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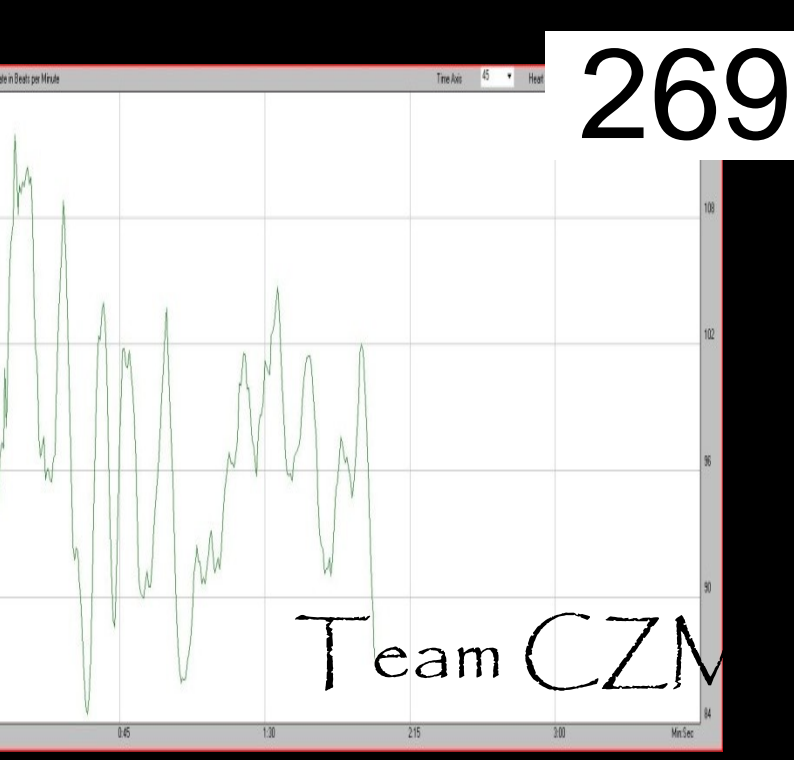
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# Does Gender and Marital Status Affect Student Anxiety in School?



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## Introduction

School related anxiety and stress is a common psychiatric issue for college students. In recent years, heart rate variability (HRV) has been utilized as a noninvasive and informative way to evaluate autonomic activity by recording electrocardiogram or pulse waves. In past studies, decreased autonomic responsiveness in correlation with task performance has served as a sign of psychological dysfunction (Shinba, 2008).

