Emotional Intelligence and Electric Shock in Relation to Galvanic Skin Response

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Introduction

Stress

- Stress is the result of "when one's perceived demands outweigh one's perceived resources" and will elicit physiological responses (Cruess et al., 2015).

Effects of Stress

- One study evaluated the level of stress by the ability of skin to conduct an electric current. This is because of the increase in sweat production during times of stress (Elfering & Grebner, 2011).

Variables Associated With Stress

- Emotional intelligence is the ability of someone to distinguish emotions and their implications (Meyer & Geher, 1996)
- There is a relation between emotional intelligence and physiological response (Zysberg, 2012).
- The more someone is stressed, the more likely they are have a poor test score on an emotional intelligence assessment (Holinka, 2015)

Hypothesis

- A lower score on an emotional intelligence test (S-PEC) will correlate with a lower galvanic skin response to stress from electric shock.

Method

Participants

- *N* = 10 students from Eastern Connecticut State University
- 40% Male (n = 4), 60% Female (n = 6)
- 10% Freshmen (n = 1), 40% Sophomore (n = 4), 20% Junior (n = 2), 30% Senior (n = 3)
- 90% Caucasian (n = 9), 10% Hispanic (n = 1)
- Mean Age: 19.7 (*SD* = 1.4)

Materials

Brief Emotional Intelligence Scale (Davies, Lane, Devonport, & Scott, 2010)

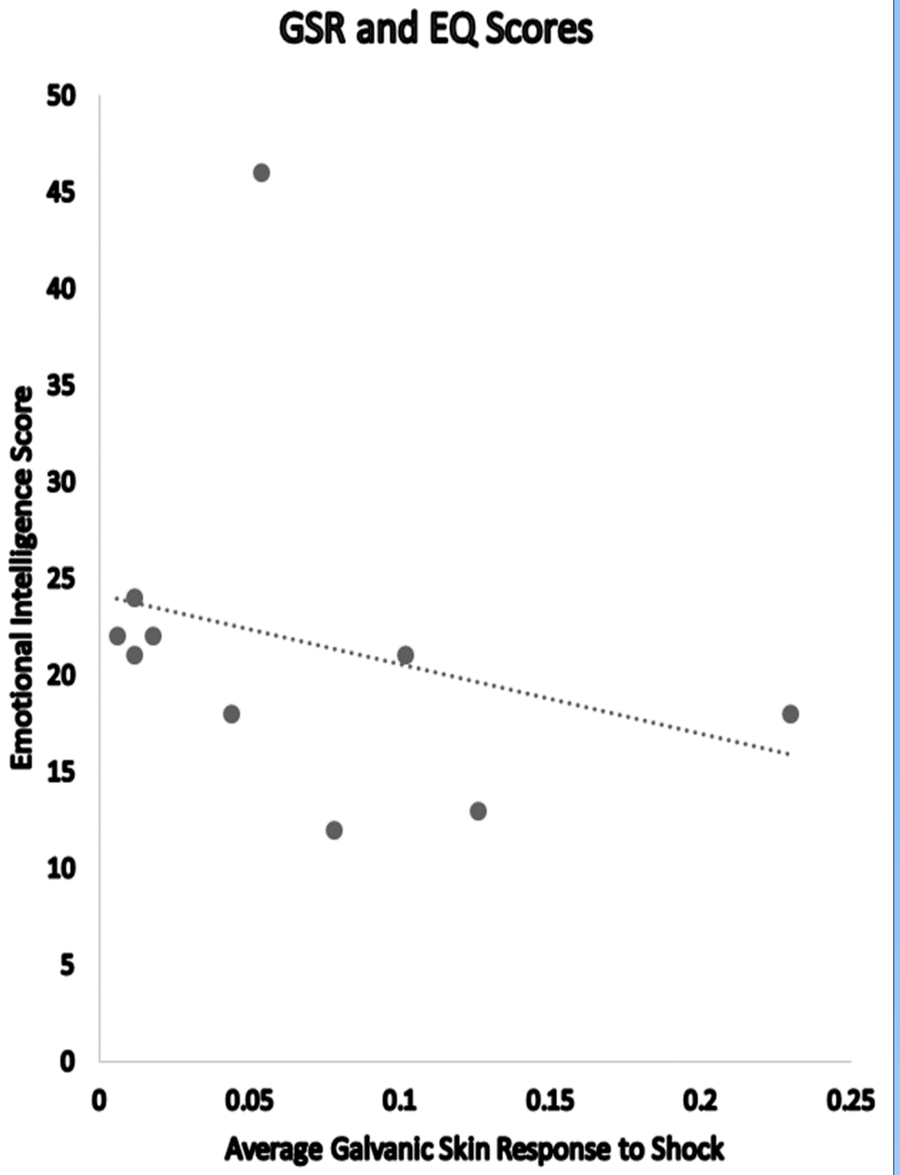
- 5 pt. Likert-type scale
- Lower score suggests higher level of emotional intelligence

Electric shock

- Low level of shock administered to each participant
- Meant to induce physiological response indicating stress
- BioPac MP150 measured GSR on the palm of the hand

Procedure

- Administer BEIS-10. Valid and reliable measure (Davies, Lane, Devonport, & Scott, 2010)
- Apply Biopac monitors to palms of the hand, record a 5 minute baseline
- Apply intermittent shock at variable intervals, record GSR levels during this time period
- Demographic measure



Results

- IBM SPSS 22
- Mean Value: GSR *M* = .07 (*SD* = .70),
- Mean Value: EQ *M* = 21.70 (*SD* = 9.39)
- A Spearman's *rho* correlation coefficient was calculated
- A negative correlation was found between EQ and GSR r_s (*N* = 10) = -.58, p = .05

Conclusion

Summary

- The hypothesis that a lower score on an emotional intelligence test (S-PEC) will correlate with a lower galvanic skin response to stress from electric shock was supported by the findings.
- It could be inferred that people who are more aware of emotions are better able to control their body's response to stress such as electrical shock.

