

Social Support and Public Speaking Stress.

Sydney Batchelder

Introduction

Stress

- Lazarus and Folkman (1984) define stress as when a situation's perceived demands exceed the perceived resources (as cited by Falconier, Nussbeck, Bodenmann, Schneider, & Bradbury, 2015).
- Stress causes increased cognitive failures (Boals, & Banks, 2012), depression (Aselton, 2012), and lower relationship satisfaction (Falconier et al., 2015).

Social Support

- Social support provides a positive effect on health problems associated with stress, independent of the type of stressor (Ditzen & Heinrichs, 2014).
- Familial social support decreases stress levels most in comparison with friendship support (Romero, Riggs, & Ruggero, 2015).
- Social support moderates the effects of stress and ambulatory blood pressure (Bowen, Uchino, Birmingham, Carlisle, Smith, & Light, 2014).

Public Speaking

- Public speaking causes a stress response by increased galvanic skin response (GSR; Elfering & Grebner, 2011).

Hypothesis

It is hypothesized that participants with higher levels of overall social support will be less reactive to stress induced by a public speaking task as measured by heart rate and galvanic skin response.

Results

- IBM SPSS 22
- Mean values: Social support, $M = 3.06$ ($SD = .80$); Heart rate, $M = 99.19$ ($SD = 12.23$); GSR, $M = .17$ ($SD = .17$).
- A Spearman's ρ correlation coefficient was calculated
- No correlation was found between social support and heart rate, $r_s (N = 10) = -.44$, $p = .20$.
- No correlation was found between social support and GSR, $r_s (N = 10) = .37$, $p = .29$.
- A median split was implemented for social support group 1 was values from 1-3, and group 2 was values above 3.
- A Mann Whitney U test was conducted
- No difference was found between groups in relation to heart rate, $U (N = 10) = 8$, $p = .42$.
- No difference was found between groups in relation to GSR, $U (N = 10) = 10$, $p = .69$.

Method

Participants

- $N = 10$ students from Eastern Connecticut State University
- 18% Male ($n = 2$), 72% Female ($n = 8$)
- 9% Freshman ($n = 1$), 45% Sophomore ($n = 5$), 36% Junior ($n = 4$)
- 72% Caucasian ($n = 8$), 18% Hispanic/Latino(a) ($n = 2$)
- Mean Age: 18.9 ($SD = .74$)

Materials

Perceived, Instrumental, and Negative Social Support Indices (Libby, Orton, Beals, Buchwald, & Manson, 2008)

- 3 pt. Likert type scale.
- Higher scores indicate higher levels of social support.

Public Speaking Task

- One minute preparation.
- Random assignment to one or two minute presentation duration.
- Questions:
 - 1. Describe your dream job and how you are qualified for it.
 - 2. Discuss the topic of Neuropsychology in regards to what we've learned this week.

BioPac MP150 machine measured GSR on the palm of the hand and heart rate using electrocardiogram on the forearms.

Procedure

- Washed hands with Neutrogena soap to the elbows.
- BioPac monitors applied to forearms and palms of the hand.
- Five minute baseline.
- Public Speaking prompt
 - One minute preparation timed by experimenter with a stopwatch.
 - GSR and heart rate were measured during speech.
- Perceived, Instrumental, and Negative Social Support Indices.
- Demographic measure.

Discussion

Summary

- No relation was found between heart rate, GSR, and social support.
- No difference found between participants with high levels of social support and participants with low levels of social support on ability to deal with stress.

Limitations

- Small sample size
- Low power
- External Validity
- Internal Validity

Future Directions

- Larger sample size
- Social support measure
- Public speaking task

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The Effects of Stress on Sleep Reactivity

Christian Caravaglia



Introduction


- Stress has been shown to have negative effects on sleep quality. “Stress arises when individuals perceive that they cannot adequately cope with the demands being made on them or with threats to their well-being” (Lazarus, R.S, 1966, p.2).
- Stress can often cause a vicious cycle with sleep deprivation as sleep deprivation causes stress. “studies have shown that sleep deprivation can predict several disorders, such as cardiovascular disease, diabetes, depression, obesity, and even death (Vahle-Hinz, Bamberg, Dettmers, Friedrich, and Keller, 2014 p.217).
- In a study conducted called *The Effects of Poor Sleep on Cognitive, Affective, Physiological Responses to a Laboratory Stressor* (Paula, et al., 2013, p.40) found that poor sleep and stress have a strong correlation.
- An electrocardiogram (ECG) and a Galvanic Skin Response (GSR) was used to measure physiology.
- This study will attempt to measure the relationship between sleep test scores and both heart rate reactivity and galvanic skin response. It is hypothesized that there will be a negative correlation between test means and skin response and heart rate reactivity.

Procedure

- All participants completed the **Ford’s Insomnia Response to Stress Test (FIRST)** online, which consists of nine multiple choice questions ranging from very likely to very unlikely.
- Each test was measured on a four point Likert scale, ranging from “very unlikely” to “very likely”.
- Participants blood pressure and Skin response was recorded using **Biopac™ electrocardiograms and Galvanic Skin Response tests**, respectively.
- The participants then were connected to the ECG and GSR and asked to answer the questions as they appeared on the screen.

Results

Sleep sum
M=2.34
SD=5.00
m=21.50
SD=4.99



- There is no correlation between the sleep scale score and either heart rate reactivity or galvanic skin response.
- A Spearman’s correlation was calculated examining the relationship between participants sleep scale score and both heart rate reactivity and galvanic skin response. A weak correlation that was not significant was found ($r(8)=.27, p=.46$).
- Neither heart rate reactivity nor galvanic skin response were related to the sleep scores.

Methods

- The population used for this study was a biased sample taken from a college setting (N = 10, male n=2, female n=8) With a mean age of **18.9** years.
- All participants were involved in the research program.
- Participants ethnicity was predominately white (n=8) with some Hispanic (n=2) participants as well.
- All participants were students at Eastern Connecticut State University.

Conclusions

- The present study analyzed the relationship between heart rate, galvanic skin response and sleep scores.
- Though no statistical significance was found in the study, results show that with significant editing, the study could be reworked to potentially show significant correlation.
- This experiment would be made more effective potentially if the participant was placed in a mock stress scenario, where they believed they had a large stressor in the morning before being given the FIRST test.
- Prior work has shown greater reduction in sleep with the introduction of a stressor the night before.

Correlations

			Sleep_HR_Resi	Sleep_GSR_Residual	Sleep_Sum	Sleep_Mean
Spearman's rho	Sleep_HR_Resi	Correlation Coefficient	1.000	-.382	.267	.267
		Sig. (2-tailed)	.	.276	.455	.455
		N	10	10	10	10
	Sleep_GSR_Residual	Correlation Coefficient	-.382	1.000	.091	.091
		Sig. (2-tailed)	.276	.	.802	.802
		N	10	10	10	10
	Sleep_Sum	Correlation Coefficient	.267	.091	1.000	1.000**
		Sig. (2-tailed)	.455	.802	.	.
		N	10	10	10	10
	Sleep_Mean	Correlation Coefficient	.267	.091	1.000**	1.000
		Sig. (2-tailed)	.455	.802	.	.
		N	10	10	10	10

** . Correlation is significant at the 0.01 level (2-tailed).

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Differences Between Mental and Physical Stress and Their Effect on Risk



Taking
Brianna Collins



Introduction

- According to Hans Selye, "stress is the nonspecific response of the body to any demand," (Selye, 1976, p. 14).
- People react to stress physiologically when the Somatic Nervous System is activated in the presence of stress, and in turn, there are physiological effects including blood pressure (Trapp, Trapp, Domej, Schillaci, Avian, & ... Baulmann, 2014).
- Even for people who are in good health, heart rate, systolic blood pressure, and diastolic blood pressure are often increased when there are stressors present (Conley, Lehman, 2012).
- Stress not only influences the body physiologically, but it also influences decision making, more specifically, risk taking (Jordan, Sivanathan, Galinsky, 2011).
- Many psychological tests, including the Balloon Analogue Risk Test (BART) have shown a positive correlation with risk taking and more use of drugs and alcohol (DeMartini, Leeman, Corbin, Toll, Fucito, Lejuez, O'Malley, 2014).
- It was hypothesized that the presence of stress would increase blood pressure which would facilitate greater risk taking.