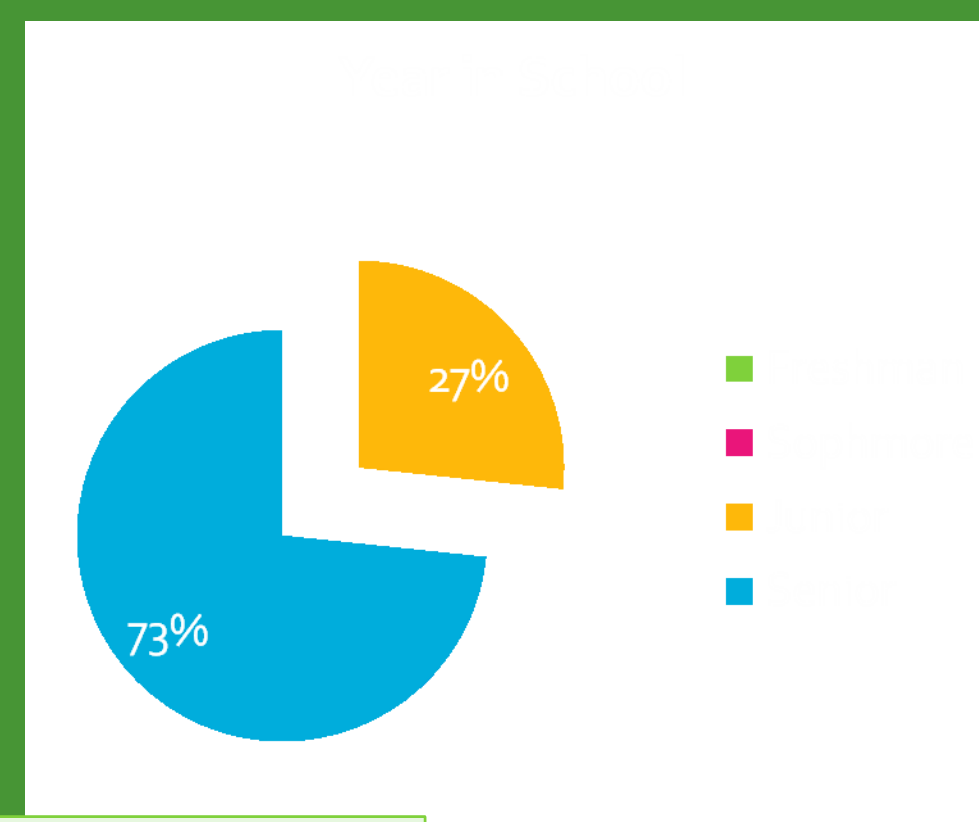
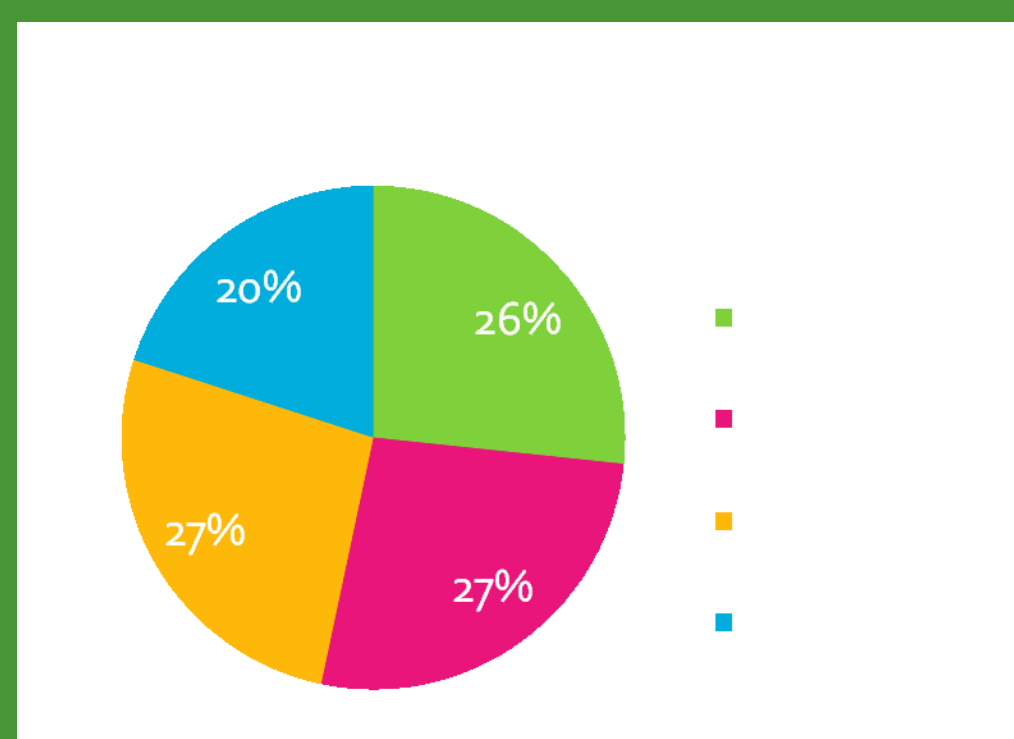
Gender studies have indicated that women are substantially more likely to develop stress disorders and exhibit higher levels of anxiety in clinical testing (McLean, 2009; MacSwain, 2009). Despite these various studies in gender, little research has been done to indicate differences in gender and marital status and school anxiety. We hypothesize that single women will experience the most dramatic decrease in HRV potentially indicative of higher levels of school anxiety

## HRV Explained

HRV is a biofeedback measure of the naturally occurring beat-to-beat changes in heart rate. The analysis of HRV, or heart rhythms, is a powerful, non-invasive measure of neurocardiac function that reflect heart – brain interaction and autonomic nervous system dynamics . This feedback was taken by means of a plethysmographic optical sensor placed at the fingertip and processed through emWave computer software.

