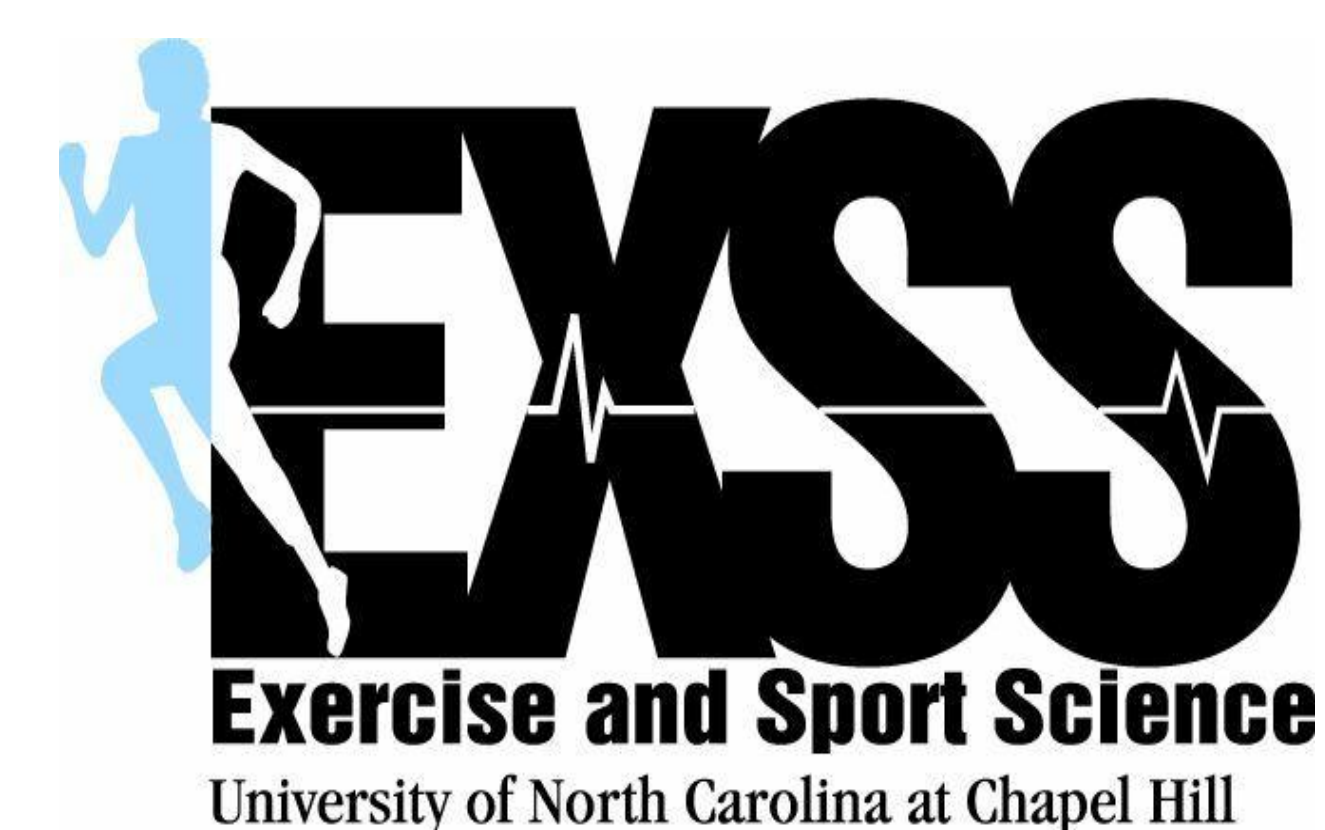


A comparative assessment of vascular and autonomic function in response to a mental stressor among fit versus non-fit young adults

