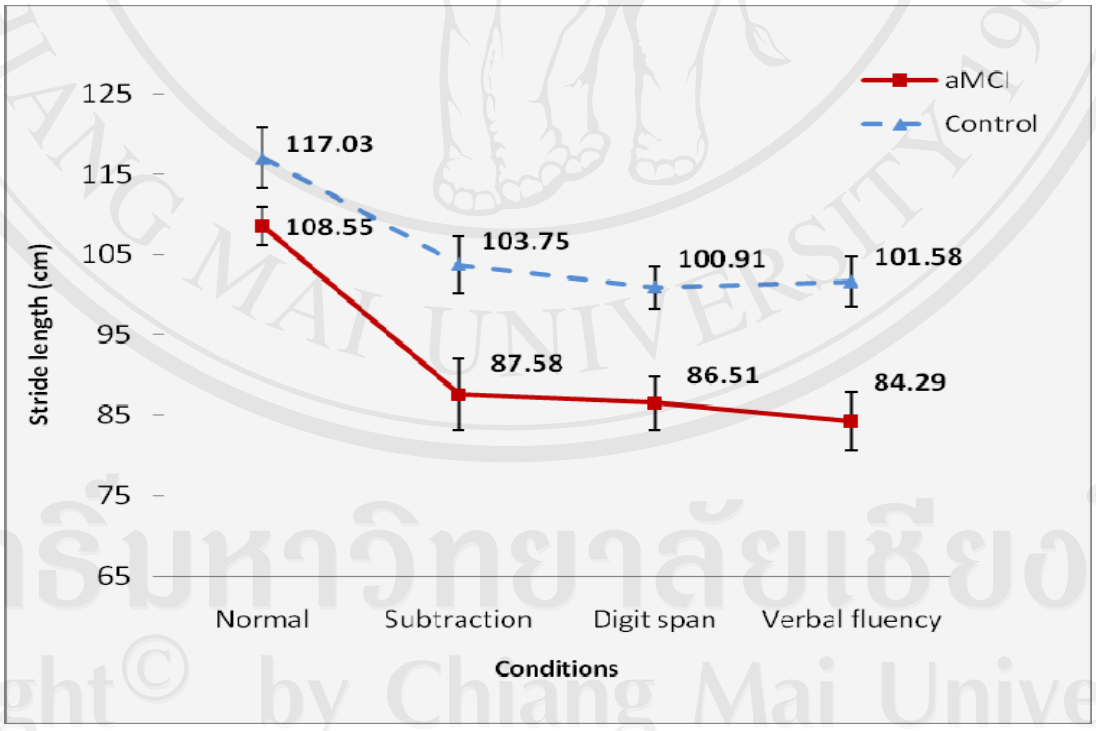

Figure 2 Mean stride length of the aMCI and Control groups under the four testing conditions. Data are presented as mean ± SEM.