Results

Descriptive Statistics

- Baseline systolic ($M=118.875$, $SD=10.23$)
- Baseline Diastolic ($M=73.625$, $SD=9.74$)
- Math Systolic ($M=122.5$, $SD=16.36$)
- Math Diastolic ($M=82.75$, $SD=17.77$)
- Cold Presser Systolic ($M=149.375$, $SD=30.52$)
- Cold Presser Diastolic ($M=22.65$, $SD=12.08$)
- Math BART ($M=25.93$, $SD=12.08$)
- Cold Presser BART ($M=22.64$, $SD=13.63$)

Inferential Statistics

- A Wilcoxin test was run to look at the difference between variables
- The difference between cold systolic ($M=149.375$, $SD=30.52$) and base systolic ($M=118.88$, $SD=10.23$) is significant ($z=-2.383$, $p=.017$). The cold presser increased systolic blood pressure significantly.
- There was no significant difference between mental arithmetic while taking the BART ($M=25.9$, $SD=12.08$) and physical stress with the cold presser ($M=22.65$, $SD=13.63$) ($z=-.560$, $p=.575$).

Method

Participants

- $N=8$, Female ($n=6$), Male ($n=2$)
- Eastern Connecticut State University students, psychology majors
- Class standing: Freshman ($n=1$), Sophomore ($n=4$), Junior ($n=3$)
- Caucasian ($n=6$), Hispanic ($n=2$)

Materials

- Blood pressure machine
- Laptop or Computer
- Balloon Analogue Risk Test on Inquinsit Lab
- Cold Presser

Procedure

- Inquinsit Lab was downloaded onto the experimenters computer for the Balloon Analogue Risk Task to be done
- Participants filled out a demographic form that included age, ethnicity, grade, and gender
- Participants were taken into the psychophysiology lab and were placed onto a blood pressure machine and sat for three minutes. After that time was up, the participants baseline systolic and diastolic blood pressure was taken
- The participants began the BART by reading the instructions on the screen, and then did 30 trials of the BART while doing mental arithmetic, counting down from 4017 by 16's
- The number of balloon pumps was recorded after each trial
- After 15 trials, blood pressure was recorded while the participant was in the middle of the mental arithmetic task
- After the mental arithmetic and 30 trials of the BART was done, the participant placed their hand in a cold presser
- The participant repeated the 30 trial BART while their hand was in the cold presser with no mental arithmetic
- The number of balloon pumps after each trial were recorded
- Blood pressure was taken after 15 trials
- The average of the 30 BART trials were taken for the mental arithmetic task and the cold presser task
- The data was analyzed for differences between blood pressure and BART scores



Discussion

- Based on the small sample size, the power, or ability to make a good decision based on the significance is limited. It is also hard to generalize for the population based on an eight person sample size
- Based on the results and the little significance between mental and physical stress, future researchers should focus on personality attributions like neuroticism or extraversion, where there tends to be significant differences between every condition

Test Statistics

	BART_Math - Neuroticism %	Neuroticism % - BART_Cold	Math_Systolic - Neuroticism %	Cold_Systolic - Neuroticism %	Math_Diastoli c - Neuroticism %	Cold_Diastoli c - Neuroticism %
Z	-2.521	-2.524	-2.521	-2.521	-2.524	-2.521
Asymp. Sig. (2-tailed)	.012	.012	.012	.012	.012	.012

Test Statistics

	BART_Math - Extraversion	Extraversion - BART_Cold	Math_Systolic - Extraversion	Cold_Systolic - Extraversion	Math_Diastoli c - Extraversion	Cold_Diastoli c - Extraversion
Z	-1.960	-1.960	-2.521	-2.521	-2.380	-2.521
Asymp. Sig. (2-tailed)	.050	.050	.012	.012	.017	.012

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The Effects of Physical Health on Stress Tolerance

By: Alyssa Daneault, Eastern Connecticut State University



Introduction

- Daily stress can be influenced by chores and relationship difficulties (Rickenbach, Almeida, Seeman, & Lachman, 2014, p.852).
- Anxiety can occur from repeated stress but how a person is exposed to stress can effect the symptoms and response (Zhang, Hetzel, Shah, Atchley, Blume, Padival, & Rosenkranz, 2014, p.e102247).
- Cortisol is part of the stress response, protecting the body throughout the psychophysiology changes (Heaney, Carroll, & Phillips, 2014, p. 465).
- The daily cortisol levels and DHEA are directly related to physiological health and psychological well-being (Heaney, Carroll, & Phillips, 2014, p. 465).
- Over time out diet has changed having more sugar, being processed to last longer and less nutrients effecting health, ability to learn, and development (Rasmussen, 2012, p.156).
- In a study used to associate personality to certain response, the cold pressor task was successful in inducing stress in the participants (Kupper, Pelle, & Denollet, 2013, 1194).
- Cortisol and ghrelin levels were recorded as a result of the cold pressor task, to find a correlation between stress and late night eating (Geliebter, Carnell, & Gluck, 2013).
- The hypothesis for the present study states that participants with a healthy lifestyle (based on nutrition and physical activity) will have a higher tolerance to the stress of a cold pressor test (measuring any alteration of the blood pressure and heart rate).