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PROBLEM

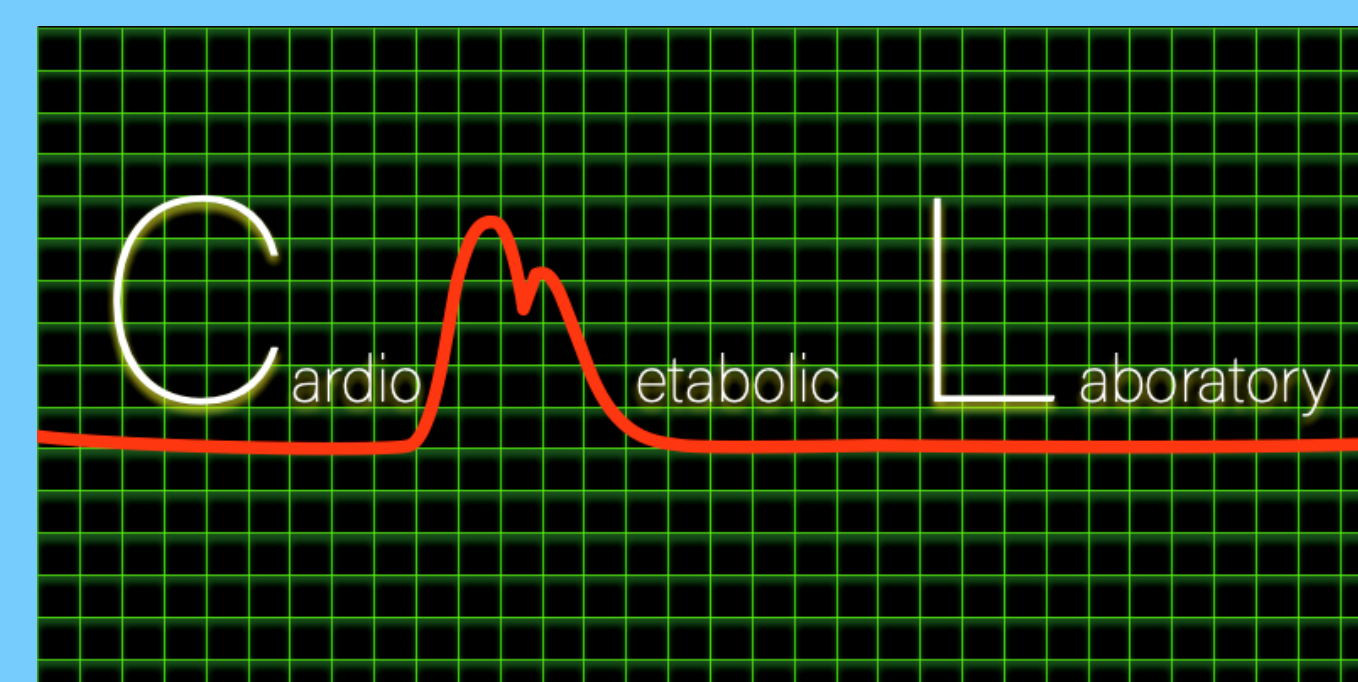
Psychological stress acutely impairs vascular function. Increased cardiometabolic disease risk may occur when acute stressors become chronic.

QUESTION

Does cardiorespiratory fitness moderate vascular and autonomic reactivity following exposure to an acute mental stressor among healthy young adults?

TAKE HOME

Parental resilience moderated the relationship between sedentary time and WC, with a positive relationship between sedentary time and WC for the high resiliency group



METHODS

Study Design

- Cross-over
- Two groups: fit and non-fit based on ACSM guidelines
- Visits: (1) Consent, familiarization, (2) VO_{2max} test to characterize fit and non-fit, (3-4) experimental (stress) and control (no-stress) visits in random order

Participants/ Sampling

- 26 healthy young adults
- Categorized as "fit" if guidelines met (150 min moderate, or 75 min vigorous aerobic exercise/wk)
- "Non-fit" if ACSM PA guidelines not met

Dependent Variables

- Brachial-femoral pulse wave velocity (PWV)
- Central and peripheral blood pressure (cSBP, cDBP, SBP, DBP)
- Augmentation Index (AIx)

Independent variables

- Time (min; 60 min measurement period post stress)
- Fitness status
- Stress exposure (5 min mental arithmetic test (MAT): subtract 7 or 13 from 4 digit number)