Limitations

- Small sample size
- Brief Measure
- Internal Validity
- External Validity

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The Relationship Between Social Networking and Stress Shown Through Galvanic Skin Response

Nicole Bosse

Introduction

Stress

- Stress is a negative reaction that is caused by a dangerous stimuli, an event outside of the person's control, or an environment that affects the well-being of the person (Sato & Wilson, 2014).
- A stress response is how a person reacts psychologically and physiologically when they encounter a problem or difficult environment (Liu, Liu, Oei, Wang, Zhou & Zhao, 2013).

Social Media

- An increase in stress is related to the increase in the dependency for social interaction through social media. Many people who report having excessive internet use have anxiety, depression, high levels of stress and etc. (Osborne, Reed, Romano, Truzoli, & Vile, 2015).
- Those exposed to stressful events and have a poor ability to cope are more likely to not resist bad habits like over eating, excessive drinking, smoking, problematic internet use (PIU), and etc. (Li, Wang & Wang, 2009).

Causes of Stress

- College students who have been through a death of a member of their family, their parents getting a divorce, and falling out of relationships; all of which can cause stress (Aksoz, Deatherage, & Servaty-Seib, 2014).
- Previous research has used the mirror tracing activity as a stressor (Nagano, Sawada, & Tanaka, 2002).

Hypothesis

- An increase in stress is related to the increase in the dependency for social interaction through social media.

Methods

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/Latino (a) (*n*=1)
- Mean age:19.75 (*SD*=1.4386)

Materials

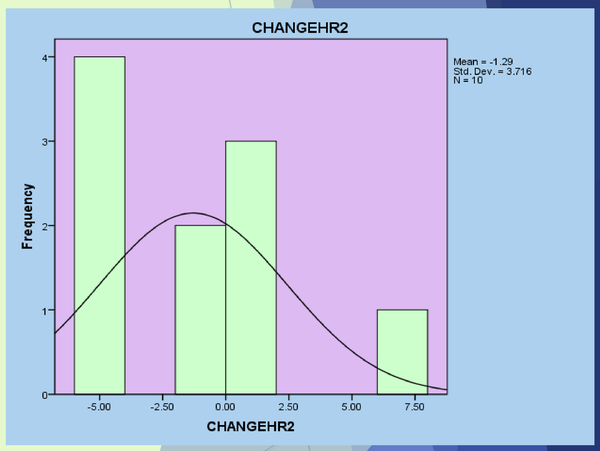
- Psycho-Social Aspects of Facebook use Questionnaire (Bodroža & Jovanović, 2016). Bodroža & Jovanović, 2016 confirm that PSAFU is a valid test.
  - 5 pt. Likert type scale.
  - Higher levels indicate stronger dependency for social interaction through social media.
- Mirror Tracing Task
  - Computer set up
  - All students take same Mirror Tracing Activity.
  - All complete all difficulty levels under the same time restrictions
- Galvanic Skin Response
  - BioPac MP150 machine measured GSR on the palm of the hand

Procedure

- Students took the Psycho-Social Aspects of Facebook use Questionnaire (modified).
- Each student was brought to quiet room
- Once in the room and comfortable the student was hooked up to the Galvanic Skin Response (GSR).
- Students then took a mirror tracing test on the computer
- Student had a set amount of time to complete each level of difficulty for the mirror tracing activity.

Results

- IBM SPSS 22
- Mean values: social networking score *M*=117.7(*SD*=17.72663), change in GSR1 *M*=.128 (*SD*=.06887), change in HR1 *M*=-2.572 (*SD*=3.85707), change in GSR2 *M*=.12 (*SD*=.15384), change in HR2 *M*=-1.294 (*SD*=3.71557)
- A Spearman's *rho* correlation coefficient was calculated
- A weak correlation between social networking and change in GSR1 that was not significant was found $p = .405$, (r_s (8) = -.297, $p > .05$); social networking is not related to change in GSR1.
- A weak correlation between social networking and change in GSR2 that was not significant was found $p = .675$, (r_s (8) = -.152, $p > .05$); social networking is not related to change in GSR2.
- A weak correlation between social networking and change in HR1 that was not significant was found $p = .467$, (r_s (8) = .261, $p > .05$); social networking is not related to change in HR1.
- A moderate correlation between social networking and change in HR2 that was not significant was found $p = .347$, (r_s (8) = .333, $p > .05$); social networking is not related to change in HR1.



Discussion

Summary

- No relationship was found between the dependency for social interaction through social networking, GSR, and heart rate.
- No difference found between participants with high dependency on social interaction through social networking and participants with low dependency on social interaction through social networking when it comes to stress level.

