

Heart Rate Variability and Psychosocial States

An Atherosclerotic Risk in Communities Study

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Understand

Introduction

Disclosures and Funding

- ▶ Emory University
- ▶ Atherosclerosis Risk in Communities Study
- ▶ No conflicts of interest

Atherosclerosis Risk in Communities Study

The ARIC study is a prospective epidemiologic study designed to investigate atherosclerosis and its clinical outcomes by cardiovascular risk factors, diseases, and demographics. It involved longitudinal follow-up over five visits from 1987 to 2013, with outcomes updated as of 2015, with over 15k initial participants. It collected measures of psychosocial stress (increased anger, increased vital exhaustion, decreased social support) and HRV over time.

Background

Psychosocial stressors, such as fatigue and vital exhaustion, are repeatedly shown to be associated independently with MACE.^{1,2} Stressors and depression are shown to correlate with lower HRV.³⁻⁵ The relationship between autonomic dysfunction and psychosocial stressors is still being studied.

Does psychosocial stressor impact HRV longitudinally, and does their interaction reflect increased cardiovascular mortality?

Purpose

Objectives:

- ▶ Examine HRV from V1 and V4
- ▶ Study the relationship of anger from V2 to V4
- ▶ Cross-sectional relationship with vital exhaustion / social support at V2
- ▶ Compare these factors with longitudinal outcomes

Hypothesis:

- ▶ increased stress will associate with lower HRV
- ▶ changes in stress will associate with proportional changes in HRV
- ▶ the interaction of lower HRV and higher stress will have increased risk of mortality

Methods

Report

Description

Population

Table 1: Summary descriptives table

	[ALL] N=15792
GENDER:	
Female	55%
Male	45%
RACE:	
Asian	0%
Black	27%
Unknown	0%
White	73%
BMI	28 (5)
HTN	35%
CHD	5%
DIABETES	12%

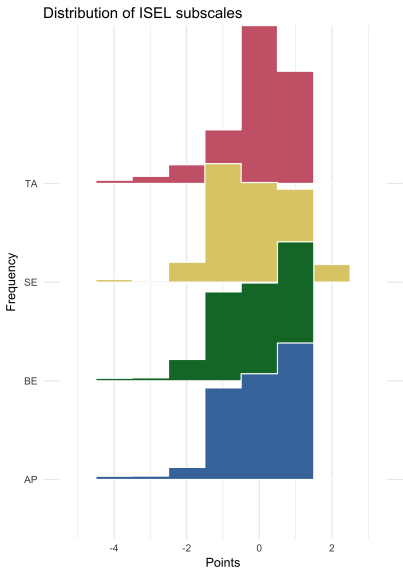
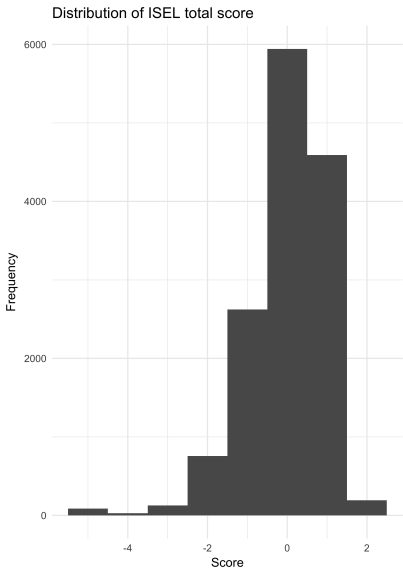
Interpersonal support evaluation list (ISEL)

The ISEL is scored from 0-3 points per question for 16-items, with the total ranging from 0-48 points (higher being more supportive). There are subscales, which are seen below as they map on to the HPAA questions.

Variable	Questions
Appraisal (AP)	7, 10, 14, 17
Tangible (TA)	8, 9, 13, 16
Belonging (BE)	4, 5, 6, 11, 18
Self-esteem (SE)	3, 12, 15

The scores were normalized for ease of comparison.