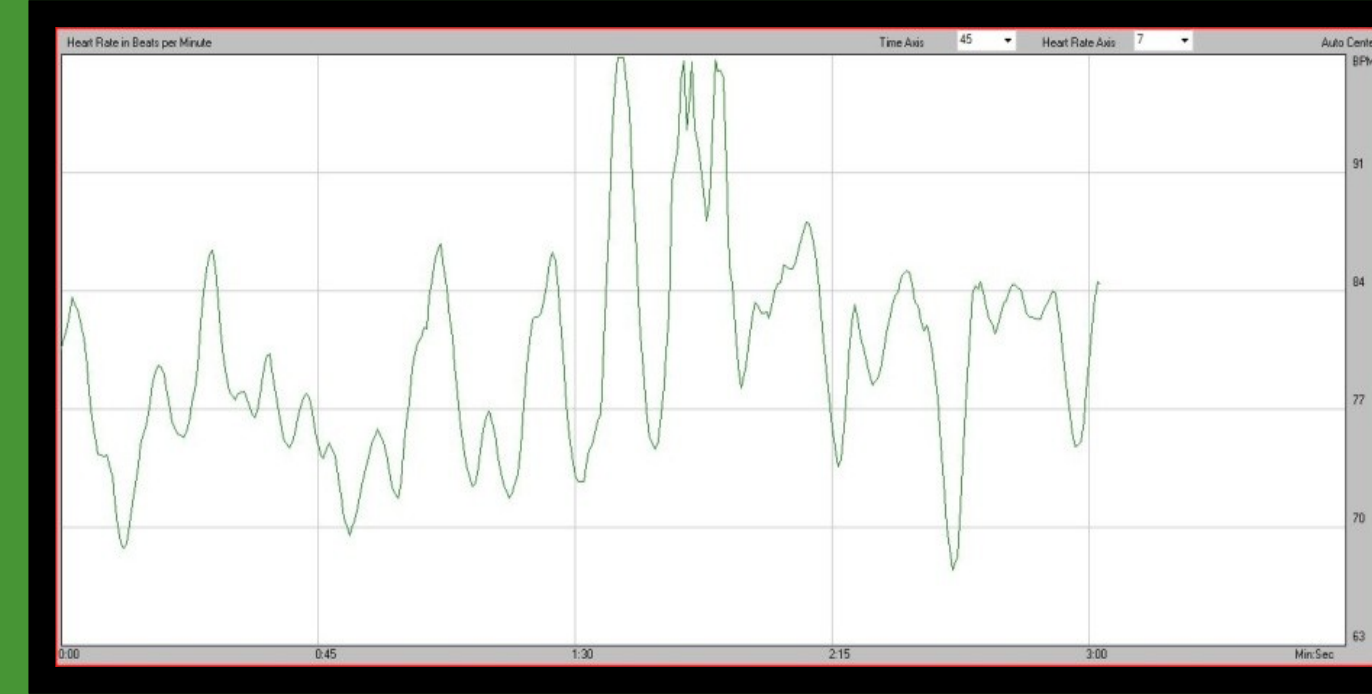
## Methods

Participants were recruited from Dr. Scott C. Steffensen's Psychology 370 class. There were 15 total participants: 4 married males, 4 married females, 4 single males and 3 single females. Participants were given a tutorial about how HRV measures physiological changes in the body. The sensor was attached to the pointer finger and participants were asked a series of eight neutral questions (T1) (e.g. What is your favorite color?) followed by six stress-inducing questions (T2) (e.g. What is your most difficult class right now?). We compared the variation in HRV from the neutral questions to the stress-inducing questions. Demographic information included gender, marital status, and year in school. All biofeedback data was extracted from emWave computer software. Alpha was set at .05.