Limitations

- The sample size was very small
- The sample group was not very diverse

Future Directions

- Use a larger sample size
- Split all the experiment up rather than doing everything at once; give the participants a break in between each experiment.

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The Relations between Heart Rate and Self-Critical Perfectionism from Induced Stress

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Introduction

Stress & Effects of Stress

- Stress can influence an individual's life both physiologically and psychologically (Cruess et al., 2015).
- Positive relations exist between high stress and poor behavioral choices, such as harmful relationships (Lewandowski, Mattingly, & Pedreiro, 2014).
- Higher levels of both self-criticism and stress are related to an increase in an individual's susceptibility to mental illnesses, such as depression and anxiety (Mandel, Dunkley, & Moroz, 2015).

Self-Critical Perfectionism

- Self-critical perfectionism (SCP) is defined by having high standards of yourself and your goals, but also being overly self-critical in the process (Blatt & Luyten, 2009).
- Previous research found a positive relation between stress and SCP (Kempke, Luyten, Mayes, Van Houdenhove, & Claes, 2016)
  - As stress increased, the participant also showed an increase in self-critical perfectionism (Kempke et al., 2016).
- Self-critical perfectionism inhibits the effectiveness of treatment programs for different mental illnesses (Blatt & Zuroff, 2005).

Hypothesis

- There will be a positive relation between induced stress, as measured by heart rate, and self-critical perfectionism.
- Specifically, those who score higher on the Depressive Experiences Questionnaire Self-Criticism 6, indicating higher self-critical perfectionism, are expected to have a higher heart rate when stress is induced (Kempke et al., 2016).

Method

Participants

- Convenience sample from Eastern Connecticut State University ($N = 10$)
- Demographics of Participants
  - 40% Male ($n = 4$), 60% Female ($n = 6$)
  - 10% Freshman ($n = 1$), 30% Sophomore ($n = 3$), 30% Junior ($n = 3$), 30% Senior ($n = 3$)
  - 90% Caucasian ($n = 9$), 10% Hispanic ($n = 1$)
  - Mean Age of 19.75 ($SD = 1.44$)

Materials

Depressive Experiences Questionnaire Self-Criticism 6 (Rudich et al., 2008)

- Self-report, paper and pencil questionnaire
- 6 items, 7-point Likert Scale
- Blatt (2004) found that the measure is both valid and reliable when measuring SCP using the self-criticism subscale of the DEQ
  - Cronbach Alpha for self-criticism .75 (Zuroff, Quinlan, & Blatt, 1990)
- Higher scores indicate an individual is more self-critical

Mirror Tracing Task (computerized)

- Stress Inducer

Psychophysiological Data

- BioPac electrocardiogram (ECG) measured heart rate

Procedure

- A demographic form was administered
- Participants took the Depressive Experiences Questionnaire Self-Criticism 6
- Hands were washed up to the elbows
- Electrocardiogram (ECG) electrodes were applied to forearms and palms
- Five minutes of baseline data were recorded
- Participants took a computerized Mirror Tracing Task, which they were given 2 minutes for each of the three levels to complete

Results

- IBM SPSS 22
- Mean values: Depressive Experiences Questionnaire Self-Criticism 6, $M = 25.10$ ($SD = 5.86$); Change in Heart Rate 1, $M = -2.57$ ($SD = 3.86$); Change in Heart Rate 2, $M = -1.29$ ($SD = 3.72$)
- Spearman's *rho* correlation coefficient was calculated
- No correlation was found between critical perfectionism and change in heart rate one nor two, r_s ($N = 10$) = -1.52, $p = .67$, r_s ($N = 10$) = .33, $p = .35$

Discussion

Summary

- No significant relations were found between induced stress, as measured by heart rate and self-critical perfectionism, which contradicts with previous research.

Limitations

- The measure's reliability was weak based on its Cronbach Alpha of .75 (Zuroff et al., 1990)
- Small sample, not generalizable

Future Research

- Looking at SCP, stress and mental illnesses, such as depression (Luyten, Kempke, Van Wambeke, Claes, Blatt, & Van Houdenhove, 2011)

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The Effects of Stress on Working Memory

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Introduction

Stress

- Lazarus and Folkman (1984) defined stress as the body's reaction to life's demands, which in this reaction the body adapts by adjusting physiologically, emotionally, and behaviorally (as cited by Amirkhan, Urizar, and Clark, 2015).

Effects and Causes of Stress

- Schonfeld, Brailovskaia, Bieda, Zhang, and Margraf (2015) found that daily stressors can have a powerful effect in causing negative mental health. The researchers found that perceived self-worth can mediate the relationship between stress and mental health, suggesting buffers to reduce negative effects (Schonfeld et al., 2015).
- Dobbs, Furham, and McClelland (2011) studied test performance under different noise conditions. The researchers found that there was greater performance in complete silence than there was in situations with background noise and music (Dobbs et al., 2011).

Working Memory

- Researchers have discovered evidence supporting the fact that unpleasant disruptions affect information in people's working memories (Garcia-Pacios, Del Rio, & Maestu, 2014).
- Vasques, Garcia, and Galera (2016) found that visuospatial working memory can be impaired due to extraneous sensory influences. Specifically, the visual-noise interference affected the ability for participants to perform as well in the Matrix Pattern Recall Task, which uses your working memory (Vasques, Garcia, and Galera, 2016).