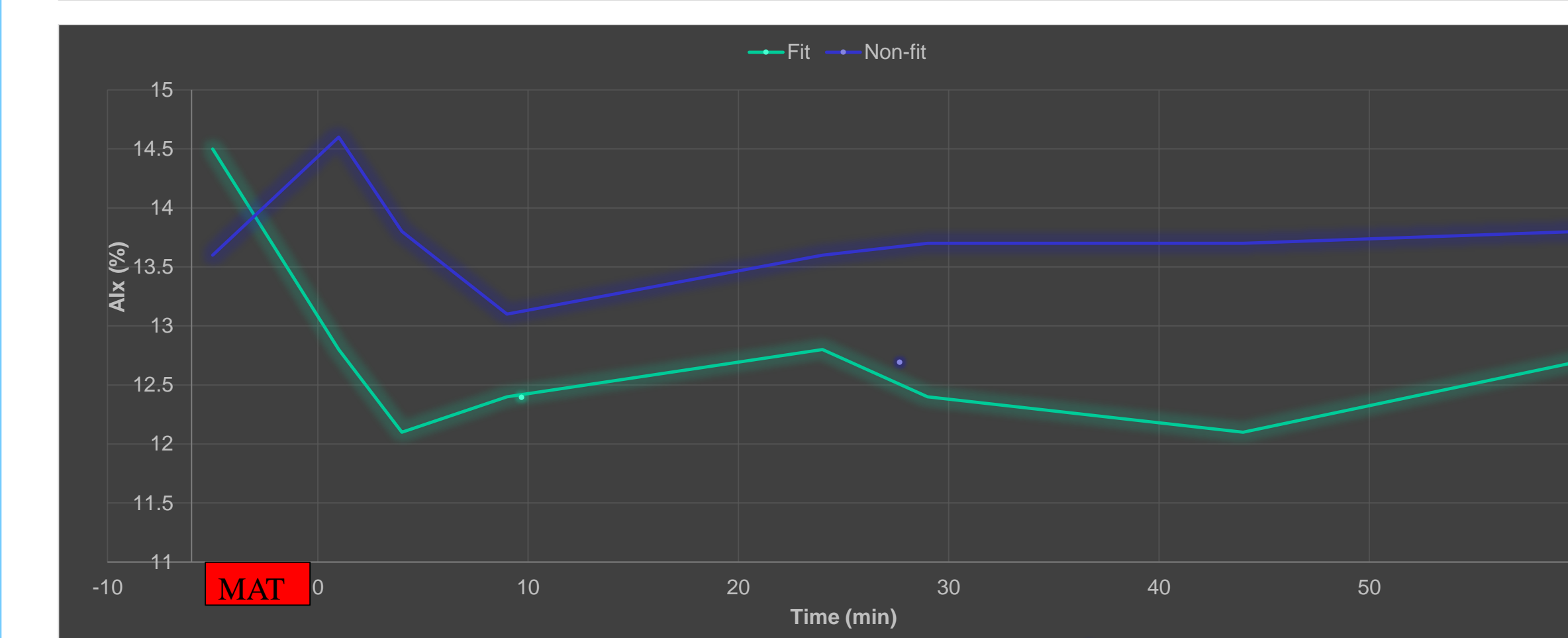
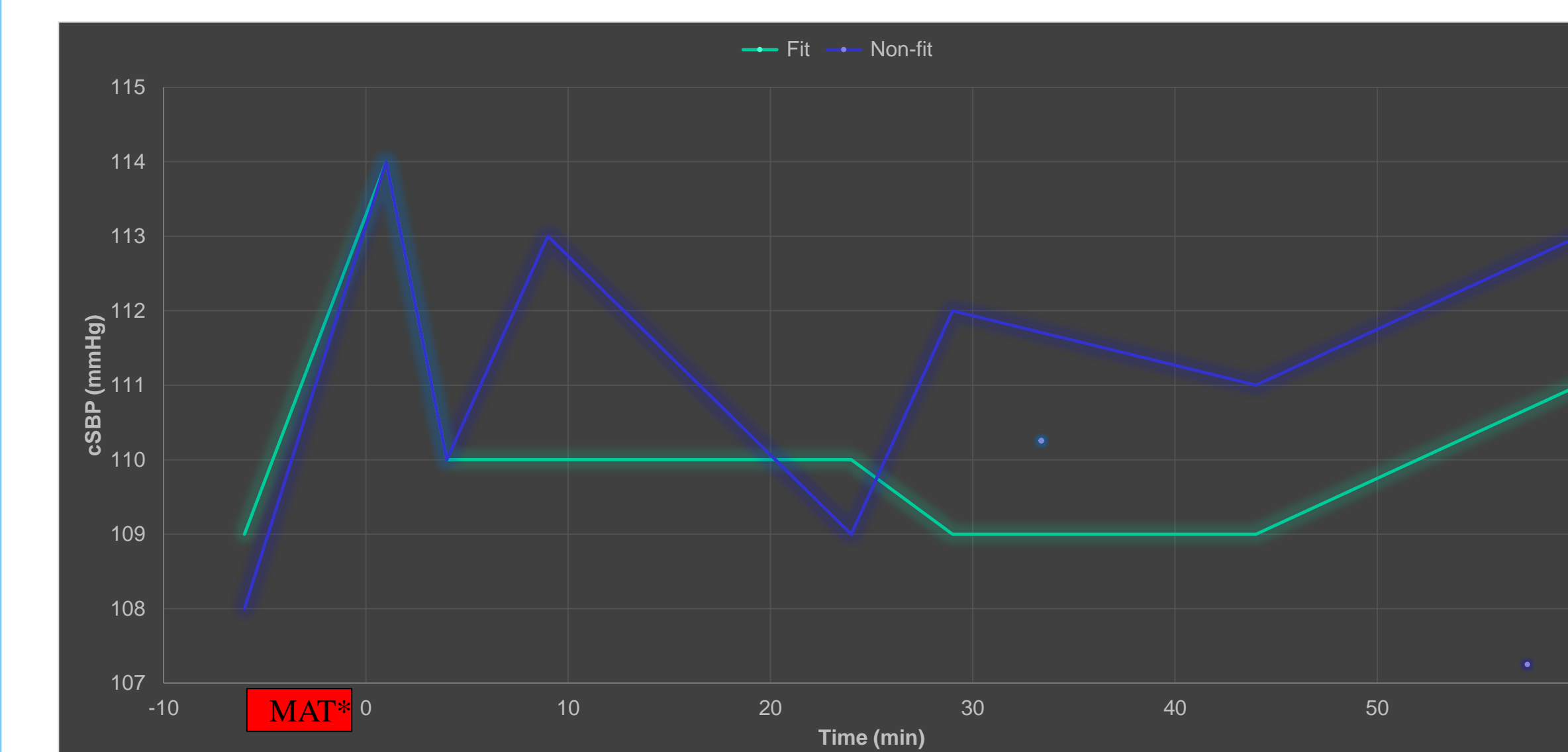
Analysis

