Supplement

**Table S1. Correlations of demographics and health behaviors with individual physiological resting and reactivity values.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Sex (men compared to women)a** | **Age** | **Habitual smoking (yes) a** | **Exercise (yes) a** | **BMI** |
| Resting levels | | | | | |
| RSA (ms) | -.10\* | -.11\*\* | -.01 | .10\* | .06 |
| IBI (ms) | .10\* | .05 | .03 | .24\*\* | .04 |
| PEP (ms) | .14\* | -.02 | -.06 | .09\* | -.05 |
| LVET (ms) | -.09\* | .06 | .04 | .16\*\* | .09\* |
| SBP (mmHg) | .27\*\* | .03 | .07 | .04 | .22\*\* |
| DBP (mmHg) | -.002 | .02 | -.06 | -.06 | .04 |
| Reactivity | | | | | |
| ΔRSA (ms) | .11\*\* | .12\*\* | .05 | -.01 | -.002 |
| ΔIBI (ms) | -.10\* | *.07* | .03 | -.04 | .03 |
| ΔPEP (ms) | .03 | .09\* | .09\* | .07 | .02 |
| ΔLVET (ms) | -.15\*\* | .05 | .003 | .10\* | .03 |
| ΔSBP (mmHg) | .08\* | -.06 | -.05 | -.03 | -.05 |
| ΔDBP (mmHg) | .09\* | -.05 | .02 | .06 | *-.06* |

Note: **a** Spearman correlation. \* p<.05, \*\* p<.01, italic: significance trend p<.10

**Resting physiological profiles as related to subsequent stress reactivity of individual measures**

Resting state profiles were associated with specific reactivity patterns of the physiological parameters (Table 5). ANOVA analyses revealed significant associations of cluster membership during rest with subsequent single-measure RSA reactivity (Ƞ2=.16), IBI reactivity (Ƞ2=.16), PEP reactivity (Ƞ2=.07), and LVET reactivity (Ƞ2=.04), but not for SBP reactivity (Ƞ2=.01), or DBP reactivity (Ƞ2=.02). Post-hoc tests showed that the resting clusters differed in the magnitude of parasympathetic reactivity to the subsequent acute mental challenge. The resting clusters characterized by a high vagal baseline (C2) and by high resting SBP (C3) exhibited relatively large parasympathetic withdrawal responses. The low vagal resting activity profile (C4) was characterized by an absence of a parasympathetic response to stress. With respect to IBI, post-hoc tests showed a similar pattern. Sympathetic stress reactivity was similar for clusters 1, 2 and 4, while sympathetic reactivity was stronger for the cluster characterized by a high resting SBP (C3) and high resting cardiac contractility (C5). LVET showed the strongest reactivity in the high resting SBP cluster, and the smallest reactivity in the high baseline contractility cluster. With respect to blood pressure, all clusters showed similar responses. Worth noting is that, consistent with the law of initial values, the high resting SBP cluster (C3) displayed the smallest SBP and DBP stress responses.

**Table S2. Prediction of stress reactivity of individual cardiovascular measures by baseline resting physiology clusters**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Means (se) | Cluster 1 “SV balance – Normative BP” | Cluster 2 “High vagal” | Cluster 3 “High SBP” | Cluster 4 “Low vagal” | Cluster 5 “ Vagal dominance, contractility ” | F | P value | Ƞ2 |
| RSA reactivity (ms) | -6.84 (2.2)a | -35.62 (2.7)b | -31.52 (2.7)b | -.04 (3.3)c | -12.67 (3.4)a | 28.34 | <.0001 | .16 |
| IBI reactivity (ms) | -131.18 (5.7) a | -198.45 (6.7) b | -178.07 (9.4) b | -99.05 (8.5) c | -136.39 (9.2) a | 27.53 | <.0001 | .16 |
| PEP reactivity (ms) | -5.04 (.4) a | -5.23 (.4) a | -6.60 (.6) b | -5.27 (.6) a | -9.42 (.6) c | 11.33 | <.0001 | .07 |
| LVET reactivity (ms) | -16.60 (1.5) a | -16.67 (1.7) a | -24.26 (2.4) b | 19.43 (2.15) a | -9.56 (2.3) c | 5.27 | <.0001 | .04 |
| SBP reactivity (mmHg) | 18.17 (.6) a | 18.47 (.7) a | 15.7 (1.0) b | 19.26 (1.0) a | 17.84 (1.1) a,b | 1.92 | .11 | .01 |
| DBP reactivity (mmHg) | 13.76 (.5) a | 14.63 (.6) a | 11.95 (.7) b | 14.76 (.8) a | 14.20 (.9) a | 2.54 | .039 | .02 |