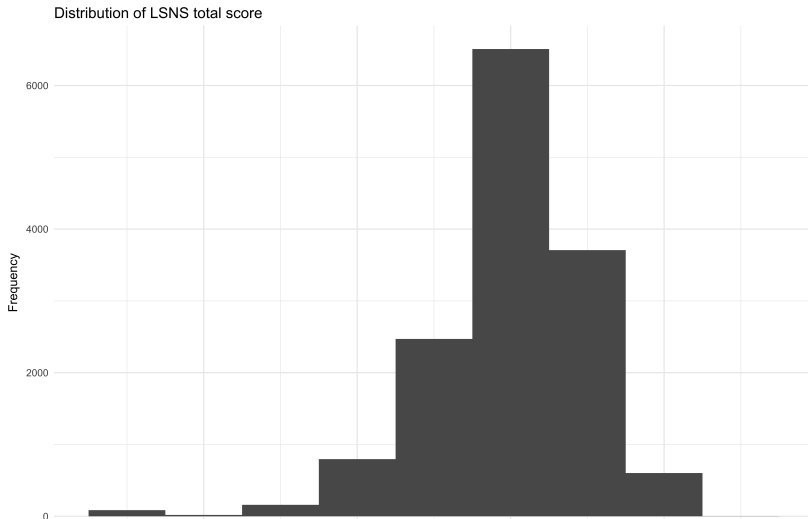
ISEL distribution



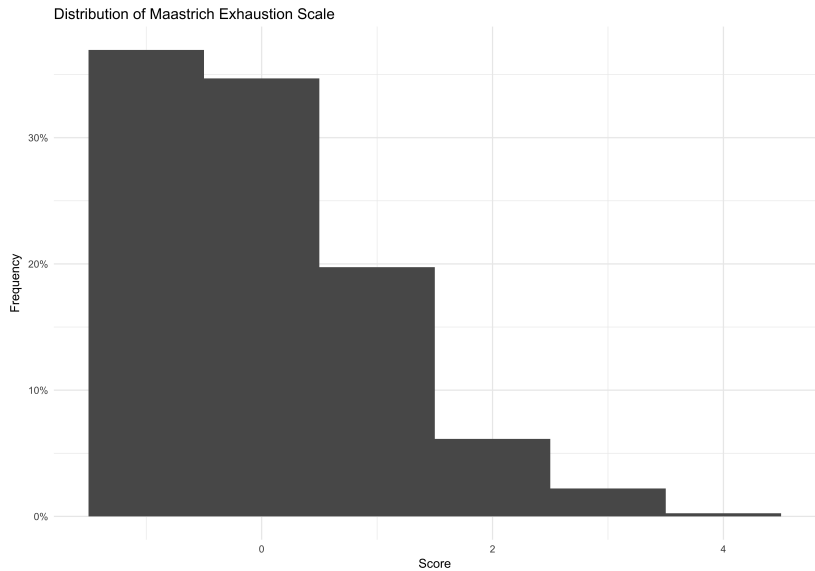
ISEL Summary

Lubben social network scale (LSNS)

The LSNS is scored from 0-5 points for an 10-item questionnaire (the original form), with the total ranging from 0-50 points (higher more supportive). The subscales haven't been validated. The scores were normalized for ease of comparison.