Stress and Working Memory

Oliver, Pinney, Maruff, and Norman (2015) studied the effects of psychosocial stress on healthy college student's working memory. The researchers found that their stress procedure, which was public speaking, did have impairments on their spatial working memory (Oliver et al., 2015).

Hypothesis

It is hypothesized that the alarm sound stressor that is played during the second Spatial Span Memory test will cause the scores to decrease from the first test scores without the stressor.

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/Latino/Latina (n = 1)
- Mean Age: 19.75 (SD = 1.44)

Materials

Cambridge Brain Science's Spatial Span Memory Test (online)

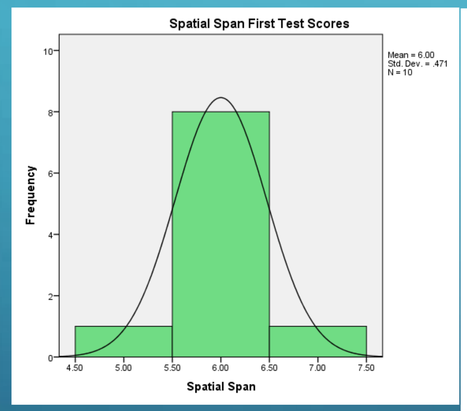
- Tests visuospatial memory (working memory)
- Higher score will demonstrate better working memory on the task
- The mean difference between the first and second scores were .40

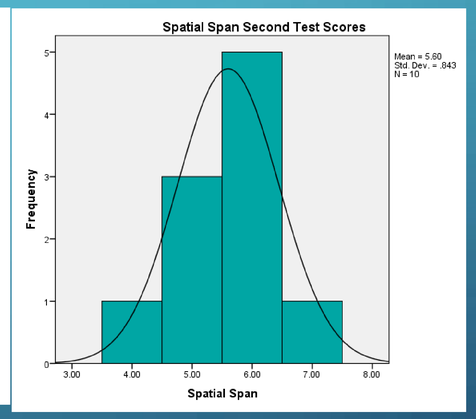
Alarm Sound Video from Youtube (modern alarm)

- A continuous alarm sound played during the second test

Procedure

- Enter room and go to computer
- Give brief directions
- Read instructions and begin the Spatial Span test until finished
- Record score for the memory test
- Then do the Spatial Span test again while alarm is played in the room
- Record score for the second memory test





Results

- IBM SPSS 22
- Mean Values: Spatial Span Memory Test: Score 1. M = 6 (SD = .47): Score 2. M = 5.6 (SD = .84).
- A Wilcoxin Signed Ranks Test was calculated
- There was not a statistically significant difference between the first and second memory scores (Z = -1.63, p = .10).

Discussion

Summary

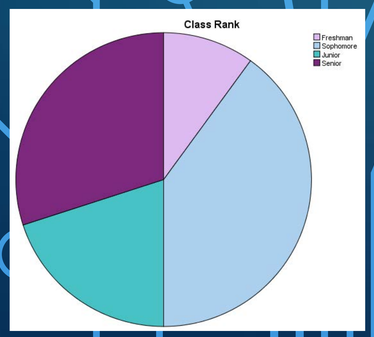
- There was not a statistically significant difference found between the first and second Spatial Span Memory Test scores.
- Therefor the alarm sound stressor did not have a statistically significant impact on working memory.

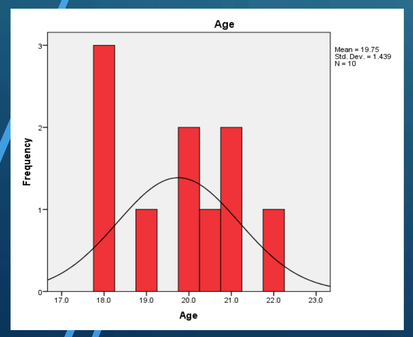
Limitations

- Small sample size
- The Spatial Span Memory Test scored the results very generally.
- The alarm sound that was chosen may not have been annoying and stressful enough to effect the performance on the Spatial Span Memory Test.
- Time available

Future Directions

- Use a larger sample size
- The scoring of the Spatial Span Memory Test could be adjusted to gain more specific scores, such as levels that the errors occurred. Also instead of having three opportunities for incorrect responses, the test could be scored after one incorrect response.
- Could also use a different type of memory test
- A more intrusive and stress inducing noise could be used, such as a video of other communication.





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How Optimism Effects Heart Rate and Ability to Multitask

Nathan Edwards

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).

Short term psychosocial stressors have been shown to limit one's ability to perform various cognitive tasks (Olver, 2015).

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

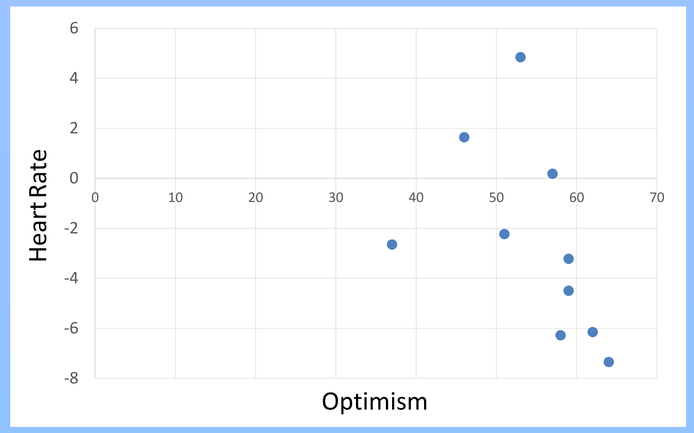
Intolerance of Ambiguity and Depression: A Cognitive Vulnerability Factor Linked to Hopelessness (Andersen, Schwartz, 1992)