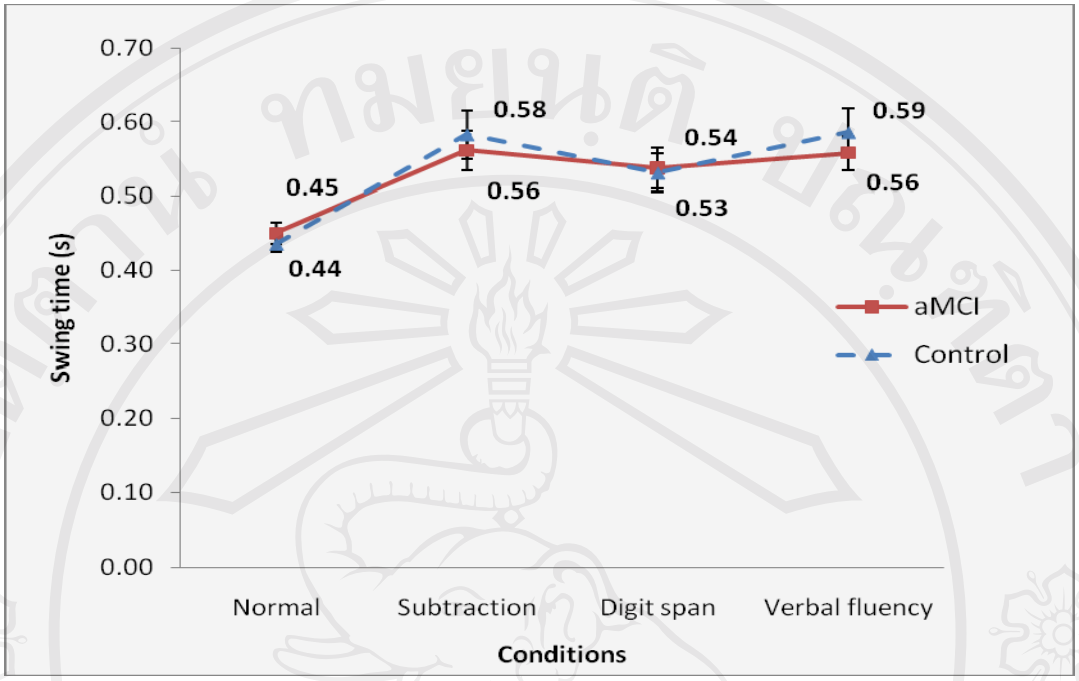

Figure 3 Mean swing time of the aMCI and Control groups under the four testing conditions. Data are presented as mean ± SEM.

4.3 Gait variability

The coefficient of variation (COV) of stride length and swing time for the aMCI and control group is presented in Figure 4 and 5, respectively. The Group X Testing condition interaction was not significant for stride length variability, however this interaction approached statistical significance for swing time variability ($F_{2,28}$ = 2.61, p = 0.06, effect size = 0.09).

Across all testing conditions, the stride length variability of the aMCI group was significant greater (6.91 ± 3.78) than the control group (4.44± 1.96); Group Effect ($F_{2,28}$ = 10.265, p = 0.003, effect size = 0.27), however swing time variability was not significant difference between aMCI and control groups.

Dual-task condition, regardless of any specific cognitive task, showed similar effect on stride length and swing time variability between the aMCI and control group (condition Effect, $p < 0.05$). Specifically, across the two groups, the stride length and swing time variability were significantly greater under the dual-task condition than the single-task condition.

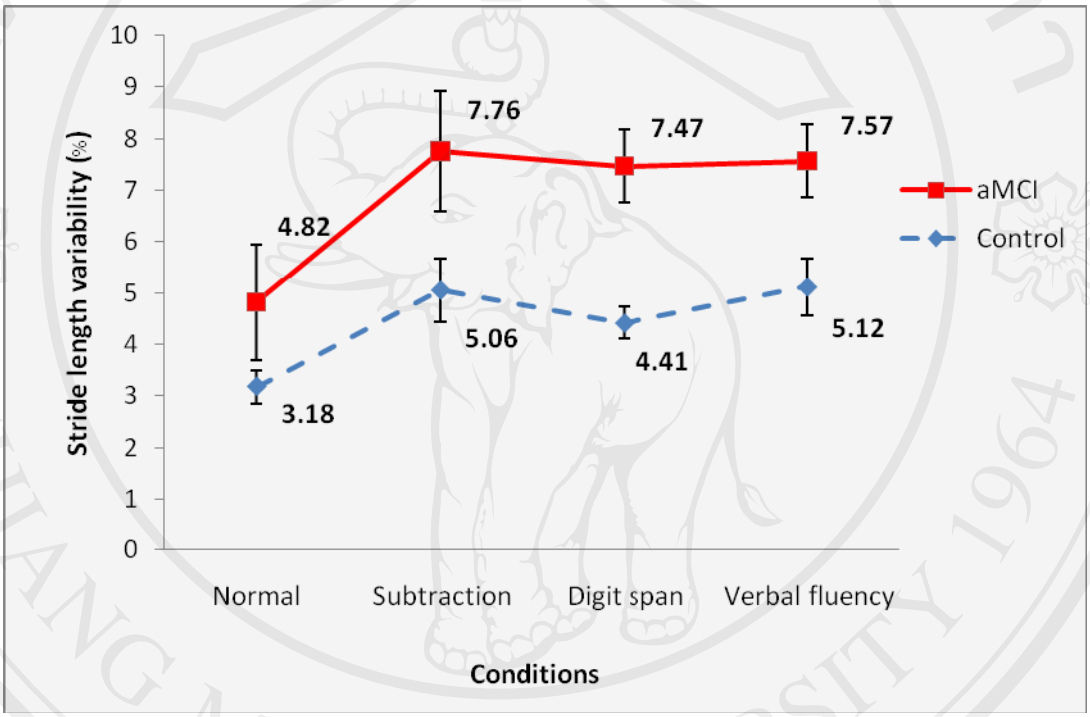

Figure 4 Coefficient of variation of stride length for the aMCI and control groups under the four testing conditions. Data are presented as mean ± SEM.