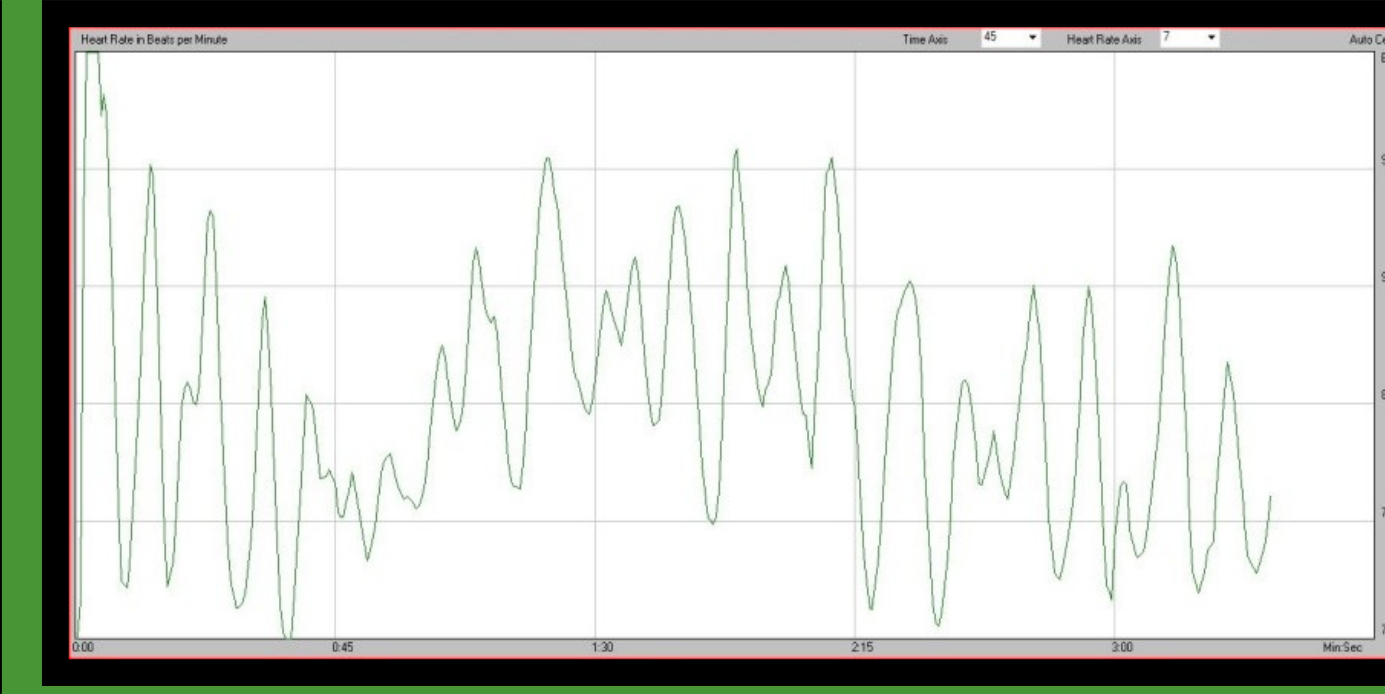


Ages ranged from 19-45 with a median of 22.