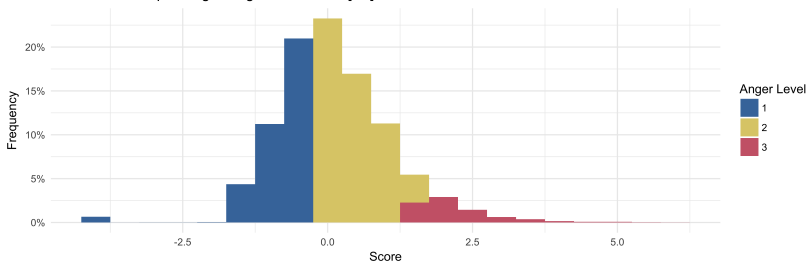


Maastrich vital exhaustion questionnaire

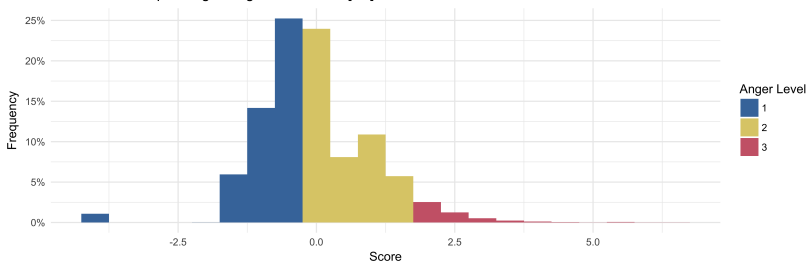


Spielberger anger trait scale

Distribution of Spielberger Anger Trait Scale [V2]

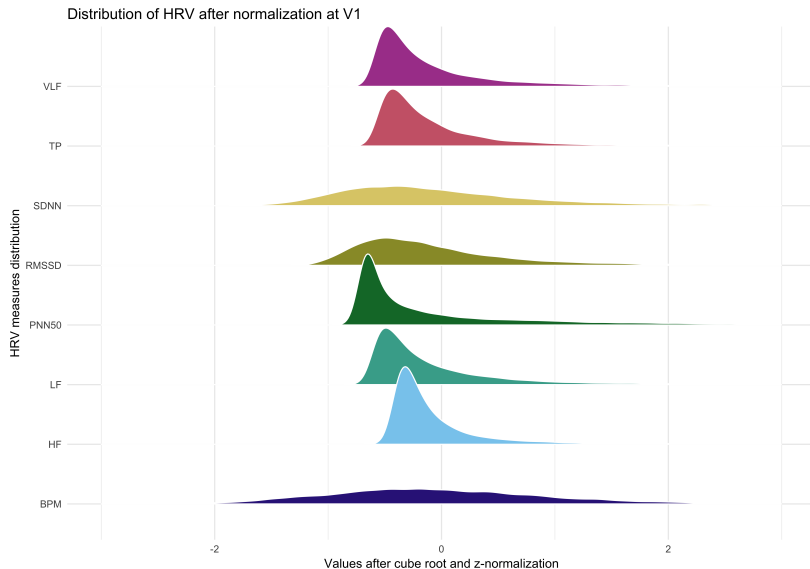


Distribution of Spielberger Anger Trait Scale [V4]