- Mixed effects regression models, subject ID as random effect
- **Adjustments:** baseline measures, control (non-MAT measures), sex.

RESULTS

- There was a significant fitness x condition interaction for AIx ($p=0.038$).
- Regardless of fitness, stress elicited a 3.05 mmHg greater increase in cSBP after the stressor versus the non-stress condition.

Figures 1 and 2. cSBP and AIx reactivity following the acute mental stressor in fit vs. non-fit



*Acute mental stressor: 5-minute mental arithmetic test

Table 1. Mixed model results for primary dependent variables

	Model	Estimate				P
		Estimate	SE	LCI	UCI	
SBP	Time	6.33	1.20	3.98	8.67	<.001
	Fit	-1.56	1.20	-117.54	119.88	0.20
	Time*Fit	-4.06	2.39	-8.75	0.63	0.40
DBP	Time	2.35	0.92	0.54	4.15	<.001
	Fit	1.81	0.92	0.01	3.62	0.06
	Time*Fit	5.15	1.85	1.53	8.78	0.13
MAP	Time	3.01	0.89	1.26	4.76	<.001
	Fit	0.76	0.90	-1.01	2.53	0.41
	Time*Fit	3.54	1.79	0.04	7.04	0.260
cSBP	Time	5.80	1.24	3.37	8.22	<.001
	Fit	-2.23	1.31	-4.82	0.36	0.11
	Time*Fit	-4.34	2.48	-9.00	0.68	0.40
fPWV	Time	0.44	1.00	0.50	0.75	<.001
	Fit	-0.12	0.22	-0.55	0.30	0.57
	Time*Fit	-0.26	0.27	-0.80	0.28	0.98
AIx	Time	-1.31	0.56	-2.40	-0.22	0.28
	Fit	-1.80	0.52	-2.82	-0.78	<.01
	Time*Fit	-2.80	1.11	-4.98	-0.61	0.01

Figure 3. Correlation matrix of VO_{2max} and maximum SBP