## Results



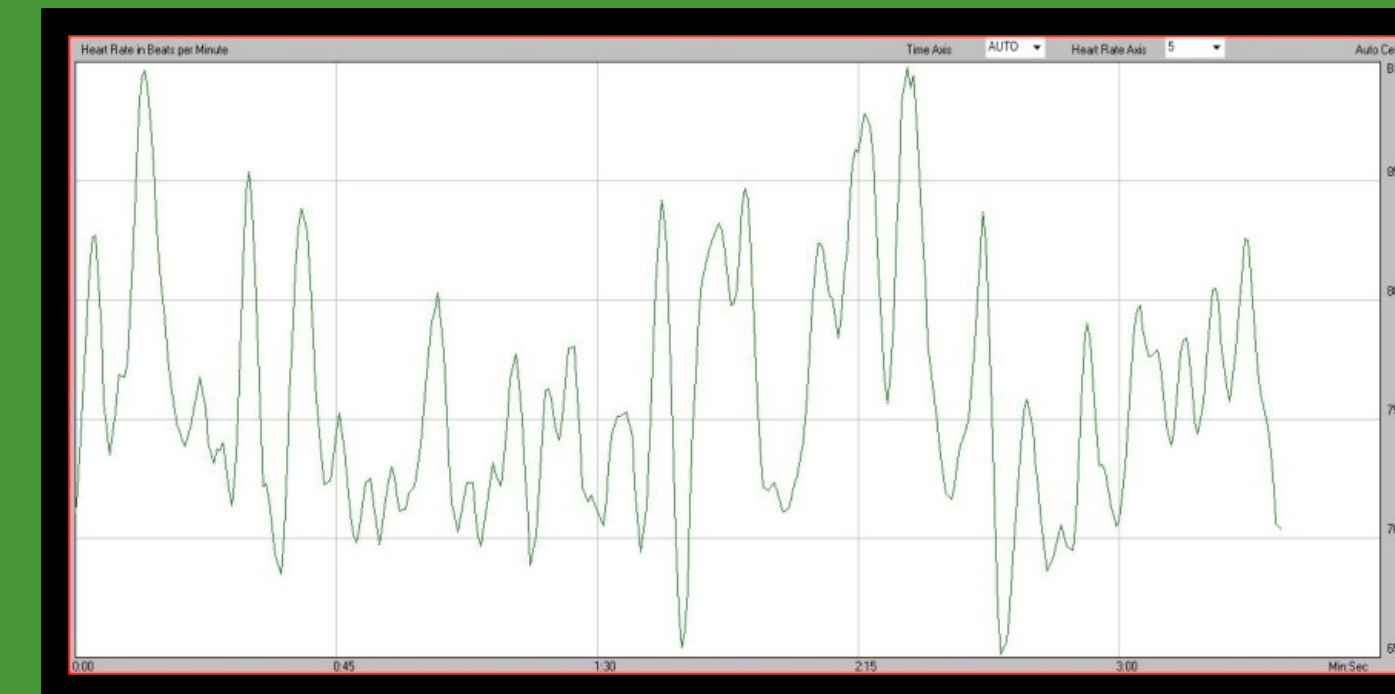
Single Females



Single Males



Married Females



Married Males

These graphs represent the HRV of the average participant, categorized according to gender and marital status.

We ran an ANOVA for the base heart rate which indicated that none of the groups were significantly different from one another. Another ANOVA was conducted on the average heart rate following stress-inducing questions. No significant results were discovered. A third ANOVA compared the average variation in T1 and T2 between all groups. The results of the third ANOVA are displayed to the upper right.

The one-way ANOVA (to the right) compared the base heart rate (T1) of married females and single females. No significance was discovered.

Descriptives						
Difference	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
married males	4	2.70	1.893	.946	-.20	5.76
single males	4	-1.00	.816	.408	-2.30	.30
married females	4	-2.00	2.445	1.225	-5.90	1.90
single females	3	-3.67	9.018	5.207	-26.07	18.74
Total	15	-.80	4.427	1.143	-3.25	1.65

Descriptives		ANOVA					
Difference	Minimum	Maximum	Sum of Squares	df	Mean Square	F	Sig.
single males	-2	0	193.417	11	17.583		
married females	-4	1					
single females	-13	5	274.400	14			
Total	-13	5					

ANOVA					
Base HR	Sum of Squares	df	Mean Square	F	Sig.
Within Groups	1058.667	5	211.733		
Total	1634.857	6			

## Discussion & Limitations

Despite between group variation of T1 and T2 no significant results were discovered. Visual representations of individual HRV depicts a trend from normal HRV waves (T1) to an increase of erratic waves and decreases HRV at (T2). Although this representation is demonstrated in almost all participants, software limitations disabled us from extracting and quantifying the data. Married males were the only group that demonstrated an increase in heart rate at T2. Nevertheless, the change was not significant.

Our conclusion differs from previous gender studies indicating a gender difference in anxiety response (Zihibin, 2008). We ascribe our contradicting conclusion to confounding variables.

In conducting our research, we recognized several limitations.

- (1) Due to undergraduate student time constraints sample size was small.
- (2) Participant homogeneity does not allow for generalization.
- (3) Participation time, question-response time, and participant preparation time was not held constant.
- (4) Student anxiety in school can be founded upon a variety of aspects. Stress-inducing questions at T2 may not have properly induced participant's anxiety in school.
- (5) Participants health was not taken into account.

As a result of these limitations future research assessing the gender, marital status and anxiety in school hypothesis is warranted.

## Acknowledgements

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MacSwain, K., Sherry, S., Stewart, S. (2009, December). Gender differences in health anxiety: an investigation of the interpersonal model of health anxiety. *Personality & Individual Differences*. 47(8), 938-43.

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