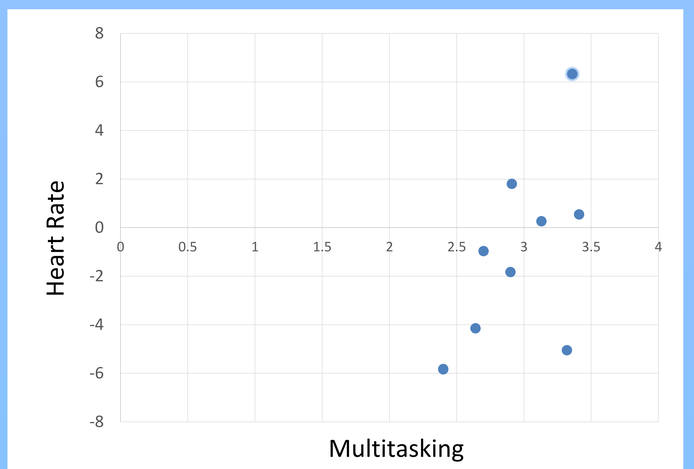
- 5 point Likert scale
- Higher scores indicate a low level of optimism
- Multitasking Assessment
- Future Events Scale Survey

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

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The Relationship Between Stress, Perfectionism and Life Satisfaction

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Introduction

Stress

- According to Kaya (2015), stress can be thought of as when a person perceives their environment to be threatening or challenging to their personal health
- The effects of stress can be measured on biological, psychological, and social dimensions. (Luijcks et al., 2014)

Effects of Stress

- Stress has been measured by psychophysiological responses such as increases in heart rate, muscle activity, and galvanic skin responses (GSR). (Luijcks et al., 2014)
- A relationship between stress, perfectionism and life satisfaction have been observed (Ashby, Noble, & Gnilka, 2010)

Perfectionism

- Yee (2003) defined effortless perfection as, "a term used to describe an intense pressure to be perfect without visible effort" (as cited by Travers et al., 2015, p. 1)
- Higher levels of perfectionism correlate with higher levels of stress and lower life satisfactions (Ashby, Noble, & Gnilka, 2010)

Life Satisfaction

- The process by which people base their state of satisfaction on how their life compares to the ideal standards of living. (Pavot & Diener, 2009)
- Lower amounts of life satisfaction result in higher amounts of stress (Kaya, Tansey, Melekoğlu, & Çakıroğlu, 2015)
- Stress is commonly measured with surveys like the perceived stress scale to compare with other life satisfaction surveys. However little research has been done with induced physiological stress. (Kaya et al., 2015)

Hypothesis

- It was hypothesized that participants with more effortless perfectionism would be positively correlated to reactivity to stress and a lower life satisfaction would be negatively correlated to reactivity to stress.

Results

- IBM SPSS 22
- Mean values: Effortless Perfectionism Scale M = 26.10 (SD = 8.24); Satisfaction with Life M = 24.40 (SD = 4.58); Change in GSR M = 0.12 (SD = 0.15)
- A Spearman's *rho* correlation was calculated
- No correlation was found between life satisfaction and change in GSR r (N= 10) = 0.434, p = 0.210
- No correlation was found between effortless perfectionism and change in GSR r (N= 10) = -0.280, p = 0.432
- A median split was implemented for more effortless perfectionism (group 1) was values above 26.5 and less effortless perfectionism (group 2) was values under 26.5.
- A Mann Whitney U test was conducted.
- No difference was found between groups in relation to change in GSR. U (N =10) = 8.00 p = 0.42.

Methods

Participants

- N = 10 students from Eastern Connecticut State University
- 40% Male (n= 4), 60% Female (n= 6)
- 90% Caucasian (n= 9), 10 % Hispanic/Latino(a) (n= 1)
- Mean Age: 19.75 (SD = 1.44)

Materials

Effortless Perfectionism Scale (Travers et al., 2015)

- 5 pt. Likert type scale
- Higher scores indicate higher tendency to effortless perfectionism
- This test has "good internal consistency reliability and validity with a Cronbach's alpha value of 0.87. (Travers et al., 2015)

Satisfaction with Life Scale (Diener, 1985)

- 7 pt. Likert type scale
- Higher scores indicate higher satisfaction with life
- This test showed good internal consistency and validity with a Cronbach's α = 0.84. (Pavot & Diener, 2009)

BioPac MP150 machine measured GSR on the palm of the hand.