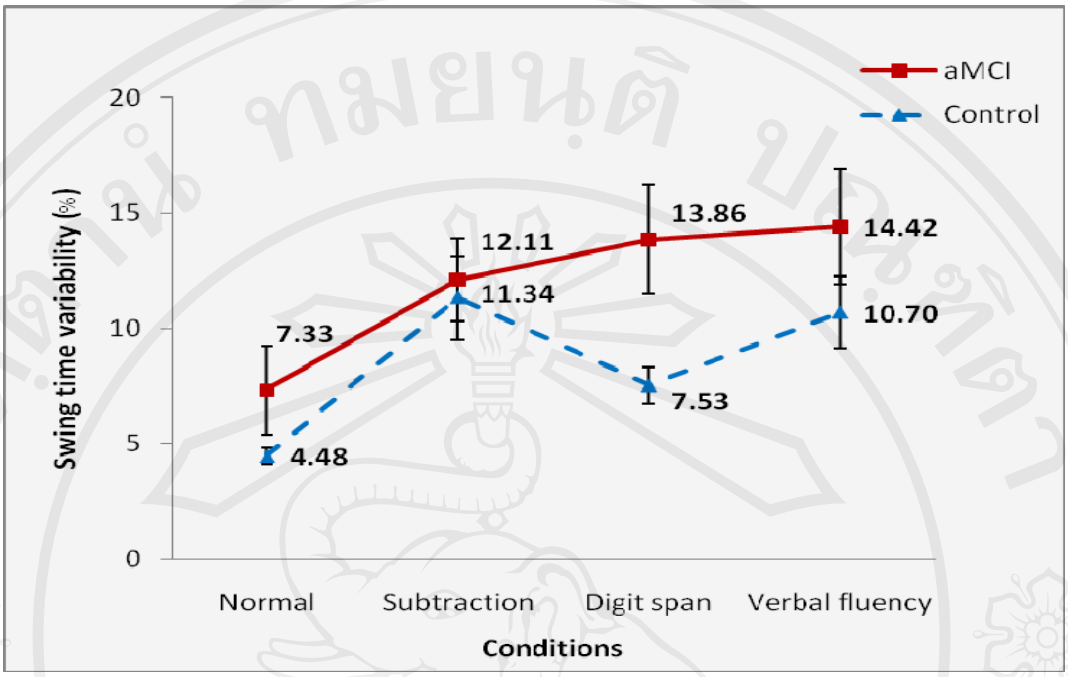

Figure 5 Coefficient of variation of swing time for the aMCI and control group under the four testing conditions. Data are presented as mean ± SEM.

4.4 Dual-Task Cost of gait (mean gait parameters)

Overall, the dual-task cost for stride length was significant higher in the aMCI group than the control group. There was no Group X Testing condition interaction. An analysis of variance (ANOVA) revealed a significant group effect for stride length ($F_{2,28}$ = 6.883, p = 0.014, effect size = 0.19) but not gait velocity and swing time. There were significant dual-task condition effects for swing time and gait velocity; Condition Effect, $p < 0.05$. Across the two groups, dual-task cost for swing time was significant lesser in the digit span condition than the subtraction and the verbal fluency conditions. The dual-task cost for gait velocity was significant lesser in the verbal fluency condition than the digit span condition.

4.5 Dual-Task Cost of gait (gait variability)

The dual-task cost of stride length and swing time variability for the aMCI and control group is presented in Figure 6 and 7, respectively. The Group X Testing condition interaction was significant for swing time variability ($F_{2,28}$ = 4.098, *p* = 0.035, effect size = 0.13) but not stride length variability. Independent t-test was used as post hoc analysis to test the difference between groups at p = 0.017 (Bonferroni correction for 3 pairs; 0.05/3 = 0.017). Results revealed that under the digit span condition, the dual-task cost of swing time variability was greater for the aMCI group than the control group. This difference was however only approached statistical significance (p = 0.018).