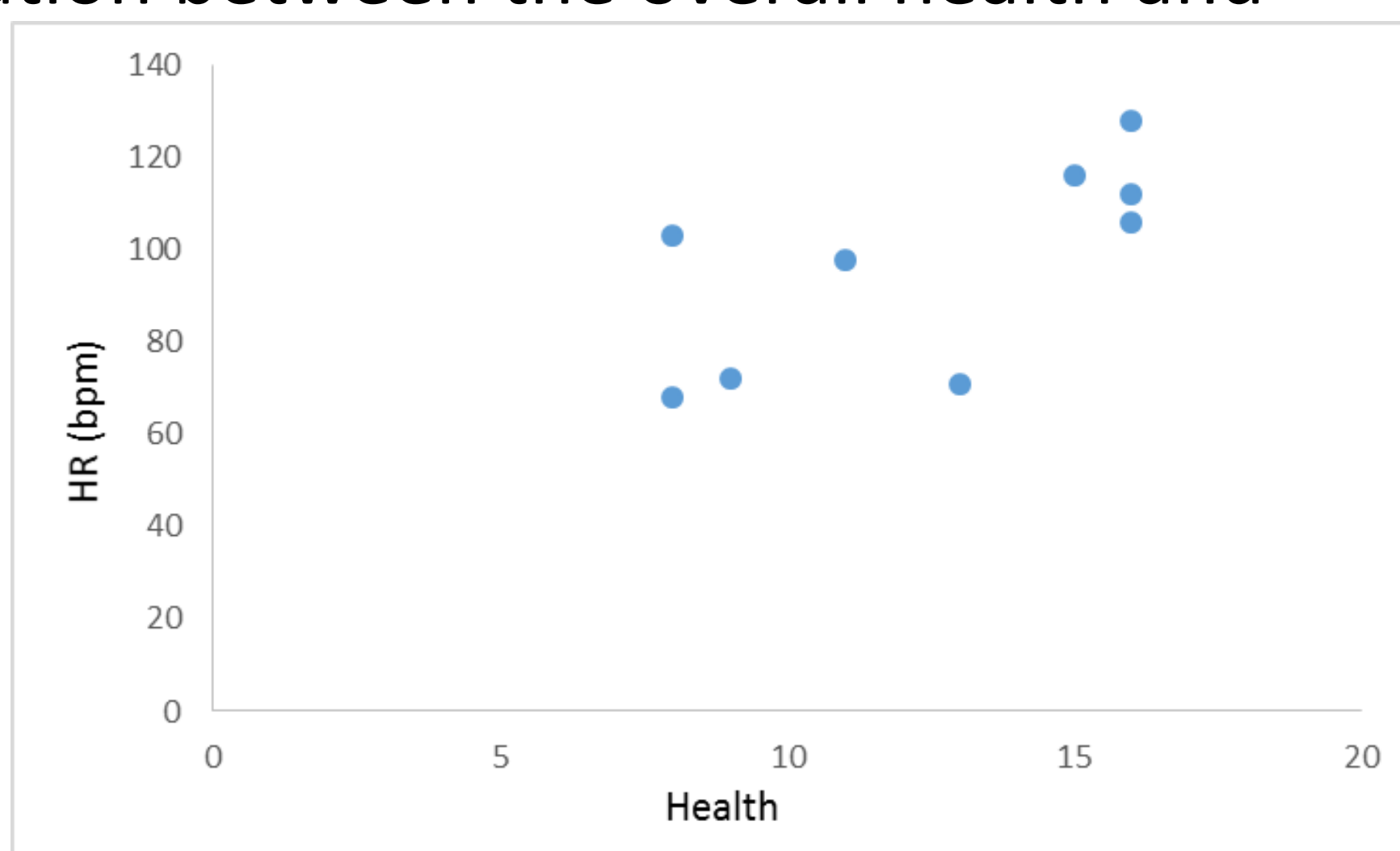
Results

➤ Descriptive

- The overall health according to the Health and Well-Being Questionnaire resulted in a mean of 12.30 and a standard deviation of 3.34.
- The baseline mean for heart rate ($M=93.67$) and the standard deviation ($SD=24.85$) were taken before the stress was induced.
- The experimental mean for the heart rate during the cold pressor task was taken ($M=97.11$) as well as the standard deviation ($SD=21.81$).

➤ Analysis

- The Spearman's Rho test was used to calculate the correlation between the baseline HR, the experimental HR, and the overall health of the participants.
- The results showed there was a positive correlation between the overall health and the experimental HR ($r(8)=.732, p>.05$).
- There was no significant correlation between the overall health and baseline HR ($r(8)=-.633, p<.05$).



Discussion

➤ Limitations

- In this experiment a small sample size consisting of 10 total participants, limited power, therefore limiting the ability to make a good decision based off the statistics (if it resulted in rejection or failure to reject).
- Of the 10 participants only two were male, influencing the male to female ratio.
- The GSR was not calculated with cold pressor task for safety reasons.
- The blood pressure cuff was inaccurate and slow but consistent, often resulting in an error.
- While participating in the cold pressor task the participants were subject to a memory test which could have influenced stress and increased the HR and BP.

Method

➤ Participants

- All the participants involved ($N=10$) are students for Eastern Connecticut State Universities.
- Each participant was selected for the Summer Research Institute.
- The ratio of males to females was imbalanced, a majority of the participants being female ($n=8$).
- The ages of the participants ranged from 18-20 years old, the mean being 18.90 and the standard deviation being .74.
- The class standing consisted of freshmen ($n=1$), sophomores ($n=5$), and juniors ($n=4$).
- The majority of the participants are white ($n=8$) while the remaining are Hispanic ($n=2$).

➤ Materials

- The Health and Well-Being Questionnaire determined overall health by asking about physical activity and nutrition habits.
- The electronic blood pressure cuff calculated the heart rate and blood pressure.
- The cold pressor task induced the participants stress.

➤ Procedure

- The pencil and paper test was administered to determine the overall health of the participants in a class room setting.
- The pencil and paper test was based on physical activity and nutrition.
- While in a laboratory setting the participants blood pressure (BP) and heart rate (HR) were assessed, after three minutes of rest, as a baseline using an electronic blood pressure cuff.
- The BP and HR were taken a second time while the participants were exposed to a stressor (the cold pressor task).

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Effect of Music on Reactance to Physiological Stress

Brian Duffany

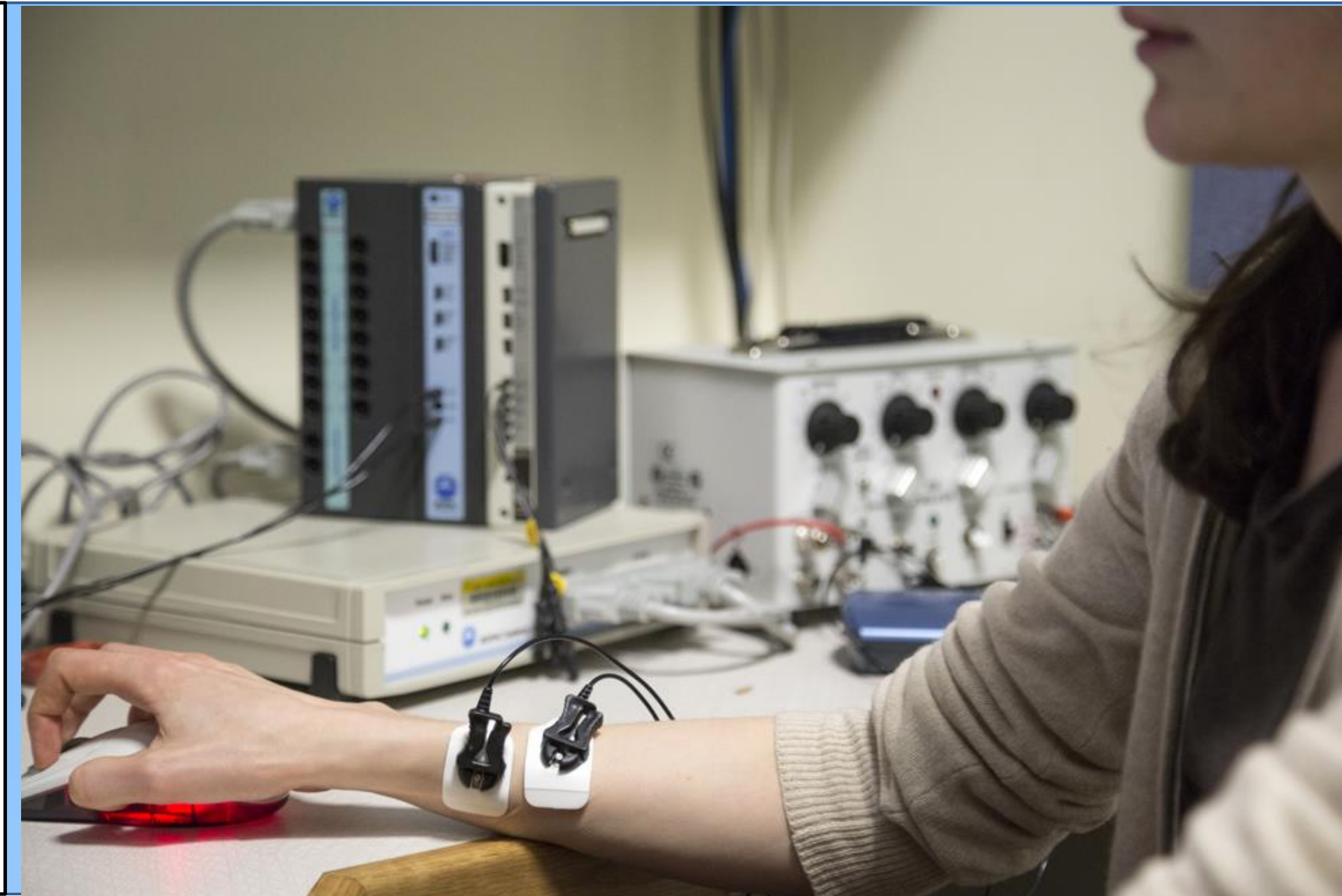
Eastern Connecticut State University

Introduction

-Like stress, anxiety has been shown to increase the activity of the sympathetic nervous system, which includes increasing heart rate(HR) and blood pressure among other physiological function whose hyperactivity can deteriorate health (Han et al., 2010).
-According to Quas (2011), physiological measures are superior measures of stress since they overcome observer and reporter biases, which are possible even in children.
-Electric shock, and the threat thereof, have been shown to be reliable stressors in experimental designs that, “Present multiple, time-limited, threat stimuli,” (Clark, et al., 2012 p. 1436)
-Previous research has studied the possibility of music as being a stimulus which can interfere with the human stress response, yet took measures of stress separately from the participants’ exposure to the musical stimulus (Thoma et al., 2013).
-Another previous study on music as being a stimulus which can interfere with the human stress response utilized a group of critically ill participants (Han et al., 2010)
-The current experiment utilized a sample that was relatively more healthy (not hospitalized), and recorded physiological measures of stress concurrently with music being played .
-It is hypothesized that heart rate, Galvanic Skin Response (GSR), and Electromyogram (EMG) responses to electric shock will decrease in response to Kathrine Jenkins’ performance of Gregorio Allegri’s *Miserere* (relaxing musical stimulus).