Procedure

- Participants washed their hands with soap to the elbows.
- BioPac monitors were applied to the palms of the non-dominant hand.
- Three minute baseline
- Mirror Tracing Task
    - Timed computer task of outlining stars that progressively increase in difficulty
    - A loud noise would sound if the mouse went outside the lines and the task would restart
- Effortless Perfectionism and Satisfaction with Life measure
- Demographic measure

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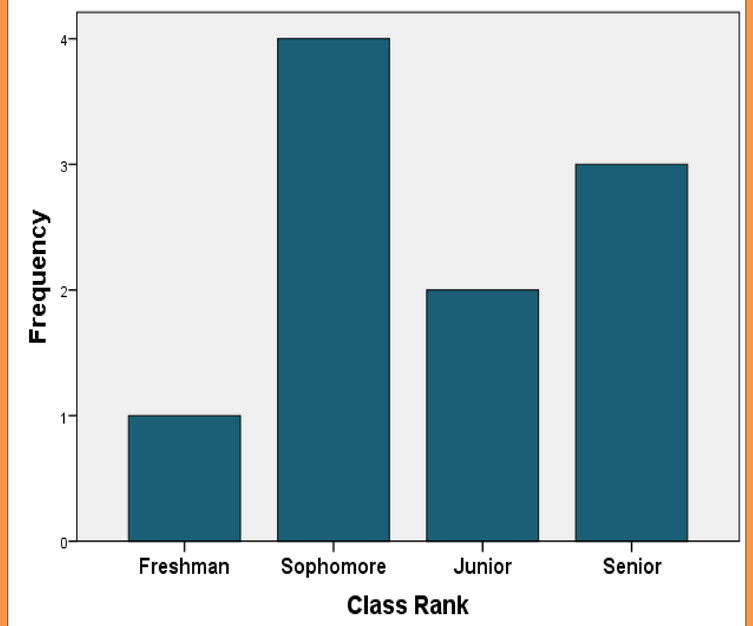

Discussion

Summary

- No relationship was found between effortless perfectionism, life satisfaction, and reactivity to stress (GSR scores)
- No difference was found between participants with more effortless perfectionism than less effortless perfectionism on reactivity to stress.

Limitations

- Small sample size
- Low power
- New type of perfectionism
- New Perfectionism Scale

Future Directions

- Larger sample size
- Pre stimulus and post stimulus
- Use more in depth psychosocial measures
- Use academic task such as math test

Effects of Sleep Disturbance and Respiration Rate on Galvanic Skin Response and Heart Rate

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Yohan Krumov

Introduction

Stress

- Stress can be defined as an environmental event causing activation of the autonomic nervous system (Lin et al., 2011).
- Stress can be beneficial in facilitating threat detection and escape when the stressor is acute, but can be detrimental to overall health when the stressor is chronic (Minkel et. al, 2012).
- Stress can be physiologically measured in terms of heart rate and skin conductance; it can also be induced through titrated electrical shock (Lin et al., 2011).

Sleep Disturbance and Stress

- Sleep disturbance, which can be defined as overall poor sleep quality due to a wide variety of reasons, can increase chronic stress levels (Williams et al., 2013).
- The Sleep Association Monitoring Index (SAMI) is a reliable and valid measure of sleep disturbance (Semler & Harvey, 2004).

Respiration Rate and Stress

- Breathing exercises that slow respiration rates increase activation of the parasympathetic nervous system, which is responsible for stress relief (Van Diest, 2014).
- Lowering respiration rate results in a lower heart rate and can cause lower levels of reported stress (Prinsloo et al., 2013).

Methods

Participants

- *N* = 10 students from Eastern Connecticut State University
- 40% Male, 60% Female
- 10% Freshman, 40% Sophomore, 20% Junior, 30% Senior
- 90% Caucasian, 10% Hispanic/Latino(a)
- Mean Age: 19.75 (*SD* = 1.439)

Materials

Sleep Association Monitoring Index (SAMI)

- 5-point Likert type scale
- Higher scores indicate higher levels of sleep disturbance

Apparatus

Audio Clips

- 1 minute of 20 bpm, followed by 1 minute of 40 bpm
- Onscreen instructions: "Please breathe in and out to the beat."

Shock administration: 4 shocks per minute

BioPac MP150 measured:

- Galvanic skin response on the palm of the non-dominant hand
- Heart rate using electrocardiogram on the forearms

Procedure

1. Demographic measure
2. Sleep Association Monitoring Index (SAMI)
3. Washed hands with soap to the elbows
4. Shock electrode and BioPac monitors applied
5. Participant selected shock setting using titration
6. 5-minute baseline
7. Audio clip and shock administration
8. Galvanic skin response and heart rate were measured

Hypothesis

It is hypothesized that lower Sleep Association Monitoring Index (SAMI) scores and breathing at 20 beats per minute will result in lower galvanic skin response levels and lower heart rate when experiencing stress in the form of electrical shock.

Results

- IBM SPSS 22
- Mean values:
  - SAMI score, *M* = 103.90 (*SD* = 17.31)
  - HR reactivity while breathing at 20 bpm, *M* = 14.77 (*SD* = 9.76)
  - HR reactivity while breathing at 40 bpm, *M* = 22.47 (*SD* = 8.17)
  - GSR reactivity while breathing at 20 bpm, *M* = .02 (*SD* = .03)
  - GSR reactivity while breathing at 40 bpm, *M* = .02 (*SD* = .02)

- A Spearman *rho* correlation coefficient was calculated for the relations between SAMI score and:
  - HR reactivity while breathing at 20 bpm: $r(10) = .01$, $p > .99$
  - HR reactivity while breathing at 40 bpm: $r(10) = -.13$, $p > .73$
  - GSR reactivity while breathing at 20 bpm: $r(10) = -.51$, $p > .13$
  - GSR reactivity while breathing at 40 bpm: $r(10) = -.02$, $p > .95$
  - All correlations are weak and not significant
  - **SAMI score is not related to GSR or HR at either breathing rate**