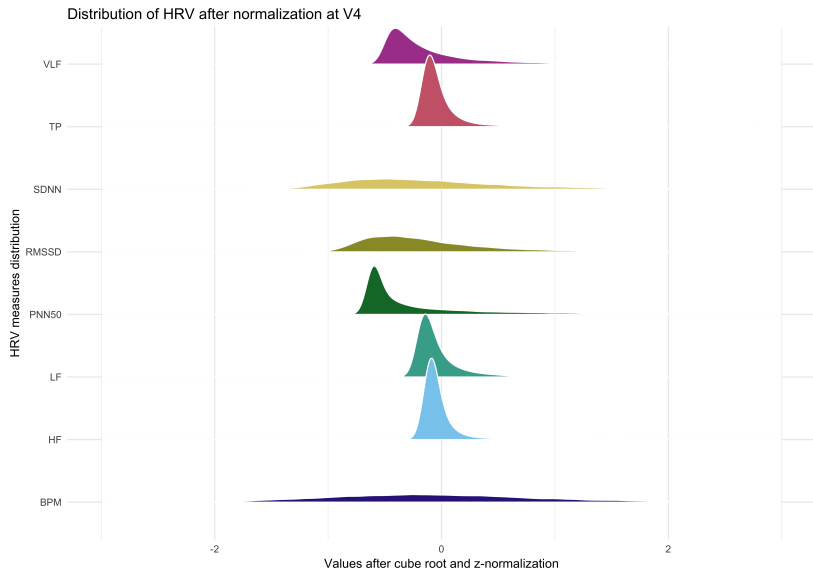


Heart rate variability measures

Distribution at visit 1



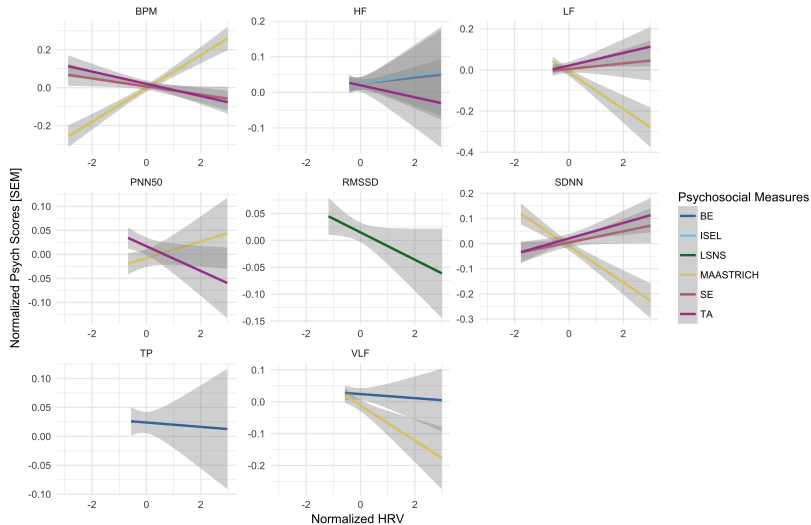
Distribution at visit 4



Relationship between stress and HRV

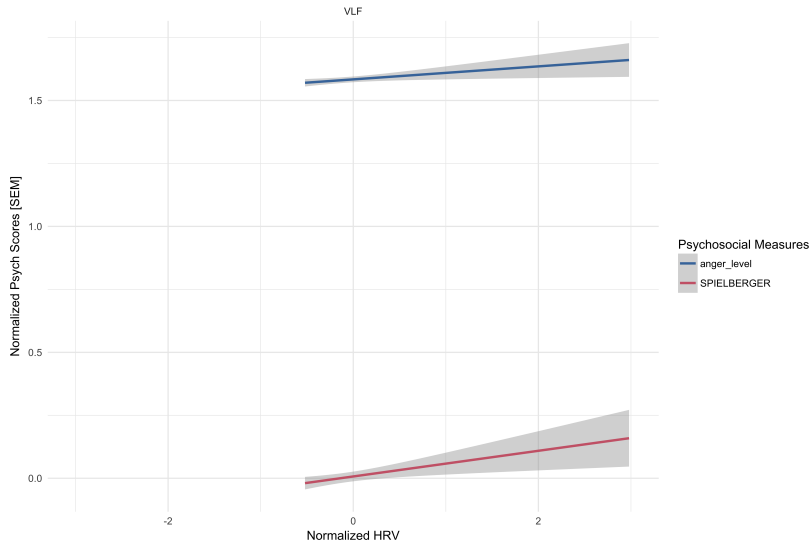
Visit 2 relationships

Linear regressions of Psych ~ HRV at Visit 2



Visit 4 Relationship

Linear regressions of Psych ~ HRV at Visit 4



Conclusion

References I

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2. Bogle BM, Sotoodehnia N, Kucharska-Newton AM, Rosamond WD. Vital exhaustion and sudden cardiac death in the Atherosclerosis Risk in Communities Study. *Heart (British Cardiac Society)*. 2018;104(5):423-429. doi:10.1136/heartjnl-2017-311825
3. Huang M, Shah A, Su S, et al. Association of Depressive Symptoms and Heart Rate Variability in Vietnam War-Era Twins. *JAMA Psychiatry*. May 2018. doi:10.1001/jamapsychiatry.2018.0747
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