References

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Procedure

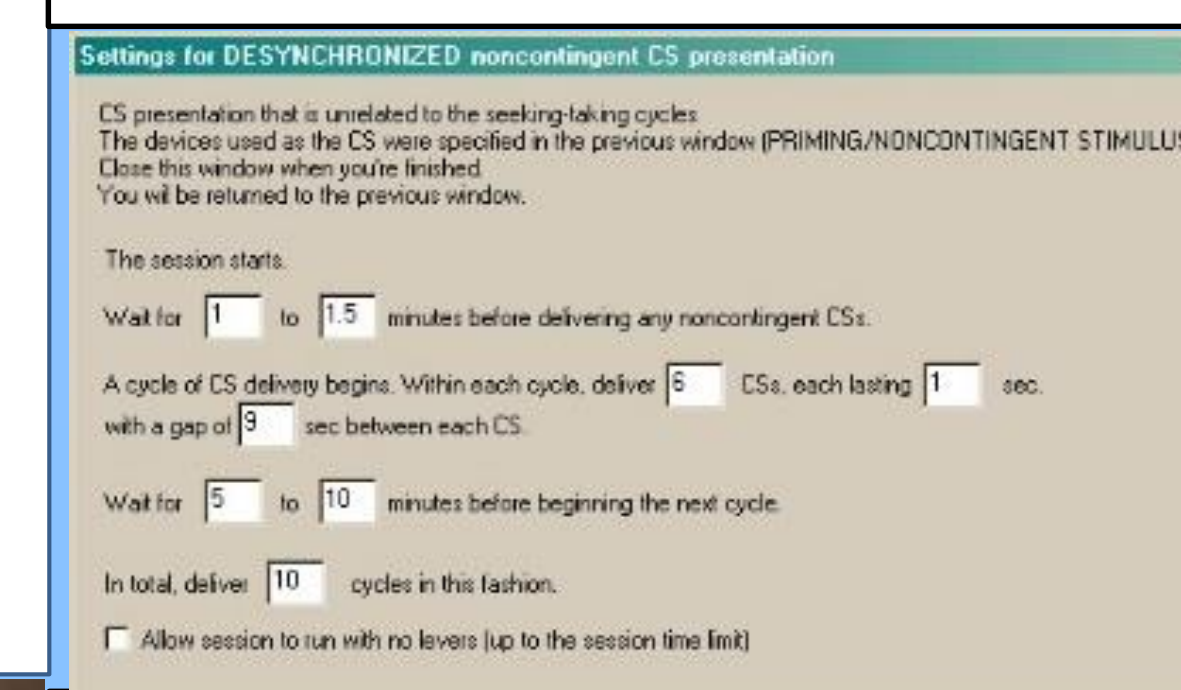
- Participants completed demographics information in a separate office space
- Participants went to laboratory space, and were connected to BioPac, which recorded physiological data
- HR was recorded throughout
- GSR was recorded throughout
- EMG was recorded throughout
- Baselines measures (with participants sitting upright, yet at rest) for all of the physiological measures were taken for a five minute period.
- Participants were then told the first test was to begin, and reminded that they would experience slight electrical shock during the testing.
- Over the next four minutes, participants received an average of ten shocks at quasi-random intervals, typically between every fifteen and thirty seconds
- Participants then completed other tests that measured effects of various variables on stress for about ten minutes
- Participants were then told that the second test was to begin, and were reminded that they would experience slight electrical shock during the test.
- Over the next four minutes, participants were exposed to Kathrine Jenkins’ performance of Gregorio Allegri’s *Miserere* and received an average of ten shocks at quasi-random intervals; between every fifteen and thirty seconds.

Participants

- 10 undergraduate students from Eastern Connecticut State University
- Males (n=2) and Females (n=8)
- Men and Women ages 18-20 ($M= 18.9, SD= .738$)
- Caucasian (n=8) and Hispanic (n=2)
- Freshmen (n=1), Sophomores (n=5), and Juniors (n=4)
- One participant did not stay for the entire study. (n=9)

Apparatus

-Biopac MP150 was used to process physiological measures
-IBM SPSS Statistics 22 software was used to process results
-Electrodes were applied to measure Galvanic Skin Response(GSR), Heart Rate(HR) via electrocardiogram(ECG), and Electromyogram (EMG), and to deliver moderate intensity shocks
-An audio file (MP3) of Kathrine Jenkins’ performance of Gregorio Allegri’s *Miserere* was used along with a standard pair of computer speakers to deliver the musical stimulus.



Results

Descriptive Statistics:

- Base pulse ($M= 88.4, SD= 12.112$)
- Base GSR ($M= .38, SD= .097$)
- Base EMG ($M= .01, SD= .006$)
- Shock 1 pulse ($M= 79.09, SD= 9.017$)
- Shock 1 GSR ($M= .47, SD= .142$)
- Shock 1 EMG ($M= .05, SD= .064$)
- Shock 2 pulse ($M= 81.70, SD= 10.312$)
- Shock 2 GSR ($M= .51, SD= .229$)
- Shock 2 EMG ($M= .01, SD= .007$)

Inferential Statistics:

A Wilcoxon test examined the results of the HR from the music condition and the control condition. No significant difference was found in the results ($Z= -1.36, p<.05 [p=.17]$). Music condition results were not significantly different from the control condition.

A Wilcoxon test examined the results of the GSR from the music condition and the control condition. No significant difference was found in the results ($Z= -.65, p<.05 [p=.52]$). Music condition results were not significantly different from the control condition.

A Wilcoxon test examined the results of the EMG from the music condition and the control condition. A significant difference was found in the results ($Z= -2.19, p>.05 [p=.03]$).

Discussion

-Most physiological responses did not change significantly with the music versus without ($p<.05$), and the one that did (EMG), showed higher reactivity in the presence of music versus without it.
-Future studies should control for ambient noise, which was present with and without the music. This may have interfered with reactivity to the stressor.
-The lack of significant results can be attributed to the small sample size (n=9)
-Applicability to the general population is further limited by how the sample was drawn entirely from a college population.
-Future studies should control for more extraneous variables such as mental disorders, preferences for music, musical training, cardiovascular, and neurological disorders which could have influenced the results.
-An ambient noise and silent control groups should be used to account for the possibility that mere noise, or a lack thereof, could influence reactivity.

The Study of Self-Reported Anxiety Scores and Psychophysiological Responses During a Stressful Public Speaking Situation

Marisa LaBrecque

Introduction

- ❖ Facility induced stress was presented in the situation of public speaking. The definition of stress in regards to this research, can be best defined as being related to public speaking anxiety. Stress can be defined as a person feeling physiologically uncomfortable (Witt, Brown, Roberts, Weisel, Sawyer, & Behnke, 2006).
- ❖ The paper-pencil test of Personal Report of Confidence as a Speaker was used in this research to be compared to heart rate and galvanic skin response during public speaking. Prior research has measured heart rate in correlation to a virtual public speaking simulation (Felnhofer, Kothgassner, Hetterle, Beutl, Helmut, & Kryspin-Exner, 2014).
- ❖ The paper-pencil test of The Talkaholic Scale was used in this research to also be compared to HR and GSR, prior research has studied heart rate while participants spoke of a stressful event (Saslow et al., 2013), this research was proposed using a real-life public speaking situation.
- ❖ This research experiment required an audience to be present throughout the duration of the participant's public speech, prior research has analyzed this factor as well (Witt, & Behnke, 2006).