- A Wilcoxon test examined galvanic skin response (GSR) reactivity between breathing at 20 bpm and breathing at 40 bpm
  - No significant difference was found in GSR ($Z = -.31$, $p > .76$)
  - **Breathing rate does not affect GSR**

- A Wilcoxon test examined heart rate (HR) reactivity between breathing at 20 bpm and breathing at 40 bpm
  - A significant difference was found in HR ($Z = -2.60$, $p < .01$)
  - **Breathing at 20 bpm resulted in lower HR***

Discussion

Summary

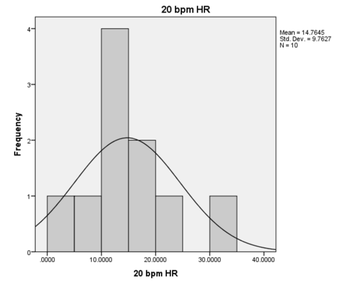
- No relations were found between Sleep Association Monitoring Index (SAMI) scores and GSR/HR reactivity when breathing at either 20 bpm or 40 bpm
- No relations were found between breathing rate and galvanic skin response (GSR) reactivity
- A significant difference was found in heart rate (HR) between the two breathing rates (see figures below)*

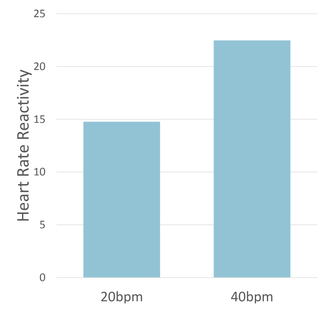
Limitations

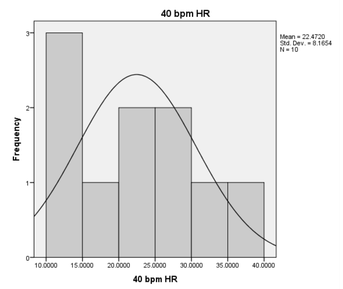
- Small sample size
- Low sample diversity
- Low power
- External/internal validity

Future Directions

- Larger sample size
- More variety in breathing rates
- Examine more measures of stress







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Are stress levels and confidence related?

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Introduction

Stress

- Stress is defined as the demand for an individual to adjust, adapt or cope (Holinka, 2015).
- Prolonged stress can affect adjustment capacity, mood, ability to experience pleasure, and physical health (Holinka, 2015).

Effects of Stress

- It may affect an individuals' motivation and control over their negative emotions (Bhanji, Kim, and Delgado, 2016).

Confidence

- Confidence is related to a prolonged response (Elfering & Grebner, 2011)
- Previous research has used public speaking as a stressor to determine how stress levels increase the longer the participant is in front of a crowd

Hypothesis

- It is hypothesized that participants' with a higher confidence score will have lower reactivity to stress from the electrical shock.
- Participants with a higher GSR mean, tend to experience stress quicker and longer than participants with a lower GSR mean.

Method

Participants

- *N*=10 student 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/Latino(a) (*n* = 1)
- Mean Age: 19.75 (SD = 1.4386)

Apparatus

- Electrical Shock Device
  - To induce stress on participant
- EKG – Electrocardiogram
  - Higher BPM, higher stress levels
- Online Confidence test
  - See confidence levels
- Galvanic Skin Response
  - Higher GSR, higher stress level

Procedure

- First, a demographic collection from the participants was made
- The participants took a Confidence test online
- Participants were taken to a room and asked to wash hands up to elbows
- Then, the EKG reader, GSR, along with the electrical shock were attached to the participant
- We asked participants to sit still for 5 minutes to create a baseline of their heart rate and GSR
- Later, the participants experienced unannounced electrical shocks while undergoing other stressors such as; a mirror tracing task, a Stroop test, and a breathing exercise

Results

- IBM SPSS 22
- Mean values: Online Survey, M = 52.2 (SD = 5.39), Galvanic Skin Response, M = .06 (SD = .06)
- A Spearman's *rho* correlation coefficient was calculated
- No correlation was found between confidence and GSR , rs (N = 10) = -.56, p = .09
- No correlation was found between GSR and heart rate, rs (N = 10) = -.29, p = .40

Discussion

Summary

- No relation was found between GSR and confidence
- No difference between participants with high confidence levels and low confidence levels on means of dealing with stress

Limitations

- Small sample size
- Measures were short timed

Future Directions

- Larger sample size

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EASTERN CONNECTICUT STATE UNIVERSITY

A Liberal Education. Practically Applied.

The Influence of Neuroticism and Extraversion

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Introduction

- High neuroticism scores predispose individuals to experience more objective negative life events. (Magnus, Diener, Fujita, Pavot, 2006).
- High extraversion scores predispose individuals to experience more objective positive life events. (Magnus, Diener, Fujita, Pavot, 2006).
- Neuroticism indirectly lowers performance on a vocal mental math test used to monitor stress, measured with heart rate. (Schneider, Rench, Lyons, Riffle, (2011).
- High amounts of stress in childhood is strongly related to poor physical health and poor social relationships later in life. (Shern, Blanch, Steverman, (2016).
- Exhaustion is positively correlated with stress and neuroticism. (Lue, Chen, Wang, Cheng, Chen, 2010)

Hypothesis

- If participants score high on personality characteristics like extraversion and neuroticism then participants will score as having high stress, represented with heart rate (HR) and galvanic skin response (GSR), after taking a stress test.

