How Optimism Effects Heart Rate and Ability to Multitask

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Introduction

Stress
Physiological measures can be used to determine a person’s stress level. Electrocardiogram data is one such measure, which has been used previously (Shearer, 2016).

Optimism
Richman (2007) points out that optimism has historically allowed people to avoid the negative impacts of stress. There exists a link between optimism and a lower risk for having long term ailments, such as coronary heart disease (Richman 2007).

Multitasking Ability
Physiological measures like heart rate and blood pressure will likely be increased in a multitasking setting (Wetherell & Carter, 2014).

Hypothesis
It is hypothesized that participants with a higher level of optimism will have a lower heart rate during stressful situations, and because they are experiencing a lower level of stress they will be better able to multitask.

Method

Participants
• N = 10 students from Eastern Connecticut State University
• 40% Male (n = 4), 60% Female (n = 6)
• 10% Freshman (n = 1) 40% Sophomore (n = 4) 20% Junior (n = 2) 30% Senior (n = 3)
• 90% Caucasian (n = 9), 10% Hispanic/Latin@ (n = 1)
• Mean Age: 19.75 (SD = 1.44)

Materials
Intolerance of Ambiguity and Depression: A Cognitive Vulnerability Factor Linked to Hopelessness (Andersen, Schwartz, 1992)
• 5 point Likert scale
• Higher scores indicate a low level of optimism
• Multitasking Assessment
• Future Events Scale Survey
BioPac MP150 machine measured heart rate using electrocardiogram on the forearms

Procedure
• Washed hands with soap to the elbows
• BioPac monitors applied to the forearms
• Three minute baseline
• Mirror Tracing task
• Multitasking Assessment
• Future Events Scale/Optimism Survey
• Demographic measure

Results
• IBM SPSS 22
• Mean Values: Optimism, M = 54.6 (SD = 8.15); Multitasking Ability, M = 2.92 (SD = .372); Heart Rate 1, M = -2.57 (SD = 3.86); Heart Rate 2, M = -1.29 (SD = 3.72)
• A Spearman’s rho correlation coefficient was calculated
• A strong correlation of -.74 was found between optimism and heart rate 1, r_s(N = 10) = -.74, p = .01
• A moderate correlation of .65 was found between multitasking ability and heart rate 2 r_s(N = 10) = -.65, p = .04
• No correlation was found between optimism and heart rate 2 r_s(N = 10) = -.23, p = .52
• No correlation was found between multitasking ability and heart rate 1 r_s(N = 10) = .07, p = .86
• No correlation was found between optimism and multitasking ability r_s(N = 10) = .27, p = .46

Discussion

Summary
• A strong negative correlation was found between optimism and heart rate 1. Participants who scored higher in optimism had lower heart rates when stressed.
• A moderate positive correlation was found between multitasking ability and heart rate 2. Participants who had high multitasking numbers (slow speeds) had high heart rates when stressed.
• No correlation was found between optimism and ability to multitask

Limitations
• Small sample size

Future Directions
• Larger sample size

References

Figure 1: Scatterplot showing the relationship between Optimism and Heart Rate.