Hypothesis

- ❖ The scores of the Personal Report of Confidence as a Speaker measure will be positively correlated to Heart Rate and Galvanic Skin Response. The scores of the Talkaholic Scale will also negatively correlate with Heart Rate and Galvanic Skin Response.

Discussion

- The hypothesis of PRCS being positively correlated to HR and GSR was supported. The hypothesis of scores of the Talkaholic Scale being negatively correlated with HR was failed to reject to null, no significance was found.
- This study showed that there was significance between HR and GSR in a negative correlation; where HR would increase as GSR would decrease, this prediction never occurred.
- Limitations of this study were the small sample size of ten participants, as well as the gender gap between male and female.
- This study was also done in conjunction with multiple other studies, results from outside studies may have affected the HR and GSR results of this experiment.
- Participants may have heard of the prompts beforehand
- Future research should have a constant audience size present for each participant, in addition to a large sample size.
- Other researchers should also have each participant perform their public speech sequentially.

Methods

Participants:

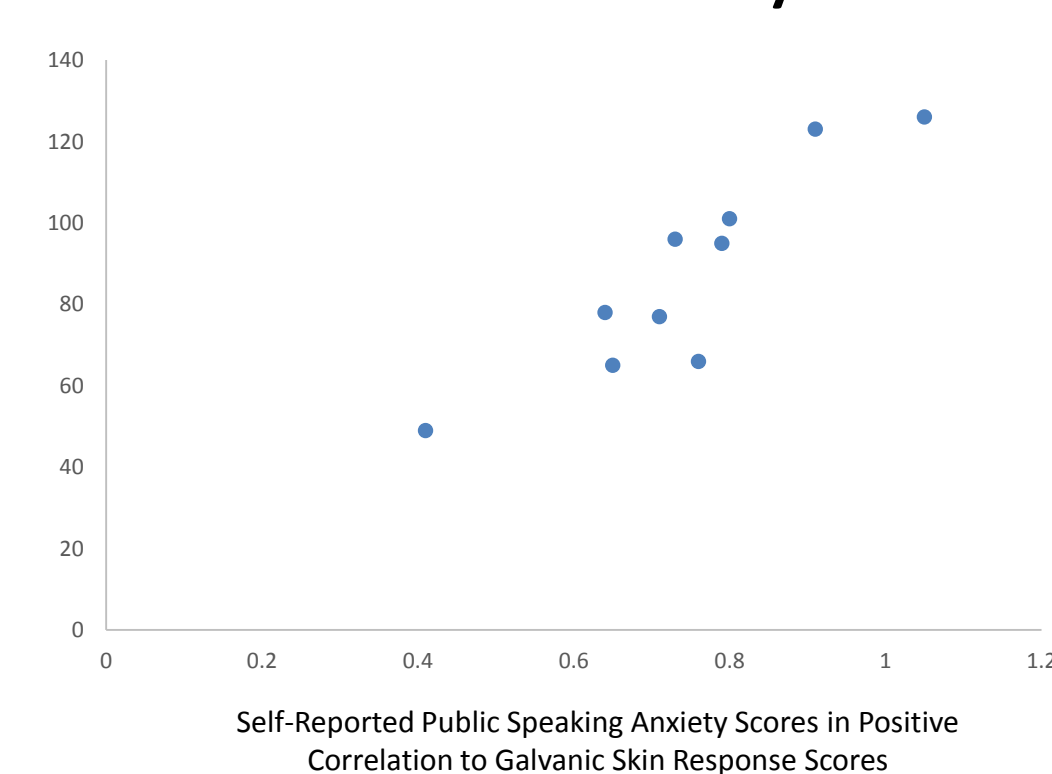
- Consisted of undergraduate students at Eastern Connecticut State University ($N=10$) of both males ($n=2$) and females ($n=8$), all students were involved in the Summer Research Institute.
- Class standing was divided into freshman ($n=1$) sophomore ($n=5$) and junior ($n=4$).
- Ethnicity was predominantly white ($n=8$) with a smaller sample of Hispanic students ($n=2$).
- The mean of age was $M=18.9$ with a standard deviation of $S.D.=.73$
- The mean score of talkativity was $M=28.00$ for with a standard deviation of $S.D.=13.88$
- The mean score of self-reported public speaking anxiety was $M=87.60$ with a standard deviation of $S.D.=25.17$
- The baseline heart rate (HR) overall was $M=88.40$ with a standard deviation of $S.D.=12.11$
 - The mean HR during public speaking was $M=99.19$ with a standard deviation of $S.D.=12.23$
- The baseline galvanic skin response (GSR) was $M=.38$ with a standard deviation of $S.D.=.09$
 - The mean GSR score during public speaking was $M=.75$ with a standard deviation of $S.D.=.16$

Procedure:

- Participants were given a four question demographic information survey to complete. Followed by a 16-question, 5-step Likert-type scale of Self-Perceived Communication Competence (SPCC).
- They then completed a 34-question, 5-step Likert-type scale of Personal Report of Confidence as a Speaker (PRCS).
- A baseline heart rate and galvanic skin response score was recorded using a Biopac system.
- Participants were told that they will receive a prompt of two questions, then they will receive one minute of preparation time, followed by one or two minutes to present.
- They were also told that they will find out how much time they'll have to present after receiving the prompt.
- The prompt was: "Describe how you are qualified for your dream job" and "Discuss the topic of Neuropsychology."
- Guests were present while each participant presented their speech.

Results

A Spearman's Rho test was performed using SPSS-22 to test the hypothesis that test scores of talkativity and self-evaluated public speaking anxiety (PSA) will be predictable factors to correlate to the results of HR and GSR during a public speaking situation. Scores from PSA ($M=87.60$, $S.D.=25.17$) have a significant positive correlation with GSR scores ($M=.75$, $S.D.=.16$) during public speaking at $r_s=.85$ and a p-value of $.002$, $p<.01$. Significance was also found with the negative correlation between HR ($M=99.19$, $S.D.=12.23$) and GSR ($M=.75$, $S.D.=.16$) during public speaking at $r_s=-.68$ and a p-value of $.02$, $p<.05$. There was no significant correlation between Talkativity scores and PRCS, or PRCS and HR.



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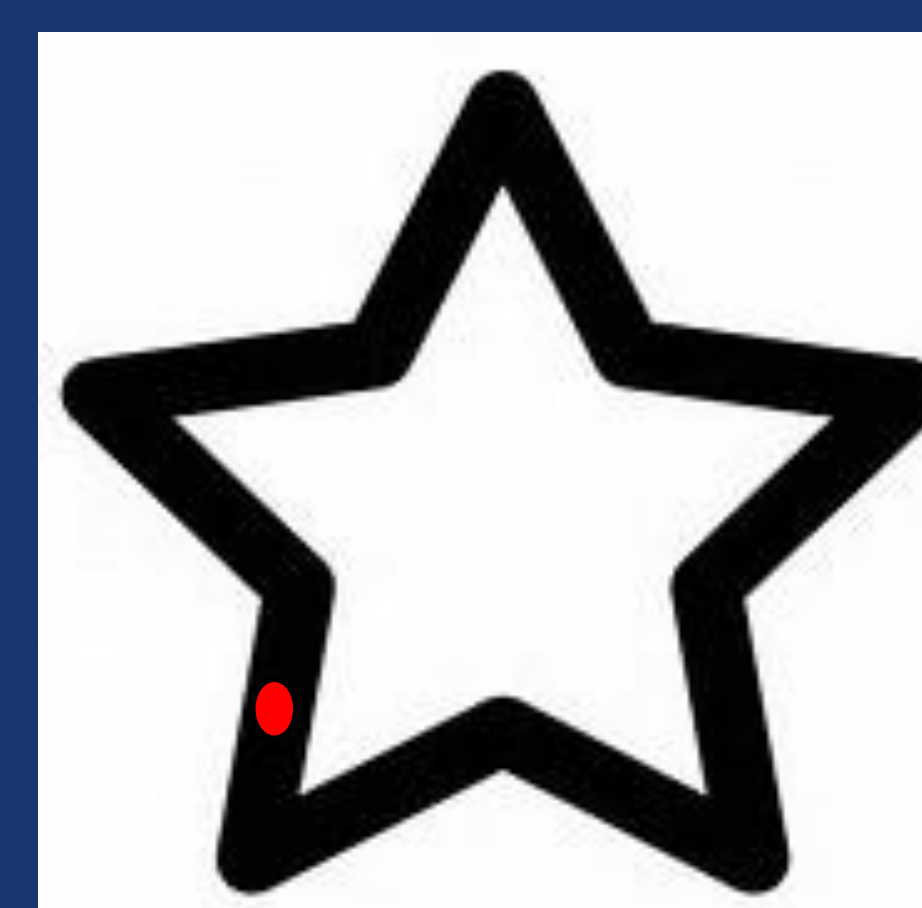
Extraversion in Relation to Psychological Stress Involving Mirror Tracing