Note: se = standard error; SV = sympathovagal; BP = blood pressure; SBP = systolic blood pressure; DBP = diastolic blood pressure; mmHg = millimetres Mercury; ms = milliseconds; RSA = respiratory sinus arrhythmia; IBI = interbeat interval; PEP = pre-ejection period; LVET = left ventricular ejection time. The subscripts a, b and c indicate the contrasts. Clusters with different letters are significantly different from each other, while clusters with the same letter are not.

**Table S3. Pearson correlations of individual resting measures of cardiovascular functioning with individual cardiovascular reactivity measures.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **RSA reactivity** | **IBI reactivity** | **PEP reactivity** | **LVET reactivity** | **SBP reactivity** | **DBP reactivity** |
| **Resting RSA** | -.75\*\* | -.32\*\* | -.05 | -.01 | *-.07* | -.01 |
| **Resting IBI** | -.23\*\* | -.48\*\* | .04 | .01 | .01 | .04 |
| **Resting PEP** | -.09\* | -.06 | -.36\*\* | .14\*\* | -.01 | -.004 |
| **Resting LVET** | -.14\*\* | -.25\*\* | .26\*\* | -.16\*\* | .001 | .003 |
| **Resting SBP** | -.03 | -.06 | -.04 | -.16\*\* | -.16\*\* | -.07 |
| **Resting DBP** | .02 | *.08* | .01 | -.12\*\* | -*.07* | -.25\*\* |

Results show an interesting pattern of relations between individual cardiovascular resting variables and cardiovascular reactivity (∆) variables. As expected, baseline levels are the strongest correlates of their corresponding reactivity measures.

**Table S4 . Descriptive statistics (Means, SD) for the entire stress protocol**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Resting baseline |  | Post task 2nd baseline | Preparation | Speech | Math |
| SBP (mmHg) | 123.0 ± 10.1 |  | 120.9 ± 12.7 | 137.4 ± 14.9 | 142.2 ±13.8 | 140.0 ± 13.4 |
| DBP (mmHg) | 74.9 ± 7.4 |  | 76.6 ± 9.7 | 88.2 ± 12.0 | 89.5 ± 10.1 | 88.3 ± 9.6 |
| RSA (ms) | 85.0 ± 41.5 |  | 87.1 ± 42.7 | 74.1 ± 36.6 | 68.0 ± 29.2 | 66.1 ± 27.3 |
| PEP (ms) | 90.1 ± 10.6 |  | 89.4 ± 10.4 | 85.1 ± 9.9 | 83.4 ± 9.5 | 84.0 ± 10.1 |
| LVET (ms) | 290.3 ± 22.8 |  | 292.3 ± 25.0 | 278.5 ± 28.1 | 273.4 ± 30.1 | 273.0 ± 28.6 |
| IBI (ms) | 831.7 ± 111.9 |  | 823.22 ± 107.2 | 723.7 ± 106.7 | 681.2 ± 107.6 | 683.3 ± 110.4 |

**Note:** Resting baseline data were used for the resting cardiovascular profiles, while the average (Speech – Math) level was used for the calculation of reactivity (reactivity = stress (mean(speech, math)) – resting baseline).

**Sensitivity analysis for reactivity data**

Table A. task order split

|  |  |  |  |
| --- | --- | --- | --- |
| Number of clusters | Task order | | Differences for best fit |
|  | Math first (N=393) BIC | Speech first (N=304) BIC |  |
| 4-Cluster model | **16550.04** | **13101.93\*** | Original Cluster 2 is absent |
| 5-Cluster model | 16570.07 | **13101.01\*** | Similar to original |
| 6-Cluster model | 16605.20 | 13130.11 |  |

\* Not significantly different from each other

Table B. reactivity for separate TSST components split

|  |  |  |  |
| --- | --- | --- | --- |
| Number of clusters | Separate stressors | | Differences for best fit |
|  | Math task (N=724) BIC | Speech task (N=724) BIC |  |
| 4-Cluster model | 30675.76 | **30606.61\*** |  |
| 5-Cluster model | **30658.54** | **30609.56\*** | Both similar to original |
| 6-Cluster model | 30662.63 | 13130.11 |  |

\* Not significantly different from each other