Discussion

Summary

- No relationship was found between neuroticism and extraversion on test-taking stress.
- No difference between participants with high levels of neuroticism and high levels of extraversion on test-taking stress.

Limitations

- Small sample size (*N*=10) limited the study's potential
- Unique sample of college age psychology majors limits the external validity and power of the study.

Future Research

- Larger sample size needed.
- Less reactive measure of stress.

Method

Participants

- *N*=10 students from Eastern Connecticut State University.
- 40% Male (*n*=4), 60% Female (*n*=6).
- 90% Caucasian (*n*=9), 10% Hispanic/Latino/Latina.
- 10% Freshmen (*n*=1), 40% Sophomore (*n*=4), 20% Junior (*n*=2), 30% Senior (*n*=3).

Measures

- Eysenck Personality Questionnaire (EPQ) (Eysenck, 1975).
  - Consists of 12 "yes' or "no" items, 6 items for extra version and 6 items for neuroticism.
  - Scores range from 0-6 on each of the 2 subsections, higher scores indicate a stronger presence of the personality trait.
- Modified Stroop Test based on J.R. Stroop's original (Stroop 1935).
  - Participants press keys after an on-screen prompt displays a color.
  - Higher scores indicate better test accuracy.
- BioPackMP150 machine measures HR and GSR using electrocardiograms on the forearm and hand respectively.

Procedure

- Wash hands with soap and water up to elbows.
- BioPac monitors applied to forearms and palms.
- Baseline data gathered first for 5 minutes.
- Stroop Test
  - Participants complete the test at their leisure.
  - Following completion, test accuracy and speed are recorded.
  - Heart rate and GSR measured during and after.
  - Mean heart rate and GSR calculated.
- Eysenck Personality Questionnaire completed by participants.
- Demographic questionnaire completed by participants.

Results

- IBM SPSS 22
- Mean values: Extraversion, *M*=4.40 (*SD*=1.34). Neuroticism, *M*=3.1 (*SD*=2.07). Changed Galvanic Skin Response (GSR), *M*=0.21 (*SD*=0.11). Changed Heart Rate (HR), *M*=-11.85 (*SD*=9.51).
- A Spearman's *rho* correlation coefficient was calculated.
- No correlation between neuroticism and GSR, r_s, (*N*=10) =-.112.
- No correlation between extraversion and GSR, r_s, (*N*=10) =.317.
- No correlation between neuroticism and heart rate, r_s, (*N*=10) =.164.
- No correlation between extraversion and heart rate, r_s, (*N*=10) =.151.

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The Relationship Between Spirituality, Stress, and Heart Rate During Induced Physiological Stress

Malvina Pietrzykowski

Introduction

Stress

- Stress causes various negative psychological and physical effects (Werdel, Dy-Liacco, Ciarrocchi, Wicks, & Breslford, 2013).

Spirituality

- Different religions practiced in Japan have been reported to promote mind-body health (Nakao & Ohara, 2012).
- Ugandan nurses who identified as religious were found to more effectively ameliorate psychological work-related stress effects (Bakibinga, Vinje, & Mittelmark, 2013).

Hypothesis

There is a negative correlation between self-reported spirituality on the Spirituality Scale and stress self-reported on the Perceived Stress Scale as well as physiological stress induced by random electric shock and recorded by BioPac EKG.

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/Latino(a) (n = 1)
- Mean Age: 19.75 years (SD = 1.44 years)

Materials

- Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983)
  - Reliability: The test-retest correlation was found to be high (Cohen et al., 1983)
  - Validity: Validity criteria were unaffected (Cohen et al., 1983)
  - 4-point Likert scale
  - Higher scores indicate higher levels of stress
- Spirituality Scale (Davis et al., 2015)
  - Reliability: The measure showed evidence of reliability (Davis et al., 2015)
  - Validity: Scores showed evidence construct validity (Davis et al., 2015)
  - 5-point Likert scale
  - Higher scores indicate higher levels of spirituality
- BioPac EKG monitor

Procedure

- BioPac EKG monitor applied, five minute baseline
- Shock administered randomly, heart rate measured for five minutes
- Participants took Perceived Stress Scale
- Participants took Spirituality Scale
- Demographic measure taken of participants

Results

- IBM SPSS 22
- Mean values: Spirituality Scale, M = 50.0 (SD = 9.29); Perceived Stress Scale, M = 22.3 (SD = 8.42); Heart rate difference, M = 20.41 (SD = 13.17).
- A Spearman's *rho* correlation coefficient was calculated.
- A negative correlation was found between score on the Spirituality Scale and the Perceived Stress Scale, r_s (N = 10) = -.70, p = .03.
- No correlation was found between score on the Spirituality Scale and heart rate reactivity, r_s (N = 10) = -.30, p = .41.

Discussion

Summary

- A correlation was found between self-reported spirituality and self-reported stress.
- No relation was found between self-reported spirituality and heart rate reactivity induced by electric shock.

Limitations

- Small sample size
- Lack of ethnic diversity in sample
- Time constraint: many measures taken at once
- Lack of accuracy in self-reported scales

Future Research

- Larger sample size with more diversity
- More physiological measures
- Compare different religions

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