By: Madison LaRusso



Introduction

- ❑ Stress is likely to be influenced by one's own behavior in social situations (Farmer & Kashdan, 2015).
- ❑ According to Farmer and Kashdan (2015), people create negative assumptions about rejection and unattainable social standards that lead them to focus excessively on reducing any judgment provoking behavior or expressions which increases physiological arousal.
- ❑ Participants traced the 5-pointed star with a computer mouse using as much accuracy as possible. The horizontal and vertical controls of the mouse were reversed through the online software (Sato & Miyake, 2004).
- ❑ Allen, Stoney, Ownes, & Matthews (1993) wrote, "More recently mirror-tracing has become a standard method for producing psychological stress (anger, anxiety, undifferentiated negative emotion) (Feldman et al., 1999) and associated physiological-cardiovascular stress (blood pressure, heart rate, stroke volume, cardiac output, or total peripheral resistance changes)" (Morton, 2003, p.295)
- ❑ In this study, Galvanic Skin Response (GSR) was used as a measure of the electrical opposition of the skin, similar to sweat secretion which is used to act as a gage of physiological stress (Jo et al., 2012 as cited by Q. Liu et al., 2013).
- ❑ The Electro Cardiogram (ECG) was used to measure heart rate in beats per minute.



Procedure:

- Before any testing began, all participants completed pencil and paper measures including a demographic survey and a short version of the IPIP-NEO Personality Test online. The test involved 120 questions meant to assess the "BIG 5" personality traits. Only the Extroversion results from the Personality Test were used for the purpose of this experiment.
- Once the surveys were completed, each participant's baseline for GSR and heart rate were assessed using an ECG with BIOPAC.
- Participants then completed a Mirror Tracing Task online. The online task required participants to trace a 5-pointed star without moving their cursor over the available area for each level. The task consisted of 3 levels: east, medium, and difficult. The participants were given 2 minutes to attempt each level.

Participants:

- ❖ Participants (N=10) consisted of undergraduate students at Eastern Connecticut State University.
- ❖ Both Males (n=2) and Females (n=8) were studied.
- ❖ All participants were students involved in the Summer Research Program.
- ❖ The sample consisted of Freshman (n=1), Sophomore (n=5), and Junior (n=4) standing students.
- ❖ The mean Age of Participants was about 19 years (n=18.900).
- ❖ Participants' Ethnicity was generally White (n=8) with a small sample of Hispanic (n=2) participants.

Results

- ✓ A Spearman's rho correlation coefficient was used to measure the relationship between Extraversion and GSR and heart rate during the Mirror-Tracing Task.
- ✓ A significant negative correlation was found between Extraversion and GSR with an $r_s = -.709$ at the p value of .022.

Correlations			Extraversion	LineGSR
Spearman's rho	Extraversion	Correlation Coefficient	1.000	-.709*
		Sig. (2-tailed)	.	.022
		N	10	10
LineGSR	Extraversion	Correlation Coefficient	-.709*	1.000
		Sig. (2-tailed)	.022	.
		N	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

- ✓ However, no significant correlation was found between Extraversion and ECG.

Correlations			Extraversion	LineHR
Spearman's rho	Extraversion	Correlation Coefficient	1.000	-.079
		Sig. (2-tailed)	.	.829
		N	10	10
LineHR	Extraversion	Correlation Coefficient	-.079	1.000
		Sig. (2-tailed)	.829	.
		N	10	10

Hypothesis

Based on previous research, it is predicted that participants who scored higher on the Extraversion section of the IPIP-NEO Personality Test will show less signs of physiological stress (measured by GSR and ECG heart rate) during the online Mirror Tracing Task.

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Materials:

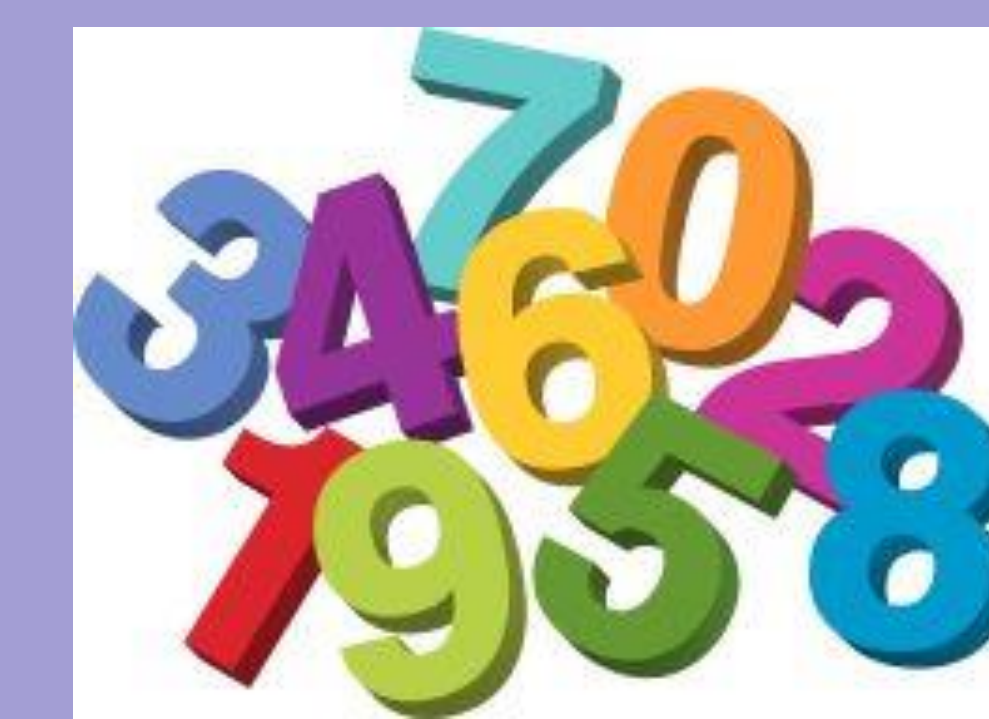
- ❖ BIOPAC (GSR, ECG)
- ❖ IPIP-NEO Personality Test
- ❖ Online Mirror Tracing Task

Discussion

Some limitations of this study include

- Small sample size
- Generalizability
- Gender

The significance of this study is limited due to such few participants, but if the study were to be repeated in the future, a suggestion would be to have a far larger sample size, and perhaps have a greater variety of age and ethnicity. If these limitations were addressed, the study could be considered far more significant.



Introduction

- Stress is defined as challenges in every day life, usually small occurrences, that disrupt the normal routine, (Almeida, 2005).
- Stress is an important aspect of life to look at because it can be a problem for anyone, but it is found to be a problem especially for college aged students, (Hintz, Frazier, & Meredith, 2015).
- Working memory is defined as “the ability to hold information actively in mind in a readily accessible state” (Brady, & Alvarez 2015, p 921).
- It has consistently been shown that stress is related to working memory, both positively and negatively, (Human et al., 2013).
- According to Belsky, Ruttle, Boyce, Armstrong, and Essex (2015) physiological responses come as a product of stress. Stress is indicated through physiological responses such as heart rate or blood pressure.
- Heart rate is an important physiological measure as it has been seen to have a relationship with the onset of many diseases (Vahle-Hinz, Bamberg, Dettmers, Friedrich, & Keller, 2014).
- It was predicted that when subjected to a cold presser task, heart rate would increase because stress was induced. It was further predicted that ability to use working memory, based off performance on a digit span task, would decrease when stress was induced.