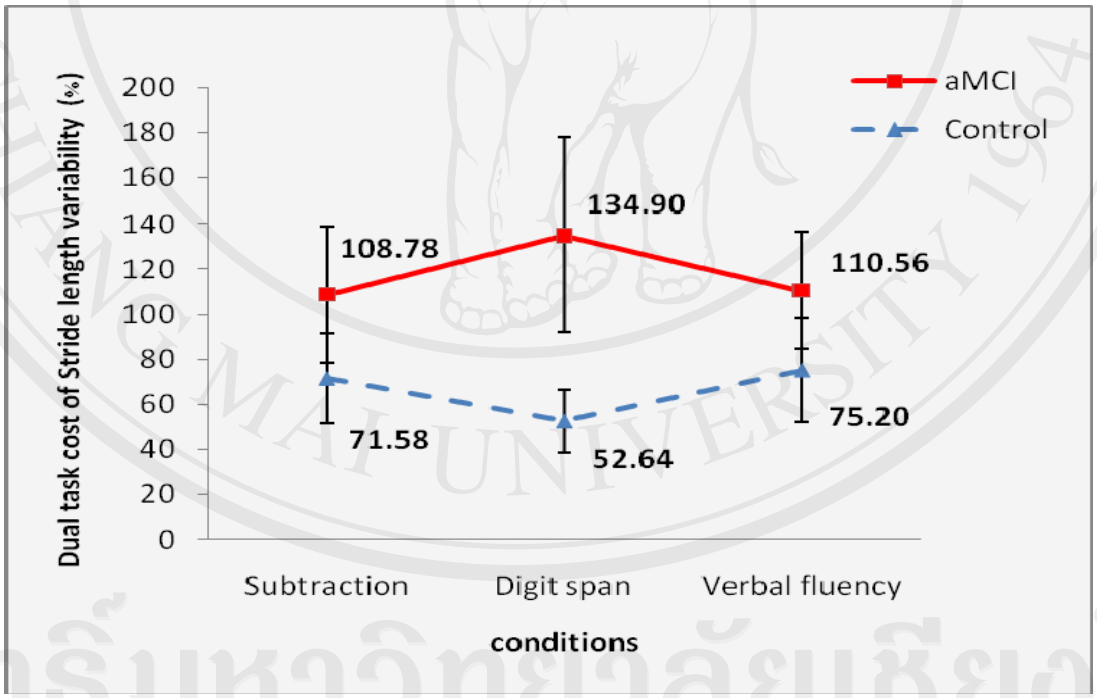

Figure 6 Dual-task cost of stride length variability for the aMCI and control groups under the three dual-task conditions. Data are presented as mean ± SEM.

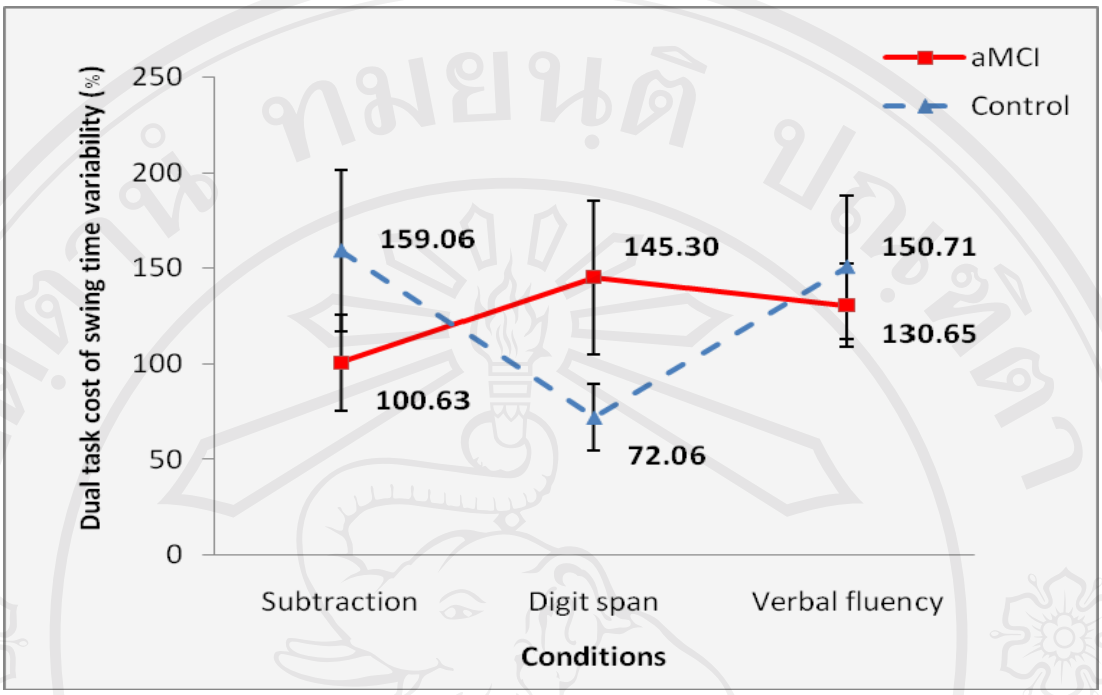

Figure 7 Dual-task cost of swing time variability for the aMCI and control groups under the three dual-task conditions. Data are presented as mean ± SEM.