Procedure

- Participants first filled out a demographics survey in a classroom setting.
- Participants were brought to the psychophysiological lab to complete a 3-minute baseline reading of their heart rate using an electronic blood pressure cuff.
- After completing the baseline, participants completed a digit span test in which they read numbers of increasing length (starting at 4 digits) and then required to repeat them back, forwards and backwards.
- The participant was finished once they got two numbers wrong in succession.
- At one random time during the test, their heart rate was again read using the same procedure as the baseline.
- Participants then completed another digit span test of the same format but with different numbers while having their right arm submerged in ice water (the Cold Presser task).
- Again their heart rate was read at a random time during the test.

Participants

- There were nine total participants, $N=9$.
- Broken down by sex, there were two males, $n=2$, and seven females. $n=7$.
- Broken down by class standing, there was one freshman, $n=1$, four sophomores, $n=4$, and four juniors, $n=4$.
- Broken down by ethnicity, there were seven white participants, $n=7$, and two Hispanic participants, $n=2$.
- Broken down by age, there were two 18 year olds, $n=2$, five 19 year olds, $n=5$, and two 20 year olds, $n=2$, with a mean age of $M=19$ and standard deviation of $S.D.=.7071$.

Apparatus

- A paper and pencil measure of demographics included four questions about sex, age, class standing, and ethnic heritage.
- An automatic electronic heart rate cuff was used on the participants wrist.
- A cooler filled with ice and water was used as a cold presser task.
- A random number generator was used to create a digit span test consisting of three numbers for each length (increasing from four digits up to twelve digits).

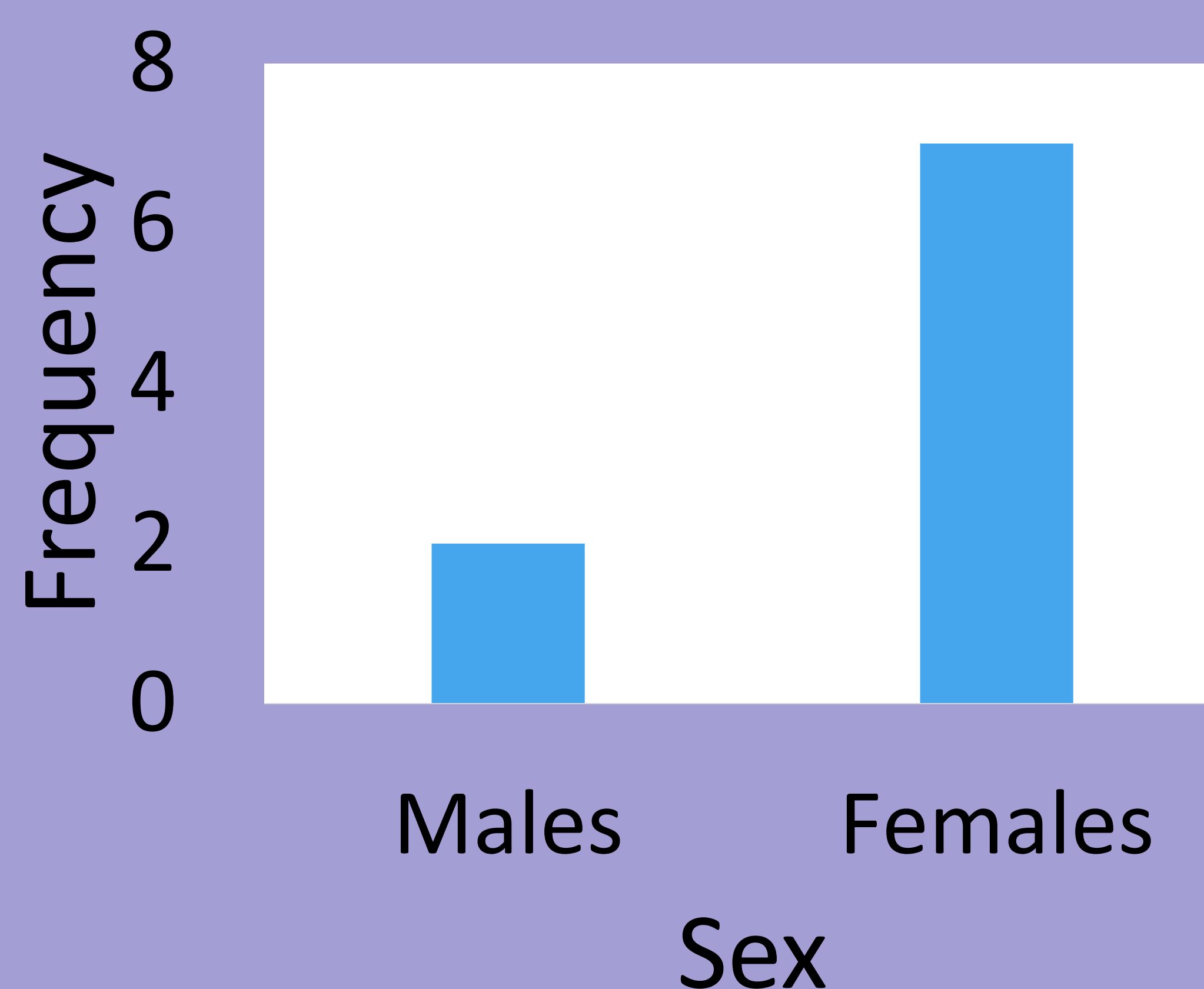


Figure 1. The graph above shows the frequency of male and female participants within the study.

Results

- The mean digit length reached in the control test was $M=6.67$ with a standard deviation of $S.D.=.87$.
- The mean digit length reached in the stress test was $M=5.78$ with a standard deviation of $S.D.=.83$.
- The mean baseline heart rate was $M=93.67$ with a standard deviation of $S.D.=24.86$.
- The mean control test heart rate was $M=93.11$ with a standard deviation of $S.D.=24.74$.
- The mean stress test heart rate was $M=97.11$ with a standard deviation of $S.D.=21.81$.
- A Wilcoxon sign-ranked test was completed.
 - No significant differences between digit span test and digit span test while stressed ($p=.07$).
 - No significant differences between baseline heart rate and heart rate during the test ($p=.83$).
 - No significant differences between baseline heart rate and heart rate while stressed ($p=.77$).
 - No differences between heart rate during the test and heart rate while stressed ($p=.59$).

Conclusions

- There are no differences between working memory performance while under stress and while not under stress.
- There are no differences between heart rate when not under stress and when under stress.
- A limiting factor in this study was that it was completed in conjunction with another study and therefore other variables may be unaccounted for.
- Another limiting factor was that whether or not caffeine was consumed prior to the experiment was not recorded.
- Future research might take into account caffeine consumption prior to the experiment.
- Another further action to take would be to use different stressors and/or different physiological measures.

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Chewing Gum During Sample SAT Mathematics Questions as a Coping Technique to Reduce Stress



By: Rachel Scrivano

Introduction

Stress

- According to previous research, it has been found that stress is related to an increase in heart rate in persons who experience stress-inducing tasks of mathematics problems (Hernandez, Larkin, & Whited, 2009).
- Stress could cause wear or tear on the body (Bennett, Klein, Granger, Ritter, & Whetzel, 2010).

Coping

- Coping strategies have been found to decrease anxiety when people encounter a stressor stimulus (Bauermeister, Caldwell, Hou, Hsieh, Wang, Xue, & Zimmerman, 2014).
- Chewing gum has been previously shown to effect anxiety in response to a stressor (Britt, Cohen, Cohen, & Collin, 2001).

Anxiety

- Test anxiety is a result of worry and emotionality; wearisomeness creates negative cognitive expectations while emotionally-charged arousal results in physiological changes in the body (Cohen, Ben-Zur, & Rosenfeld, 2008).
- Previous literature has stated that there is a link between mathematics anxiety and task performance (Lee, & Ng, 2010).

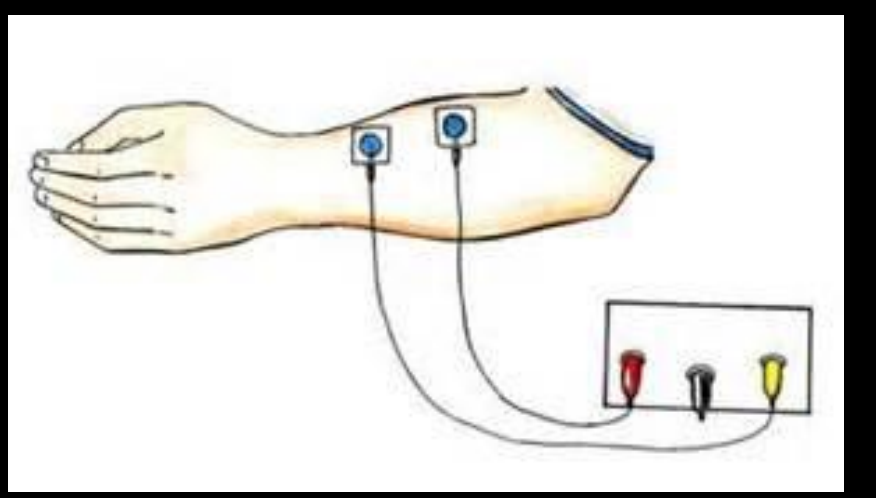
Current Study

- This study focused on comparing heart rate to the control of no gum and gum while answering mathematics problems.

Hypothesis

- It was hypothesized that chewing gum while mentally computing mathematics problems would decrease anxiety and increase accuracy in the number of correct answers given.

Method



Participants

- 10 students from Eastern Connecticut State University
 - 10 Total Students (N=10), 8 Female and 2 Male (n=8, n=2), 8 White and 2 Hispanic (n=8, n=2), 1 Freshmen, 5 Sophomores and 4 Juniors (n=1, n=5, n=4), and 3 18 year olds, 5 19 year olds and 2 20 year olds (n=3, n=5, n=2)

Materials

- Heart rate monitor to measure the rate of cardiac activity through an electrocardiogram
 - Each participant had an electrode placed on their upper arm
- Gum used as coping technique
 - Big Red gum was distributed to each participant during the second set of SAT Mathematics questions
- SAT Mathematics Questions
 - 2 sets of 5 SAT Mathematics Practice Questions
 - Multiple choice Response Pad
(http://www.anlyzemath.com/practice_tests/sat/sat_sample_1.html)

Procedure

- Participants were placed in a room with 1-2 other students, hooked up to a heart monitor.
- One SAT mathematics question viewed at a time (5 per trial, 2 trials total).
- Participants used a multiple choice response pad to record their answers.
- After trial 1 finished, researcher gave participant a piece of Big Red gum. Participant chewed the gum through trial 2 and completed 5 more SAT mathematics questions.
- Participant spit out gum after trial 2 finished.

Results

- Mean values: Heart Rate before gum, $M=86.66$ ($SD=7.22$), Heart Rate after gum, $M=85.10$ ($SD=8.01$), Accuracy before gum, $M=.26$ ($SD=.16$), Accuracy after gum, $M=.22$ ($SD=.17$).
- A Spearman's Rho correlation coefficient was calculated.
- No correlation was found between heart rate and gum chewing compared to the control of no gum present.
- After running a Mann Whitney test, there was no significance found between before gum and after gum in relation to heart rate.
- In relation to accuracy, there was also no significance found.

Discussion

Summary

- There was no significance in this study to support that gum affects heart rate when taking mathematics tests.

Limitations

- There was a small sample size of only $N=10$.
- Although gum was in the participants' mouths, it does not mean they chewed it.
- There were only 5 mathematics questions used.
- Scrap paper and pencils were not given to participants.
- There were only 2 males compared to 8 females.
- Mathematics questions were difficult so some participants might have just guessed on answers.

Future Research

- Have at least 25 participants with equal male to female ratio.
- Have more simple mathematic questions with more of them.
- Compare different types of gum to one another; some might not like just one flavor resulting in them not wanting to chew it.

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Effects of Self-Confidence as a Public Speaker on Physiological Response

Molly Smith



Introduction

- ❖ Daily stressors can impact emotional response and can cause an increase in reactivity to daily situations (Farmer & Kashdan, 2015).
- ❖ Hammen (2015) states that, "Current articles define stress or stressors...as naturally occurring daily stressors or momentary life experiences, and recent stressful life events..."
- ❖ Past research has supported that speaking in front of others causes an increase in physiological response (Farmer & Kashdan, 2015)
- ❖ In a past experiment, when people reported experiencing performance anxiety, they had a higher level of reaction to outside criticism rather than just doing a self-evaluation (Hook, Valentiner, & Connelly, 2011).
- ❖ In this same experiment, participants displayed slight increases in heart rate while partaking in the public speaking task (Hook, Valentiner, & Connelly, 2011)
- ❖ When presented with a public speaking task, participants that rated themselves with a lower public speaking self-confidence, prior to actually completing the task, will show an increase in heartrate as well as Galvin Skin Response.

Method

Participants

- ❖ $N=10$
- ❖ Female ($n=8$)
- ❖ Male ($n=2$)
- ❖ Average age was 18.9 years

Materials

- ❖ Biopac™ Electrocardiogram
- ❖ Personal Report on Self-Confidence as a Public Speaker Scale (PRCS)
- ❖ Galvin Skin Response

Procedure

- ❖ Prior to exposure to public speaking, each participant was asked to fill out a paper and pencil measure called the Personal Report of Self-Confidence on Public Speaking (PRCS) as well as demographic information.
- ❖ Each participant was asked to prepare a speech for one minute based on two prompted questions.
- ❖ The two questions asked were to describe how you are qualified for your dream job and to discuss neuropsychology based on what was learned this week. The participant was either given one minute or two minutes to execute their speech based on random assignment to the condition.
- ❖ While giving the speech, there were people present in the room with the participant.
- ❖ To measure heart rate, participants were hooked up to the Biopac™ electrocardiogram (ECG). A measure of Galvin Skin Response (GSR) was also recorded.

Results

Personal Report of Self-Confidence as a Public Speaker

$M=4.80$ $SD=3.48$

Heart rate

$M=99.19$ $SD=12.23$

Galvin Skin Response

$M=0.74$ $SD=0.16$

Correlations

			Personal Report of Confidence as a Speaker	Heartrate residual	Galvin Skin Response Residual
Spearman's rho	Personal Report of Confidence as a Speaker	Correlation Coefficient	1.000	-.238	-.372
		Sig. (2-tailed)	.	.508	.290
		N	10	10	10
Standardized Residual	Standardized Residual	Correlation Coefficient	-.238	1.000	-.479
		Sig. (2-tailed)	.508	.	.162
		N	10	10	10
Standardized Residual	Standardized Residual	Correlation Coefficient	-.372	-.479	1.000
		Sig. (2-tailed)	.290	.162	.
		N	10	10	10

- ❖ A Spearman's Rho correlation was calculated to examine the relationship between the Personal Report of Self-Confidence as a Public Speaker (PRCS) scale and heart rate during the task.
 - There was no correlation found ($r(8)=-.238$, $p=.508$)
- ❖ The correlation between the PRCS scale and Galvin Skin Response during the task was also examined.
 - There was no correlation found ($r(8)=-.372$, $p=.290$)
- ❖ The PRCS is not related to heartrate or Galvin Skin Response during a public speaking task.

Conclusion

- ❖ The hypothesis was disproven.
- ❖ No correlation was found between the PRCS and heart rate and the PRCS and Galvin Skin Response during the public speaking task.
- ❖ These results, however, are not generalizable because of the small sample size as well as a small age range between the students who participated in the task.
- ❖ If this experiment was to be redone, a larger sample size could give a better result due to a more diverse group of people as well as a larger data set to analyze.
- ❖ There were other tasks that were being done in conjunction with the present task which could have caused skewed results.
- ❖ In future studies, participants could be put into a more stressful situation while completely the public speaking task i.e. a larger audience to speak to, a more detailed public speaking task, or having zero prep time before hand.

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